Phase II Environmental Site Assessment Report: Long Falls Paperboard, 161 Wellington Road, Brattleboro, Vermont (SMS #20184828)

PROJECT NO.

15-0015

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Executive Summary

This Phase II Environmental Site Assessment (ESA) Report has been prepared by Stone Environmental, Inc. (Stone) on behalf of the Vermont Department of Environmental Conservation (VT DEC), the Town of Brattleboro, Vermont, and the Windham Regional Commission (WRC) for the Brattleboro Development Credit Corporation (BDCC). This Phase II ESA has been prepared in accordance with the VT DEC Investigation and Remediation of Contaminated Properties Rule (IRule) dated July 6, 2019 and the approved Site-Specific Quality Assurance Project Plan (SSQAPP) dated July 13, 2019 as amended on August 13, 2019.

According to a Phase I ESA completed by Ramboll US Environ Corporation (2015 Ramboll), the Site has been in continuous use as a paper mill since it was originally developed in 1960 by Case Brothers which operated at the Site until 1967 at which time it was acquired by Boise Cascade. The facility was operated by Boise Cascade until 1989 when the name was changed to Specialty Paper Board, Inc, which ultimately was renamed as FiberMark, Inc. in 1998. FiberMark filed for bankruptcy in 2004 and reemerged under new ownership of Silver Point Capital in 2006 before subsequently being acquired by America Securities in 2008. The FiberMark business was sold to Neenah in 2015 and operated as Neenah until purchase by BDCC in December 2018. Upon purchase by BDCC, Long Falls Paperboard took over facility operations.

A number of environmental assessments have been performed at the Site, beginning as far back as 1989 and up to the Phase I ESA performed in December 2018 by LE Environmental (LEE). LEE's Phase I ESA identified twelve Recognized Environmental Conditions. This Phase II ESA was performed to address these RECs as well as potential impacts from the wastewater treatment plant lagoons.

Based on the results of the Phase II ESA, Stone has made the following conclusions:

1. No. 6 fuel oil from the pre-1990 release is still present in the subsurface, but not at concentrations high enough to impact sensitive receptors, e.g. downgradient groundwater or soil.
2. With the exception of methyl-tert-butyl ether (MTBE) detections in the facility production wells, there was no evidence of a gasoline release from former USTs, and no evidence of diesel fuel releases that are significantly impacting groundwater.
3. Historically detected chlorinated volatile organic compounds (cVOCs) in groundwater have naturally attenuated over time and there appears to be no on or off-site continuing source.
4. Per- and polyfluoroalkyl substances (PFAS) are present in some on-site soils and in groundwater, but at concentrations below current Vermont Soil Standard (VSS) and Vermont Groundwater Enforcement Standard (VGES) standards.
5. Vanadium is present in on-site surface and subsurface soils at concentrations exceeding the VSS Resident standard, but with the exception of the shallow soil sample collected from the wastewater treatment system lagoon holding basin, below VSS Non-Resident Standard.
6. Total lead, manganese and arsenic are present in on-Site groundwater at concentrations exceeding the VGES. Concentrations of these metals in groundwater may be elevated due to sample turbidity.

7. Poly-cyclic aromatic hydrocarbons (PAHs) are present along the railway (DU-2) and railway spur to the Site (DU-1), as measured by the calculated B(a)P-TEQ 95% UCL, at concentrations that exceed the VSS Resident standard, but that are below the VSS Non-Resident standard.
8. Dioxins, polychlorinated biphenyls (PCBs) and metals are present in the wastewater treatment system lagoon holding basin at concentrations that exceed the VSS Non-Resident standards. The vertical and horizontal extent of these exceedances are unknown.

An Evaluation of Corrective Action Alternatives (ECAA) should be prepared to assess remedial alternatives to prevent unacceptable exposure of contaminants to Site users. An ECAA will require the following additional assessment tasks:

1. Sampling of on-site groundwater for dissolved lead, manganese and arsenic in select on-Site groundwater monitoring wells.
2. Continued assessment, i.e. groundwater monitoring, of PFAS in groundwater.
3. Additional soil assessment to determine the vertical and horizontal extent of dioxin, PCB, and metals contamination related to the holding basin.
4. Assessment of soils to support soil management during construction activities associated with the proposed installation of a biomass heat plant, including potential underground biomass storage, and other Site improvements, as appropriate.

Upon completion of an ECAA and its approval by the VTDEC, a Corrective Action Plan (CAP) can be prepared.

Phase II Environmental Site Assessment Report: Long Falls Paperboard, 161 Wellington Road, Brattleboro, Vermont (SMS No. 2018-4828)

Cover Photo: Advancing hollow-stem augers at IP-08

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Title and Approval Page

Document Title
Phase II Environmental Site Assessment Report: Long Falls Paperboard Facility, Brattleboro, Vermont

October 14, 2019

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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.

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10/14/19

Signature Date

1. Introduction

This Phase II Environmental Site Assessment (ESA) Report has been prepared by Stone Environmental, Inc. (Stone) on behalf of the Vermont Department of Environmental Conservation (VT DEC), the Town of Brattleboro, Vermont, and the Windham Regional Commission (WRC) for the Brattleboro Development Credit Corporation (BDCC). This Phase II ESA has been prepared in accordance with the VT DEC Investigation and Remediation of Contaminated Properties Rule (IRule) dated July 6, 2019 and the approved Site-Specific Quality Assurance Project Plan (SSQAPP) dated July 13, 2019 as amended in an update letter dated August 13, 2019.

1.1. Site Description

The Site is located at 42°53'22.34" north latitude 72°32'234.28" west longitude and is situated on a 39.52-acre parcel of land located at 161 Wellington Road in Brattleboro, Vermont (Figure 1, Appendix A). A Site Vicinity Map is provided as Figure 2 in Appendix A. The Site includes an approximately 200,000-square foot paper manufacturing plant, an associated wastewater treatment plant and lagoons, and a sand filter house (Figure 3). The manufacturing facility is a concrete and metal structure with a partial basement and partial second floor. The facility was constructed in 1960, with several additions being constructed between the late 1960s and late 1990s. The wastewater treatment plant is composed of a clarifier that discharges liquids to four aerated treatment lagoons which were installed circa 1972; there is also an emergency lagoon located to the southwest and in-line with the four lined lagoons and it is believed that this is an unlined lagoon. The purpose of the emergency lagoon is to provide storage for contaminated liquid wastewater if the clarifier building receives input of toxic materials that would risk a die-off of the bacterial colonies of the main lagoons. Liquid effluent from the lagoons is discharged to the Connecticut River. Solids from the clarifier and lagoons are transported off-site. The sand filter house is a single-story structure constructed of cement blocks and contains a disinfection system. This building was constructed in 1996 to treat process water from the Connecticut River prior to use in the manufacturing facility.

The Site is generally flat and is situated on an alluvial terrace of the Connecticut River, and is zoned for industrial use. Process water for the plant is pumped primarily from the Connecticut River; the plant is also served by two on-site backup process water supply wells installed in the overburden (i.e., not drilled in to bedrock) in the southern corner of the site and are indicated as "Shallow Well" and "Deep Well" on Figure 3. The facility is also serviced by the municipal public water system. The bathrooms and laboratory are served by an on-site septic system located to the northwest of the wastewater treatment plant lagoons.

The Site is bound to the east by the Connecticut River, to the north by an undeveloped woodland, to the south by an electrical substation and Wellington Road, and to the west by several commercial properties, including: the BDCC Business Park, Suburban Propane, C&S Wholesale Grocers, and now closed Windham Solid Waste Management District (SWMD) Landfill.

1.2. Site History

According to a Phase I ESA completed by Ramboll US Environ Corporation (2015 Ramboll), the Site has been in continuous use as a paper mill since it was originally developed in 1960 by Case Brothers which operated at the Site until 1967 at which time it was acquired by Boise Cascade. The facility was operated by Boise Cascade until 1989 when the name was changed to Specialty Paper Board, Inc, which ultimately was renamed as FiberMark, Inc. in 1998. FiberMark filed for bankruptcy in 2004 and reemerged under new ownership of Silver Point Capital in 2006 before subsequently being acquired by America Securities in 2008. The FiberMark business was sold to Neenah in 2015 and operated as Neenah until purchase by BDCC in December 2018. Upon purchase by BDCC, Long Falls Paperboard took over facility operations.

1.3. Prior Environmental Investigations

1.3.1. 1989 – 2015 Various Environmental Assessments, Phase I ESAs and Environmental Compliance Reviews

Several environmental assessments, including Phase I ESAs and Limited Environmental Compliance Reviews, were performed on behalf of the owner and/or operator of the facility, the earliest available of which was performed in 1989 and the most recent in 2015. These assessments have been generally referenced in each subsequent assessment, including LEE's 2018 Phase I ESA, so the results of those assessments are not individually summarized. The available assessments include:

- Boise Cascade Corporation, Environmental Compliance Audit, Pressboard Products Mill, Brattleboro, Vermont, performed by C-E Engineering, May 1989
- Phase I ESA, Limited ACM and SVM Survey and Regulatory Compliance Review, FiberMark, performed by Tighe & Bond, November 2007
- Phase I Environmental Site Assessment and Limited Environmental Compliance Review of FiberMark, Inc., prepared by ENVIRON International Corporation, December 2007
- Phase I Environmental Site Assessment, FiberMark, prepared by Clayton Group Services, Inc., September 2003
- Phase I Environmental Site Assessment and Limited Environmental Compliance Review, FiberMark North America Inc., prepared by Ramboll Environ US Corporation, June 2015

1.3.2. 1990 – 1994 No. 6 Fuel Oil Release Investigation Reports

In February 1990, two 25,000-gallon underground storage tanks (USTs) containing No. 6 fuel oil USTs were excavated and removed from the property. Griffin International, Inc. (Griffin) performed an initial site investigation in 1990 and follow-up monitoring in 1994, recommending that the Site be considered for a Site Management Activities Complete (SMAC) designation, which was reportedly granted in 1994. Available documentation includes:

- Report on the Investigation of Subsurface Petroleum Contamination, Specialty Paperboard, Brattleboro, Vermont performed by Griffin International, Inc., July 1990
- Report on August 1994 Groundwater Sampling and Analysis for Specialty Paperboard, Brattleboro, Vermont performed by Griffin International, Inc., October 1994.

1.3.3. LE Environmental Phase I ESA, December 2018

LEE completed a Phase I ESA on December 12, 2018 of the Neenah Paper Manufacturing facility on behalf of the BDCC (2018 LEE). The Phase I was performed using the *Standard Practice for Environmental Site*

Assessments: Phase I ESA Assessment Process, published by ASTM International as Standard Practice E1527-13. The Phase I was performed as part of environmental due diligence in anticipation of purchasing the property. The Phase I ESA revealed no evidence of RECs in connection with the property, except for the following:

1. Documented No. 6 fuel oil release (historical REC and REC) due to leaking USTs.
2. Potential petroleum contamination due to diesel and gasoline USTs removed in 1988.
3. Use of the property for paper manufacturing for 58 years, which may have resulted in soil, groundwater and/or soil vapor contamination. Potential contaminants of concern include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, dioxin, and perfluorinated chemicals (PFCs).
4. Potential chemical and petroleum discharge to basement floor sumps and underground piping of unknown integrity possibly resulting in releases via piping breaches.
5. Visible and potential releases from equipment in the storage yard.
6. Potential for subsurface contamination due to an abandoned drum.
7. Filled area at the north end of the property with undocumented fill materials.
8. Windham Solid Waste Management District (SWMD) landfill documented and potential influence on the property's groundwater quality (Controlled REC).
9. Potential soil and groundwater contamination from the active septic system north of the mill.
10. Potential soil and groundwater contamination from the unused septic system east of the mill.
11. Potential contamination in connection with the active rail line adjoining the west side of the facility.
12. Potential releases of hazardous substances and/or petroleum products from the historical printing press adjoining the property to the west.

LEE made the following recommendations further assessment to determine whether these RECs constitute an actual release to the environment:

1. The Phase II ESA should include soil, groundwater and soil gas testing. Chlorinated VOC (CVOC) detections in groundwater at 70-foot depth suggest there is a source of CVOCs in the nearby soils.
2. Groundwater monitoring wells from the previous site investigation may be present beneath the pavement. These wells were 70-80 feet deep and in light of the cost of replacement, a geophysical survey to attempt to locate the buried wells might be cost effective.
3. Groundwater beneath the northern portion of the property in the Class IV zone is non-potable and its investigation may be less of a priority than elsewhere on the property. The contents of the fill area should be evaluated via backhoe test pits to determine if hazardous substances and/or petroleum products are present and whether there is soil contamination.
4. A video evaluation of the basement sump and piping system could provide useful information on the condition of the piping and whether there are breaches that should be evaluated for soil contamination.

1.3.4. Weston & Sampson Limited PFAS Sampling – December 2018

On December 12, 2018, Weston & Sampson (W&S) collected a sample of wastewater treatment plant biosolids and submitted it for per- and polyfluoroalkyl substances (PFAS) analysis as well as synthetic precipitation leaching procedure (SPLP) for PFAS (2018 WSE). W&S also collected groundwater samples from the two on-Site facility production wells and liquid samples of the wastewater treatment plant effluent and lagoon liquids and submitted them to a laboratory for PFAS analysis. PFASs were not detected in the biosolids sample, however, Perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA) and perfluorooctanesulfonic acid (PFOS) were detected in the biosolids SPLP analysis sample above the method detection limit, but below the method reporting limit, at estimated concentrations of 6.19 nanograms per liter (ng/L), 4.00 ng/L and 4.11

ng/L, respectively. Perfluorooctanoic acid (PFOA) and PFOS were detected in the wastewater treatment plant effluent sample at concentrations of 2.59 (estimated) and 17.1 ng/L, respectively. PFBA, perfluorohexanoic acid (PFHxA) and PFOS were detected in the liquid sample collected from the lagoon at concentrations of 4.13 ng/L (estimated), 8.02 ng/L and 10.2 ng/L (estimated), respectively.

1.4. Prior Environmental Investigations – Adjacent Properties

Stone reviewed files available on the VT Environmental Research Tool to evaluate potential contamination from nearby off-site sources. Stone reviewed the following sites which are all located to the north-north west of the Site.

1.4.1. Former The Book Press, Putney Road, Brattleboro, Vermont, SMS No. 93-1461

The former The Book Press property is located off the southwestern property boundary across and adjacent to the railroad tracks and as of the date of this Phase II ESA report, is currently owned by BDCC. As reported by Environmental Services of America, Inc. (ESA) in their 1994 Environmental Site Investigation Report for Quebecor Printing Book Press on Putney Road, five USTs were excavated and removed from the property in 1992. The five USTs were used to store diesel, naphtha, kerosene, alcohol and gasoline. Soil screening using a photoionization detector (PID) indicated a release of product from the naphtha and gasoline USTs. Soils in former naphtha and gasoline UST areas were further assessed in 1993; volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs), including naphthalene, were not detected in the subsurface soil samples. VTDEC subsequently issued a SMAC letter on April 5, 1994. It is not anticipated

The former The Book Press property was noted as a REC in the LE Phase I ESA for the potential for VOCs and metals, if released, potentially migrating onto the Site. This REC is addressed in this Phase II ESA report.

1.4.2. Melsur Corporation, 239 Old Ferry Road

In October 2005, a 10,000-gallon fuel oil UST reportedly in fair condition was removed from the former Melsur Corporation property located at 239 Old Ferry Road, located to the northwest of the Site, adjacent to the Windham SWMD landfill. Petroleum contamination appeared isolated to an area surrounding the UST fill pipes. The VT DEC subsequently issued a SMAC letter in December 2005. Based on the information contained in the SMAC letter, there is likely no impact to the Site due to a release from this former UST.

1.4.3. Former Vantem Panels Property, SMS No. 2013-4372

In February 2013, it was discovered that a 275-gallon kerosene aboveground storage tank (AST) had leaked to the ground surface and the adjacent concrete building foundation. Five 55-gallon drums (roughly 1.5 cubic yards) of surface and subsurface soils were excavated and transported off-site for disposal. In 2017, VTDEC issued a SMAC letter after confirmation of drum disposal and a filing of a Notice to Land Records indicating the presence of at-depth petroleum contamination were provided. Based on the presumed depth to groundwater (> 50 feet) at the release location and distance relative to the site, it is unlikely that this release would impact the Site.

1.4.4. C&S Wholesale, 54 O'Bryan Drive, SMS No. 2009-3895

Three diesel USTs (2,000, 10,000 and 12,000 gallons in capacity) – located on the western side of the main C&S Wholesale building, were removed in November 2008. Approximately 300 – 400 cubic yards of petroleum impacted soils were removed, but post-excavation confirmation sampling indicated total petroleum hydrocarbons remaining as high as 7,500 parts per million (ppm). A Notice to Land Records (NTLR) indicating the presence of diesel fuel oil-related compounds remaining at the site was filed with the Town of Brattleboro in April 2009 and VTDEC issued a SMAC letter in May 2009.

1.4.5. C&S Wholesale Grocers, Old Ferry Road, SMS No. 92-1258

In the First Letter dated July 1992, three 10,000-gallon gasoline USTs and one 1,000-gallon oil UST were removed from the property Approximately 3,850 cubic yards of contaminated soil were removed and stockpiled at an off-site location. There was no follow-up investigation performed, with the exception of screening subsurface utilities for organic vapors using a PID which revealed 'no detectable vapors' according to the consultant's report. Groundwater is greater than 70 feet below ground surface (bgs). Priority of the site is listed as LOW and there is not closure date on the Vermont Environmental Research Tool, so it is presumed that this site has not been closed by VTDEC.

2. Methods

Phase II ESA field work was performed by Stone between July 22 and July 24, 2019 and August 14 and August 30, 2019. Field notes and soil boring logs are provided as Appendix B. Drilling locations were marked for DigSafe utility clearance prior to advancing soil borings and installing groundwater monitoring wells. Vermont Underground Locators provided mark-out of private Site utilities in the proposed subsurface investigation locations.

2.1. Initial Site Activities

Stone prepared a Site-specific health and safety plan and participated in on-site training and orientation by Long Falls Paperboard.

Stone performed demarcation of sample locations for Dig-safe utility clearance on July 17, 2019. Stone assessed the condition of previously installed groundwater monitoring wells on July 17, 2019. Monitoring wells MW-9, MW-10, MW-11, MW-12, and MW-13 could not be located using a sub-meter GPS and magnetic locator; they are presumed destroyed. MW-1, MW-3, MW-4, and MW-16 were each found. MW-1 was dry to a depth of 72.1 feet. MW-3 has a total depth of 72 feet and was also found to be dry. MW-4 was found to be 83 feet deep with a depth to water of 80 feet. MW-16 was found to be 68 feet deep and contains approximately 1 foot of heavy petroleum non-aqueous phase liquid (NAPL). Due to lack of groundwater in MW-1 and MW-3, minimal groundwater observed in MW-4 and product observed in MW-16, it was determined that these wells would not be redeveloped for future sampling. Wells downgradient of the Windham SWMD landfill MW-5, 6 & 7 were located, however, MW-5 was found to be on the southeast side of the field, generally in line with MW-6 & 7. The formerly labeled MW-5 was found to be a landfill vapor well, similar to the others.

Due to the density of plant-owned underground infrastructure at the Site, Stone subcontracted and oversaw geophysical survey at the Site by Vermont Underground Locators (VUL) clear each proposed location. Several locations, due to their proximity to buried and/over overhead utilities required relocation. VUL performed geophysical survey of each proposed investigation location using a ground penetrating radar on July 22, 2019.

2.2. SSQAPP Deviations

Due to subsurface conditions, specifically the presence of coarse gravel and cobbles at the Site, deep soil cores and monitoring wells were performed using hollow-stem augur with split spoon sampling. The need for this alternative method was identified during the initial site investigation work between July 22 and July 24 and an amendment to the SSQAPP was submitted and approved on August 13, 2019.

The following deviations to the SSQAPP were encountered during the completion of Phase II ESA field work.

1. Due to the depth and severity of the slope, the bank of the Connecticut River could not be safely accessed; therefore, a staff gauge was not installed and groundwater elevations observed during execution of this Phase II ESA were not compared to the surface water elevation of the Connecticut

River. The lack of a staff gauge surveyed to the same datum prevents the comparison of hydraulic head within the monitoring well network to the Connecticut River.

2. Stone was unable to locate the local survey benchmark noted on Sheet 1 of 2 titled "ALTA / ACSM Land Title Survey" of the Boise Cascade Corp. Facility and therefore, monitoring well top of casing elevations are referenced to an arbitrary benchmark of 100 feet. This deviation does not affect the findings or conclusions of the Phase II ESA.
3. Three additional soil borings (IP-22 through IP-24) were performed to assess potential buried solid wastes in the northeastern corner of property. These borings were added to provide better special coverage due to observations by Stone field staff that solid wastes, including asphalt and concrete rubble, was visible at the surface in these areas. This deviation provides additional clarity on the content of buried waste area.
4. Groundwater samples collected for metals analyses that exhibited greater than 10 NTUs of turbidity were not field filtered.
5. A trip blank for VOC analysis was provided in the cooler shipment on July 24, 2019 but was inadvertently left off of the chain-of-custody and was therefore, not analyzed. This does not impact the usability of the results as discussed in Section 3.6.
6. Stressed vegetation was not observed in the area of planned IP-14 (near the active leach field); IP-14 was subsequently moved to immediately above the center of the active leach field. This deviation does not have an adverse impact on the interpretation of the results.
7. The wastewater treatment lagoons were not accessible during this Phase II ESA and there was no lagoon sludge on-site; therefore, sludge samples were instead collected off of the wastewater treatment system clarifier. This deviation is not expected to have an effect on the interpretation of the results.

2.3. Soil Assessment

Subsurface and surface soil assessment was performed as part of this Phase II ESA as presented in the following subsections. All soil boring locations were located using a Global Positioning System (GPS) capable of sub-meter horizontal accuracy

Between July 22 and July 23, Stone oversaw the advancement of ten stand-alone soil borings using a Geoprobe 7822 DT and closed-piston, direct push tooling (i.e., Geoprobe MC5) at investigation locations IP-12, 13, 15 and 18 through 24 (Figure 3). Soil cores were recovered in dedicated, disposable acetate sleeves using a closed piston corer (MC5). Tooling was advanced in five-foot intervals to refusal, except where the objective of the boring was achieved prior to refusal. Nine additional borings were performed using 4.25-inch hollow-stem augers and subsequently converted to be groundwater monitoring wells (see Section 2.4). Table 1, below, summarizes soil borings performed at the Site, their associated area of concern, terminal depth, sample depth(s) and sample analytical parameters.

Soil borings were logged by a Stone field geologist for texture, color, moisture content, visual or olfactory evidence of contamination, and VOCs using a handheld photoionization detector (PID) equipped with a 11.6 eV lamp. The PID was calibrated at the beginning of each day in accordance with Stone SOPs. Soil sample intervals were selected based on visual, olfactory, or PID evidence of contamination. Soil boring logs are included in Appendix B.

Table 1: Summary of Soil Borings & Samples

Soil Boring ID	Area of Concern	Total Depth (ft bgs)	Sample Depths (ft bgs)	Analytical Parameters
IP-01	Presumed downgradient of basement area with floor drains, adjacent to loading dock.	75	None	None
IP-02	Presumed downgradient of former clarifier and basement area.	75	66	VOCs, SVOCs, TAL Metals + Cn
IP-03/3a	Within former fuel oil release area and presumed downgradient of current maintenance shop.	75	70.5	VOCs, SVOCs, TAL Metals + Cn
IP-04	Presumed downgradient of northern portion of plant	75	None	None
IP-05	Adjacent sludge storage area, stormwater DI.	75	11.0	VOCs, SVOCs, TAL Metals + Cn, Dioxins, PCBs, PFAS
IP-06/6A	Within and adjacent to overflow lagoon.	80	0.5	VOCs, SVOCs, TAL Metals + Cn, Dioxins, PCBs, PFAS
IP-07	Presumed downgradient of former fuel release	75	66.5 / 71.0	VOCs, SVOCs, TAL Metals + Cn
IP-08	Presumed downgradient of active lagoons	85	None	None
IP-12	Assess former leach field	18.1	7.5 / 11.0	VOCs, SVOCs, TAL Metals + Cn, PCBs, PFAS
IP-13	Assess former leach field	42.4	7.5 / 10.5 / 13.0	VOCs, SVOCs, TAL Metals + Cn, PCBs, PFAS
IP-15	Assess current leach field	8.5	6.0 / 7.0 / 8.0	VOCs, SVOCs, TAL Metals + Cn
IP-16	Assess potential upgradient sources in groundwater.	75	None	None
IP-18	Assess former solid waste disposal area.	8	None	None
IP-19	Assess former solid waste disposal area.	8	None	None
IP-20	Assess former solid waste disposal area.	8	None	None
IP-21	Assess former solid waste	8	None	None

Soil Boring ID	Area of Concern	Total Depth (ft bgs)	Sample Depths (ft bgs)	Analytical Parameters
	disposal area.			
IP-22	Assess former solid waste disposal area.	8.5	None	None
IP-23	Assess former solid waste disposal area.	8	None	None
IP-24	Assess former solid waste disposal area.	8	None	None

Abbreviations: bgs – below ground surface; VOCs – volatile organic compounds, PFAS – poly- and perfluoroalkyl substances; TAL Metals – target analyte list metals; Cn – cyanide; SVOCs – semi-volatile organic compounds; PCBs – polychlorinated biphenyls;

Soil samples were collected in accordance with Stone's SOPs, placed in an ice filled cooler and submitted under chain-of-custody protocol to NELAP-accredited Alpha Analytical's (Alpha's) Westboro, Massachusetts laboratory for analysis. Samples for dioxins and PFAS analyses were transported by Alpha to their NELAP-accredited Mansfield, Massachusetts laboratory for analysis. Quality assurance/ quality control (QA/QC) samples included field duplicates collected at a 5% frequency, one trip blank per sample shipment containing samples for VOC analysis, and one field blank per shipment containing samples for PFAS analysis. Analytical methods for soil samples submitted for parameters noted in Table 1 included the following EPA Methods:

- VOCs – 8260C;
- SVOCs – 8270D and 8270D-SIM[1];
- Dioxins – 8290A;
- PCBs – 8082A;
- PFAS – 537(M);
- Metals (23 TAL and cyanide) – 6010D, 7471B, and 4500CN-CE;

2.3.1. Surface Soil Sampling

Surface soil was evaluated at locations IP-11, 14 and 17. Soils were inspected for visible indications of a release and field screened using a PID.

No evidence visual, olfactory or other evidence of a release was observed at IP-17, located at the "sartomer drum" and therefore, no sample was collected for laboratory analysis. The drum was partially filled with concrete and concrete rubble was observed adjacent to the drum. Based on this observation, it is Stone's opinion that this drum was used to contain concrete refuse.

Stone inspected the equipment storage area (IP-11), located southeast of the wastewater lagoons. The equipment storage area was much smaller in size than originally thought. Note that this area was covered in snow during the Phase I ESA site inspection in November 2018 and a site visit by Stone in January 2019 and it

[1] For benzo(a)pyrene, and dibenzo(a,h)anthracene only.

was not known at that time that this area was paved. The equipment storage is located on asphalt pavement, and oily releases to the pavement appeared to be contained to the asphalt. At locations where precipitation would run off the pavement, surficial soils were inspected and field screened; there was no visual or olfactory evidence of contamination and no PID readings above background, therefore, no samples were collected.

A discrete sample for analysis was collected at IP-14, associated with the active leach field, which was moved from the planned location as noted in Section 2.2. The sample was collected into laboratory-supplied glass ware from 0.5 ft bgs after removing sod using a hand trowel and submitted for laboratory analysis of VOCs, semi-volatile organic compounds (SVOCs), total analyte list (TAL) metals and cyanide (Cn).

To evaluate soil quality adjacent to the railroad line for polycyclic aromatic hydrocarbons (PAHs) and herbicides, Stone completed an assessment of surface soil using incremental sampling methodology (ISM) in two decision units (DUs). DUs are presented on Figure 3 and include:

- DU1: along the Site rail spur off the northern corner of the manufacturing facility.
- DU2: along the adjacent rail corridor along the northwestern boundary of the Site.

Each ISM sample consisted of soil from a minimum of 30 grid-based increments. Hand tooling was used to remove topsoil and vegetation at each ISM increment location and to collect soil from the 0.0-0.5 ft bgs interval. This sampling procedure was repeated at three locations (A, B, and C) per increment, following a randomized sampling strategy, in order to generate three replicates of the ISM sample.

To collect each ISM replicate, approximately 90 grams of soil was collected from each increment location and placed in dedicated aluminum trays. Separate aluminum trays were used for each of the three replicates within each DU. Once all increments had been sampled and soil aliquots placed in the aluminum trays, soil was mixed, subsampled, and placed in sample containers in accordance with Stone SOPs. A key aspect of ISM is to provide the laboratory with only enough sample that is required for extraction and analysis. In this manner, potential bias resulting in the settling of grain sizes within the sample jar during transport is limited. Subsampling was conducted by spreading the mixed soil to uniform thickness across the aluminum trays, dividing the trays into 30 equally sized grid squares, and placing approximately 3 grams of soil from each grid square into the sample container for the replicate. An electronic field balance was used to weigh the proper amount of soil from each increment and from each subsample grid square. Duplication is inherent in ISM; therefore, field duplicates were not collected. Samples were submitted to Alpha for PAHs and herbicides.

All soil samples were placed in ice-filled coolers and transported via same-day currier under chain of custody protocols to NELAP accredited Alpha's Westboro, Massachusetts laboratory for analysis. Samples collected for dioxins, PFAS and metals were subsequent transported by Alpha to their NELAP accredited laboratory in Mansfield, Massachusetts for analysis. Quality assurance/ quality control (QA/QC) samples included field duplicates collected at a 5% frequency and 1 trip blank per sample shipment containing VOC or PFAs samples.

Analytical methods for surface soil samples included the following EPA Methods:

- VOCs – 8260C;
- SVOCs – 8270D and 8270D-SIM[2];
- PCBs – 8082A;
- Metals (23 TAL and cyanide) – 6010D, 7471B, and 4500CN-CE;
- PAHs – 8270D, and 8270D-SIM[2]; and
- Herbicides – 8151A

2.4. Groundwater Assessment

To assess whether past Site practices have adversely affected groundwater quality, Stone utilized two existing groundwater production wells and oversaw the installation of nine new groundwater monitoring wells. Groundwater monitoring wells were installed under the direction of a Stone field geologist by Drilex Environmental (Drilex) of Auburn, Massachusetts. Wells were constructed within 4.25-inch inner-diameter hollow stem augers advanced to at least 5 feet below the potentiometric surface, using new, 2-inch diameter PVC well screen with 0.010 machine-slotted screen interval and sufficient riser to reach the ground surface. A sand pack, consisting of #1 silica sand, was installed within the annular space to approximately 2 feet above the screened interval. The screen and sand pack were sealed from meteoric input using approximately 2 feet of bentonite chips. The remaining annular space was backfilled with cuttings generated during the drilling of the associated bore hole. Wells were completed with 5- or 7-inch diameter flush-mount road boxes set within a concrete pad. Table 2, below, includes a summary of each well installed and its construction details.

Table 2: Summary of Groundwater Monitoring Wells

ID	Total Depth (ft bgs)	Top of Screen Interval (ft bgs)	Top of Sand Pack (ft bgs)	Top of Well Seal (ft bgs)	Analytical Parameters
IP-01	75.0	65.0	63.0	61.0	VOCs, SVOCs, TAL Metals + Cn, PFAS
IP-02	75.0	65.0	63.0	61.0	
IP-03	75.0	65.0	63.0	61.0	
IP-04	75.0	65.0	63.0	61.0	
IP-05	75.0	65.0	62.5	59.5	VOCs, SVOCs, TAL Metals + Cn, PFAS, Dioxins, PCBs
IP-06	80.0	70.0	67.4	64.9	
IP-07	75.0	65.0	63.0	61.0	VOCs, SVOCs, TAL Metals + Cn, PFAS
IP-08	82.0	72.0	70.0	68.0	
IP-16	75.0	65.0	62.5	60.5	VOCs, TAL Metals + Cn

Abbreviations: bgs – below ground surface; VOCs – volatile organic compounds, PFAS – poly- and perfluoroalkyl substances; TAL Metals – target analyte list metals; Cn – cyanide; SVOCs – semi-volatile organic compounds; PCBs – polychlorinated biphenyls;

Upon installation, Stone developed each well using a Waterra Hydrolift-2 to simultaneously surge and purge groundwater. Dedicated 5/8-inch outer diameter high density polyethylene (HDPE) tubing and a stainless-

[2] For benzo(a)pyrene, and dibenzo(a,h)anthracene only.

steel check valve were used for each well. Wells were developed until purge water was visibly clear of sediment. All purge water was contained within two 55-gallon drums.

On August 29 and 30, 2019, one week following installation, Stone collected groundwater samples from each well using low-flow (slow purge) methods in accordance with Stone SOPs. Due to the depth to water, Stone used a 1.5-inch diameter stainless steel bladder pump equipped with dedicated HDPE bladders and ¼-inch tubing. Effluent from the wells was routed via a flow-through cell to a calibrated, multi-parameter water quality sonde equipped with sensors for pH, specific conductance, temperature, dissolved oxygen [DO], oxidation reduction potential [ORP]) and turbidity. Total volume purged was recorded using a graduated cylinder. Each well was purged until the following parameters stabilized:

- pH ± 0.1 unit
- Specific Conductance ±3%
- ORP ± 10 mV
- DO ± 10%, or 3 consecutive readings below 0.5 mg/L
- Temperature ± 3%
- Turbidity ± 10%, or 3 consecutive readings below 5.0 nephelometric turbidity units (NTU)

Prior to purging each well, the depth to groundwater from top of casing was measured with a groundwater interface probe. Upon stabilization, samples were collected in accordance with Stone SOPs. Groundwater monitoring well top of casing were surveyed using a total station versus an assigned Site datum.

On July 23, 2019, grab samples were collected from the two groundwater production wells located in the southern corner of the site. Samples were collected from a hose spigot near where the water from each well enters the manufacturing facility. Each well was allowed to purge for thirty minutes before collecting samples. Sample were collected and submitted for VOC, SVOC, PFAS, and TAL Metals plus Cn analyses. On August 29, 2019, additional sample volume was collected in the same manner for low-level SIM procedure for 1,4-dixoane analysis.

All groundwater samples were collected into laboratory supplied bottle ware, placed in an ice-filled cooler, and shipped under chain of custody protocols to NELAP-accredited Alpha's Westboro, Massachusetts laboratory for analysis. Samples collected for dioxins, PFAS and metals were transported by Alpha to their NELAP accredited laboratory in Mansfield, Massachusetts for analysis.

Quality assurance/ quality control (QA/QC) samples included field duplicates collected at a 5% frequency, 1 trip blank per sample shipment containing VOC or PFAs samples, 1 field blank per day of PFAS sampling, and 1 equipment blank sampling from groundwater sampling equipment for PFAS analysis. Analytical methods for groundwater samples include the following EPA Methods:

- VOCs – 8260C;
- 1,4-Dioxane – 8270D GS/MS-SIM;
- SVOCs – 8270D, and 8270D-SIM
- Dioxins/ Furans – 8290A;
- PCBs – 8082A;
- PFAS – 537(M); and
- Metals (23 TAL and cyanide) – 6010D, 6020B, 7470A, and 9010C/9012B

2.5. Wastewater Treatment System Sludge Assessment

To evaluate potential contaminants in the sludge generated in the wastewater treatment system per VT DEC's request, Stone collected a grab sample of the sludge as it came off of the wastewater treatment system clarifier on July 23, 2019. The single sample was collected in laboratory supplied bottle ware and in accordance with Stone's SOPs. The sludge sample was placed in an ice-filled cooler and transported via currier under chain of custody protocols to NELAP accredited Alpha's Westboro, Massachusetts laboratory for analysis. Samples collected for dioxins, PFAS and metals were subsequently transported by Alpha to their NELAP accredited laboratory in Mansfield, Massachusetts for analysis. Analytical methods for the lagoon sludge sample include the following EPA Methods:

- VOCs – 8260C;
- SVOCs – 8270D, and 8270D-SIM
- Dioxins/ Furans – 8290A;
- PCBs – 8082A;
- PFAS – 537(M); and
- Metals (23 TAL and cyanide) – 6010D, 7471B, and 4500CN-CE

Additional sludge sample volume was collected on August 20, 2019 and submitted for Synthetic Precipitation Leaching Procedure (SPLP) extraction. The extract was analyzed for PFAS and also underwent a Total Oxidizable Precursor (TOP) Assay to mimic biotransformation of polyfluorinated perfluoroalkyl acids (PFAA) precursors into PFAAs; the subsequent aliquot was also be analyzed for PFAS.

2.6. Maintenance Area Drain Assessment

On July 24, 2019, the floor drain in the maintenance bay area was dye tested to aid in determining its discharge location. Red dye initially used was not observed in any basement trenches or drains, catch basins, or the clarifier. Green dye was then applied and no dye was observed in the catch basins or the clarifier after a short period of time. On the morning of July 25, 2019, facility personnel observed green dye in basement process water trench, indicating that the maintenance area floor drain discharges there. Facility personnel mentioned that this floor drain backs up when the septic system backs up, but the septic system (e.g. tank) was not observed during this assessment.

2.7. Investigation Derived Waste

Investigation derived wastes (IDW) generated during the Phase II ESA included purge water, soil cuttings, tubing, decontamination fluids, and personal protective equipment (PPE). To the extent possible, soil was backfilled in each boring from which it was collected. Excess soil generated during the groundwater monitoring well installation was contained within 55-gallon drums.

All purge water and decontamination fluid generated during the Phase II ESA was contained within a US DOT-approved, 55-gallon drum pending analytical results of groundwater samples.

PPE and other consumables were managed as solid waste.

3. Evaluation of Investigation Results

Analytical results are summarized in the following tables located in Appendix C:

- Table C-1: Metals and Cyanide Analytical Results – Soil;
- Table C-2: VOC Analytical Results – Soil;
- Table C-3: SVOC Analytical Results – Soil;
- Table C-4: PFAS Analytical – Soil;
- Table C-5: PCB Analytical Results – Soil;
- Table C-6: Herbicide Analytical Results – Soil;
- Table C-7: Dioxin Analytical Results – Soil;
- Table C-8: Metals and Cyanide Analytical Results – Groundwater;
- Table C-9: VOC Analytical Results – Groundwater;
- Table C-10: SVOC Analytical Results – Groundwater;
- Table C-11: PFAS Analytical Results – Groundwater;
- Table C-12: PCB Analytical Results – Groundwater;
- Table C-13: 1,4-Dioxane Analytical Results – Groundwater;
- Table C-14: Dioxin Analytical Results – Groundwater;
- Table C-15: Metals and Cyanide Analytical Results – Sludge;
- Table C-16: VOC Analytical Results – Sludge;
- Table C-17: SVOC Analytical Results – Sludge;
- Table C-18: PFAS Analytical – Sludge;
- Table C-19: PCB Analytical Results – Sludge;
- Table C-20: Dioxin Analytical Results – Sludge;
- Table C-21: SPLP PFAS / TOP Assay Analytical Results – Sludge.

FID and PID soil screening results are summarized on soil boring logs within Appendix B. Full analytical laboratory reports are provided as Appendix D.

3.1. Relevant Regulatory Criteria

For this Phase II ESA, Stone has compared analytical results to the following regulatory criteria:

- Soil and Sludge: VT DEC Soil Standards (VSS) included in Appendix A of the July 6, 2019 IRule, and, in the absence of a VSS, the current Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) for residential and industrial soils (April 2019);
- Groundwater: Vermont Groundwater Enforcement Standards (VGES).

3.2. Subsurface Soil Assessment

3.2.1. Description of Stratigraphy

Stratigraphy across the Site varies significantly with depth and from one location to another. Within IP-16, at the southeast end of the Site, stratigraphy was predominantly coarse sand and gravel. Roundness of individual

grains ranged from sub round to angular, with the majority of clasts being sub-angular. In the center of the Site, as indicated by IP-2, -7, -3, and -5, the sand and gravel deposits are predominant to approximately 20 ft bgs and below 40 ft bgs. In some cases, such as IP-5 and IP-7, the sand and gravel unit is un-interrupted to the bottom of the borehole while in others, such as IP-3 and IP-4, the sand and gravel unit is underlain by sand with silt starting at approximately 65 ft bgs. Strata from 20 to 40 ft bgs in the center of the Site are comprised of interbedded fine to medium sands or fine sands and silt couplets – typical of a lacustrine environment. At the northeast end of the Site, demonstrated by IP-6 and IP-8, lacustrine deposits were not observed; strata in this area of the Site is dominated by interbedded sand and sand and gravel, indicative of a higher energy, alluvial environment.

Soil borings IP-18 through IP-24 were advanced in the area noted as "Active Fill Area' in the 1989 survey of the property. Physical evidence of fill included concrete and asphalt rubble; there was no evidence of any other material used as fill in this area and no elevated PID readings (all were 0.0 parts per million on volume basis (PPMv). It appears this area was used to dispose of concrete and asphalt only, therefore, no soil samples were collected.

3.2.2. Metals Results

With the exception of thallium, all 23 TAL Metals and cyanide were detected above reporting limits in one or more soil samples (Table C-1, Appendix B). Table 3, below, provides a summary of metals in soil that were detected at or above applicable screening value in any soil sample. These results are shown graphically in Figure 4 (Appendix A).

Table 3: Summary of Metals Detected in Soil in Excess of Standards

Sample ID (sample depth in feet bgs is last number of ID)	Arsenic (mg/Kg)	Cadmium (mg/Kg)	Iron (mg/Kg)	Lead (mg/Kg)	Vanadium (mg/Kg)	Mercury (mg/Kg)
VSS Resident	16	6.9	51,302	400	2.8	3.1
VSS Non-Resident	16	87	686,351	800	27	3.1
IP-02-66	**1.09 J**	**1.07**	**19,400**	**9.84**	**17.9**	< 0.66
IP-3A-70.5	**0.548 J**	**0.43 J**	**7,640**	**2.67 J**	**6.64**	< 0.075
IP-05-11.0	< 4.2	**0.743 J**	**11,200**	**3.71 J**	**14.3**	< 0.069
IP-06-0.5	**16**	**8.56**	**122,000**	**633**	**246**	**3.45**
IP-06-0.5-FD	**6.81**	**3.66**	**47,100**	**555**	**243**	**3.04**
IP-12-7.5	**2.75**	**0.688 J**	**11,500**	**3.24 J**	**15.8**	< 0.073
IP-13-7.5	**2.28**	**0.612 J**	**10,400**	**2.45 J**	**14**	< 0.705
IP-15-6.0	**2.53**	**0.7 J**	**11,500**	**3.6 J**	**15.3**	< 0.072
IP-15-6.0-FD	**2.56**	**0.772 J**	**12,800**	**4.06 J**	**16.8**	< 0.077

< Indicates analyte was not detected, laboratory reporting limit provided; mg/kg – milligrams per kilogram; bgs – feet below ground surface; bold values indicate detection; shaded cell indicates exceedance of one or more standards.

Vanadium was detected in all soil samples above the VSS Resident standard, but, with the exception the sample and its duplicate collected from shallow soil within the holding lagoon (IP-06-0.5 and IP-06-0.5-FD), below the VSS Non-Resident standard.

For IP-06-0.5 and IP-06-0.5-FD, vanadium exceeded the VSS Non-Resident standard. Lead in these two samples was also reported at concentrations that exceeded the VSS Resident standard but were below the VSS Non-Resident standard. Cadmium and iron were also detected in the primary sample at concentrations above the VSS Resident standard, but below the VSS Non-Resident standard. Arsenic was also detected in this sample at the VSS standards of 16 mg/Kg in the primary sample, but below the standards in the duplicate

sample. Mercury was detected in the primary sample above the VSS Resident and Non-Resident standards, but just below these standards in the duplicate sample.

Arsenic, cadmium, iron, lead and mercury were not detected in any other subsurface soil sample at concentrations exceeding the applicable standard.

3.2.3. Volatile Organic Compound Results

No VOCs were detected in any soil sample above the applicable regulatory standard. Only acetone was detected above the reporting limit, with a maximum reported concentration of 0.21 mg/Kg, many orders of magnitude below the VSS-Resident standard of 40,609 mg/Kg; all other detections were estimated above the method detection limit, but below the reporting limit.

3.2.4. Semi-Volatile Organic Compound Results

No SVOCs were detected in any subsurface soil sample at concentrations above the applicable regulatory standard. Two compounds, benzidine and n-nitrosodimethylamine, had MDLs above the applicable regulatory standards. According to the EPA, uses of n-nitrosodimethylamine included as a research chemical, additive for lubricants, as a softener of copolymers and in the production of rocket fuels. It is unlikely that this compound was used at the site and therefore, is not considered a contaminant of concern (COC). According to the EPA, benzidine was used in the production of dyes ("benzidine-based dyes") and could be found in printing inks and paper, however, according to the Agency for Toxic Substances and Disease Registry, benzidine has not been made for sale in the United States since the mid-1970s. In the absence of a noticeable release of dyes at the Site, it is unlikely benzidine has been released and therefore, is not a Site COC.

Toxicity equivalency quotients (TEQ) were calculated for the seven cPAHs in accordance with Appendix F of the IRule and summed to compare to the B(a)P-TEQ. One-half the reporting limit was used to calculate the TEQ where an analyte was not detected at a concentration above the laboratory reporting limit, in accordance with IRule. Total TEQs, are included in Table C-3 (Appendix C). No B(a)P-TEQs exceeded the VSS Resident standard in the subsurface soil samples.

3.2.5. Poly- and Perfluoroalkyl Substances Results

PFAS were detected in each of the four soil samples analyzed for PFAS, but well below the VSS Resident standard of 1.22 mg/Kg for the total of five regulated PFAS. The highest levels and largest number of PFAS detected were in the shallow subsurface sample collected from the holding basin and totaled 0.47 mg/Kg (sample IP-06-0.5). Analytical results are summarized in Table C-4 (Appendix C).

3.2.6. Polychlorinated Biphenyl Results

PCBs were detected in the shallow subsurface soil sample collected from the holding basin, and its duplicate (IP-06-0.5 and IP-06-0.5-FD) at total PCB concentrations of 3.53 and 2.72 mg/Kg, respectively, above the VSS Resident and Non-Resident standards and above the EPA Toxic Substances Control Act (TSCA) walk away criteria of 1 PPM. PCBs were not detected in any other soil samples. PCB results for soil samples are summarized in Table C-6 (Appendix C) are shown graphically in Figure 4 (Appendix A).

3.2.7. Dioxin Results

Dioxins were detected primarily in the shallow subsurface sample collected from the holding basin (IP-06-0.5) and its duplicate. In the other three subsurface soil samples collected for dioxin analysis, only octachloro-dibenzo-p-dioxin (OCDD) was detected (IP-05-11.0 and IP-12-11.0). No dioxins were detected in subsurface soil sample IP-13-10.5. TEQs were calculated for the seventeen dioxins in accordance with Appendix F of the IRule and summed to compare to the 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) TEQ standard. One-half the reporting limit was used to calculate the TEQ where an analyte was not detected at a

concentration above the laboratory reporting limit. . 2,3,7,8-TCDD TEQ for IP-06-0.5 and its duplicate exceeded the VSS Non-Resident standard; the 2,3,7,8-TCDD TEQs for the other subsurface soil samples did not exceed either VSS. Dioxin results are summarized in Table C-7 in Appendix C and graphically depicted in Figure 4, Appendix A.

3.3. Surface Soil Assessment

The surface soil sample collected from above the active leach field at IP-14 (IP-14-0.5) was analyzed for VOCs, SVOCs and TAL Metals plus cyanide. Vanadium was reported at 14.6 mg/Kg, above the VSS Resident standard of 2.8 mg/Kg, but below the VSS Non-Resident standard of 27 mg/Kg. No other analytes were detected in this sample above the applicable standard.

ISM was performed at DU-1 and DU-2 to evaluate if the area along the railroad has been impacted by PAHs and/or herbicides and, if so, to evaluate risk to Site users. No herbicides were detected in the three replicate samples collected from each DU, therefore, an Upper Confidence Level of the arithmetic mean (UCL) was not calculated for herbicides. With the exception of cPAHs, no other PAHs were detected above applicable standards.

To determine the concentration of cPAHs as averaged across DU-1 and DU-2, Stone calculated the 95% UCL for PAHs as B(a)P-TEQ. The 95% UCL is a value that, when repeatedly calculated for randomly drawn subsets from a population, equals or exceeds the population arithmetic mean ninety-five percent of the time (State of Connecticut, 2014). Stone utilized the Chebyshev method for calculating the 95% UCL as provided by the Interstate Technology Regulatory Council (ITRC) calculator, http://www.itrcweb.org/ism-/4_2_2_UCL_Calculation_Method.html.

ISM cPAH results for DU-1 and DU-2, expressed as B(a)P-TEQ and 95% UCL are shown below in Tables 4 and 5, respectively. The B(a)P-TEQ 95% UCL for DU-1 was 0.94 mg/Kg, above the VSS Resident standard of 0.07, but below the VSS Non-Resident standard of 1.54. The B(a)P-TEQ 95% UCL for DU-2 was 0.14 mg/Kg, also above the VSS Resident standard of 0.07, but below the VSS Non-Resident standard of 1.54.

Table 4: DU-1 Summary of Carcinogenic PAHs – ISM Samples

Analyte	VSS – Resident (mg/Kg)	VSS – Non Resident (mg/Kg)	DU-1-A (mg/Kg)	DU-1-B (mg/Kg)	DU-1-C (mg/Kg)
Benzo(a)anthracene			0.079	0.450	0.290
Benzo(a)pyrene			0.130 U	0.310	0.180
Benzo(b)fluoranthene			0.170	1.20	0.890
Benzo(k)fluoranthene			0.088 U	0.300	0.250
Chrysene			110	0.870	0.920
Dibenz(a,h)anthracene			0.064 U	0.079	0.066 U
Indeno(1,2,3-cd)pyrene			0.077 U	0.320	0.200
B(a)P-TEQ	0.07	1.54	**0.126**	**0.590**	**0.351**
B(a)P-TEQ 95% UCL	0.07	1.54	**0.94**		

U: Not detected – method detection limit shown; One-half the method detection limit was used in the TEQ calculation if the compound was not detected; VSS: Vermont Soil Standard; Total carcinogenic PAH (cPAH) calculated as benzo(a)pyrene Toxicity Equivalence Quotient (B(a)P-TEQ) using Toxicity Equivalency Factors per IRule; B(a)P-TEQ 95% UCL calculated using the Chebyshev method as provided by the Interstate Technology Regulatory Council (ITRC) calculator, source: http://www.itrcweb.org/ism-1/4_2_2_UCL_Calculation_Method.html.

Table 5: DU-2 Summary of Carcinogenic PAHs – ISM Samples

Analyte	VSS – Resident (mg/Kg)	VSS – Non Resident (mg/Kg)	DU-2-A (mg/Kg)	DU-2-B (mg/Kg)	DU-2-C (mg/Kg)
Benzo(a)anthracene			0.088	0.058 U	0.058 U
Benzo(a)pyrene			0.130 U	0.130 U	0.120 U
Benzo(b)fluoranthene			130	0.088 U	0.086 U
Benzo(k)fluoranthene			0.085 U	0.083 U	0.082 U
Chrysene			0.094	0.054 U	0.053 U
Dibenz(a,h)anthracene			0.061 U	0.060 U	0.059 U
Indeno(1,2,3-cd)pyrene			0.074 U	0.072 U	0.071 U
B(a)P-TEQ	0.07	1.54	**0.122**	**0.106**	**0.101**
B(a)P-TEQ 95% UCL	0.07	1.54	**0.14**		

U: Not detected – method detection limit shown; One-half the method detection limit was used in the TEQ calculation if the compound was not detected; VSS: Vermont Soil Standard; Total carcinogenic PAH (cPAH) calculated as benzo(a)pyrene Toxicity Equivalence Quotient (B(a)P-TEQ) using Toxicity Equivalency Factors per IRule; B(a)P-TEQ 95% UCL calculated using the Chebyshev method as provided by the Interstate Technology Regulatory Council (ITRC) calculator, source: http://www.itrcweb.org/ism-1/4_2_2_UCL_Calculation_Method.html.

3.4. Groundwater Assessment

Table 6 summarizes equilibrated physical chemical parameters for each well sampled in August 2019. Values presented in Table 6 for these locations represent the last values recorded prior sample collection.

Table 6: Groundwater Physical-Chemical Properties

Location ID	Temperature (°C)	ORP (mV)	pH (S.U.)	DO (mg/L)	Specific Conductivity (µS/cm)	Turbidity (NTU)
IP-01	16.3	146	6.87	9.84	1407	25.3
IP-02	16.5	163	6.58	6.28	870	164
IP-03	18.8	248	5.95	7.68	155	80
IP-04	14.2	220	5.92	9.80	1614	41
IP-05	14.7	280	6.12	9.55	148	22
IP-06	14.2	215	6.13	6.21	1052	47
IP-07	14.9	283	6.50	6.29	929	12
IP-08	12.5	142	6.01	8.90	778	1296
IP-16	14.2	258	6.14	6.45	1800	23.8

ORP = oxygen-reduction potential
pH = log hydrogen ion concentration
DO = dissolved oxygen
µS/cm = microSeimens per centimeter
NC = not collected
mV = milliVolts
s.u. = standard units
mg/L = milligrams per liter
NTU = nephelometric turbidity units
°C = degrees centigrade

Oxidation reduction potential (ORP) and dissolved oxygen (DO) indicate the presence of an oxidizing environment in Site groundwater. Monitoring wells IP-02 and IP-08 had relatively elevated turbidity measurements.

3.4.1. Hydrology

Groundwater elevations in Site monitoring wells were measured during the groundwater sampling conducted on August 29 and 30, 2019, relative to an assigned Site datum. Groundwater elevations are shown in Table 7, below. The groundwater surface ranged between 26.22 feet (IP-08) and 28.75 feet (IP-16). In the primary groundwater investigation area of the Site between IP-01 and IP-08, the general hydraulic gradient is to the

east, with some variance to the north-northeast and to the southeast. The horizontal component of the hydraulic gradient varies between 0.001 feet per foot (ft/ft) as calculated between IP-04 to IP-08 to 0.004 ft/ft as calculated between IP-03 and IP-07. It is likely that local variations in groundwater levels contribute to the varying horizontal hydraulic gradient direction. Based on these data, the Connecticut was likely a marginally gaining river during this groundwater monitoring event. Potentiometric surface contours are included on Figure 5 (Appendix A).

Table 7: Groundwater Elevations

Location ID	Top of Casing Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
IP-01	95.93	69.05	26.88
IP-02	93.52	67.00	26.52
IP-03	94.76	67.94	26.82
IP-04	95.86	69.12	26.74
IP-05	95.54	68.83	26.71
IP-06	101.82	75.35	26.47
IP-07	93.14	66.85	26.29
IP-08	100.72	74.50	26.22
IP-16	96.68	67.93	28.75

The monitoring well network is not sufficient to accurately evaluate hydraulic gradients in the southwestern portion of the Site. Groundwater elevations in the southwestern extent of the Site (IP-16) was higher than those observed in other areas. The vertical component of the hydraulic gradient was not assessed during this Phase II ESA.

3.4.2. Metals Results

Total lead, manganese and arsenic were detected in the groundwater samples collected from monitoring wells IP-02 and IP-08 at concentrations that exceed their respective VGES. Total manganese was also detected above the VGES in groundwater samples collected from monitoring wells IP-03, IP-04 and IP-06. Total lead was also detected above the VGES in groundwater sample collected from the 'Deep' production well. A summary of lead, manganese and arsenic results in groundwater are provided below in Table 8; the complete metals analyses are summarized in Table C-8 in Appendix C.

Table 8: Summary of Total Metals Detected in Groundwater in Excess of VGES

Sample ID	Lead (µg/L)	Manganese (µg/L)	Arsenic (µg/L)
VGES	**15**	**300**	**10**
IP-01	< 10	**136**	**0.26 J**
IP-02	**52**	**2580**	**20.54**
IP-03	**8 J**	**777**	**2.76**
IP-04	**5 J**	**443**	**1.26**
IP-05	< 10	**78**	**0.24 J**
IP-05-FD	< 10	**65**	< 0.5
IP-06	**6 J**	**346**	**4.15**
IP-07	**3 J**	**45**	**0.71**
IP-08	**21**	**722**	**22.03**
IP-16	**3 J**	**161**	**1.48**
Deep Well	**27**	**31**	**0.37**
Shallow Well	**3 J**	**267**	**0.64**

Abbreviations: VGES – Vermont Groundwater Enforcement Standards; µg/L – micrograms per liter; < Indicates analyte was not detected, laboratory reporting limit provided; J – estimated detection above the method detection limit but below the reporting limit.

3.4.3. Volatile Organic Compound Results

Several VOCs were detected in one or more groundwater samples, including acetone, chloroform, tetrachloroethene, 1,2-dichloroethene, bromomethane, methyl-tert-butyl-ether (MTBE) and naphthalene. Of these, only naphthalene was detected above the VGES of 0.5 micrograms per liter (µg/L). This occurred in both the 'Deep' and 'Shallow' production well samples at estimated concentrations of 1.1 µg/L and 1.8 µg/L, respectively. Note that the reported naphthalene concentrations in the SVOC analysis were estimated at 0.06 µg/L and 0.27 µg/L, respectively, for these two samples which is below the VGES.

Tetrachloroethene was detected in groundwater samples collected from IP-03 and IP-04 at concentrations of 1.5 µg/L and 0.19 µg/L (estimated), respectively, below the VGES of 5 µg/L. 1,2-Dichloroethene was detected in the 'Shallow' production well at an estimated concentration of 0.21 µg/L, below the VGES of 5 µg/L. MTBE was detected in both the 'Deep' and 'Shallow' projection wells at concentrations of 2 µg/L and 9.9 µg/L, respectively, below the VGES of 11 µg/L. 1,4-dixoane was detected in groundwater samples collected from IP-04 and the 'Shallow' production well at concentrations of 0.0542 µg/L (estimated) and 0.16 µg/L, respectively, below the VGES of 0.3 µg/L, however, it is likely that acetone was introduced within the laboratory as discussed in Section 3.6.

VOC analytical results are summarized in Table C-9 in Appendix C. Low-level 1,4-dioxane results are summarized in Table C-13 in Appendix C.

As identified in Table A.2 of the SSQAPP, the laboratory MDLs for 1,2,3-trichloropropane, 1,2-dibromo-3-chloropropane and 1,2-dibromomethane were above the VGES. 1,2,3-trichloropropane is used in solvents, and in the absence of other solvent constituents, is not considered a COC in groundwater at this Site. 1,2-dibromo-3-chloropropane and 1,2-dibromomethane are fumigant pesticides and are not considered COCs at this Site.

3.4.4. Semi Volatile Organic Compound Results

Several SVOCs were detected in one or more groundwater samples, including bis-2-ethylhexyl-phthalate, dimethyl phthalate and a number of PAHs, but none at concentrations above their respective VGES. Bis-2-ethylhexyl-phthalate (a plasticizer) was detected in groundwater samples collected from IP-16 and both the 'Deep' and 'Shallow' production wells at concentrations of 2.5 µg/L (estimated), 4.2 µg/L, and 2.2 µg/L (estimated) respectively, all below the VGES of 6 µg/L. Dimethyl phthalate was detected in the groundwater sample collected from IP-07 at an estimated concentration of 1.3 µg/L; there is no VGES for this compound. SVOC analytical results are summarized in Table C-10 in Appendix C.

3.4.5. Poly- and Perfluoroalkyl Substances Results

A number of PFAS were detected in all groundwater samples, but at concentrations below the VGES of 20 nanograms per liter (ng/L) for the sum of five PFAS: perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA) and perfluorononanoic acid (PFNA). The maximum concentration of the sum of these five PFAS was 13 ng/L in the sample collected from IP-06. PFAS analytical results for groundwater are summarized in Table C-11 in Appendix C.

3.4.6. Polychlorinated Biphenyl Results

Arochlor-1260 was detected in the groundwater sample collected from IP-06 at an estimated concentration of 0.1 µg/L, below the VGES for total PCBs of 0.5 µg/L. No other PCBs were detected in groundwater samples. PCB analytical results are summarized in Table C-12 in Appendix C.

3.4.7. Dioxin Results

No dioxins were detected in the two groundwater samples collected from IP-05 and IP-06. The dioxin analytical results are summarized in Table C-14 in Appendix C.

3.5. Wastewater Treatment System Sludge Assessment

Analytical results for the wastewater treatment plant sludge sample collected on July 23, 2019 are summarized in Tables C-15 through C-20 in Appendix C. This sample reported as containing 29% solids. The results of the PFAS / TOP Assay performed on the SPLP extract of the sludge sample collected on August 30, 2019 are summarized in Table C-21 in Appendix C.

3.5.1. Metals

Metals were detected in the sludge sample, but results were below applicable VSS or EPA RSL standards. Thallium's MDL of 0.855 mg/Kg is just above the EPA Residential RSL of 0.78 mg/Kg, but below the EPA Industrial RSL.

3.5.2. Volatile Organic Compounds

VOC 1,4-dichlorobutane was detected at a concentration of 0.0029 mg/Kg; there is no related soil standard for this VOC. Acetone was detected at a concentration of 0.093 mg/Kg, well below the VSS Resident standard of 40,609 μg/L. No other VOCs were detected in the sludge sample.

3.5.3. Semi-Volatile Organic Compounds

No SVOCs were detected above reporting limits; some MDLs were above VSS Resident or EPA RSLs.

3.5.4. Polychlorinated Biphenyls

PCBs were not detected in the sludge sample.

3.5.5. Dioxins

Each dioxin in the analysis was detected in the sludge sample. The 2,3,7,8-TCDD TEQ was calculated at 22.988 picograms per gram(pg/g), above the VSS Non-Resident standard of 13.7 pg/g.

3.5.6. Poly- and Perfluoroalkyl Substances

PFAS 6:2 FTS, PFDoA, PFHxA were detected at estimated concentrations of 0.00202 mg/Kg, 0.000229 mg/Kg and 0.000203 mg/Kg, respectively. None of the five PFAS regulated compounds included in the VSS were detected.

Results of the PFAS TOP Assay procedure performed on the SPLP extract showed that total per-fluorinated carboxylic acids (PFCAs) exhibited a net increase of 10.74 nanograms per liter (ng/L), from 32.72 ng/L to 43.46 ng/L after undergoing the TOP Assay procedure. Ignoring net decreases reported in the PFCAs, the total increase was 16.84 ng/L.

3.6. Quality Assurance/Quality Control

Field duplicate samples were collected for each media and analyte group sampled during the Phase II ESA. Additionally, a number of trip blanks, field equipment blanks and for PFAS, field reagent blanks, were submitted and analyzed.

Field blank data were used to assess precision of the analytical results by calculating relative percent difference (RPD) values for each primary-duplicate field blank sample pair using the following formula:

$$RPD = \frac{|C_1 - C_2|}{\frac{C_1 + C_2}{2}} \times 100$$

Where: C1 = Concentration of a given target analyte in the Primary Sample, and

C2 = Concentration of a given target analyte in the Field Duplicate sample

The results of these QA/QC sampling are provided in the following subsections. Full laboratory analytical reports are provided in Appendix D and provide additional discussion regarding internal surrogate recoveries and sample re-analysis.

3.6.1. Soil

Field Duplicates

As a general note, calculated RPDs in soil sample IP-06-0.5 and its duplicate ranged greatly, indicating high degree of heterogeneity in this sample.

Calculated RPDs for metals in soil ranged between 1% and 38% in sample IP-15-6.0 and its duplicate, which is within quality control threshold of 50%. RPDs for metals in soil ranged between 1% and 99% in sample IP-06-0.5 and its duplicate, with many of the RPDs exceeding the 50% quality control threshold; this is likely due to matrix interference for this sample and does not impact the usability of the data. The poor RPD values for sample IP-06-0.5 and its duplicate illustrates the high degree of heterogeneity of these contaminants in this soil sample.

Calculated RPDs for VOCs in soil sample IP-15-8.0 and its duplicate were 11% for toluene and 46% for acetone, a common laboratory contaminant, both within the 50% quality control threshold. RPDs for VOCs in IP-06-0.5 and its duplicate ranged from 40% to 102% and again, likely represents high degree of heterogeneity in this sample.

The calculated RPDs for SVOCs in soil sample IP-06-0.5 and its duplicate ranged from 17% to 130%, most exceeding the 50% quality control threshold.

The calculated RPDs for PFAS and PCBs in soil sample IP-06-0.5 and its duplicate ranged from 0% to 45%, within the 50% quality control threshold.

The calculated RPDs for dioxin in soil sample IP-06-0.5 and its duplicate ranged from 0% to 81%, with 6 of the 17 RPDs above the 50% quality control threshold.

Field Blanks

PFAS: PFOA and PFDA were detected at low concentrations in both field blanks collected in conjunction with the soil sampling at locations IP-05 and IP-06, but were also detected at much higher concentrations in the laboratory method blank analyses for these samples; therefore, the presence of PFOA and PFDA in the field blanks does not impact the data usability. The method blank analyses for the primary samples were within limits.

3.6.2. Groundwater

Field Duplicates

Calculated RPDs for metals in groundwater ranged from 0% to 43%, with only the RPD for aluminum outside the 30% quality control threshold. Based on the results of this Phase II ESA, aluminum is not considered a COC, so this RPD result does not impact the usability of the data. Calculated RPDs for PFAS in groundwater ranged from 1% to 16%, within the 30% quality control threshold. No RPDs were calculated for SVOCs, PCBs, or dioxins in groundwater due to lack of detections in the primary and/or duplicate sample.

Trip Blanks

The trip blank sample for VOCs submitted with the Deep and Shallow production well groundwater samples was not analyzed due to an incomplete chain of custody record. This did not come to Stone's attention until after the sample was outside of the 14-day hold time. Chloroform, MTBE and naphthalene were detected in the primary samples. Because MTBE use has been phased out of commercial use in gasoline and has only been historically detected in groundwater at the site, it is unlikely that the MTBE detected in the primary samples was introduced to the samples after collection. Due to the low relative volatility of naphthalene, it is also unlikely that it was introduced to the samples after collection. Chloroform detected at an estimated concentration in the Shallow production well sample well below the VT Water Quality Criteria for the protection of human health and aquatic biota. Therefore, the absence of a trip blank does not affect the usability of these data in relation to the conclusions of this Phase II ESA.

In the trip blank samples submitted with the groundwater samples collected on August 29th and 30th, 2019, the VOC acetone was detected at 3.4 ug/L and PFAS PFHxA was detected at estimated concentration of 0.379 ng/L. Acetone is a known common laboratory contaminant and it is likely that the detections in groundwater samples at the site is due to laboratory contamination. Additionally, the detections were orders of magnitude below the VGES, so even with these detections, it does not affect the conclusions of this Phase II ESA. PFHxA was detected in all but one groundwater sample at varying concentrations. PFHxA is currently not regulated and no other standards were exceeded for PFAS compounds, so the detection of PFHxA in the trip blank does not affect the conclusions of this Phase II ESA.

Field Blanks

PFAS PFHxA was detected at estimated concentrations of 0.372 ng/L and 0.686 ng/L in the field blanks associated with the groundwater samples collected on August 29 and 30, 2019. As stated above, PFHxA was detected in all but one groundwater sample at varying concentrations. PFHxA is currently not regulated and no other standards were exceeded for PFAS compounds, so the detection of PFHxA in the field blank does not affect the conclusions of this Phase II ESA. PFAS 6:2FTS and 8:2FTS were detected in the field blank sample associated with the groundwater samples collected on August 30, 2019 at concentrations of 12.5 ng/L and 1.81 ng/L, respectively. 8:2FTS was detected in 2 of the 3 primary groundwater samples collected on August 30, 2019 at concentrations of 2.32 ng/L and 1.85 ng/L (estimated). 6:2FTS was also detected in 2 of the 3 primary groundwater samples collected on August 30, 2019 at concentrations of 22.9 ng/L and 11 ng/L. 6:2FTS and 8:2FTS are currently not regulated and no other standards were exceeded for PFAS compounds, so the detection of 6:2FTS and 8:2 FTS in the field blank does not affect the conclusions of this Phase II ESA. See equipment blank note below regarding 6:2FTS.

Equipment Blanks

PFAS PFHxA was detected at an estimated concentration of 0.326 ng/L in the equipment blank sample collected on August 29, 2019. The following PFAS were detected in the equipment blank collected on August 30, 2019: PFHxA at 0.647 ng/L (estimated), PFOA at 0.588 ng/L (estimated), 6:2 FTS at 13.6 ng/L and 8:2FTS at 1.98 ng/L. Of these, only PFHxA was detected after re-extraction at an estimated concentration of 0.381 ng/L. 6:2FTS was detected in all primary samples collected on August 30, 2019 therefore, the results of

these samples may not be indicative of groundwater concentrations. Because 6:2FTS is currently not regulated, and no other standards were exceeded for PFAS compounds, the detection of these compounds in the equipment blanks does not affect the conclusions of this Phase II ESA.

4. Conceptual Site Model

The Conceptual Site Model (CSM) presented herein is based on results from the Phase II ESA and historical investigations and assessments of the Site, including those sources referenced in Section 1.3 of this report. This CSM provides a set of working hypotheses that describe key aspects of the Site. As with any hypothesis, the CSM may require additional testing to arrive at the desired level of confidence. The CSM includes a discussion of the known physical, geologic, and hydraulic attributes of the Site and surrounding area, how chemicals were or may have been released at the Site, their transport pathways, fate mechanisms, and potential routes of exposure to ecological and human receptors. The CSM provides the context from which site investigation activities are developed and a framework to make sound Site management decisions.

4.1. Geology and Hydrogeology

According to the Agency of Natural Resource (ANR) Atlas, the Site is underlain by schist (primary) and metawacke (secondary) bedrock. The bedrock is described as dark gray to coaly-black, fine-grained plagioclase-muscovite-quartz schist and metawacke, shown southeast of Springfield, in part correlative with staurolite-grade rocks mapped as Littleton Formation. Bedrock was reported at depths of 137 and 142 feet below ground surface in two bedrock wells drilled to the west and southwest of the Site where ground surface elevations are relatively similar to that of the Site. Overburden groundwater production wells at the Site were drilled to approximately 100 ft bgs. Therefore, it is anticipated that bedrock would be encountered between 100 and 150 ft bgs at the Site. Depth to water is approximately was measured between 66 and 69 ft bgs in the parking area of the site, and 75 ft bgs in the area immediately southeast of the lagoons.

Overburden soils at the Site are mapped as fluvial sands. In an appendix to the 2015 Ramboll Phase I ESA, Griffin reported in their "Report on the Investigation of Subsurface Petroleum Contamination, Specialty Paperboard, Brattleboro, Vermont" dated July 1990 (1990 Griffin), that subsurface soils consisted of "nearly horizontal stratigraphic sequences, each measuring approximately one-foot thick and that they begin as coarse, well rounded, well sorted sand at the top and grade into fine, silty sand at the bottom" of each sequence. Griffin further concluded that the stratigraphic sequence planes dip slightly to the south. During this Phase II ESA, strata observed during the installation of groundwater monitoring wells did not concur with this prior assessment; while lower-energy (e.g., fine sands and silt) stratigraphic units were observed in select borings, such as IP-05 and IP-03, high-energy deposits (medium to coarse sands through gravel and cobbles) were common. We interpret this variability within Site strata to be indicative of a meandering river system bisecting through previously deposited lacustrine deltaic sediments. Coarser sediments with angular to sub-angular grains, like those that are prominent between 0 and 20 ft bgs Site-wide, suggest that these sediments are close to their source and that the paleo-Connecticut River flowed at high velocities along the Site.

Ground surface at the Site is generally flat, except along the Connecticut River where the land slopes steeply downward approximately 70 feet. Ground surface in the surrounding area north and northwest of the Site generally slopes to the south and east. Based on surrounding area topography, groundwater flow would be presumed to be east or southeast toward the Connecticut, however, due to the impoundment of the Connecticut River by the Vernon Dam at Vernon, Vermont approximately 10 miles downstream of the Site, at

least periodically, the Connecticut River may be a losing stream in the vicinity of the Site. Groundwater contour maps created during prior environmental assessment of the Site indicate groundwater surface gradient toward the river (Griffin, 1994) and groundwater elevation data collected as part of this Phase II ESA showed slight horizontal gradients to the east and southeast. Based on this information, and in the absence of multiple rounds of groundwater and surface water level data, we would expect the Connecticut to be both a losing and gaining stream near the LFP property, depending on groundwater and river levels and recharge.

The vertical component of the hydraulic head distribution is unknown. In the southeast portion of the Site, we expect that pumping of the Long Falls Paperboard production wells will induce a downward gradient.

The connection between the unconsolidated, overburden aquifer and the bedrock aquifer is unknown.

Groundwater at the northeastern portion of the site, northeast of the wastewater treatment system lagoons, has been reclassified as Class IV groundwater due to contaminants from the Windham SWMD landfill located immediately to the northwest of the site.

4.2. Industrial Setting and Release Mechanisms

As noted in Section 1.2, the Property was developed in 1960 for paperboard manufacturing. Manufactured wood pulp from off-site sources is delivered to the facility for use in making paperboard. The facility also receives recycled paper that is processed through a re-pulper. The LFP facility currently does not bleach pulp, although a chemical bleaching process was used in color stripping in the 1960s and was discontinued in the 1970s (2015 Ramboll). Dioxins are known to be present in paper pulp that has been bleached; if pulp that was bleached was used at the plant, then dioxins may be present, most likely in the facility waste sludge, and wherever these sludges were stored and/or disposed at the site.

The only known documented contaminant releases at the Site are from various petroleum surface spills and releases from No. 6 fuel oil USTs. Reported petroleum spills were generally contained (with the exception of a reported release that impacted the on-site clarifier) and the no. 6 fuel oil leaking UST release received a VT DEC SMAC letter in 1994. However, soil and groundwater were not sampled for the primary constituents of no. 6 fuel oil: PAHs. Additionally, detections of CVOCs in groundwater samples collected during the No. 6 fuel oil investigation from 1990 to 1994 indicate undocumented releases of CVOCs at the Site and/or at an unknown upgradient source; this was possibly an indication of a release mechanism for other contaminants of concern at the Site that had not been investigated until this Phase II ESA.

Other potential COCs include VOCs, SVOCs, metals, dioxins, and PFAS. In regard to metals, it is known that copper is used at the facility and titanium was used historically, along with aluminum and sodium compounds, although these metals were not detected at concentrations that exceeded their regulatory standards.

4.3. Contaminant Distribution, Fate and Transport

The initial CSM was presented in the SSQAPP primarily in table format (Table 1 in the SSQAPP) and is included as Appendix E of this Phase II ESA report. This table outlined contaminants and potential contaminants of concern, source and release mechanisms, and media of interest, organized by REC, for what was previously understood.

Performance of this Phase II ESA has greatly refined the CSM, including closing the following RECs identified in the Phase I ESA:

- RECs 5 – Equipment Storage Yard. There was no evidence of a release to surface soils or subsurface soils.
- REC 6 – Abandoned Drum. There was no evidence of a release observed related to this drum. The drum appeared to have been empty and used for moving concrete rubble. Additional inert debris (e.g. plastic pipe) was also located in this area.
- REC 7 – Former 'Active Fill Area' in the northwest end of the site. There was no evidence of fill other than concrete, asphalt, & inert debris (e.g. plastic pipe) in this area.
- REC 8 – Windham SWMD closed landfill's influence on the Site's groundwater quality beneath the northeastern portion of the Site. This is considered a controlled REC and therefore was not investigated further as part of this Phase II ESA. The groundwater in this area had previously been reclassified as a Class IV groundwater and it should be assumed that groundwater beneath this area of the Site remains contaminated.
- RECs 9 & 10 – Active and Inactive Septic Leach Fields. There was no evidence from soil screening or the soil sample analytical results of any substantial release to soils in the area of the current active and inactive leach fields.
- REC – 12 – There were no COCs detected in the groundwater sample collected from IP-16, therefore, the contaminants migrating in groundwater to the Site from the former The Book Press property does not appear to be a concern for this Site.

The following subsections update the CSM for the remaining RECs.

4.3.1. RECs 1 and 2: No. 6 Fuel Oil Release and Former Diesel & Gasoline USTs

Petroleum products, containing VOCs and SVOCs, will tend to migrate downward through soil to the groundwater table with some of the product adsorbing to soil particles. Petroleum VOCs and most SVOCs have a specific gravity less than water and will tend to stay high in the groundwater column.

Investigation point IP-03 was advanced as close as practicable to the former leaking No. 6 fuel oil USTs. Less than 1 ppmv PID response was measured in screened soils to the water table. In the soil sample collected at 70.5 feet depth, no VOCs or SVOCs were detected above screening values. Of note, an extremely low detection of tetrachloroethene in this soil sample was estimated at 0.00029 mg/Kg, many orders of magnitude below the VSS Resident standard of 2.4 mg/Kg. In groundwater, no VOCs of concern or SVOCs were detected in IP-03.

Free-phase petroleum product was detected in monitoring well MW-16 at an elevation > 10 feet above the observed water table; is unknown if this is representative of current in-situ conditions as it could be the same No. 6 fuel oil present as it was left when last monitored in 1994.

Monitoring wells IP-02 and IP-07 were installed at locations that were presumed to be hydraulically downgradient of the suspected former locations of the five diesel and gasoline USTs to evaluate current groundwater conditions. PID response of soils screened were at 1.0 ppmv or lower at each well location. No VOCs of concern or SVOCs were detected in the groundwater. Note that due to above ground natural gas tanks and underground utilities, IP-07 could not be installed directly in the suspected area of the former USTs.

Naphthalene was detected in samples collected from both the 'Deep' and 'Shallow' production well (EPA Method 8260C analysis) at estimated concentrations of 1.1 μg/L and 1.8 μg/L, above the VGES of 0.5 μg/L for this compound. Additional SVOCs were detected in each of these samples but well below the respective VGES standards. MTBE was also detected in each of these samples at concentrations of 2 μg/L and 9.9 μg/L, below the VGES standard of 11 μg/L. MTBE was detected in a 1994 sample collected from nearby former

monitoring well MW-11 at a concentration of 14.2 μg/L. These data indicate that petroleum products may have migrated and/or were hydraulically influenced due to pumping to the production well area and in the absence of a continuing source, are and/or would be expected to decline over time.

4.3.2. RECs 3 & 4: General Use of the Property for Paperboard Manufacturing and Potential Releases from Basement Sumps and/or Underground Piping

With the exception of the MTBE and naphthalene detections discussed above, and PCBs in the holding lagoon discussed below, VOCs, SVOCs and PCBs were not detected above applicable standards and are not a current concern at the Site. Chlorinated VOCs were detected in groundwater between 1990 and 1994 above current VGES but were only detected at concentrations well below VGES during this Phase II ESA, indicating that there is currently no on- or off-Site continuing source of cVOCs and natural attenuation of the cVOCs previously detected has occurred over time.

PFAS were detected at levels well below the VSS for regulated PFAS compounds in select subsurface soil samples collected at the Site. PFAS were also detected in ten of the eleven groundwater samples collected, but at concentrations below the VGES standard of 20 ng/L for the total of five regulated PFAS compounds.

PFAS have been used historically in paper coatings, among other uses, and have been detected in the facility wastewater treatment liquid effluent in December 2018 as well as the sludge samples collected during this Phase II ESA. Some PFAS can adsorb to material with high organic content, but in general, they tend to move with groundwater.

Vanadium was detected in all soil samples at concentrations above the VSS Resident standard, but, with the exception of the shallow soil sample collected from the wastewater treatment plant holding basin (discussed below), were below the VSS Non-Resident standard. Vanadium was also detected in five of the eleven groundwater samples, up to 11 ug/L; there is no VGES for vanadium in groundwater. There is no known use for vanadium at the Site; vanadium is used in the production of steel to reduce its weight. Total lead, manganese, and arsenic were each detected in more than one groundwater sample at concentrations above the VGES; this may not be indicative of what is migrating through soils due to the relatively high turbidity readings measured during sample collection. The samples with the highest turbidity readings had the highest concentrations of total metals. Dissolved concentrations of these metals would likely be lower. While copper and magnesium are used at the facility and titanium was used historically along with sodium and aluminum compounds, these metals were not detected in soil or groundwater above VSS or VGES standards. Cyanide may also be a byproduct of the papermaking process but was not detected above VGES.

Dioxins were detected in subsurface soils, but, with the exception of the shallow subsurface soil sample collected in the wastewater treatment system lagoon holding basin, at concentrations that calculated well below 2,3,7,8-TCDD TEQ VSS standards. Dioxins were not detected in the two groundwater samples collected from monitoring wells IP-05 and IP-06 indicating that if there has been a release to soil, the dioxins have not migrated to groundwater in these areas.

4.3.3. REC 11: Impacts from the Adjacent Railway Line

PAHs are known to be historically deposited along railroads; they occur naturally in fuel oil, coal, and tar and are common byproducts of the combustion of fuels in internal combustion engines including train engines. Select PAHs have been identified as carcinogenic compounds (cPAHs). PAHs do not readily dissolve into water without help from a co-solvent and are therefore slow to migrate to or via groundwater.

Herbicides, including chlorinated herbicides, have been commonly used for agricultural or maintenance purposes including those along the railway right of way and can have carcinogenic and/or mutagenic

properties. Herbicides typically bioaccumulate in animal fat and will bind to soil and sediment. They are less soluble in water and do not typically migrate via groundwater.

Herbicides were not detected along the railway in the ISM samples collected. However, cPAHs were detected. These compounds were evaluated by calculating the B(a)P-TEQ 95% UCL for the ISM samples collected in each of the two decision units. The B(a)P-TEQ 95% UCL for DU-1 was 0.94 mg/Kg, above the VSS Resident standard of 0.07, but below the VSS Non-Resident standard of 1.54. The B(a)P-TEQ 95% UCL for DU-2 was 0.14 mg/Kg, also above the VSS Resident standard of 0.07, but below the VSS Non-Resident standard of 1.54.

4.3.4. REC 13: Wastewater Treatment Plant Lagoons

The wastewater treatment plant lagoons receive liquid wastes from the clarifier and oxygenate them for additional processing prior to discharge to the Connecticut River under the facility's discharge permit. Investigation points IP-06 and IP-08 were advanced adjacent and hydraulically downgradient of the lagoons to assess groundwater quality. Total lead, manganese, and arsenic were each detected in the groundwater sample collected at IP-08 at concentrations above the VGES; however, this may not be indicative of what is migrating through soils due to the relatively high turbidity readings measured during sample collection. This groundwater sample had the highest turbidity measurement of all groundwater samples at 1,296 nephelometric turbidity units (NTUs); dissolved concentrations of these metals would likely be lower.

A shallow subsurface soil sample and its duplicate were collected from the center of the wastewater treatment plant lagoon holding basin (IP-06-0.5 and IP-06-0.5-FD). Metals vanadium and mercury were detected at concentrations above the VSS Non-Resident standard. PCBs were detected in these samples at total PCB concentrations of 3.53 and 2.72 mg/Kg, respectively, above the VSS Resident and Non-Resident standards and above the EPA Toxic Substances Control Act (TSCA) walk away criteria of 1 PPM. PCBs are extremely persistent in the environment.

PFAS were detected in these shallow subsurface soil samples, but well below current VSS. No VOCs or SVOCs were detected above VSS standards and are not a concern.

Dioxins were detected primarily in the shallow subsurface sample collected from the holding basin (IP-06-0.5) and its duplicate. The calculated 2,3,7,8-TCDD TEQ in sample IP-06-0.5 was calculated as 14.7 picograms per gram (pg/g), exceeding both the VSS Resident and VSS Non-Resident standards of 2.25 pg/g and 13.7 pg/g, respectively. The duplicate sample calculated 2,3,7,8-TCDD TEQ was 11.4 pg/g, above the VSS Resident standard but just below the VSS Non-Resident standard of 13.7 pg/g. Dioxins and their subset furans, are produced during pulp bleaching operations The LFP facility currently does not bleach pulp, although a chemical bleaching process was used in color stripping in the 1960s and was discontinued in the 1970s (2015 Ramboll). Dioxins are known to be present in paper pulp that has been bleached. If pulp that was bleached was used at the plant, then dioxins may have been or are present, most likely in the facility waste sludge, and wherever these sludges were disposed. Dioxins are extremely persistent in the environment and tend to stay strongly sorbed to soil, especially those with a high organic content.

The wastewater treatment system lagoons were installed circa 1972; it is unknown when the holding basin was installed, but it was present in 1989 based on a survey. According to Long Falls Paperboard personnel, the holding basin serves as an emergency storage basin to contain wastewater in the event of an incident at the Site where materials enter the wastewater treatment system that would result in a die-off of the bacterial colony within the aeration lagoons. Field observations of sludge and stained soils within the holding basin by Stone staff during the collection of IP-6A-0.5 indicate that discharge(s) to the holding basin have occurred in the past. It is not known when such incidents have occurred or what materials may have been discharged to the basin.

Based on the analytical results of this shallow subsurface soil sample, dioxins, metals and PCBs are of concern in the holding basin area. It is likely that these contaminants extend in soil to at least the top of the holding basin berm, however, the complete horizontal extent, along with the vertical extent, are unknown.

The results of the wastewater treatment system sludge assessment (Section 3.5) relates to waste management of facility operations and is not in and of itself considered a REC.

4.4. Sensitive Receptor Evaluation

Contamination from Site sources has been evaluated for its potential to adversely affect sensitive receptors. Table 9 presents the potentially affected media, potential pathways, and potential receptors.

Table 9: Sensitive Receptors Evaluation

Affected Media	Potential Pathways	Sensitive Receptors/Potential Risk
Surface Water	Overland flow of stormwater runoff and groundwater discharge	Connecticut River / Low – contaminants in groundwater are generally at concentrations below VGES and or just above, with the exception of total lead, manganese and arsenic which may not be in a dissolved state.
Surface Soil	Direct contact to contaminated materials	Site users & trespassers / Medium – Surface soil sample collected near the active septic leach field contained vanadium above VSS Resident, but below VSS Non-Resident standards. However, a shallow subsurface soil from the holding basin contained metals, dioxins and PCBs at concentrations exceeding VSS Non-Resident standards.
Sub Surface Soil	Prior fuel spill and/or releases from wastewater processes.	Groundwater / Low – there does not appear to be any widespread groundwater contamination at the Site. Construction workers / Medium
Groundwater	Infiltration of surface water through impacted soil may leach contaminants to groundwater.	Potential discharge to Connecticut River / Unknown Potential uptake into facility process water / Medium – naphthalene and lead were detected in the sample collected from the 'Deep' production well at concentrations above VGES.
Sediment	Discharge of contaminated soils to the Connecticut River from stormwater.	Potential discharge to the Connecticut River / Low

Affected Media	Potential Pathways	Sensitive Receptors/Potential Risk
Air	Vapor intrusion of petroleum or chlorinated VOCs. Discharge to ambient air from contaminated Site Media.	Potential Vapor Intrusion from subsurface VOCs / Low Potential volatilization of VOCs in soil (current or future) / Low

Abbreviations: VOCs – volatile organic compounds; CVOCs- chlorinated volatile organic compounds; VSS – Vermont Soil Standards; VGES – Vermont Groundwater Enforcement Standards; PCBs – polychlorinated biphenyls;

4.5. Adjoining Property Owners

Adjoining property owners, as presented in the City of Brattleboro 2018 Grand List, are summarized in Table 10, below.

Table 10: Adjoining Property Owner Information

Property Address	Parcel Id	Direction	Owner
153 Wellington Road	00080041.000	Southeast	Green Mountain Power Corp
22 Browne Court	00080035.000	Northeast	Brattleboro Development Credit Corp
89 Glen Orne Drive	00080006.000	North	L & S Associates
109 Glen Orne Drive	00080006.000	North	L & S Associates
111 Glen Orne Drive	00080006.000	North	L & S Associates
54 O'Bryan Drive	00080006.000	North	L & S Associates
47 Old Ferry Road	00080006.000	North	L & S Associates
Old Ferry Road	00080025.000	East	Allard Ruth B Revocable Trust
327-329 Old Ferry Road	00080022.100	Northeast	Windham Solid Waste Management District

5. Conclusions and Recommendations

Based on the results of the Phase II ESA, Stone has made the following conclusions:

1. No. 6 fuel oil from the pre-1990 release is still present in the subsurface, but not at concentrations high enough to impact sensitive receptors, e.g. downgradient groundwater or soil.
2. With the exception of MTBE detections in the facility production wells, there was no evidence of a gasoline release from former USTs, and no evidence of diesel fuel releases that are significantly impacting groundwater.
3. Historically detected cVOCs in groundwater have naturally attenuated over time and there appears to be no on or off-site continuing source.
4. PFAS are present in some on-site soils and in groundwater, but at concentrations below current VSS and VGES standards.
5. Vanadium is present in on-site surface and subsurface soils at concentrations exceeding the VSS Resident standard, but with the exception of the shallow soil sample collected from the wastewater treatment system lagoon holding basin, below VSS Non-Resident Standard.
6. Total lead, manganese and arsenic are present in on-Site groundwater at concentrations exceeding the VGES. Concentrations of these metals in groundwater may be elevated due to sample turbidity.
7. PAHs are present along the railway (DU-2) and railway spur to the Site (DU-1), as measured by the calculated B(a)P-TEQ 95% UCL, at concentrations that exceed the VSS Resident standard, but that are below the VSS Non-Resident standard.
8. Dioxins, PCBs and metals are present in the wastewater treatment system lagoon holding basin at concentrations that exceed the VSS Non-Resident standards. The vertical and horizontal extent of these exceedances are unknown.

An Evaluation of Corrective Action Alternatives (ECAA) should be prepared to assess remedial alternatives to prevent unacceptable exposure of contaminants to Site users. An ECAA will require the following additional assessment tasks:

1. Sampling of on-site groundwater for dissolved lead, manganese and arsenic in select on-Site groundwater monitoring wells.
2. Continued assessment, i.e. groundwater monitoring, of PFAS in groundwater.
3. Additional soil assessment to determine the vertical and horizontal extent of dioxin, PCB, and metals contamination related to the holding basin.
4. Assessment of soils to support soil management during construction activities associated with the proposed installation of a biomass heat plant, including potential underground biomass storage, and other Site improvements, as appropriate.

Upon completion of an ECAA and its approval by the VTDEC, a Corrective Action Plan (CAP) can be prepared.

6. References

Environmental Services of America, Inc., 1994. Environmental Site Investigation Report for Quebecor Printing Book Press, Putney Road, Brattleboro, Vermont. January 21.

LE Environmental, 2018. LE Environmental Phase I Environmental Site Assessment Report, Neenah Northeast LLC, December 12.

Rambol Environ, 2015. Phase I Environmental Site Assessment and Limited Environmental Compliance Review of Fibermark North America, Inc., Brattleboro, Vermont, June.

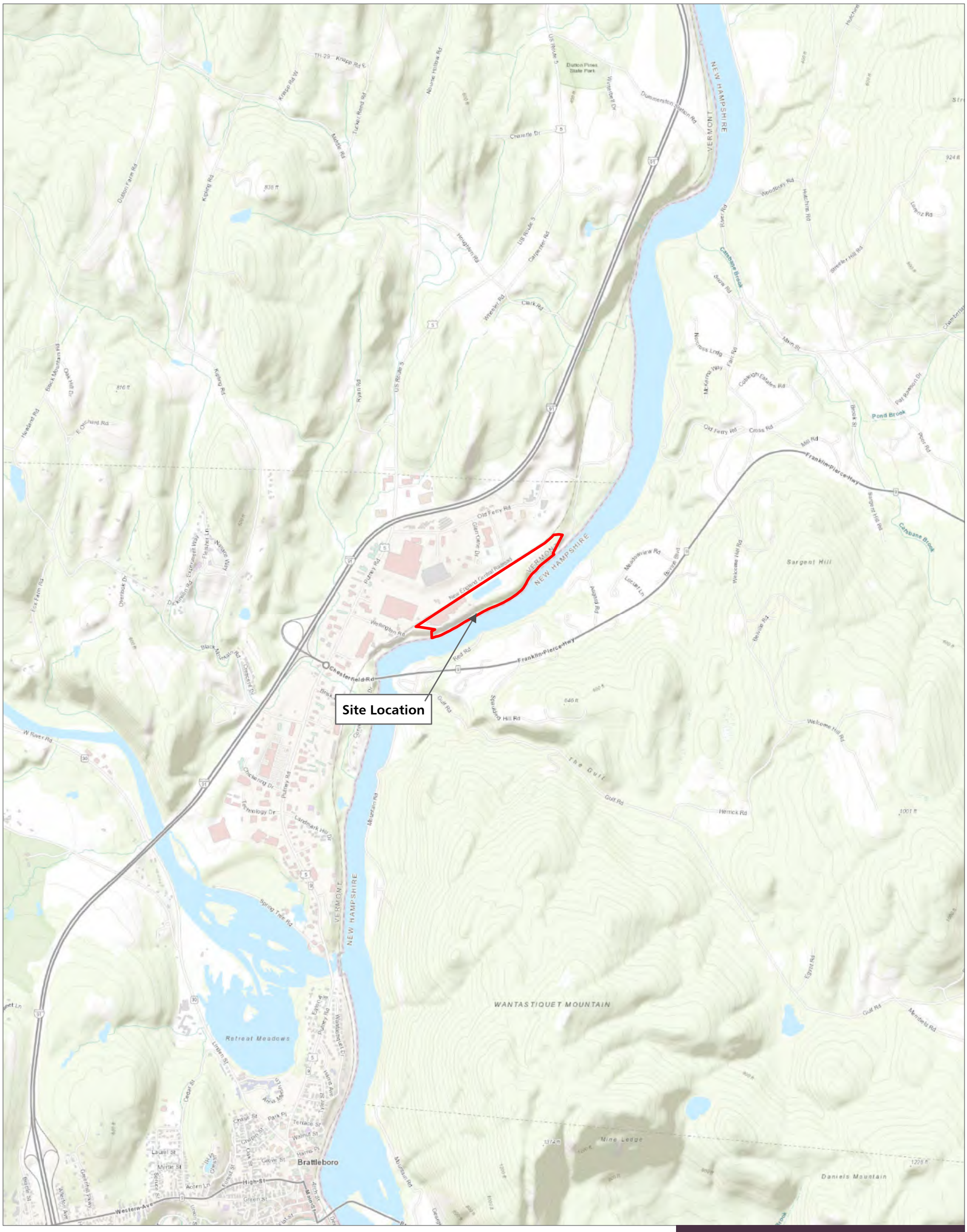
Weston & Sampson, 2018. Limited Baseline PFAS Sampling, December 2018, Tables 1 and 2.

Griffin International, Inc., 1990. Report on the Investigation of Subsurface Petroleum Contamination, Specialty Paperboard, Brattleboro, Vermont, July.

C.T. Male Associates, P.C., 1989. ALTA/ACSM Land Title Survey, Boise Cascade Corp. Facility. Sheets 1 and 2 of 2. May.

Appendix A: Figures

Figure 1: Site Location Map
Figure 2: Site Vicinity Map
Figure 3: Site Map
Figure 4: Soil Metals Results
Figure 5: Soil PCB and 2,3,7,8-TCDD Results
Figure 6: Groundwater Surface Contours
Figure 7: Groundwater Metals Results



LEGEND

Target Property Boundary

N

0 1,000 2,000

Feet

Figure 1 Site Location

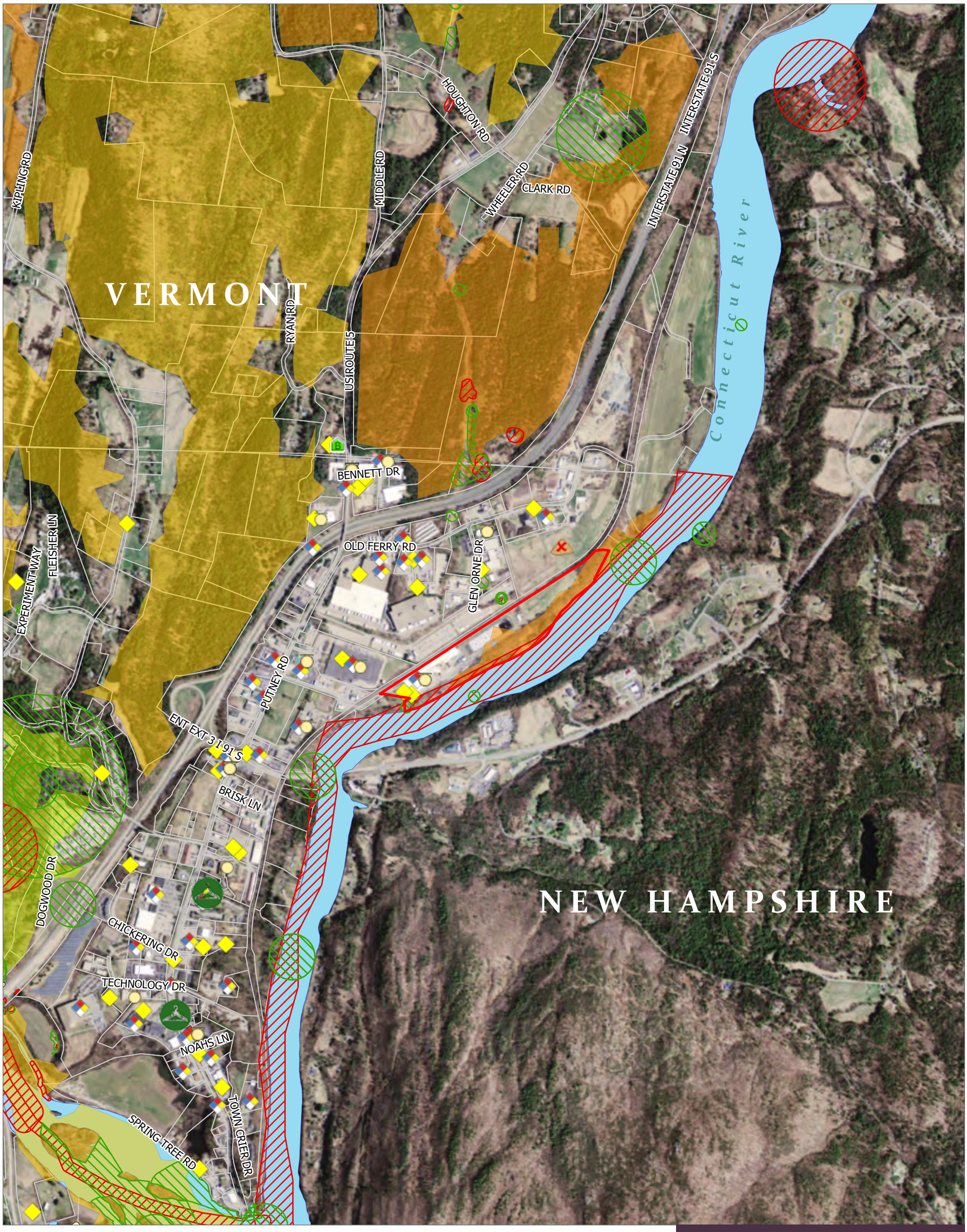
Long Falls Paperboard Phase II
Environmental Site Assessment

Prepared for
Vermont Department of Environmental Conservation

STONE ENVIRONMENTAL

Source: Esri World Imagery

Path: O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\GIS\MapDocuments\PresentationsAndReports\19-015 Long Falls Paper Phase II ESA\19-015 Long Falls Paper Phase II ESA.aprx Site Location 11x17 Exported: 10/3/2019 3:48 PM by wrich



LEGEND

- Target Property Boundary
- Parcels
- Waterbody
- Underground Storage Tank (working)
- Brownfields
- Dry Cleaner
- Hazardous Waste Generators
- Hazardous Waste Site
- Landfill - CLOSED

Rare, Threatened, Endangered Species and Significant Natural Communities

- Threatened or Endangered
- Rare
- Significant Natural Communities

Habitat Blocks and Wildlife Corridors

- 6 - Higher Priority
- 4
- 3 - Lower Priority

N

0 650 1,300

Feet

Source: Imagery - Esri World Imagery; Parcels and Roads - VCGI; Environmental Features - VTANR

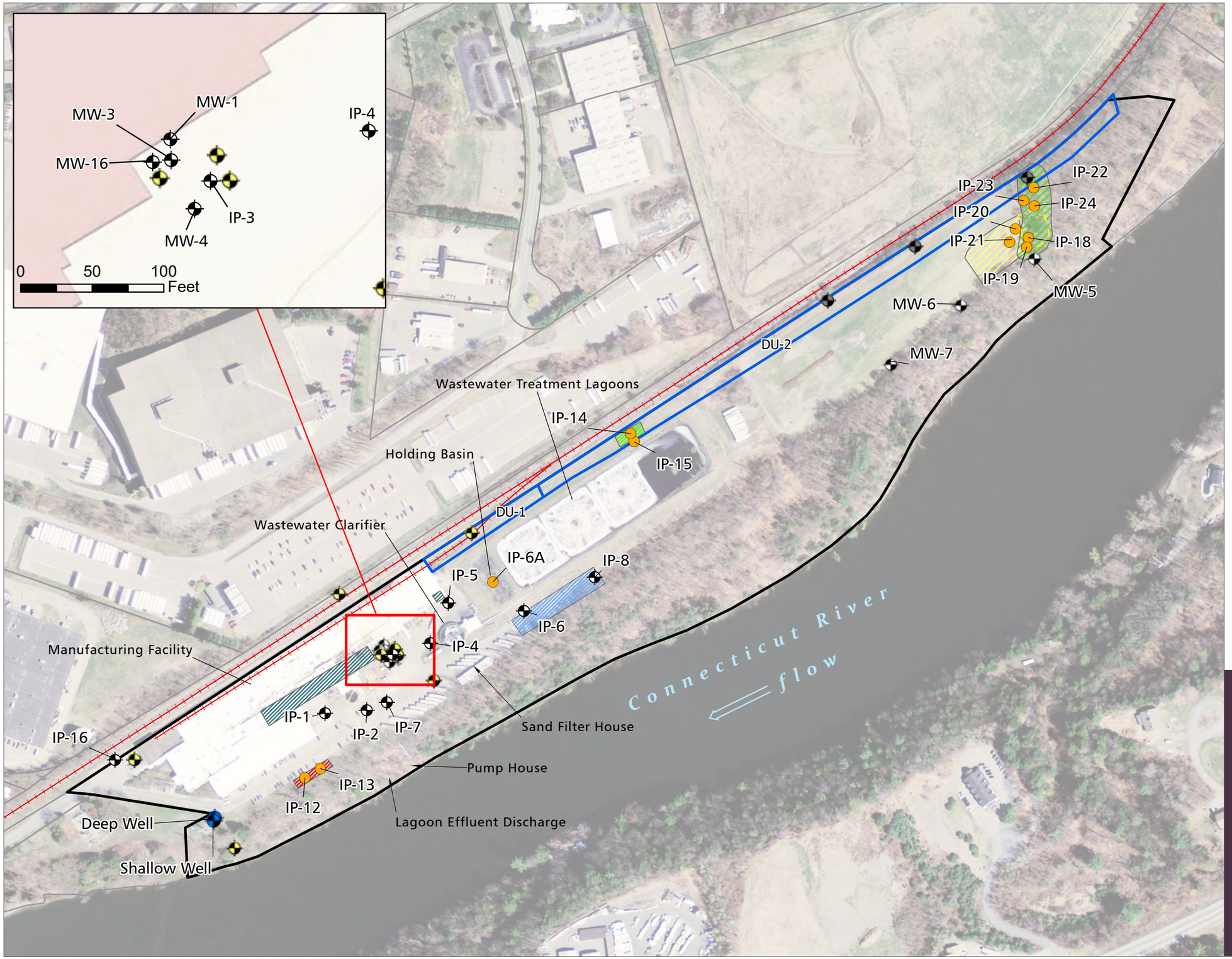
Path: O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\GIS\MapDocuments\PresentationsAndReports\19-015 Long Falls Paper Phase II ESA\19-015 Long Falls Paper Phase II ESA.aprx Vicinity Map Exported: 10/10/2019 12:24 PM by wrich

Figure 2 Vicinity Map

Long Falls Paperboard Phase II
Environmental Site Assessment

Prepared for
Vermont Department of Environmental Conservation

STONE ENVIRONMENTAL



N

0 150 300

Feet

LEGEND

Sample Locations
- Groundwater
- Soil Boring

Prior Existing Well
- Former Groundwater Monitoring Well
- Windham SWMD Vapor Well
- Production Well

ISM Decision Unit

Site Features
- Outdoor Equipment Area
- Former "Active Fill Area" Observed During Phase II Investigation
- Former "Active Fill Area" as Reported from 1989 Investigation
- Active Leaching Bed
- Former Leaching Bed
- Basement Area
- Rail Line
- Target Property Boundary
- All Parcels

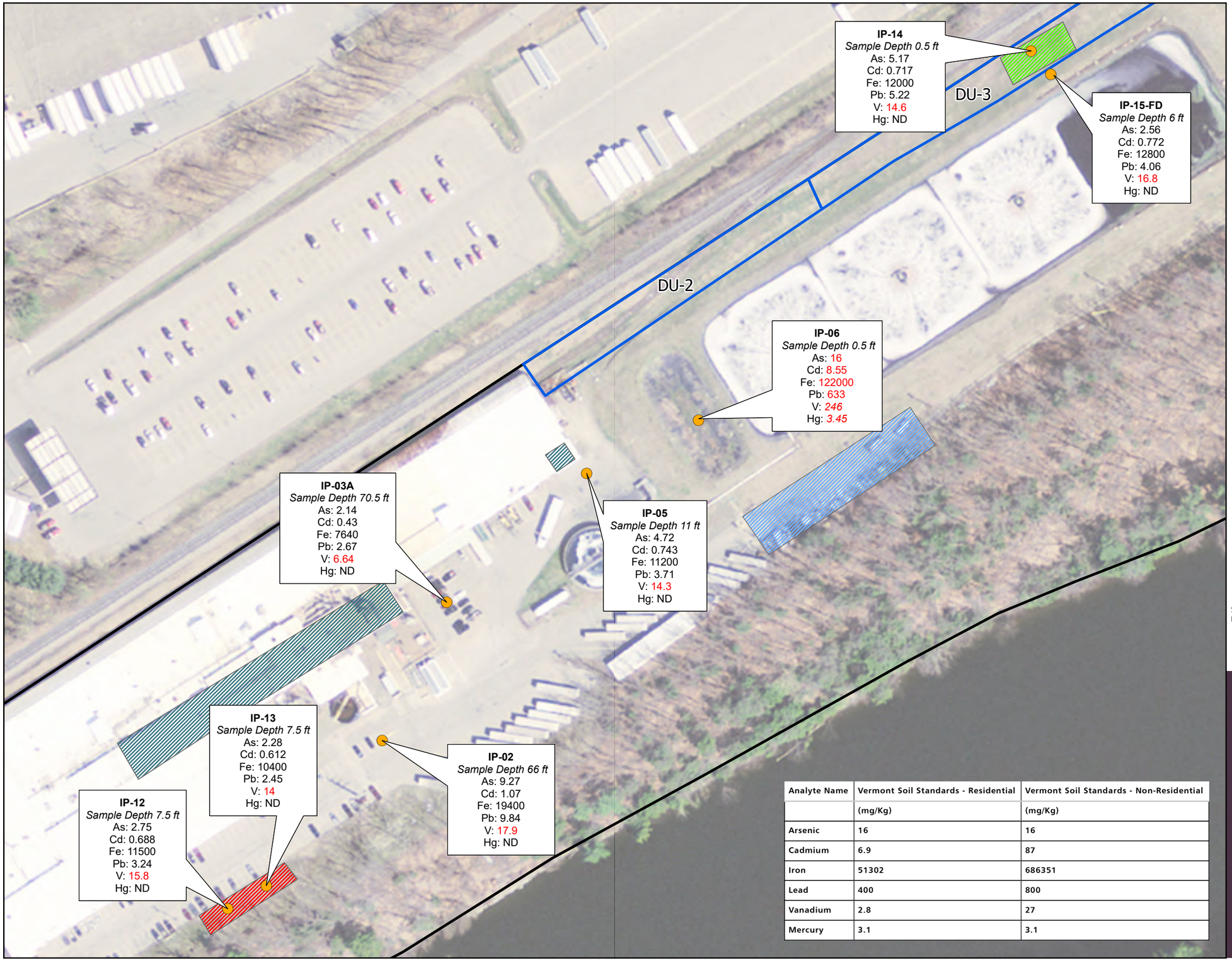
Source: Imagery - Esri World Imagery; Site Features and Well Locations - Stone Environmental; Parcels and Rail Lines - VCGI
Path: O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\GIS\MapDocuments\PresentationsAndReports\19-015 Long Falls Paper Phase II ESA\19-015 Long Falls Paper Phase II ESA.aprx Site Map Exported: 10/11/2019 2:01 PM

Figure 3 Site Map

Long Falls Paperboard
Phase II Environmental Site Assessment

Prepared For
Vermont Department of Environmental Conservation

Stone Environmental



Analyte Name	Vermont Soil Standards - Residential	Vermont Soil Standards - Non-Residential
	(mg/Kg)	(mg/Kg)
Arsenic	16	16
Cadmium	6.9	87
Iron	51302	686351
Lead	400	800
Vanadium	2.8	27
Mercury	3.1	3.1

N

0 100 200
Feet

LEGEND

- Soil Boring

Site Features

- Active Leaching Bed
- Former Leaching Bed
- Outdoor Equipment Area
- BasementArea
- ISM Decision Unit
- Target Property Boundary

All results in mg/Kg
ND = Non-Detect
Detections over Residential Enforcement Standards in RED
Detections over Non-Residential Enforcement Standards in *Italicized RED*
As = Arsenic
Cd = Cadmium
Fe = Iron
Pb = Lead
V = Vanadium
Hg = Mercury

Source: Imagery - Esri World Imagery; Sample Locations/Results and Site Features - Stone Environmental

Path: O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\GIS\MapDocuments\PresentationsAndReports\19-015 Long Falls Paper Phase II ESA\19-015 Long Falls Paper Phase II ESA.aprx Fig 4 Soil Metals
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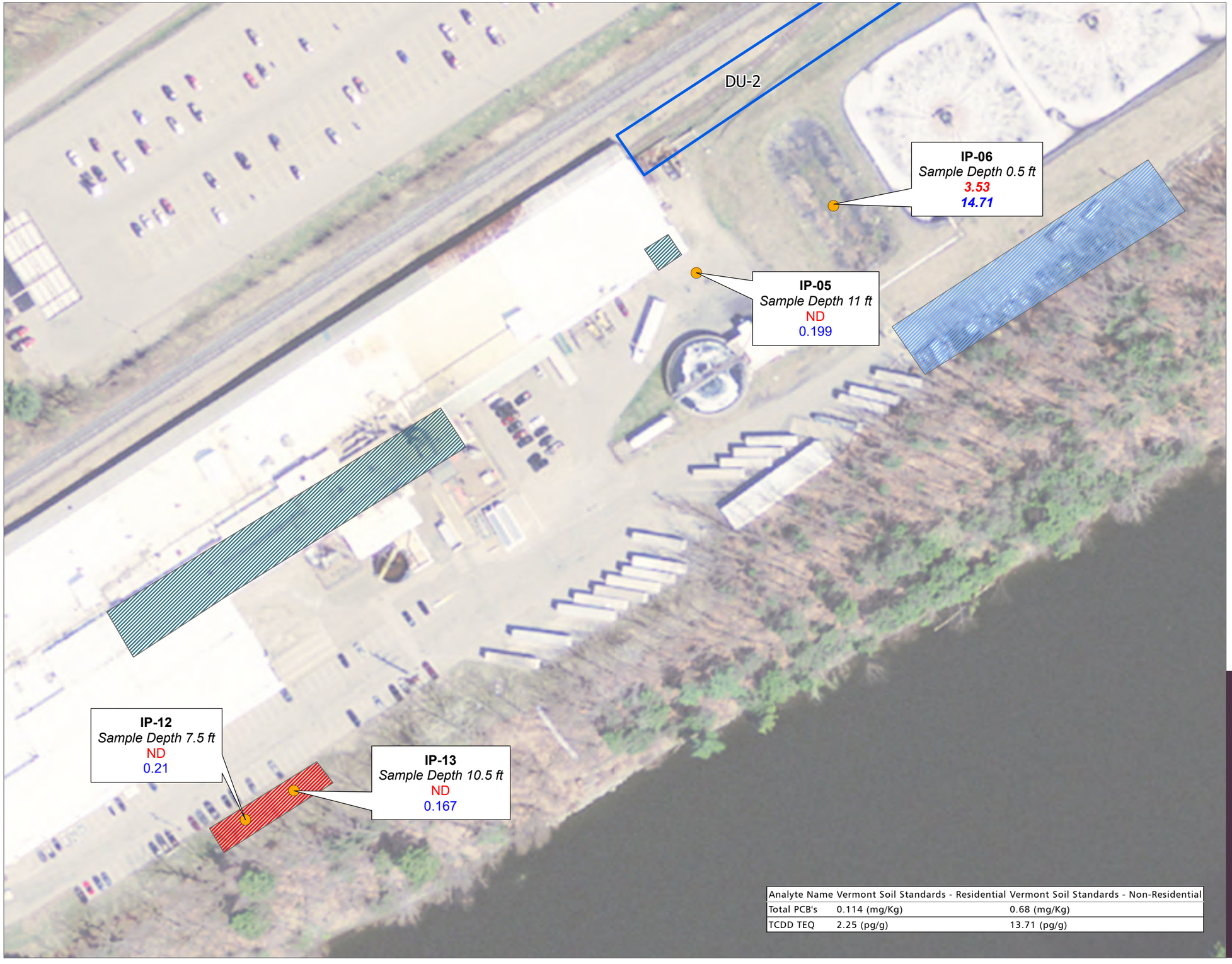
Figure 4 Soil Metals Results

Long Falls Paperboard Phase II
Environmental Site Assessment

Prepared For
Vermont Department of Environmental Conservation

STONE ENVIRONMENTAL



Analyte Name	Vermont Soil Standards - Residential	Vermont Soil Standards - Non-Residential
Total PCB's	0.114 (mg/Kg)	0.68 (mg/Kg)
TCDD TEQ	2.25 (pg/g)	13.71 (pg/g)

N

0 100 200

Feet

LEGEND

- Soil Boring
- ISM Decision Unit

Site Features

- Outdoor Equipment Area
- Active Leaching Bed
- Former Leaching Bed
- BasementArea

ND = Non-Detect
PCB Results (mg/Kg) in RED
TCDD TEQ Results (pg/g) in BLUE
Exceedance of Vermont Non-Residential Standard indicated in ***Bold Italics***

Source: Imagery - Esri World Imagery; Sample Locations and Site Features - Stone Environmental

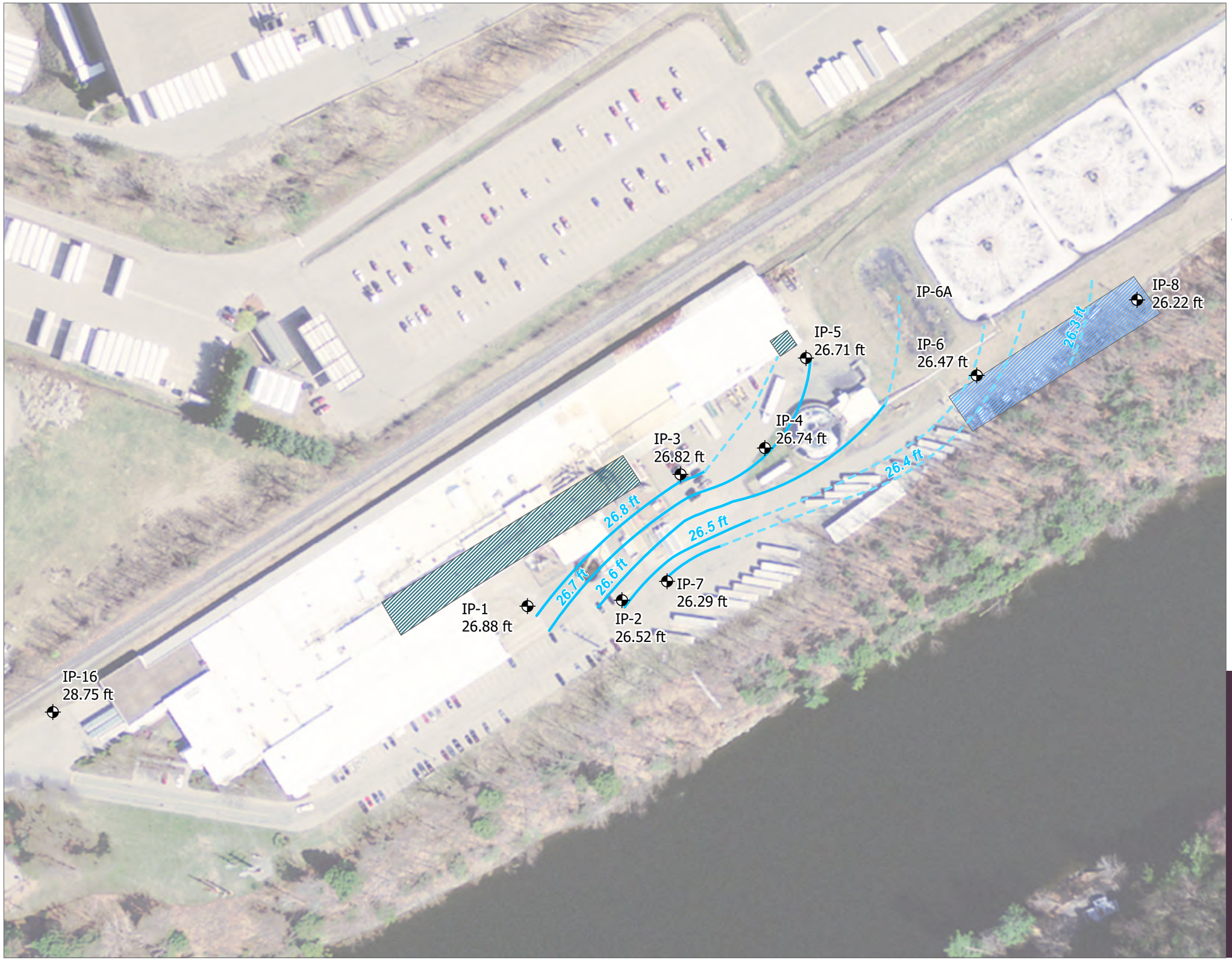
Path: O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\GIS\MapDocuments\PresentationsAndReports\19-015 Long Falls Paper Phase II ESA\19-015 Long Falls Paper Phase II ESA.aprx Figure 5 Soil PCBs Exported: 10/10/2019

Figure 5 Soil PCB & 2,3,7,8 - TCDD TEQ Results

Long Falls Paperboard Phase II Environmental Site Assessment

Prepared For Vermont Department of Environmental Conservation

STONE ENVIRONMENTAL



N

0 110 220

Feet

LEGEND

- Groundwater Sample Location
- Groundwater Depth Contour
- Estimated Groundwater Depth Contour

Site Features

- Outdoor Equipment Area
- BasementArea

Source: Imagery - Esri World Imagery; Sample Locations and Groundwater Depths - Stone Environmental

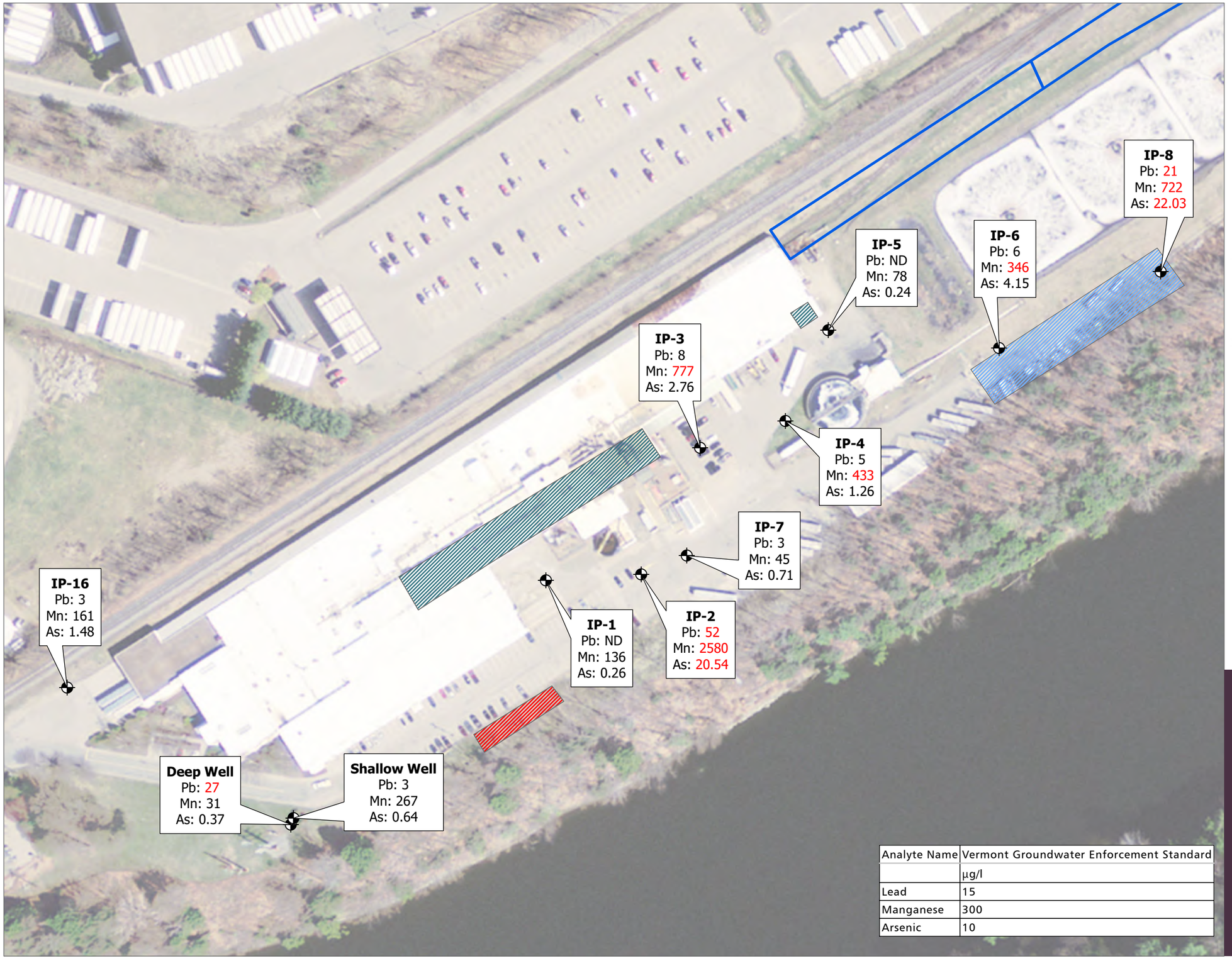
Path: O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\GIS\MapDocuments\PresentationsAndReports\19-015 Long Falls Paper Phase II ESA\19-015 Long Falls Paper Phase II ESA.aprx Fig 6 GW Contour Map Exported:

Figure 6 Groundwater Surface Contours

Long Falls Paperboard Phase II Environmental Site Assessment

Prepared For Vermont Department of Environmental Conservation

STONE ENVIRONMENTAL



Analyte Name	Vermont Groundwater Enforcement Standard
	µg/l
Lead	15
Manganese	300
Arsenic	10

N

0 100 200

Feet

LEGEND

- Groundwater Monitoring Well
- ISM Decision Unit

Site Features

- Outdoor Equipment Area
- Active Leaching Bed
- Former Leaching Bed
- BasementArea

All results in µg/l
ND = Non-Detect
Detections over Vermont Groundwater Enforcement Standard in RED
Pb = Lead
Mn = Manganese
As = Arsenic

Source: Imagery - Esri World Imagery; Site Features and Sample Locations/ Results - Stone Environmental

Path: O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\GIS\MapDocuments\PresentationsAndReports\19-015 Long Falls Paper Phase II ESA\19-015 Long Falls Paper Phase II ESA.aprx Figure 7 Groundwater Metals Exported: 10/10/2019 4:07 PM by wrich

Figure 7 Groundwater Metals Results

Long Falls Paperboard Phase II Environmental Site Assessment

Prepared For Vermont Department of Environmental Conservation

STONE ENVIRONMENTAL

Appendix B: Field Notes and Soil Boring Logs

Soil Boring Log
BORING NO. IP-1
Brattleboro, VT, Montpelier, Vermont

07/22/19, 8/20/19
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT: Drilled to refusal on 7/22, Continued 8/20

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin, L. Rosberg

SOURCE: Stone field notes, 8/20/19
LOG PREPARED BY: DTV 9/27/19
O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\Data\Boring Logs

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		GRAVEL, very coarse grained, angular, well sorted, no odor, no staining, dry, Gravel fill	*Native Backfill*		
		Brown, SAND, fine grained, well sorted, no odor, no staining, dry, homogeneous			
-5		Brown, SILT, no odor, no staining, moist, homogeneous, Sandy silt coarsening downward to fine sand			0.0 @5.0'
		Light brown, SAND, fine to medium grained, well sorted, no odor, iron oxide staining, dry, laminated, Wet at 15 feet			
-10					0.0 @10.6'
					0.0 @11.5'
					0.0 @12.7'
-15		Light brown, SAND, medium grained, subrounded, some silt, no odor, no staining, wet			0.0 @15.5'
-20					
-25					
-30					

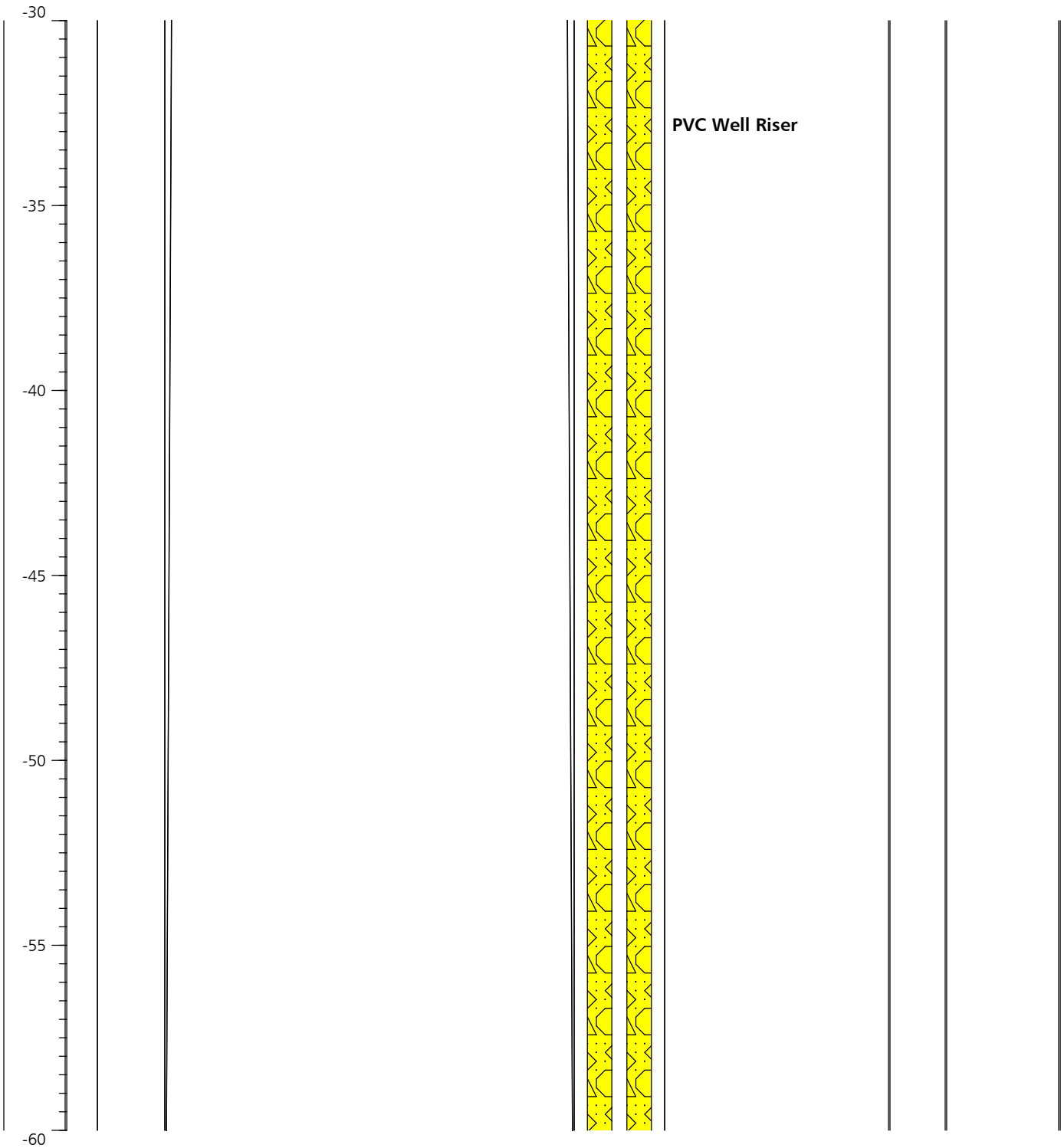
Soil Boring Log
BORING NO. IP-1
Brattleboro, VT, Montpelier, Vermont

07/22/19, 8/20/19
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin, L. Rosberg
COMMENT: Drilled to refusal on 7/22, Continued 8/20

SOURCE: Stone field notes, 8/20/19
LOG PREPARED BY: DTV 9/27/19
O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\Data\Boring Logs

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)



Soil Boring Log
BORING NO. IP-1
Brattleboro, VT, Montpelier, Vermont

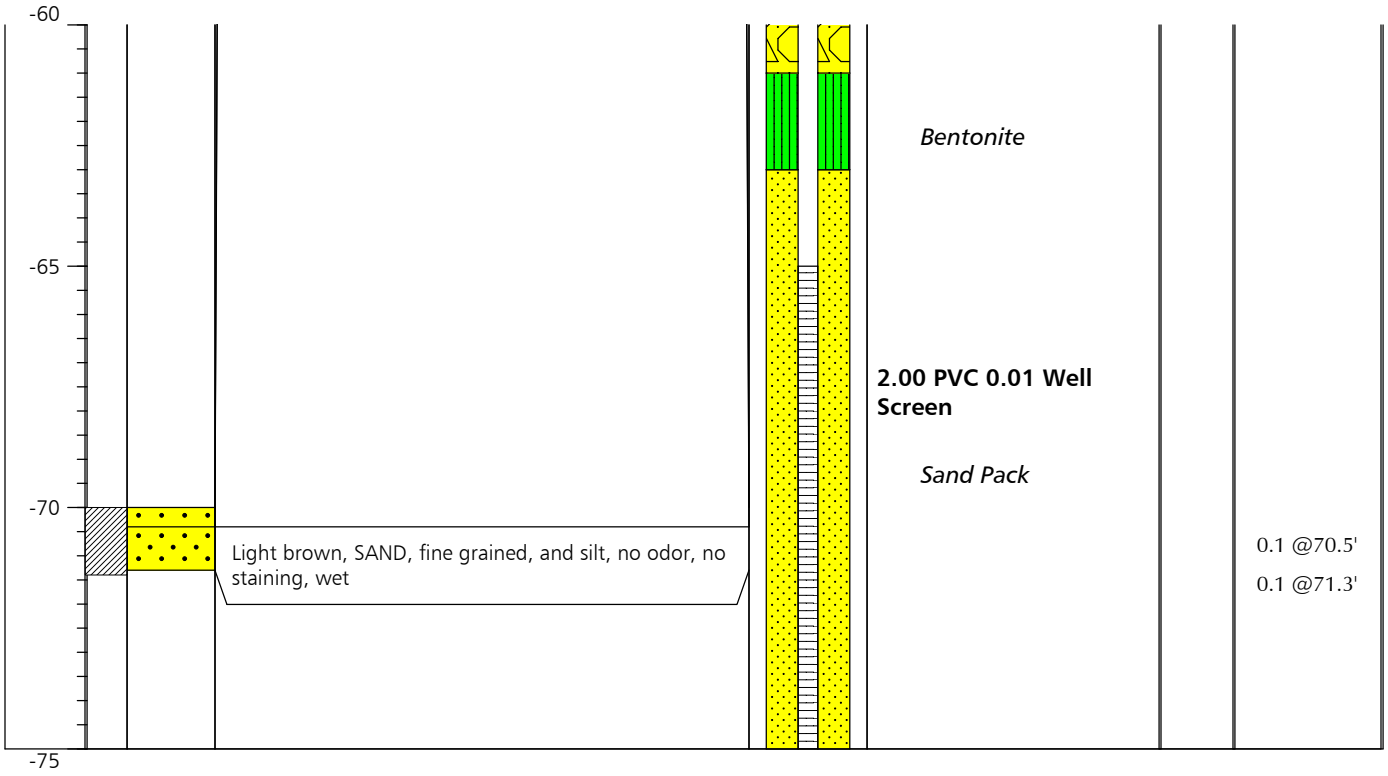
07/22/19, 8/20/19
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT: Drilled to refusal on 7/22, Continued 8/20

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin, L. Rosberg

SOURCE: Stone field notes, 8/20/19
LOG PREPARED BY: DTV 9/27/19
O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\Data\Boring Logs

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)



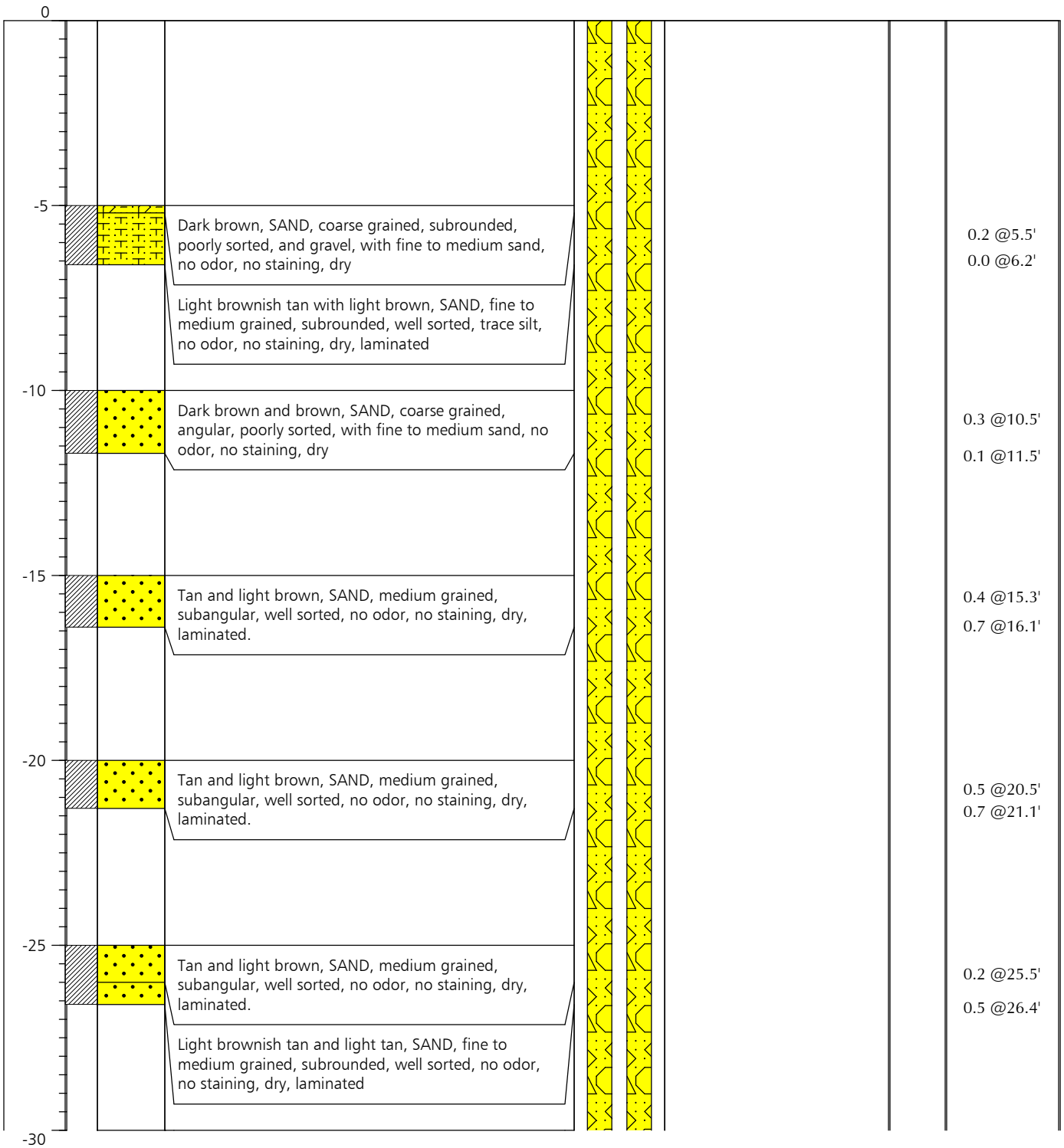
Soil Boring Log
BORING NO. IP-2
Brattleboro, VT, Montpelier, Vermont

DATE DRILLED: 08/20/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/20/19-8/21/19
LOG PREPARED BY: DTV 9/27/19
O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\Data\Boring Logs

STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-2
Brattleboro, VT, Montpelier, Vermont

DATE DRILLED: 08/20/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/20/19-8/21/19
LOG PREPARED BY: DTV 9/27/19
O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\Data\Boring Logs

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-30		Light brown and tan, SAND, coarse to very coarse grained, subangular, well sorted, trace fine to medium sand, no odor, no staining, dry, laminated.	*Native Backfill*		0.0 @30.5'
					0.0 @31.2'
		Light tannish brown, SAND, medium to coarse grained, subangular, poorly sorted, and gravel, no odor, no staining, dry	**PVC Well Riser**		
-35					0.0 @35.5'
-40		Dark brown and tan, SAND, coarse to very coarse grained, subangular, no odor, no staining, dry			0.0 @40.5'
		Dark tannish brown, SAND, medium to coarse grained, subrounded, well sorted, no odor, no staining, dry			0.1 @41.2'
		Light brown and tan, GRAVEL, medium to coarse grained, angular, no odor, no staining, dry			
-45		Light brown and tan, GRAVEL, medium to coarse grained, angular, no odor, no staining, dry			0.0 @45.5'
		Light brown and tan, GRAVEL, medium to coarse grained, angular, no odor, no staining, dry			
-50					0.0 @50.3'
-55		Dark grayish brown, SAND, coarse to very coarse grained, subangular, poorly sorted, trace fine to medium sand, no odor, iron oxide staining, dry, Very light FeO staining on <2%			0.0 @55.6'
-60					

Soil Boring Log
BORING NO. IP-2
Brattleboro, VT, Montpelier, Vermont

DATE DRILLED: 08/20/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/20/19-8/21/19
LOG PREPARED BY: DTV 9/27/19
O:\PROJ-19\EAR\19-015 Long Falls Paper Phase II ESA\Data\Boring Logs

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-60		Dark grayish brown, SAND, coarse to very coarse grained, subangular, poorly sorted, trace fine to medium sand, no odor, iron oxide staining, dry, Very light FeO staining on <2%	*Bentonite*		0.0 @60.5' 0.1 @61.2'
		Light brown, SAND, medium grained, subrounded, trace silt, no odor, no staining, dry			
-65		Light brown, SAND, medium grained, subrounded, trace silt, no odor, no staining, dry, Rusty staining at 65.6 and 66.3			0.6 @65.5' 0.3 @66.3'
		Light brown, SAND, coarse grained, subangular, with fine to medium sand, and silt, no odor, no staining, wet	**2.00 PVC 0.01 Well Screen** *Sand Pack*		
-70		Light brown, SAND, coarse grained, subangular, poorly sorted, and fine gravel, trace coarse gravel, no odor, no staining, wet			0.7 @70.3'
-75					

Soil Boring Log
BORING NO. IP-03a
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/22/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT: 75.0

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/22/19
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0					
-5					
-10					
-15		Dark brown, SAND, medium to coarse grained, subrounded, poorly sorted, trace silt, trace gravel, no odor, no staining, dry			0.1 @15.5'
		Light brown and tan, SAND, medium grained, subangular, trace silt, trace gravel, no odor, no staining, dry			0.2 @16.2'
-20		Light brown and light reddish brown, SAND, medium to coarse grained, subangular, trace silt, no odor, no staining, dry, laminated			0.3 @20.5'
					0.4 @21.2'
-25		Light brown and light reddish brown, SAND, medium to coarse grained, subangular, trace silt, no odor, no staining, dry, laminated			0.4 @25.5'
					0.6 @26.3'
-30					

Soil Boring Log
BORING NO. IP-03a
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/22/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT: 75.0

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/22/19
LOG PREPARED BY: DTV 9/27/19
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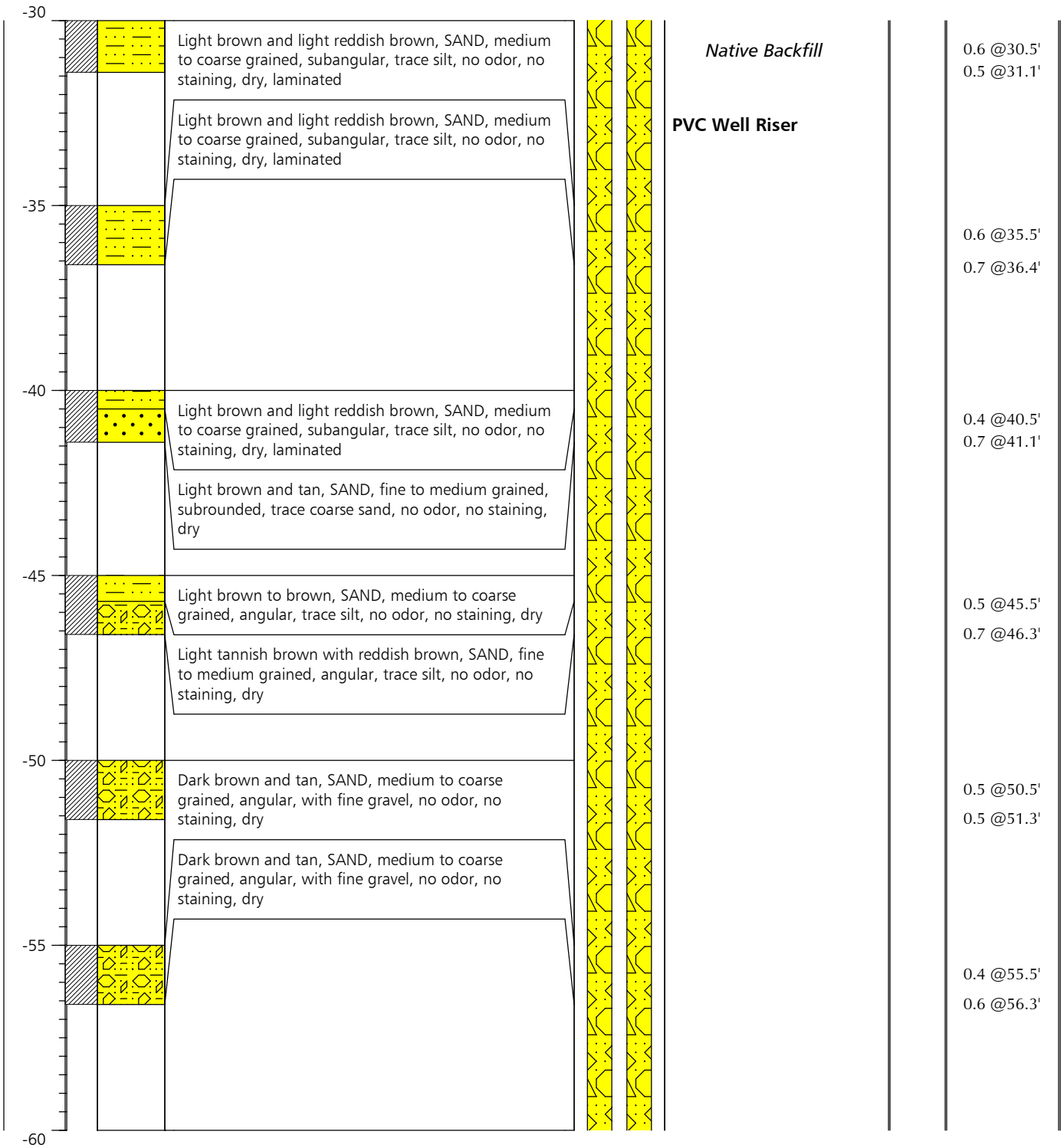
STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-03a
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/22/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT: 75.0

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/22/19
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-60		Dark brown and tan, SAND, medium to coarse grained, angular, with fine gravel, no odor, no staining, dry	*Bentonite*		0.3 @60.5' 0.3 @61.1'
		Dark brown and tan, SAND, coarse to very coarse grained, angular, some fine to medium sand, no odor, no staining, dry			
-65		Dark brown and tan, SAND, medium to coarse grained, angular, some fine sand, no odor, no staining, dry			0.4 @65.5' 0.4 @66.3'
		Dark brown and tan, SAND, medium to coarse grained, angular, some fine sand, no odor, no staining, dry	**2.00 PVC 0.01 Well Screen** *Sand Pack*	▼	
-70		Dark brown, SAND, very coarse grained, angular, trace silt, no odor, no staining, wet			0.0 @70.5' 0.2 @71.2'
-75					

Soil Boring Log
BORING NO. IP-04
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 08/16/2019
DRILLING METHOD: 4-1/4" Hollow stem auger
DRILLING CONTRACTOR: DrillX
LOGGED BY: D. Voisin
DRILLER: Chris Hogan
COMMENT: Drilled to 65 ft bgs with center plug.

SOURCE: Stone field notes 8/16/19
LOG PREPARED BY: DTV 9/27/19
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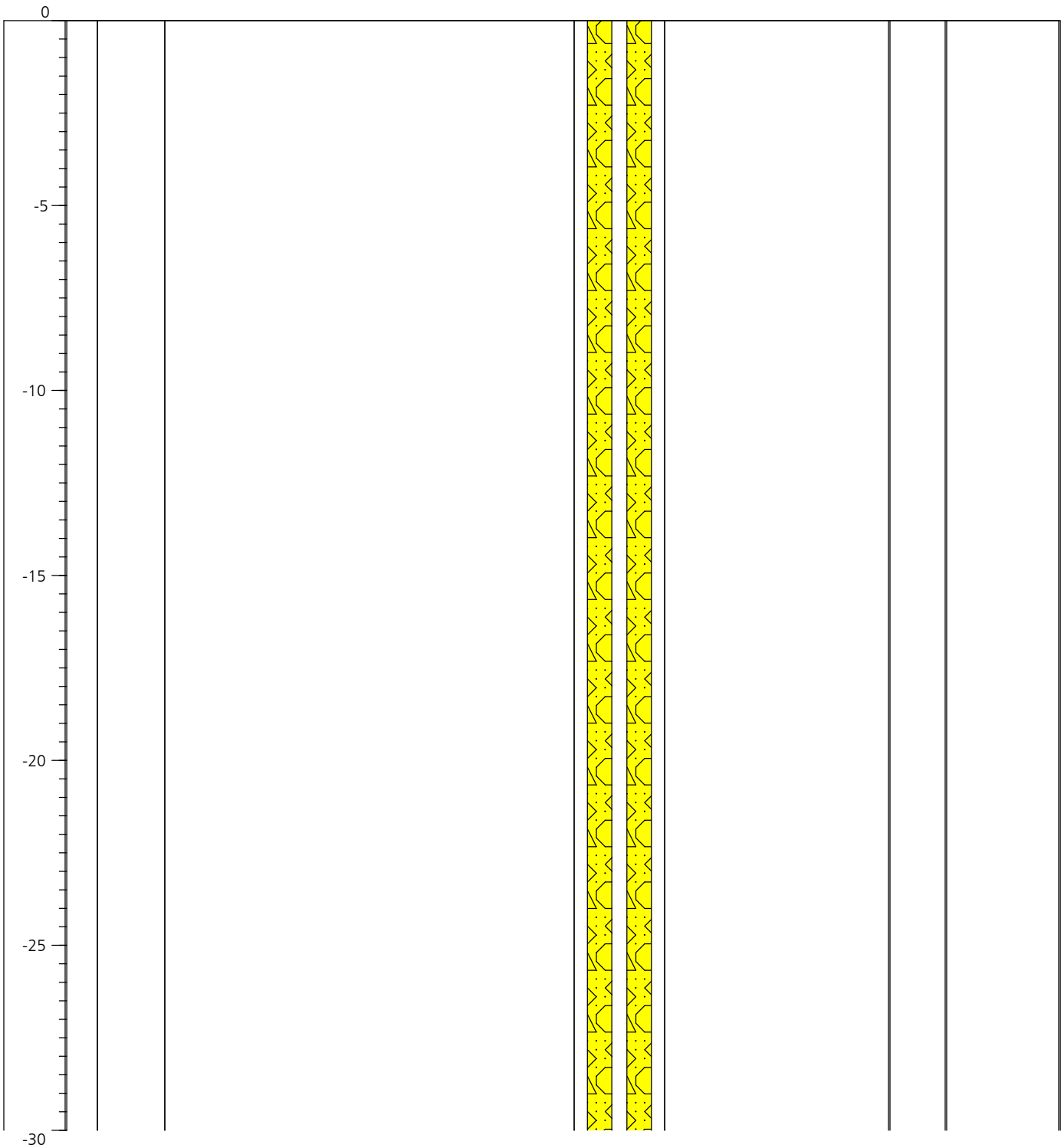
STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)



Soil Boring Log
BORING NO. IP-04
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 08/16/2019
DRILLING METHOD: 4-1/4" Hollow stem auger
DRILLING CONTRACTOR: DrillX
LOGGED BY: D. Voisin
DRILLER: Chris Hogan
COMMENT: Drilled to 65 ft bgs with center plug.

SOURCE: Stone field notes 8/16/19
LOG PREPARED BY: DTV 9/27/19
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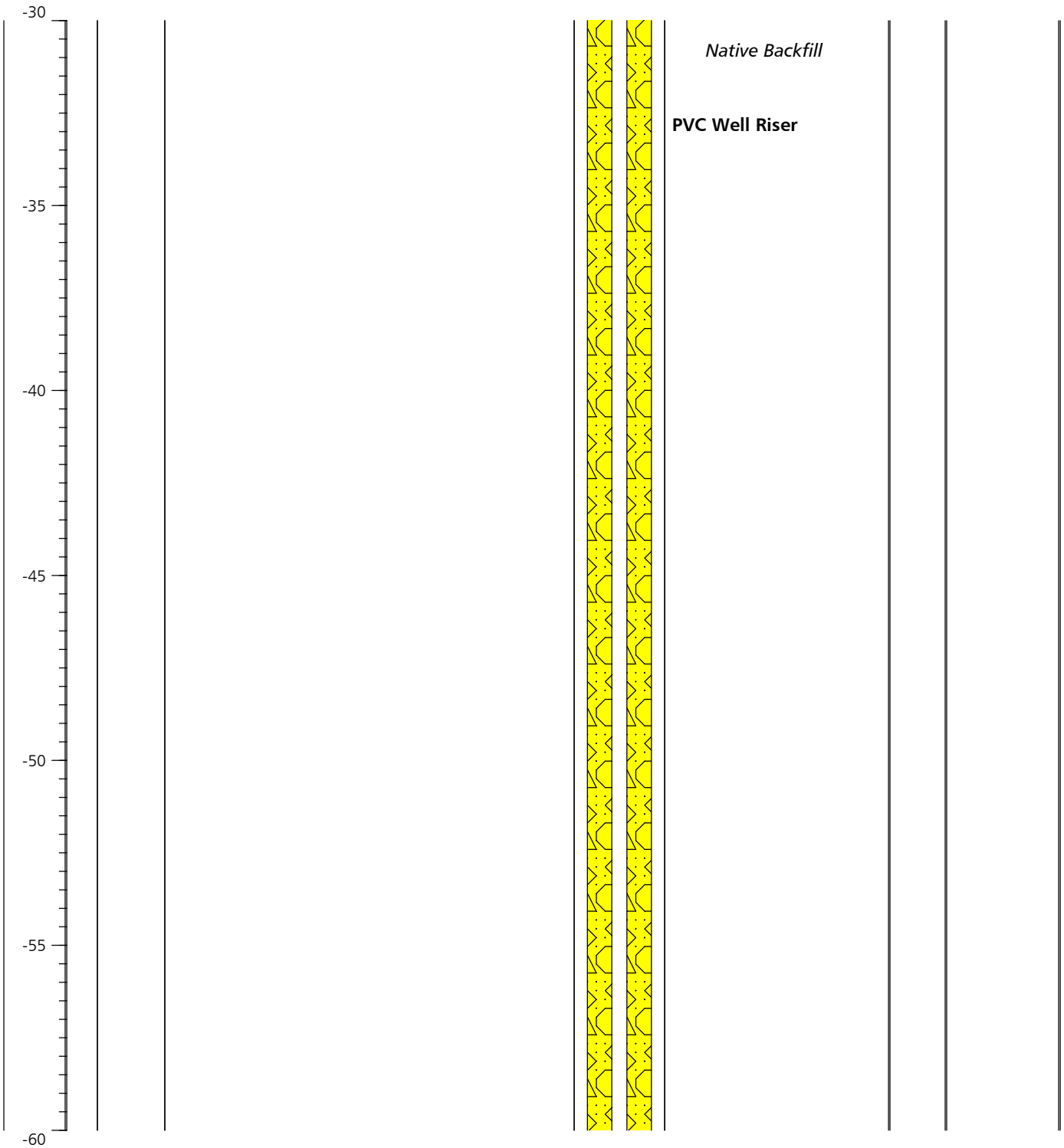
STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)



Soil Boring Log
BORING NO. IP-04
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 08/16/2019
DRILLING METHOD: 4-1/4" Hollow stem auger
DRILLING CONTRACTOR: DrillX
LOGGED BY: D. Voisin
DRILLER: Chris Hogan
COMMENT: Drilled to 65 ft bgs with center plug.

SOURCE: Stone field notes 8/16/19
LOG PREPARED BY: DTV 9/27/19
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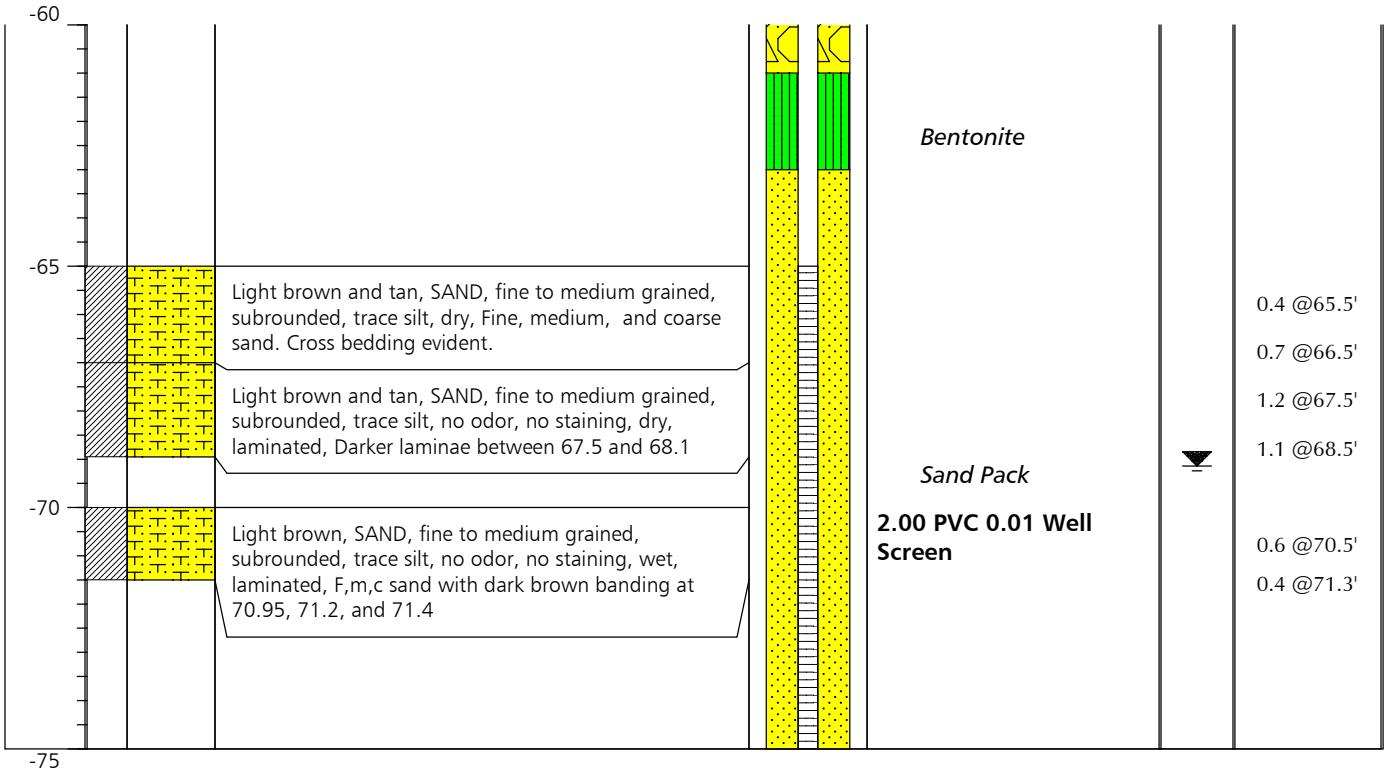
STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)



Soil Boring Log
BORING NO. IP-05
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/14/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes, 8/14/19
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0					
-5		Brown, SAND, coarse grained, some fine gravel, no odor, no staining, dry, Slough			0.5 @6.0'
		Light brown, SAND, fine to medium grained, no odor, no staining, dry			
-10		Light brown, SAND, medium grained, with gravel, no odor, no staining, dry			0.3 @10.5'
		Light brown, SAND, fine to medium grained, trace silt, with fine to medium sand, no odor, no staining, dry, laminated			0.3 @12.5'
-15		Light brown, SAND, fine to medium grained, trace silt, with fine to medium sand, no odor, no staining, dry, laminated			0.3 @16.0'
		Light brown, SAND, coarse grained, and gravel, no odor, no staining, dry			
		Brown, SAND, coarse grained, some fine gravel, no odor, no staining, dry, Slough			
-20		Light brown, SAND, fine grained, and silt, and silt, no odor, no staining, dry, varved, ~3mm silt layers with 10 mm fine sand			0.2 @20.5'
		Light brown, SAND, fine grained, and silt, and silt, no odor, no staining, dry, varved			0.3 @21.5'
		Light brown, SAND, fine grained, and silt, and silt, no odor, no staining, dry, varved			
-25					0.2 @25.5'
					0.2 @26.5'
-30					

Soil Boring Log
BORING NO. IP-05
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/14/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes, 8/14/19
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-30		Light brown, SAND, fine grained, and silt, and silt, no odor, no staining, dry, varved	*Native Backfill*		0.2 @30.5'
		Light brown, SAND, fine grained, and silt, and silt, no odor, no staining, dry, varved			0.2 @31.5'
			PVC Well Riser		
-35		Dark tan to light brown, SAND, medium to coarse grained, with silt, no odor, no staining, dry to moist, stratified			0.2 @35.5' 0.2 @36.1'
		Light brown, SAND, fine grained, and silt, and silt, no odor, no staining, dry, varved			
-40		Light brown, SAND, fine grained, and silt, and silt, no odor, no staining, dry, varved			0.2 @40.5'
		Light brown, GRAVEL, coarse grained, poorly sorted, and medium to coarse sand, no odor, no staining, dry			0.6 @41.5'
-45		Light brown with brown, SAND, fine grained, with sandy silt, no odor, no staining, moist			0.2 @45.5' 0.3 @46.2'
		Brown, SILT, moist, mottled, Slight rusty mottling			
-50		Light brown and tan, SAND, medium to coarse grained, poorly sorted, and fine sand, with fine gravel, no odor, no staining, dry			0.1 @50.5' 0.0 @51.2'
		Light brown and tan, SAND, medium to coarse grained, poorly sorted, and fine sand, with fine gravel, no odor, no staining, dry			
-55		Light brown, SAND, fine grained, trace silt, no odor, no staining, dry			0.5 @55.5' 0.8 @56.1'
		Light brown and tan, SAND, fine to medium grained, with silt, no odor, no staining, moist, stratified, Prominent biotite throughout. Occasional silt stringers among stratified sand			
-60					

Soil Boring Log
BORING NO. IP-05
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/14/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes, 8/14/19
LOG PREPARED BY: DTV 9/27/19
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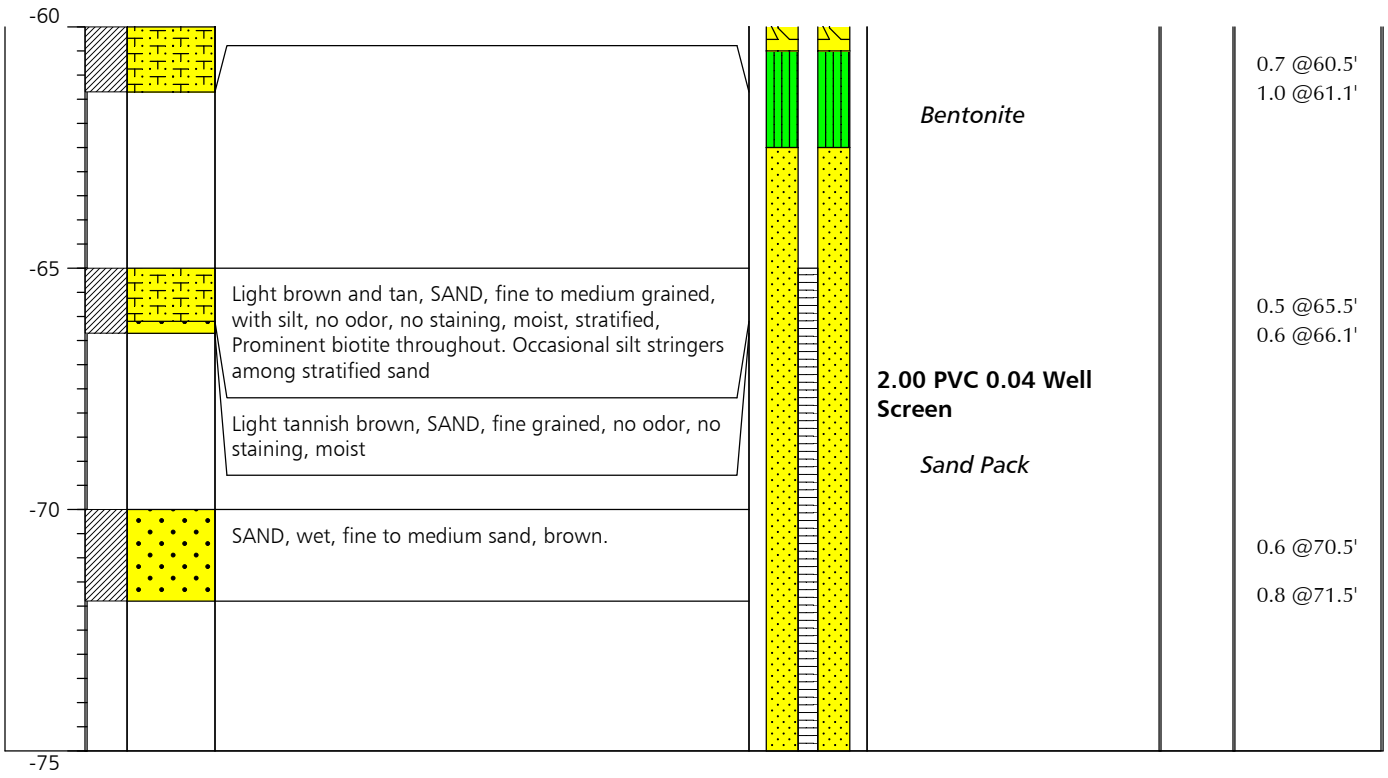
STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-06
161 Wellington Road. Brattleboro VT

DATE DRILLED: 08/15/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 08/15/19
LOG PREPARED BY: DTV 9/27/19
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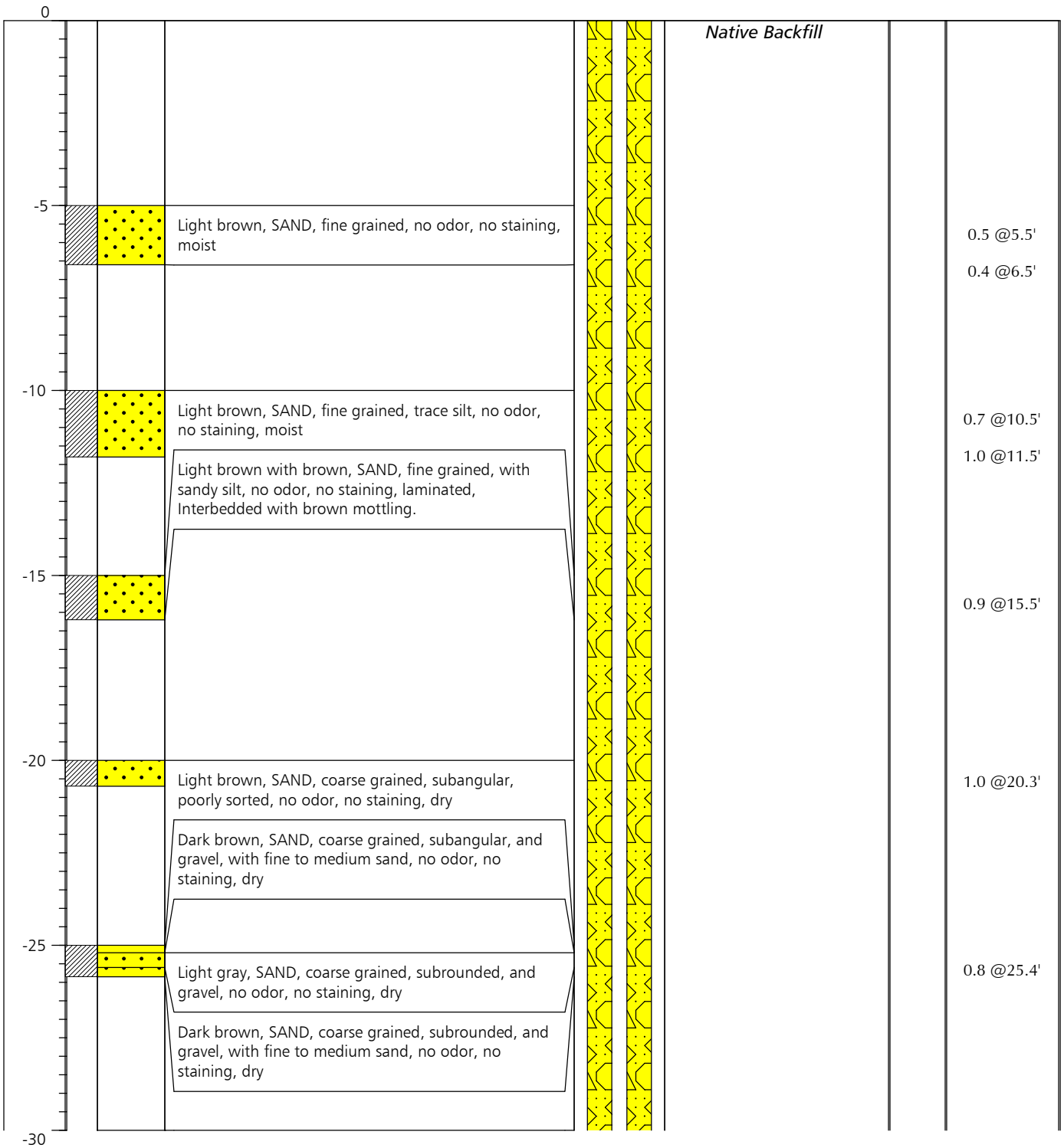
STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-06
161 Wellington Road. Brattleboro VT

DATE DRILLED: 08/15/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 08/15/19
LOG PREPARED BY: DTV 9/27/19
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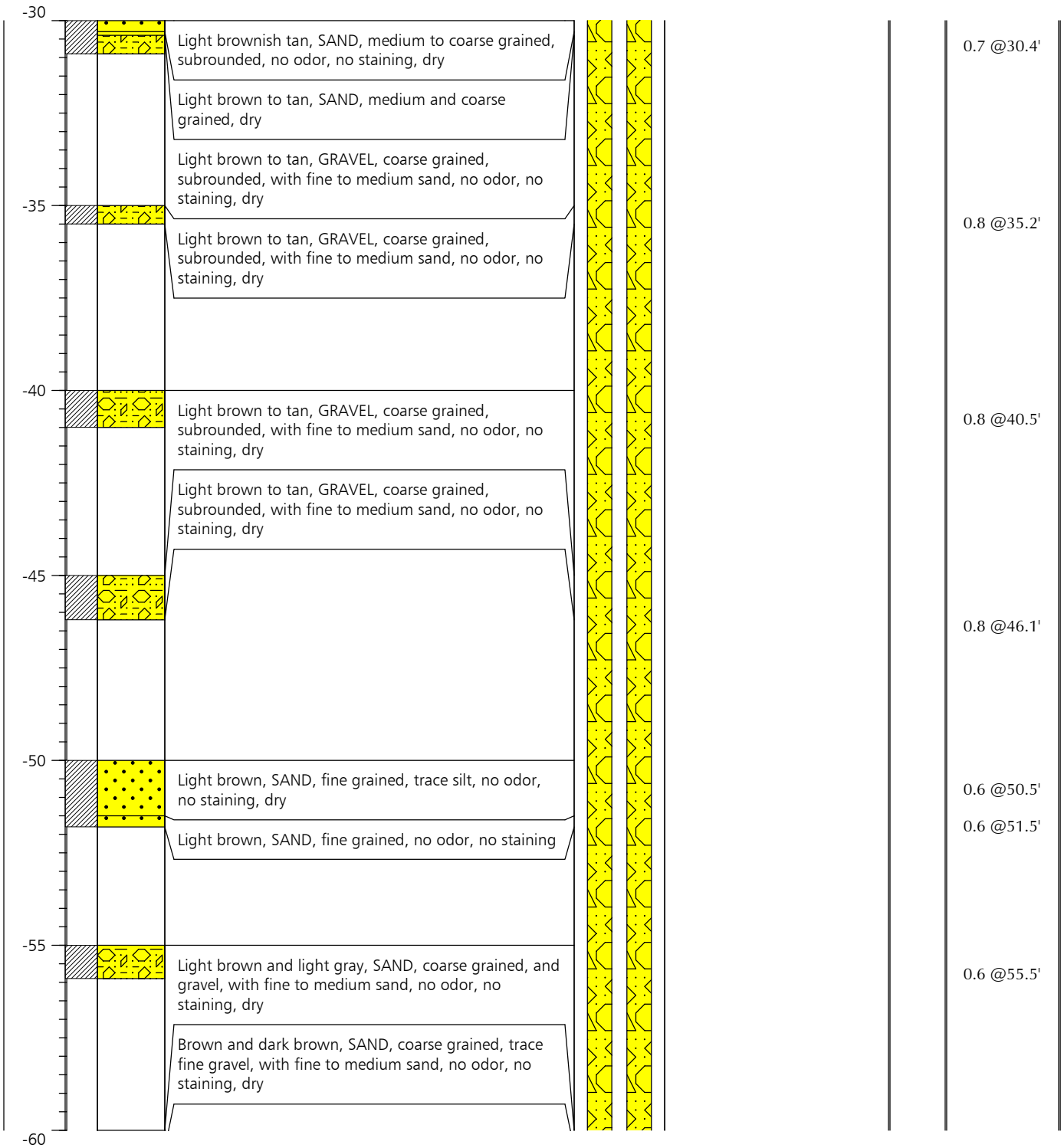
STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-06
161 Wellington Road. Brattleboro VT

DATE DRILLED: 08/15/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 08/15/19
LOG PREPARED BY: DTV 9/27/19
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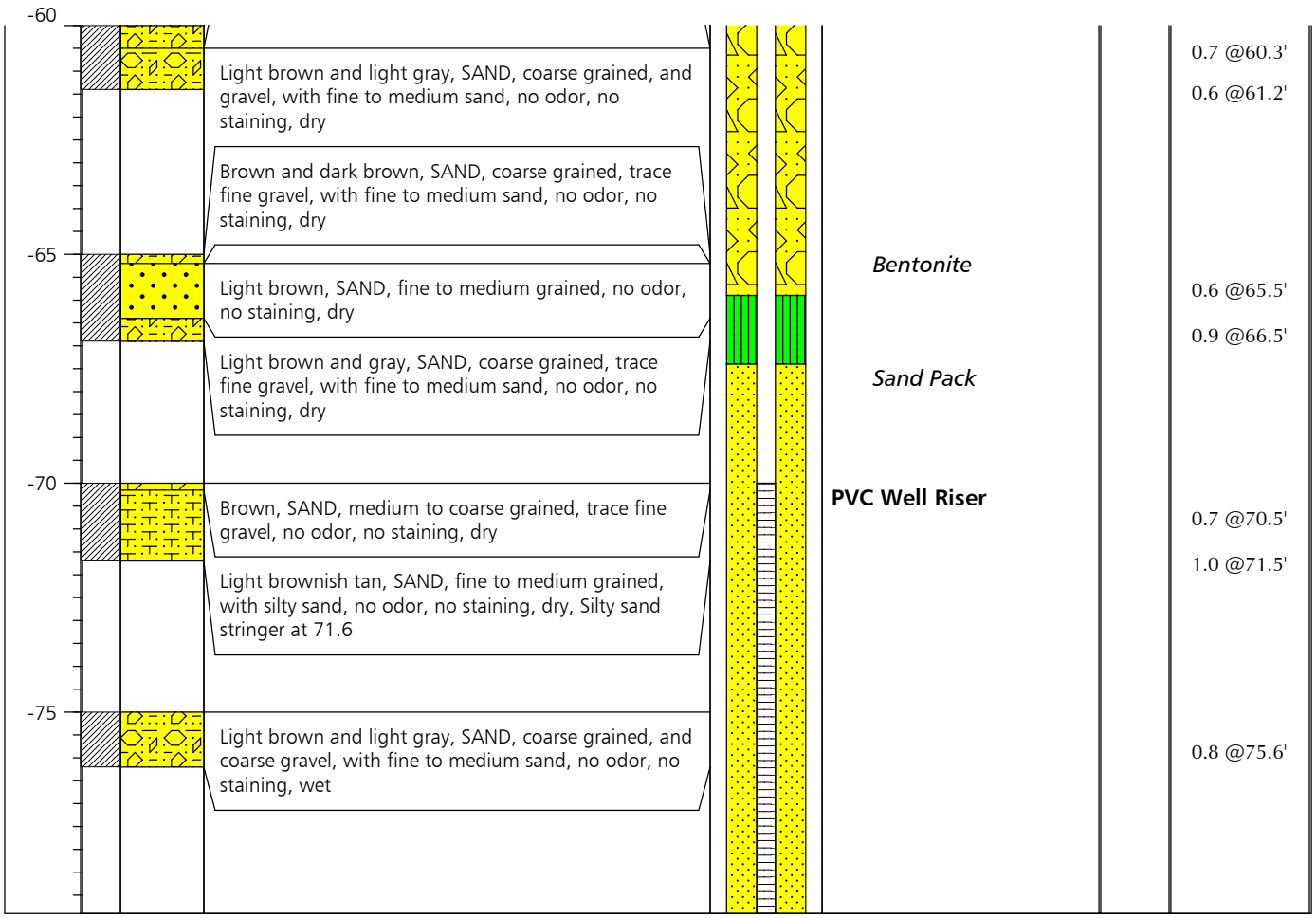
STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-07
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 08/21/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0					
-5		Dark brown, SAND, coarse grained, with fine to medium sand, and silt, no odor, no staining, dry, Slough			0.4 @5.5'
		Light brownish tan, SAND, fine to medium grained, no odor, no staining, dry			
-10		Light tannish brown, SAND, coarse grained, angular, with fine to medium sand, trace silt, no odor, no staining, dry			0.4 @10.5'
-15		Light brown and tan, SAND, medium grained, subangular, trace fine sand, no odor, no staining, dry, laminated			0.7 @15.5' 1.0 @16.1'
-20		Light brown and tan, SAND, medium grained, subangular, trace fine sand, no odor, no staining, dry, laminated			0.9 @20.5' 0.9 @21.2'
-25		Light brown and tan, SAND, medium grained, subangular, trace fine sand, no odor, no staining, dry, laminated			0.4 @25.5'
		Tannish brown and light reddish tan, SAND, coarse grained, subangular, poorly sorted, with fine to medium sand, and silt, no odor, no staining, dry			0.6 @26.5'
-30					

Soil Boring Log
BORING NO. IP-07
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 08/21/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-30		Tannish brown and light reddish tan, SAND, coarse grained, subangular, poorly sorted, with fine to medium sand, and silt, no odor, no staining, dry	*Native Backfill*		0.5 @30.5' 0.6 @31.2'
		Light brown and tan, SAND, fine to medium grained, trace sandy silt, no odor, no staining, dry	**PVC Well Riser**		
		Light brownish tan, GRAVEL, fine to medium grained, angular, poorly sorted, and coarse sand, no odor, no staining, dry			
-35		Light brownish tan, SAND, fine grained, no odor, no staining, dry			0.6 @35.5' 0.7 @36.1'
		Light brown and gray, SAND, coarse grained, with gravel, and fine to medium sand, no odor, no staining, dry			
-40		Light brown and gray, SAND, coarse grained, with gravel, and fine to medium sand, no odor, no staining, dry			0.4 @40.5' 0.6 @41.0'
-45		Light brown and gray, SAND, coarse grained, with gravel, and fine to medium sand, no odor, no staining, dry, Dark brown band at 45.7			0.5 @45.5' 0.7 @46.1'
		Light brownish gray and, SAND, coarse grained, with gravel, and fine to medium sand, no odor, no staining, dry			
-50					0.4 @50.5'
-55		Light brownish gray and, SAND, coarse grained, with gravel, and fine to medium sand, no odor, no staining, dry			0.6 @55.5' 0.6 @56.1'
		Dark brown and tan, SAND, coarse to very coarse grained, angular, poorly sorted, no odor, no staining, dry			
-60					

Soil Boring Log
BORING NO. IP-07
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 08/21/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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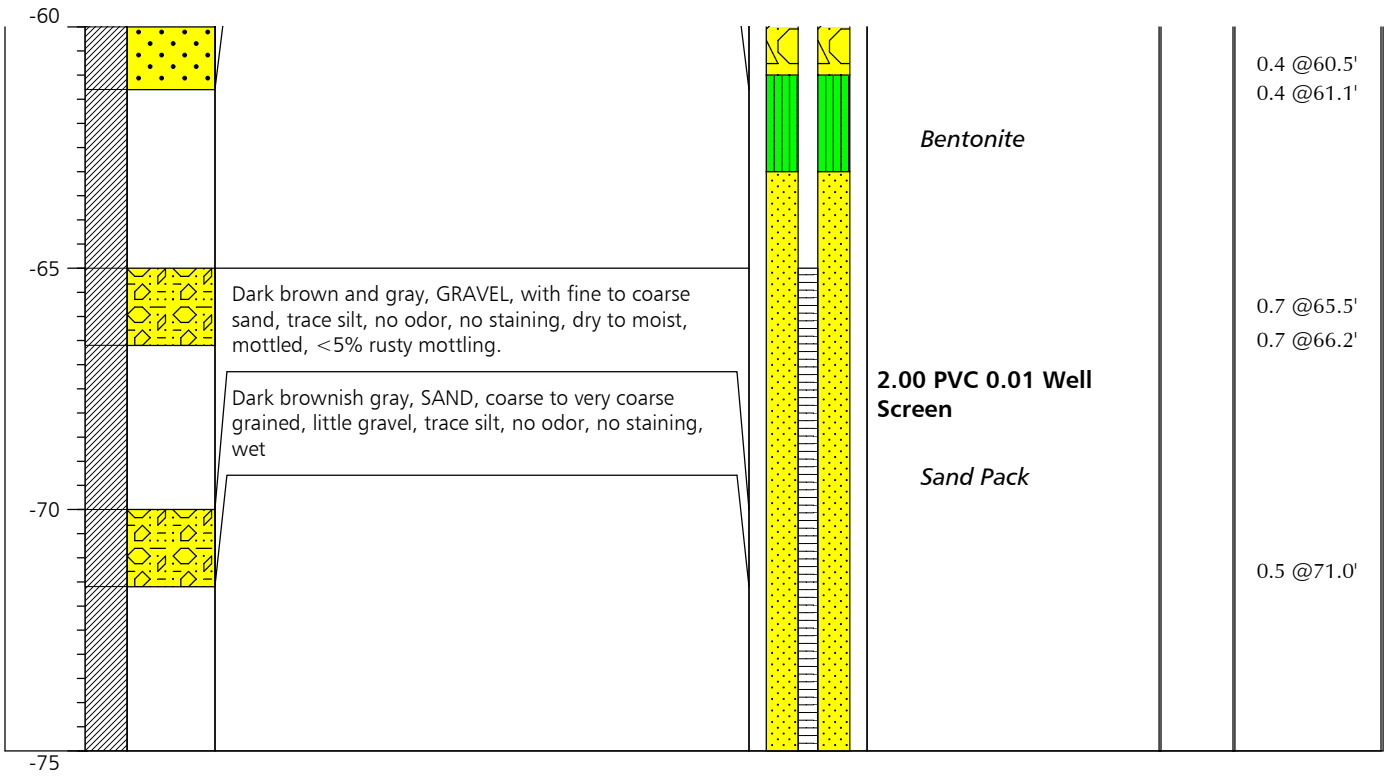
STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-08
161 Wellington Rd. Brattleboro, VT,

DATE DRILLED: 08/15/2019
DRILLING METHOD: 4-1/4" Hollow stem auger
DRILLING CONTRACTOR: DrillX
LOGGED BY: D. Voisin
DRILLER: Chris Hogan
COMMENT: Drilled to 65 ft with center plug before sampling.

SOURCE: Stone field notes, 8/15/19
LOG PREPARED BY: DTV 9/27/19
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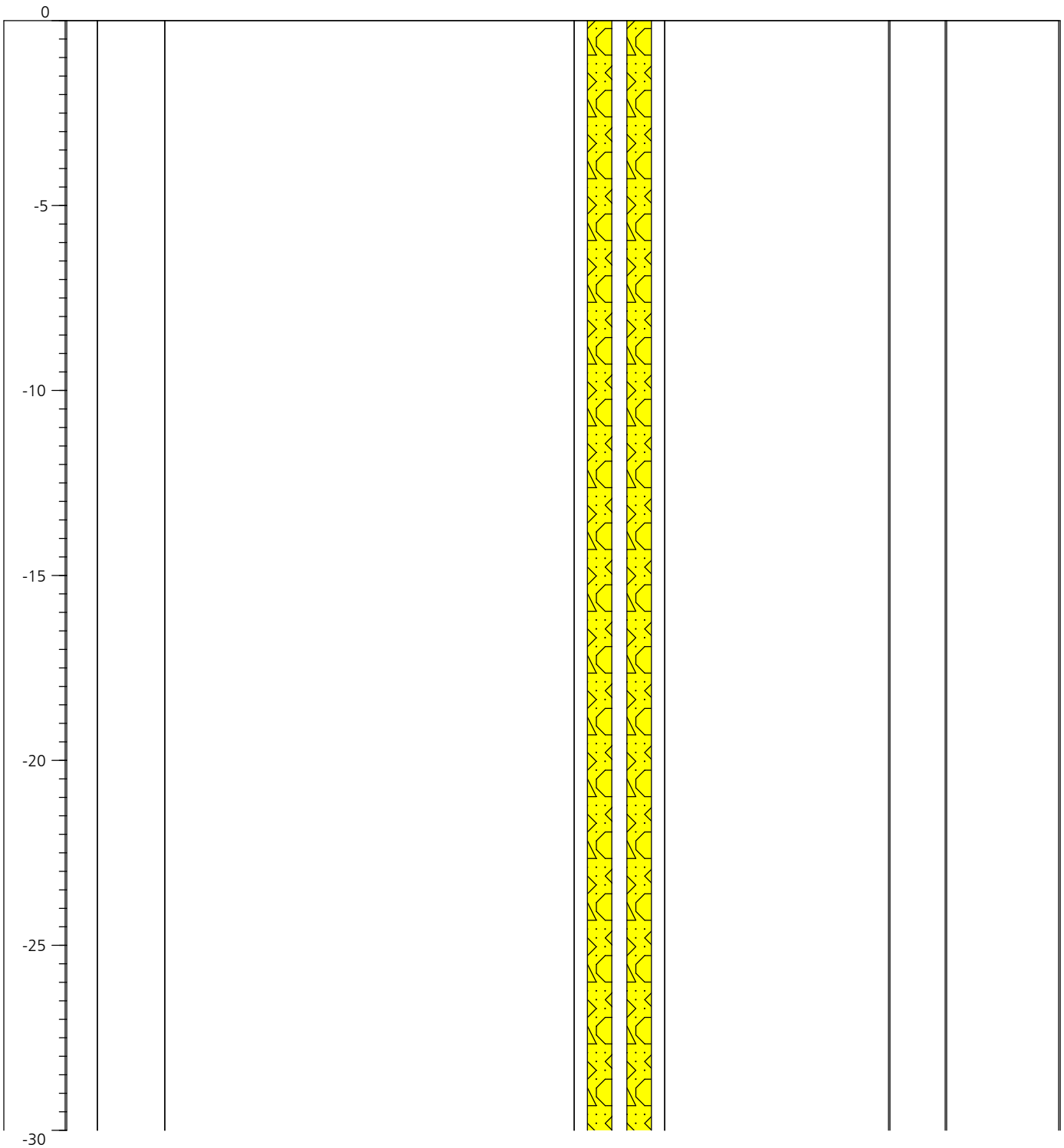
STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)



Soil Boring Log
BORING NO. IP-08
161 Wellington Rd. Brattleboro, VT,

DATE DRILLED: 08/15/2019
DRILLING METHOD: 4-1/4" Hollow stem auger
DRILLING CONTRACTOR: DrillX
LOGGED BY: D. Voisin
DRILLER: Chris Hogan
COMMENT: Drilled to 65 ft with center plug before sampling.

SOURCE: Stone field notes, 8/15/19
LOG PREPARED BY: DTV 9/27/19
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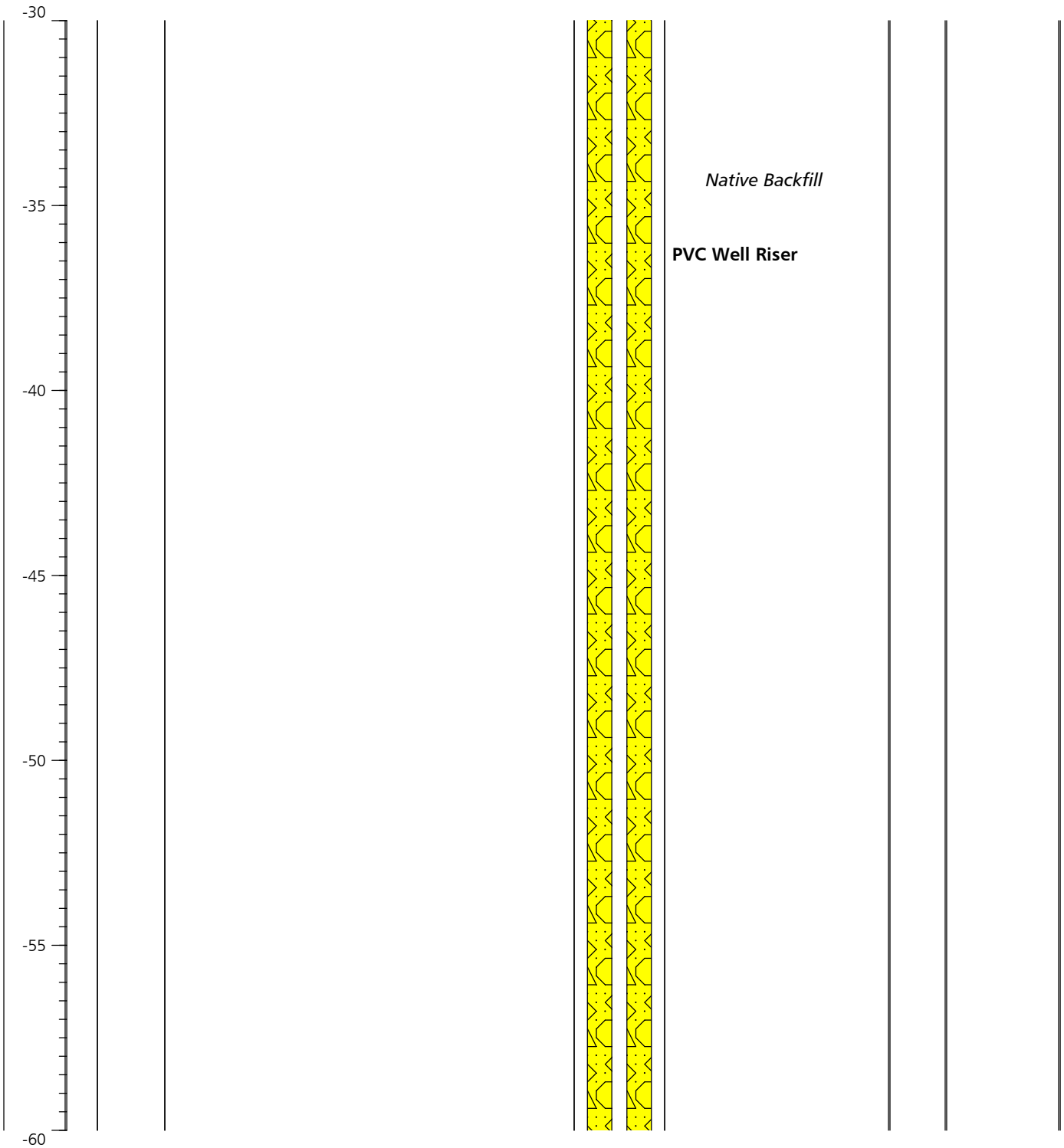
STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)



Soil Boring Log
BORING NO. IP-08
161 Wellington Rd. Brattleboro, VT,

DATE DRILLED: 08/15/2019
DRILLING METHOD: 4-1/4" Hollow stem auger
DRILLING CONTRACTOR: DrillX
LOGGED BY: D. Voisin
DRILLER: Chris Hogan
COMMENT: Drilled to 65 ft with center plug before sampling.

SOURCE: Stone field notes, 8/15/19
LOG PREPARED BY: DTV 9/27/19
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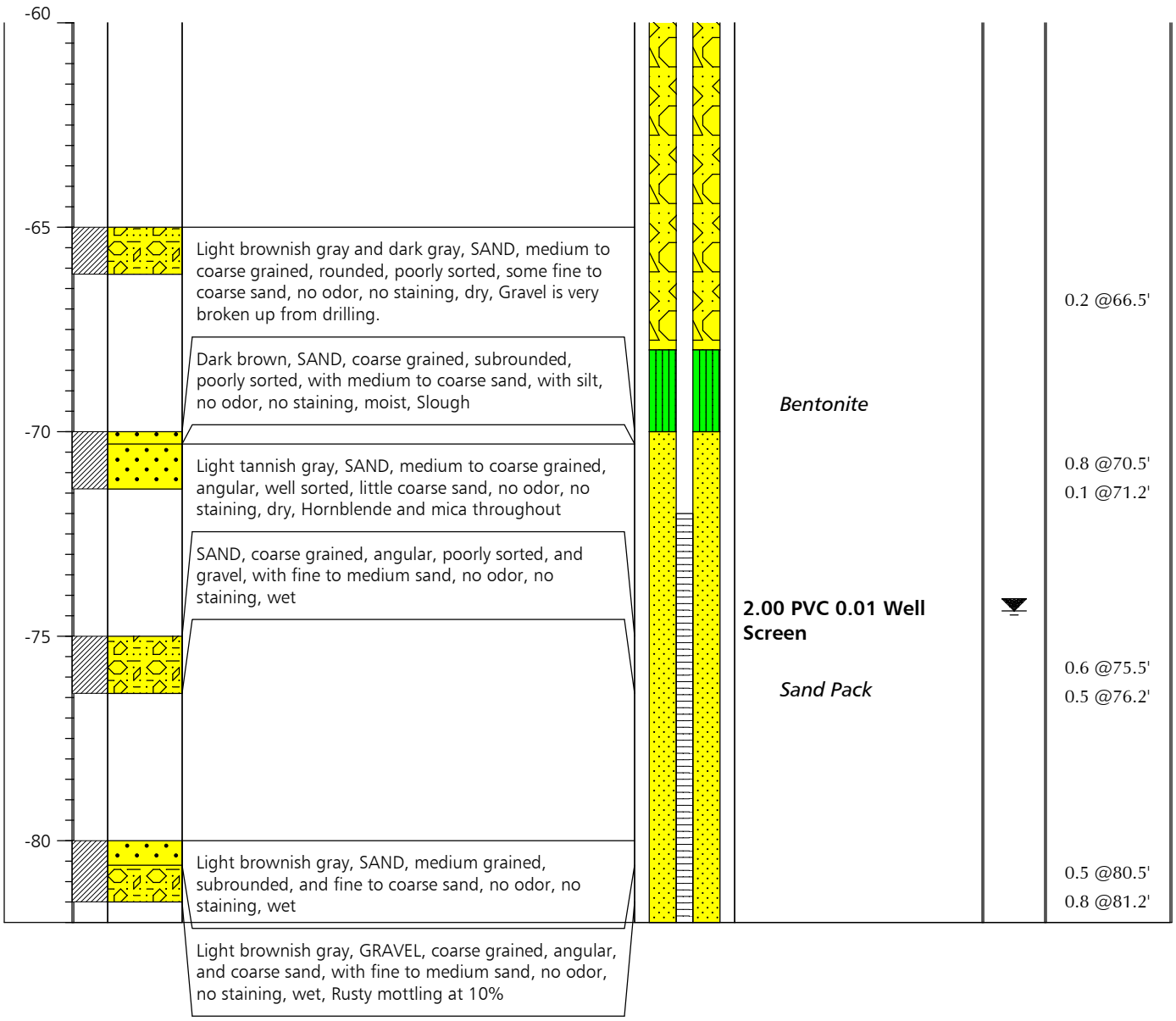
STONE ENVIRONMENTAL



Soil Boring Log
BORING NO. IP-12
161 Wellington Road, Brattleboro, VT

DATE DRILLED: 07/22/2019 DRILLING METHOD: Direct Push - Macro Core
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Stone field notes, 7/22/19
LOG PREPARED BY: DTV 9/27/19
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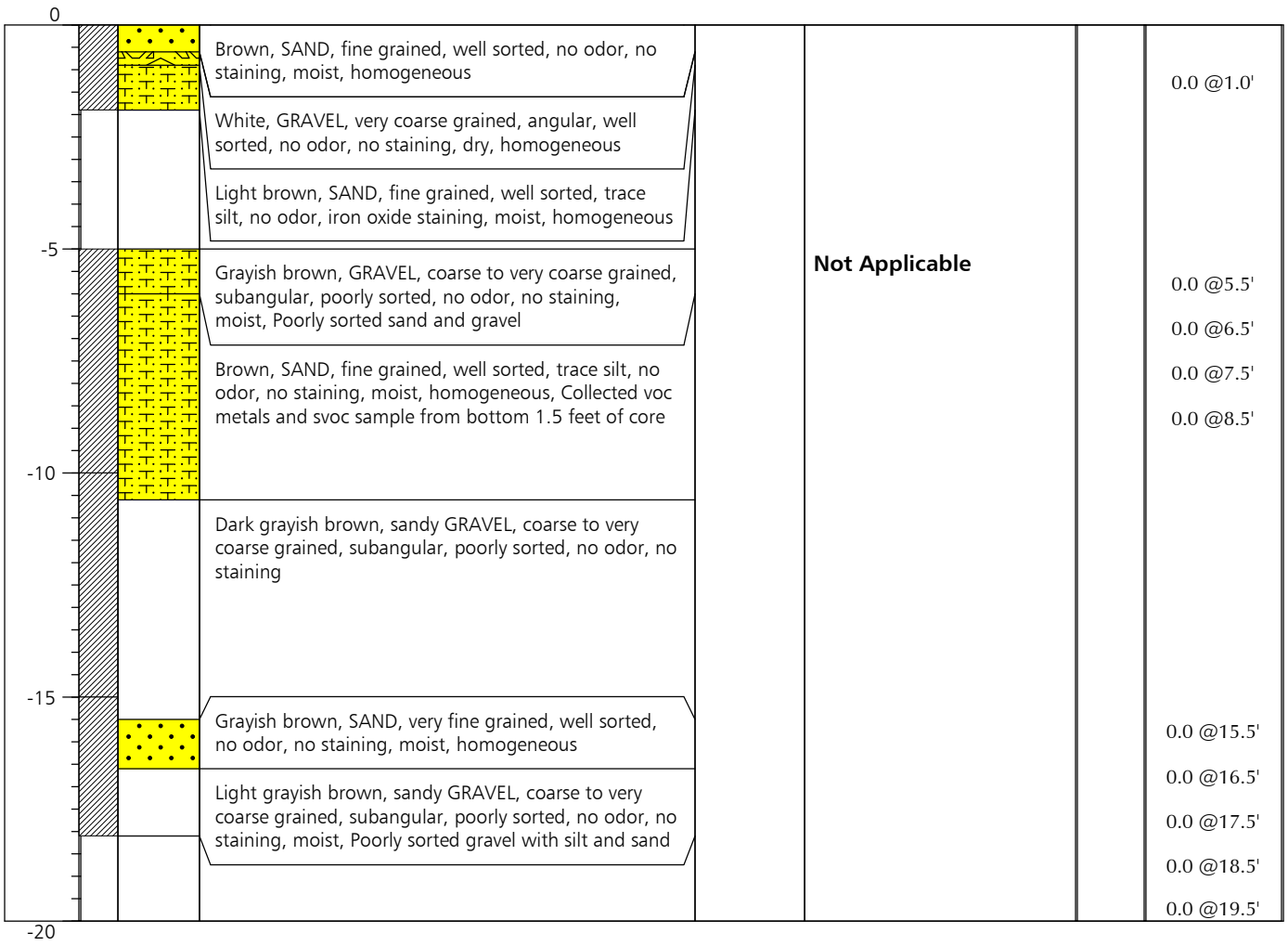
STONE ENVIRONMENTAL



DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Brown, SAND, fine grained, well sorted, no odor, no staining, moist, homogeneous	Not Applicable		0.0 @1.0'
		White, GRAVEL, very coarse grained, angular, well sorted, no odor, no staining, dry, homogeneous			
		Light brown, SAND, fine grained, well sorted, trace silt, no odor, iron oxide staining, moist, homogeneous			
-5		Grayish brown, GRAVEL, coarse to very coarse grained, subangular, poorly sorted, no odor, no staining, moist, Poorly sorted sand and gravel			0.0 @5.5'
					0.0 @6.5'
		Brown, SAND, fine grained, well sorted, trace silt, no odor, no staining, moist, homogeneous, Collected voc metals and svoc sample from bottom 1.5 feet of core			0.0 @7.5'
					0.0 @8.5'
-10		Dark grayish brown, sandy GRAVEL, coarse to very coarse grained, subangular, poorly sorted, no odor, no staining			
-15		Grayish brown, SAND, very fine grained, well sorted, no odor, no staining, moist, homogeneous			0.0 @15.5'
					0.0 @16.5'
		Light grayish brown, sandy GRAVEL, coarse to very coarse grained, subangular, poorly sorted, no odor, no staining, moist, Poorly sorted gravel with silt and sand			0.0 @17.5'
					0.0 @18.5'
-20					0.0 @19.5'

Soil Boring Log
BORING NO. IP-13
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Dark brown, silty SAND, very fine to fine grained, well sorted, no odor, no staining, moist, homogeneous			0.0 @0.5'
		Light gray, GRAVEL, very coarse grained, angular, well sorted, no odor, no staining, homogeneous			0.0 @1.5'
-5		Brown, SAND, very fine to fine grained, well sorted, no odor, no staining, moist, homogeneous			0.0 @5.5'
					0.0 @6.5'
					0.0 @7.5'
-10			**Not Applicable**		
		Reddish brown, GRAVEL, coarse to very coarse grained, subangular, well sorted, no odor, no staining, moist, homogeneous, Coarsening downward to very coarse gravel by 12 feet			0.0 @10.5'
					0.0 @11.5'
					0.0 @12.5'
-15					0.0 @15.8'
					0.0 @17.0'
-20					0.0 @20.5'
					@21.5'
-25					0.0 @25.5'
					0.0 @26.5'
-30					

Soil Boring Log
BORING NO. IP-13
161 Wellington Rd. Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-30					0.0 @30.5'
		Brown, SAND, medium grained, well sorted, no odor, no staining, moist, homogeneous, Well sorted medium sand			0.0 @31.5'
-35					0.0 @35.6'
		Reddish brown, GRAVEL, coarse to very coarse grained, well sorted, no odor, no staining, moist, homogeneous, Coarse sand coarsening downward to coarse sand and gravel			0.0 @36.7'
					0.0 @37.8'
-40			**Not Applicable**		
					0.0 @40.5'
					0.0 @41.5'
-45					
-50					
-55					

Soil Boring Log
BORING NO. IP-15
Brattleboro, VT, Montpelier, Vermont

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Light brown, SAND, very fine to fine grained, well sorted, no odor, no staining, moist, homogeneous, Silty fine sand grading to fine sand at 5.5 feet	**Not Applicable**		0.0 @0.5' 0.0 @1.5' 0.0 @2.5' 0.0 @5.8' 0.0 @6.9' 0.0 @8.2'
-5					
-10					

Soil Boring Log
BORING NO. IP-16
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/19/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/19/19
LOG PREPARED BY:DTV 9/27/19
19015

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Black, Asphalt	*Native Backfill*		
		Light brown, GRAVEL, coarse to very coarse grained, subangular, no odor, no staining, dry, homogeneous			0.0 @1.0'
		Light brown, SAND, fine to medium grained, well sorted, no odor, no staining, moist, homogeneous			0.0 @2.0'
		Pale gray, COBBLES, very coarse grained, angular, poorly sorted, no odor, no staining, dry			0.0 @3.0'
-5		Light brown, COBBLES, coarse to very coarse grained, angular, poorly sorted, some coarse gravel, no odor, no staining, dry			
-10		Light brown, SAND, medium to coarse grained, subangular, well sorted, little coarse gravel, no odor, no staining, dry, homogeneous, Medium to coarse sand with some pebbles			0.0 @10.8' 0.0 @11.0' 0.0 @11.5'
					0.0 @12.5'
-15		Brown, SAND, coarse to very coarse grained, subangular, well sorted, with coarse gravel, no odor, no staining, dry, stratified, Medium sand coarsening downward to coarse sand and gravel			0.0 @16.0'
		Brown, SAND, coarse to very coarse grained, subangular, well sorted, with coarse gravel, no odor, no staining, dry, stratified, Medium sand coarsening downward to coarse sand and gravel			0.0 @17.0'
-20		Brown, SAND, medium to coarse grained, subangular, well sorted, trace gravel, no odor, no staining, stratified, Medium sand coarsening downward			0.0 @18.0'
		Dark brown, sandy GRAVEL, coarse to very coarse grained, subangular, poorly sorted, no odor, no staining, moist, Poorly sorted gravel with some silt			
-25		Dark brown, sandy GRAVEL, coarse to very coarse grained, subangular, poorly sorted, no odor, no staining, moist, Poorly sorted gravel with some silt			0.0 @25.5' 0.0 @26.0'
					0.0 @27.0'
-30					

Soil Boring Log
BORING NO. IP-16
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 08/19/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/19/19
LOG PREPARED BY:DTV 9/27/19
19015

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-30		Light brown and light gray, SAND, coarse grained, angular, poorly sorted, and gravel, no odor, no staining, dry	**PVC Well Riser**		0.1 @30.8'
		SAND, medium to coarse grained, subangular, no odor, no staining, dry			
-35		Dark brown, SAND, coarse to very coarse grained, subrounded, with fine to medium sand, no odor, no staining, moist, Slough			0.2 @35.5' 0.5 @36.1'
		Dark brownish gray, GRAVEL, coarse grained, angular, with silty sand, no odor, no staining, dry			
-40		Light reddish brown with tan, SAND, fine to medium grained, subrounded, with silt, no odor, no staining, dry			0.3 @40.2' 0.6 @41.1'
		Light brown and light gray, SAND, medium to coarse grained, and gravel, no odor, no staining, dry			
-45		Light brown, gravelly SAND, coarse grained, subrounded, little silt, some gravel, no odor, no staining, dry			0.7 @45.4'
		Light brownish gray, SAND, coarse grained, subangular, with gravel, trace silt, no odor, no staining, dry			
-50		Light gray and light brown, SAND, coarse to very coarse grained, subrounded, with gravel, no odor, no staining, dry			0.3 @50.5' 0.6 @51.2'
		Light brown and light gray, SAND, coarse to very coarse grained, subangular, and gravel, no odor, no staining, dry			
-55					0.4 @55.5'
-60					

Soil Boring Log
BORING NO. IP-16
161 Wellington Rd., Brattleboro, VT

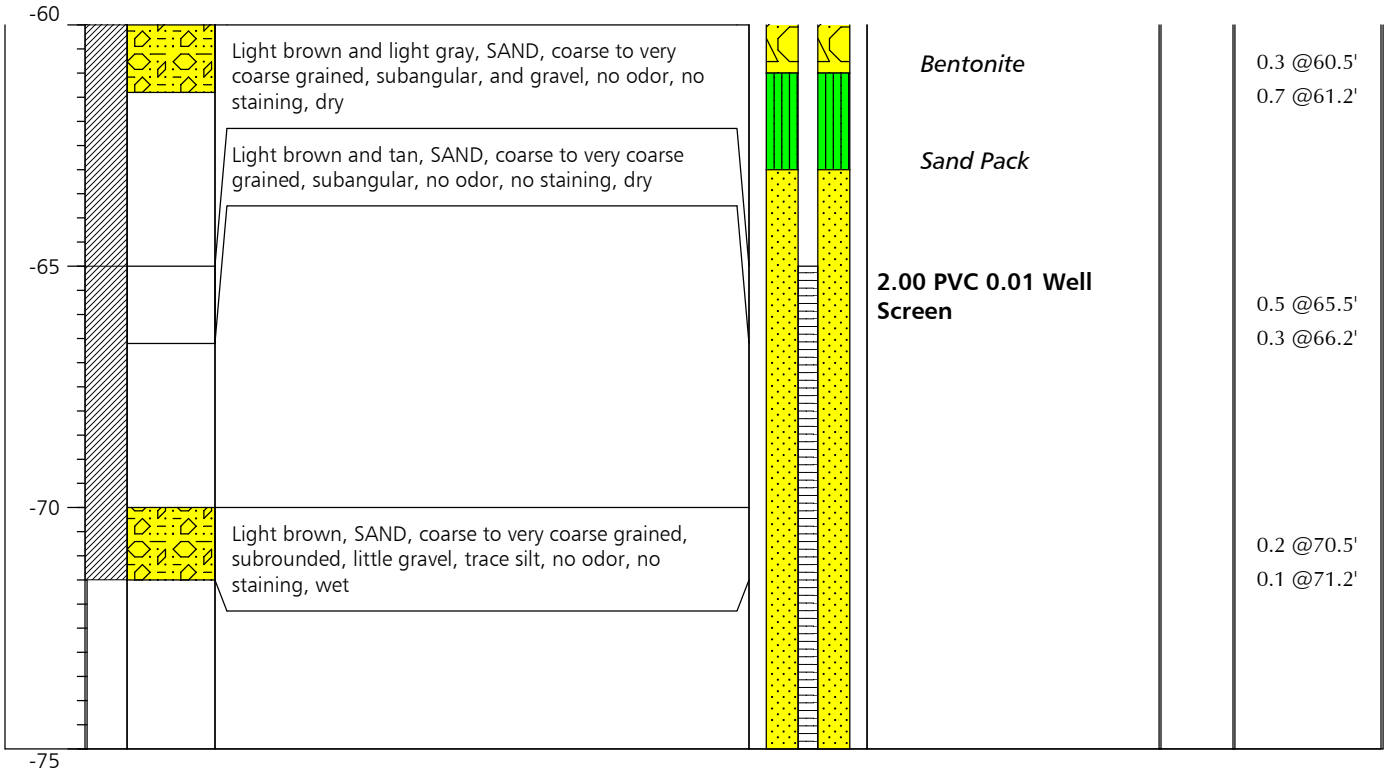
DATE DRILLED: 08/19/2019
DRILLING CONTRACTOR: DrillX
DRILLER: Chris Hogan
COMMENT:

DRILLING METHOD: 4-1/4" Hollow stem auger
LOGGED BY: D. Voisin

SOURCE: Stone field notes 8/19/19
LOG PREPARED BY:DTV 9/27/19
19015

STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
-60		Light brown and light gray, SAND, coarse to very coarse grained, subangular, and gravel, no odor, no staining, dry	*Bentonite*		0.3 @60.5' 0.7 @61.2'
		Light brown and tan, SAND, coarse to very coarse grained, subangular, no odor, no staining, dry	*Sand Pack*		
-65			**2.00 PVC 0.01 Well Screen**		0.5 @65.5' 0.3 @66.2'
-70		Light brown, SAND, coarse to very coarse grained, subrounded, little gravel, trace silt, no odor, no staining, wet			0.2 @70.5' 0.1 @71.2'
-75					



Soil Boring Log
BORING NO. IP-18
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Stone field notes
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Brown, SAND, fine grained, well sorted, no odor, no staining, moist, laminated, Well sorted sand	**Not Applicable**		0.0 @0.8' 0.0 @1.6' 0.0 @2.7' 0.0 @5.6' 0.0 @6.2' 0.0 @7.2' 0.0 @8.3'
-5					
-10					

Soil Boring Log
BORING NO. IP-19
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Stone field notes, 7/23/19
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Very dark brown, SILT, no odor, no staining, moist, Organic loamy sand	**Not Applicable**		0.0 @0.5'
		Brown, GRAVEL, coarse to very coarse grained, angular, poorly sorted, no odor, no staining, blocky, Poorly sorted sand and gravel			0.0 @1.5'
-5		Light brown, SAND, very fine to fine grained, well sorted, no odor, iron oxide staining, moist, Iron staining in silt lenses between 5.5 and 7 feet			0.0 @5.7'
					0.0 @7.0'
					0.0 @8.2'
-10					

Soil Boring Log
BORING NO. IP-20
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern ANALYTICAL LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT: Edge of wooded area west of IP-18

SOURCE: Stone field notes, 7/23/19
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Light brown, gravelly SAND, medium to coarse grained, subangular, poorly sorted, no odor, no staining, moist, blocky, Loamy pebbly sand	**Not Applicable**		0.0 @1.0'
		SAND, medium grained, well sorted, no odor, no staining, moist, Well sorted sand			0.0 @2.0'
-5		Gray, SILT, trace fine sand, some coarse gravel, no odor, no staining, moist, lensed			0.0 @5.5'
		Brown, SAND, fine to medium grained, well sorted, no odor, no staining, moist, lensed			0.0 @6.5'
					0.0 @7.5'
-10					

Soil Boring Log
BORING NO. IP-21
Brattleboro, VT, Montpelier, Vermont

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Brown, gravelly SAND, medium to coarse grained, poorly sorted, no odor, no staining, moist, blocky, Pebbly Fine sand with silt lenses	**Not Applicable**		0.0 @1.0' 0.0 @2.0' 0.0 @2.9'
-5		Dark brown, SILT, no odor, no staining, moist, blocky			0.0 @5.8'
		Light brown, SAND, very fine to fine grained, well sorted, trace silt, no odor, no staining, moist, blocky			0.0 @7.0' 0.0 @7.9'
-10					

Soil Boring Log
BORING NO. IP-22
161 Wellington Rd., Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Dark brown, SILT, no odor, no staining, moist	**Not Applicable**		0.0 @0.5'
		Concrete rubble			
-5		Concrete rubble and stone			0.0 @5.5'
		Dark brown to black, SILT, no odor, no staining, moist, Organic rich loamy silt			0.0 @6.5'
		Light grayish brown, SAND, very fine to fine grained, well sorted, no odor, no staining, moist, blocky, Silty fine sand			0.0 @7.5'
-10					

Soil Boring Log
BORING NO. IP-23
Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Stone field notes, 7/23/19
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Dark brown, COBBLES, very coarse grained, angular, poorly sorted, no odor, no staining, dry	**Not Applicable**		0.0 @1.0'
		Light brown, SAND, well sorted, no odor, no staining, moist, stratified			
-5		Very dark brown, SAND, fine grained, well sorted, some construction debris, no odor, no staining, moist, Some concrete rubble			0.0 @5.6'
		SAND, very fine to fine grained, well sorted, no odor, no staining, moist, stratified			0.0 @6.5'
					0.0 @7.6'
-10					

Soil Boring Log
BORING NO. IP-24
161 Wellington, Rd. Brattleboro, VT

DATE DRILLED: 07/23/2019 DRILLING METHOD: Direct Push - Dual Tube
DRILLING CONTRACTOR: Eastern Analytical LOGGED BY: L. Rosberg
DRILLER: Brian Law
COMMENT:

SOURCE: Field boring log
LOG PREPARED BY: DTV 9/27/19
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STONE ENVIRONMENTAL

DEPTH (Feet)	RECOVERY	LITHOLOGY / SOIL DESCRIPTION	WELL CONSTRUCTION *AND BACKFILL MATERIAL*	Water Depth (ft)	PID (ppm v/v)
0		Very dark brown to black, SILT, trace fine gravel, no odor, no staining, moist	**Not Applicable**		0.0 @0.5'
		Brown, SAND, fine to medium grained, well sorted, no odor, no staining, moist, blocky, Asphalt rubble at 1.2 to 1.8 feet			0.0 @1.5'
					0.0 @2.4'
-5		Concrete rubble			0.0 @5.4'
		Light brown, SAND, very fine to fine grained, well sorted, no odor, no staining, moist			0.0 @6.5'
					0.0 @7.5'
-10					

2 7/22/19 Location: Brattleboro, VT

Proj. Name / ID: Lowe, Falls Paperboard / 19-015

07:30 Lee Rasberg (LSR) on-site. Signed in and met w/ Gabby.

08:00 Reviewed IP's / dig safe markings. Markup alternative locs. For IP-4, 7, and 2. Eastern Analytical (EA) on-site. Brian Law and Josh

09:00 Completed safe work permit / reviewed HASP. Tyler - Vermont Underground Locators (VUL) on-site. Reviewed IP's, begin utility loc. @ IP-16

09:15 Alpha Analytical courrier delivered sample bottles off-site @ 09:25, EA off-load rig + prep tooling

10:00 Shawn Donovan on-site.

10:25 No recovery in 10-15' and 15-20' intervals in IP-16, likely pushing cobbles in front of cutting shoe. Off-set ~10' east.

11:05 IP-16 → no recovery from 30-35'

LSR 7/22/19

Scale: 1 square = _____

7/22/19 Loc. Brattleboro, VT

Lowe, Falls Paperboard 19-015

11:15 No recovery from 35-40' IP-16, likely pushing rock in front of drive shoe. Pulled tooling

11:55 Moved to IP-1 and began drilling

12:15 Sudden hard refusal @ IP-1 @ 16 ft bgs. VUL cleared new loc. ~ 43' south: IP-1A

12:45 Rate of penetration refusal @ 16' @ IP-1A.

13:00 Called Dave Abrahamson to discuss drilling challenges. Shawn Donovan off-site.

13:30 Opened well boxes

Well ID	Depth (ft btoc)
MW-3	72' - dry
MW-4	83' - DTW ~ 80'
MW-16	68' ~ 1' of No. 6 oil

14:00 Began advancing IP-3, VUL off-site

14:30 IP-3 Rate of penetration refusal @ 29 ft bgs w/in coarse sand.

LSR 7/22/19

Scale: 1 square = _____

Rite in the Rain

7/22/19 Long Falls Paperboard 19-015

14:40 Called Dave Abrahamson. Will move to IP-12 and IP-13 and reassess drilling technique for deeper borings / gw monitoring points.

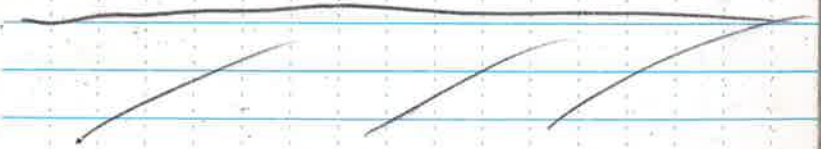
15:30 Moved to IP-12.

Collected following samples

ID	Depth(ft)	Time	Analysis
IP-12-7.5	7.5	16:00	VOC - 8260
IP12-7.5	7.5	16:00	SVOC - 8270
IP-12-11.0	11.0	16:05	Dioxin/Furan
IP-12-7.5	7.5	16:00	PCBs
IP-12-11.0	11.0	16:05	PFAS
IP-12-7.5	7.5	16:00	Metals

16:30 Could not advance past 20' @ IP-12 w/MCS due to hole collapse.

16:55 Tidied work areas and moved drill rig/support truck to parking area. LSR/EA off-site



Scale: 1 square = _____ SJR 7/22/19

7/23/19 Long Falls Paperboard 19-015

06:45 LSR on-site. Completed safe work permit.

07:00 Eastern Analytical on-site, begin setup @ IP-13 w/ DT225.

07:30 Begin drilling @ IP-13.

IP-13 Sample Summary

ID	Depth(ft)	Time	Analysis
IP-13-7.5	7.5	07:45	VOCs
IP13-7.5	7.5	07:45	Metals
IP-13-7.5	7.5	07:45	SVOCs
IP-13-10.5	10.5	07:55	Dioxin/Furan
IP-13-10.5	10.5	07:55	PCBs
IP-13-13.0	13.0	08:05	PFAs

08:50 End of soil boring @ IP-13 @ 45 ft bgs. EA out of 2.25" rod. Slow rate of penetration but rock still advancing.

09:00 Eric Swaich (ES) on-site

09:15 Checked ES in at visitor entrance. Requested gate east of lagoons be unlocked to access IP-15 and IPs 18-21.

Scale: 1 square = _____ SJR 7/23/19

IP-15 sample summary

Sample ID	Depth (ft bgs)	Time	Analysis
IP-15-8.0	8.0	09:55	VOCs
IP-15-8.0-FD	8.0	09:55	VOCs
IP-15-7.0	7.0	1012	SVOCs
IP-15-7.0	7.0	1012	SVOCs
IP-15-6.0	6.0	1021	TOTAL METALS
IP-15-6.0-FD	6.0	1021	TOTAL METALS

10:20 Collected VOC, SVOC, and Metals samples from IP-14. Removed sod w/ shovel and collected surface soil from 0.5 ft bgs. (IP-14-0.5)

11:30 Completed IP-18 near plastic pipe, concrete, and asphalt spread on ground surface. Soils consist of sand w/ no indication of contamination. No soil samples collected.

11:55 Completed IP-19, No soil samples collected. Asphalt and concrete on ground surface.

SJR 7/23/19

Scale: 1 square = _____

12:00 Begin IP-20, loc. west of IP-18 Near edge of field. No soil samples collected.

12:25 End IP-21, loc. west of IP-19 Near edge of field. No soil samples collected.

12:45 Marked out three additional soil boring locations near asphalt + concrete fill (IP-22, 23, and 24). EA mobing rig to IP-22. Marked locs. w/ grade stakes

13:50 Completed IP-22, 23, and 24. Concrete and asphalt rubble observed but no indication of other contamination. No soil samples collected. EA mobing rig to main facility. No other shallow soil borings to be completed. Will backfill soil borings completed on 7/22.

14:10 located "Sartomer" drum

14:20 Excavated on east, west, and south side of drum. Concrete underlying organic humus and duff at about 6" bgs. Concrete in drum, encasing north side. Concrete rubble

Scale: 1 square = _____ SJR 7/23/19

in woods next to drum. PID readings on east, west, and south side of drum at ~6" all 0.0 ppm/v

15:00 (E) SJR 7/23/19
~~15:00~~ Assessed equip. area for staining. Several areas of staining observed on asphalt. Asphalt underlying equipment storage area is competent. Staining extends to gravel east of asphalt at one location. Excavated to 0.5' bgs w/shovel. Soils consist of coarse gravel and crushed stone. Staining extends to 2" bgs. PID@ 1" = 0.0 ppmv. PID@ 6" = 0.0 ppmv. No samples collected.

15:15 EA filled in all IP's drilled on 7/22 w/ sand to 5' bgs, bentonite to 1' bgs, and sand to GS. EA off-site.

1530 COLLECT "IP-25" (LAGOON SLUDGE). SOLIDS ARE ACTIVELY BEING DISCHARGED VIA AUGER FROM THE CLARIFIER. PILE IS "FRESH" FROM TODAY.

SJR 7/23/19

Scale: 1 square = _____

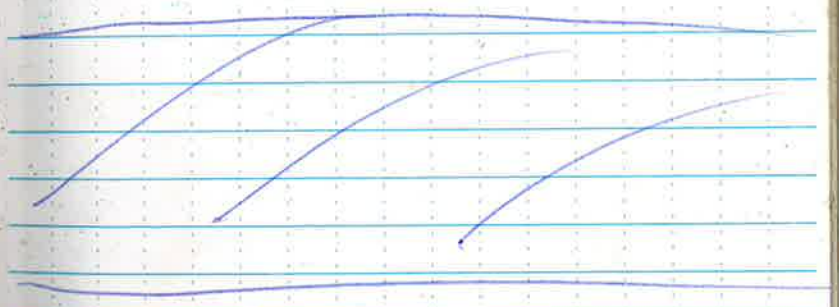
16:35 Began purging "Shallow" well spigot through hose into floor drain.

16:45 Began purging "Deep Well" @ spigot @ bldg. entry. Purged through hose to discharge in driveway

16:55 Removed hose from shallow well spigot and collected water supply sample "Shallow Well" for VOCs, SVOCs, PFAS, and Metals analysis

17:15 Removed hose from deep well spigot and collected water supply sample "Deep Well" for VOC, SVOC, PFAS, and Metals Analysis

17:35 LSR + ES off-site



SJR 7/23/19

Scale: 1 square = _____

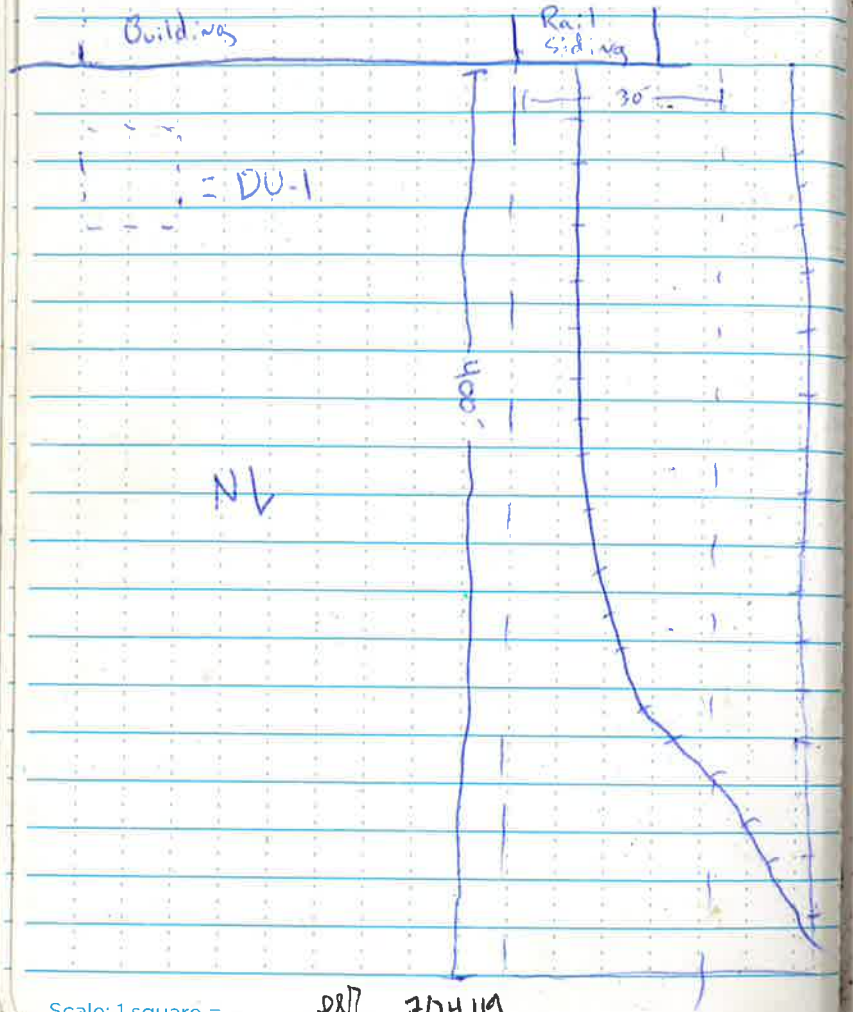
Rite in the Rain

7/24/19 Long Falls Paperboard 19-015

07:00 LSR + ES on-site. Completed Safe work permit.

07:30 decontaminated shovel and step probe. began layout of DU-1 grid.

08:00 began sampling DU-1 w/step probe



BR 7/24/19

BR 7/24/19

DU-1 Soil description

Increment/ Replicate	Color, texture, moisture
1/A, B, and C	Dark brown, loamy silt + FS, moist
2/A, B, and C	
3/A, B, and C	
4/A, B, and C	
5/A, B, and C	
6/A, B, and C	
7/A, B, and C	
8/A, B, and C	
9/A, B, and C	
10/A, B, and C	
11/A, B, and C	
12/A, B, and C	
13/A, B, and C	
14/A, B, and C	
15/A, B, and C	
16/A, B, and C	
17/A, B, and C	
18/A, B, and C	
19/A, B, and C	
20/A, B, and C	
21/A, B, and C	
22/A, B, and C	

Scale: 1 square = _____

SR 7/24/19

DU-1 Soil description continued

each replicate consists of 20 g measured w/ field balance.

Increment/ Replicate	Color, texture, moisture
23/A, B, and C	Dark brown, loamy silt + FS, moist
24/A, B, and C	
25/A, B, and C	
26/A, B, and C	
27/A, B, and C	
28/A, B, and C	
29/A, B, and C	
30/A, B, and C	

10:25 Began subsampling procedure for DU1

Sample ID	Time	Analysis
		~~He~~ E
DU1-A	10:35	Herbicides and PAHs
DU1-B	10:40	
DU1-C	10:45	

Retrieved extra soil in case of sample breakage, or other scenario that would require additional volume.

SR 7/24/19

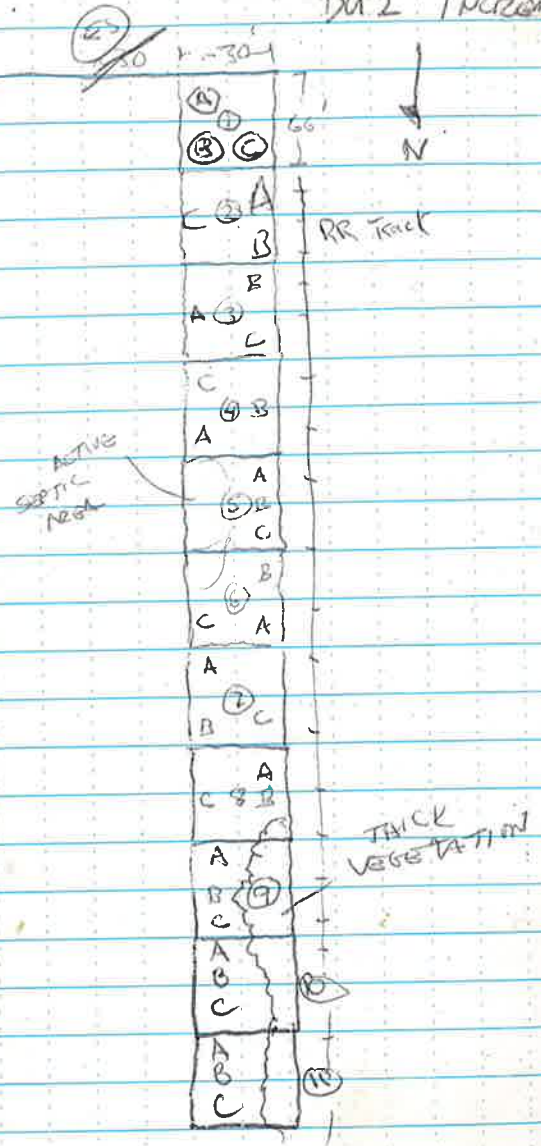
Scale: 1 square = _____

Rite in the Rain

7/24/19 LongFalls Paperboard 19-015

11:00 begin DU2 sampling

DU2 INCREMENTS



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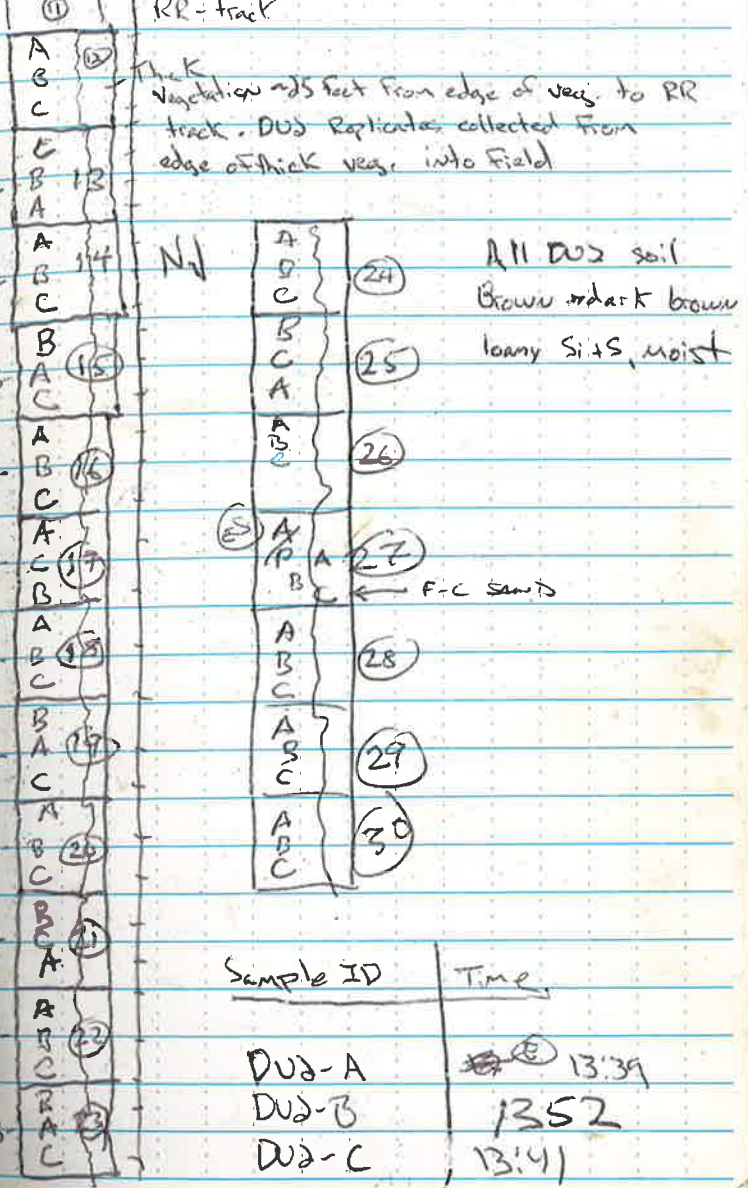
SR 7/24/19

7/24/19 LongFalls Paperboard 19-015

DU2 Sampling increments continued



Sample ID	Time
DU2-A	~~13:39~~ 13:52
DU2-B	13:41
DU2-C	

Scale: 1 square = _____

SR 7/24/19

Rite in the Rain

14:00 Completed ISM sampling. Retained DU1 and DU2 soil for archive. Recorded loc. of IP-14, 15, and 18-24 w/ GPS.

14:10 Called Alpha Analytical. ETA of courier is 15:00-16:00.

14:30 Relinquished samples to Alpha Analytical courier.

15:00 Maintenance personell indicated the Northern maint. shop floor drain discharges to the septic system. Water backs up into floor drain when septic is backed up.
Two catch basins east of maintenance area only have one pipe, oriented N-S

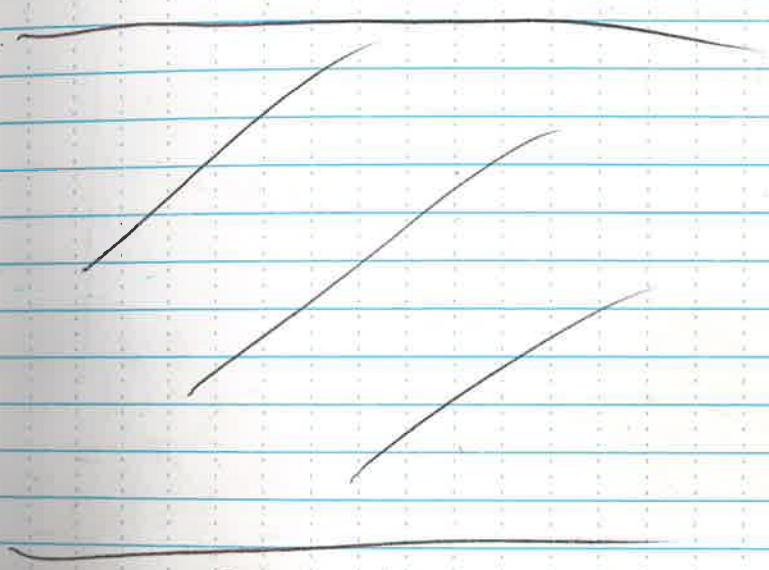
15:12 Dumped ~1L of red dye down maint. floor drain while flushing w/hose @ ~1gal/min
15:20 No dye observed in three catch basins, clarifier, or basement trenches/sumps
15:27 Discharged ~1.5L of green dye into maint. shop floor drain while flushing w/water @ ~1gal/min.

Scale: 1 square = _____ 7/24/19

15:37 No green dye observed @ clarifier or catch basins.

15:55 Investigated two 55-gal drums NW of shipping dock. Locked curb-stop w/curb stop wrench present. Both drums empty, one labeled "Main water". Drums likely present to mark + protect curb stop from mowing. No odors or soil staining.

16:15 LTR + ES off-site



7/24/19

Scale: 1 square = _____

Location 161 Wellington Rd Date 8/14/18

Project / Client Long Falls Pipeline Battle Board

DV + LBR on site at 0740, after getting ice
LJR onsite @ 0800, reviewed locations
Met w/ Gebby Construction (QFP)
reviewed H&S plan, safety Training
Inspected areas w/ Gebby

DrillX onsite (Chris Lead driller) + Joe (helper)
@ 0845

Reviewed IP-6 location w/ DrillX
need to get OK from National Grid
to be within 15 ft of location

Set up on IP-5
began drilling at 0950

logging every 2' for 5' intervals
HSA, w/ 4¼ Augers 1.5" diameter split-spoon
x 2' long

Began setting well @ 1405
Well set from 65.7' to 62.5' of
sand pack and 3 feet of bentonite chips
hydrated.

Location 161 Wellington Rd Date 8/19/19

Project / Client 19-015 LFP

Begin Developing well @ 1532 using Waterra w/ 5/8 by 1/2" HDPE tubing

Depth of Well = 75.6' TOC

Depth to water prior to Development = 68.8' TOC

7.5 min for 5 gallons = 0.66 gpm

Ended at 16:10 for 38 mins = 25 gallons

Pack up off-site by 1645

Location 161 Wellington Rd Date 8/20/19

Project / Client 19-015 LFP

DW + LGR on-site at 0750, met Gabby of LEP, signed in

Built on-site @ 0810

Picked up soil cuttings around IP5

Moved IP6 slightly N+W to accomodate Power lines.

Set up on IP-6 @ 0828

Drilled to ~80 ft w/ HSA, split spoons every five feet.

Shaya Ronovan onsite b/w 1030-1145

Well set b/w 79.4 and 69.4

Sand pack to 67.4, well seal to 64.9

▽ @ 75.25

Began developing well @ 1445. Purged 18 gallons until clear

Set up on IP-05 @ 1500. split spoon

Drilled w/ center plug to 65, took soils @ 65-67 (Dry) pulled back 5ft + re-did

Left off site @ 1700

Rite in the Rain

Location LFP Phase II ESA Date 8/16/19

Project / Client 161 Wellington Rd Burlington VT

0730 DN + LBR onsite partly cloudy ~65°F
Drill X onsite - resume drilling @ IP-08
Met w/ Safety officer regarding IP-04
- Taking delivery of propane today would need to shut down for IP-4.
- We will move to another location after IP-08
- Calibrated PID w/ 100ppm Iso, Bump = 99.4 ✓
Finished Drilling & setting MW on IP-08 @ 1020

DN 8/16/19
Started Developing well at ~~1050~~ 1053

Total = 81.20
▽ = 74.38
Rate = 0.9 gal/min

Moving Rig @ 1050 to IP-04, Auger to 65, run sample
Stopped developing well at 1125, Purged 28.8 gallons

Location LFP Date 8/16/19

Project / Client

1330 Drilled to 65 ft bgs, sampled 65-67 and 67-69, both dry

Hanging augers at ~~7~~ 65.0 for weekend not enough materials here to set wells.

Bump checked PID = 96.5 ppm → OK.

Setting pads on IP6 & IP8, will set w/ IP-5 next week.

Off site @ ~1500

Location 161 Wellington Rd, Gotham Date 8/15/17

Project / Client 19-015 LFP Phase II EA

PM + LBR onsite at LFP at 0745 after getting ice onsite

Resumed drilling at IP-4

Calibrated + Zeroed PID.

Started developing well at 1035

IP-04

Total = 74.43

∇ = 69.14

Rate = 0.83 gallons/min

IP-16 @ 15:50

Total = 74.16

∇ = 67.95

Rate = 1 gpm

End: 16:15

Stopped developing well at 1055. Purged 16.6 gallons. ∇ at end of purge 69.14.

Moved to IP-16, securing keys

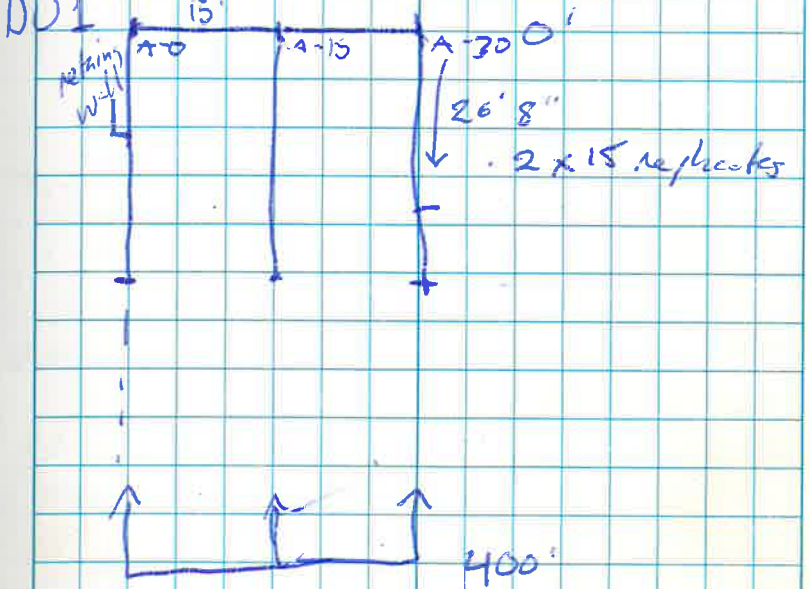
Finished developing well at 1630

Tiddled up off site at 1700

Location 161 Wellington Rd Date 8/16/17

Project / Client 19-015 LFP Phase II EA

Setting up DU's for ISM re-do



Setup DU #2, starting at NE end of DU1