2010 Data Summary

Commerce Street Plume Superfund Site
Williston, Vermont

Remedial Investigation / Feasibility Study
EPA Task Order No. 0036-RI-FS-019L

REMEDIAL ACTION CONTRACT
No. EP-S1-06-03

FOR

US Environmental Protection Agency
Region 1

BY

Nobis Engineering, Inc.

Nobis Project No. 80036

June 2011

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1.0 INTRODUCTION

Nobis Engineering, Inc. (Nobis) has prepared this 2010 Data Summary Report for the Commerce Street Plume Superfund Site (Study Area) located in Williston, Vermont (Figure 1-1). This work was performed in accordance with the United States Environmental Protection Agency (EPA) Region I Remedial Action Contract 2, No. EP-S1-06-03, Task Order No. 0036-RI-FS-019L.

1.1 Objective

The objective of this report is to present and evaluate the analytical data for groundwater and soil collected during 2010. The data collection and evaluation are used to assess the nature and extent of groundwater and soil contamination at the Study Area. This Data Summary Report includes an evaluation of the analytical data collected during 2010 and compares the results to the Vermont Groundwater Protection Rule (GWPR and EPA Maximum Contaminant Level (MCL) regulatory criteria.

1.2 Report Organization

This report is organized as follows:

- Section 1 of the report provides a description of the Study Area and summarizes previous investigations.
- Section 2 presents a description of the 2010 investigation activities.
- Section 3 presents the analytical results for samples collected during the 2010 investigations.
- Section 4 presents an update to the Conceptual Site Model (Nobis, 2009).
- Section 5 presents the summary, conclusions and recommendations.

1.3 Study Area Location and Description

The Commerce Street Plume Superfund Site is located at an industrial park in Williston, Chittenden County, Vermont, approximately four miles east of Burlington, Vermont (Figure 1-1). The entire Study Area itself encompasses the Alling Industrial Park (AIP) and a portion of the adjacent residential area to the west. AIP has had light industrial and commercial tenants since

1946 (Nobis, 2008a). The Study Area is located within the Winooski River watershed at an elevation ranging between 330 and 350 feet above mean sea level (ft msl). The Study Area is bounded to the north by Vermont State Route 2 (Rt. 2), to the east by Harvest Lane, to the south by Marshall Avenue, and to the west by South Brownell Road (Figure 1-2).

The area is zoned for mixed residential, business, and industrial uses. Commerce Street and the areas to the east are predominantly commercially zoned lots that are currently developed or in the process of being developed. Kirby Lane and South Brownell Road are zoned residential, with limited commercial developments on South Brownell Road. The ground surface over the entire area exhibits little relief and slopes gently to the southwest. Surface water at the Study Area consists of a small unnamed stream and its three tributaries which flow in a southerly direction to Muddy Brook. Public pedestrian access is unrestricted within the Study Area (Geo Trans, 2000).

The unnamed stream, located in the eastern portion of the Study Area, is a habitat for two State-designated threatened species and is a State-designated area for protection and maintenance of aquatic life under the Clean Water Act. The Winooski River downstream of the property is a known fishery.

Previous studies identified three properties/lots within the Study Area as locations of former manufacturing and/or fabrication operations that could have contributed to groundwater contamination. Compounds found in groundwater beneath the study area include trichloroethene (TCE), tetrachloroethene (PCE), benzene, toluene, ethylbenzene and xylene compounds (commonly referred to as BTEX), cadmium, and chromium. The three lots and the potential sources are described below. Additional information about the historical uses of these properties is provided in Section 1.5.

1. Lot 19-11 (Mitec property/96 Commerce Street): The property formerly leased by Mitec Systems Corp. (Mitec) occupies one acre and currently includes one 6,000 square foot building. In 1983, the State of Vermont notified Mitec that their electroplating rinse water was hazardous and was being discharged. Two potential sources were identified at this property: a wastewater disposal lagoon behind (west) the building and a leach field next to (south) the building are suspected sources of TCE, PCE and/or metals. The

electroplating industry often used TCE for degreasing metal surfaces prior to plating operations.

Wastewater disposal lagoon – Unlined; thought to be created sometime between 1972 and 1974. In 1979, a pipe that led directly to the lagoon from the building was installed. In June 1984, Mitec laid discharge to the lagoon and installed a temporary treatment recovery system for chromium. Contaminated soil was reportedly removed from the lagoon in 1985 and 1989.

Leach field – Reportedly for sanitary use only, however, a significant TCE plume and Dense Non-Aqueous Phase Liquid (DNAPL) appeared to be emanating from it. Historical sampling in the vicinity of the leach field at a depth of 32.1 feet indicated at 19,000 µg/L in T1-2 and 22,000 µg/L in RB-1.

2. Lot 19-12 (Bove-Fagan property/87 Commerce Street): Two underground storage tanks were removed from this lot in 1994 revealing a previous release of BTEX compounds.

3. Lot 19-2 (Former EMCO property/63 Commerce Street): Manufacturing operations began in 1947, and both a disposal pit and outfall pipe to the unnamed brook have been identified.

A Study Area map that depicts Study Area features and Lot numbers is included as Figure 1-2.

1.4 Study Area History

Various manufacturing and electroplating operations occurred on the 96 Commerce Street property since 1960. The two primary potential sources of contamination on the property were identified as an unlined lagoon and a leach field, which were both created to dispose of liquid waste. Plating rinse water and sludge wastes containing heavy metals and solvents were disposed of into the unlined lagoon intermittently through 1984.

From 1979 to 1986, Mitec leased the property for manufacturing of electronic and microwave components. Between 1979 and 1984, Mitec discharged an undetermined quantity of rinse waters and sludge wastes containing chromium, cadmium, cyanide, nickel, and industrial

solvents associated with electroplating operations into the unlined lagoon (Weston, 1998). After a Mitec employee expressed concern to the Vermont Department of Environmental Conservation (VTDEC) in March 1982, the State found the company in violation of hazardous waste regulations for the disposal of chromium contaminated wastes.

In 1984, monitoring wells detected chromium in groundwater downgradient of the lagoon. In July 1985, sampling by Vermont Department of Health (VTDOH) showed six residential private drinking water wells downgradient of the lagoon and leach field to be contaminated with TCE up to 190 micrograms per liter (µg/L) and PCE up to 12 µg/L; these concentrations are above Federal MCLs for drinking water. The drinking water wells were subsequently removed from service as drinking water sources, and residents were provided with an alternate drinking water supply.

Additionally, elevated concentrations of PCE and TCE have been detected in the indoor air of South Brownell Road residences, including the residence at Lot 3-30 (Figure 1-2). The presence of volatile organic compound (VOC) vapors inside the Lot 3-30 residence, located at 941 South Brownell Road, is believed to have resulted from volatilization of contaminants from the groundwater that underlies the house and Study Area. The residence had a continuously operating sump pump that removed groundwater that accumulates in a sump beneath the basement floor. According to the VTDEC, venting the sump to the exterior of the house mitigated the indoor air concentrations of these contaminants to an acceptable concentration. The mitigation was done as part of a state-sponsored action (Geo Trans, 2000).

Numerous groundwater, surface water, sediment, residential indoor air, and soil sampling events occurred between 1984 and 2002. In 1987 and 1988, concentrations of TCE and PCE were detected in groundwater up to 3,300 µg/L and 660 µg/L, respectively, throughout the Industrial Park. In 1996, soil samples collected by Vermont Agency for Natural Resources (VTANR) identified TCE concentrations up to 1,790 µg/L directly downgradient of the leach field located at the Mitec property. Additional studies detected dichloroethene (DCE) concentrations of up to 180 µg/L, chromium at 3.4 µg/L, TCE at 170 µg/L, and vinyl chloride at 11 µg/L in the surface water in the wetlands and the nearby unnamed brook, which flows into Muddy Brook and ultimately the Winooski River. In 1999, groundwater samples taken by the VTANR found TCE in ground water at levels as high as 90,000 µg/L downgradient of the former Mitec facility. In 2002, EPA detected elevated levels of 11 volatile organic compounds (VOCs) and 13 metals

in monitoring wells located throughout the Industrial Park and surrounding residential area. Groundwater contamination continues to be detected directly downgradient of the Mitec property and has the potential to migrate to private and public water supplies serving approximately 1,575 people within 4 miles of the property.

In summary, previous investigations identified TCE, PCE, BTEX, chromium, and cadmium in groundwater concentrations above their applicable State and Federal standards. Of these contaminants, TCE was found to be the most widespread and is present throughout the Study Area groundwater contaminant plume. Metal contamination was evaluated in the VTDEC SI (1996), and it was determined that metals contamination was confined to the areas near Lot 19-11 and the central portion of the Study Area. The report concluded that metals were not likely to migrate much farther and should not present a risk to surface water.

1.5 Summary of Previous Investigations

Presented below is a comprehensive, chronological list (compiled from Geo Trans' SI) of previous environmental investigations conducted at the Study Area:

- December 1984: Mitec (Lot 19-11) contracted an environmental consultant to install the MI series monitoring wells (MI-1 through MI-9) which were located adjacent to the wastewater disposal lagoon and to the west of Lot 19-11. The wells were installed to a maximum depth of 17 feet below ground surface (ft bgs).

- March – May 1985: Mitec hired a contractor to remove 30 cubic yards of material from the wastewater lagoon. All materials were transported off-site and disposed of by licensed hazardous waste haulers.

- June – July 1985: Six private potable water supply wells, on South Brownell Road were found to be contaminated with TCE and PCE above the State Health Advisory Levels. All residences were subsequently connected to the Williston public water supply system.

- 1985 – 1986: VTDEC installed and sampled groundwater monitoring wells AL-1 through AL-21. Data from the wells identified VOC and metal contaminated groundwater downgradient of the Lot 19-11 wastewater disposal lagoon. TCE was detected in

shallow groundwater east of Commerce Street. Study Area investigators assume additional sources are present at the Industrial Park.

- March 1987: A CERCLIS Preliminary Assessment (PA) completed for Lot 19-11 by an EPA consultant recommended further investigation.

- February 1989: VTDEC completed a PA of the AIP. The PA recommended further investigation of the Study Area, including suspected contamination on Lot 19-2.

- 1989: A Site Assessment Report was prepared on behalf of the property owner for Lot 19-28, related to a potential real estate transaction. No soil or groundwater samples were collected for this site assessment.

- 1990: Site investigation was conducted for Lot 19-20 on behalf of the property owner. Groundwater monitoring wells BM-1D, BM-2S, BM-2D, BM-3S, and BM-3D were installed and sampled. Maximum concentrations of TCE and PCE in groundwater were reported as 2,110 µg/L and 7.27 µg/L, respectively.

- 1993: An SI of the AIP was conducted for the EPA. The primary focus was Lot 19-2. Limited sampling and analysis did not reveal the suspected source for the TCE contamination east of Commerce Street. However, historical monitoring of well AL-14 indicates TCE contamination.

- July 1993: An SI was conducted for Lot 19-05 on behalf of the property owner. Monitoring wells PO-North and PO-South were installed and sampled. No VOC contamination was observed. Low concentrations of metals were detected and assumed to be associated with the downgradient Lot 19-11.

- September 1994: An SI was performed on Lot 19-23. Soil samples were collected from a depth of 2 to 3 feet-bgs and shallow monitoring wells ARC-1, ARC-2, and ARC-3 were installed. Metals contamination was detected in soil and groundwater; VOC contamination was not detected in groundwater from shallow monitoring wells.

- June 1994: An SI was performed on Lot 19-12 in response to a petroleum release. Shallow monitoring wells were installed and analysis revealed the presence of BTEX contamination in groundwater.

- July 1995: An SI was performed on Lot 19-30. Monitoring wells NO-1 through NO-4 were installed and sampled. TCE was detected at concentrations ranging up to 19,000 µg/L.

- January 1996: A summary report of the various investigations of properties in the AIP was performed on behalf of the VTDEC. The report identified data gaps that existed in the previous work performed in the area.

- October 1996: An SI was performed on behalf of VTDEC to further investigate the AIP. Several monitoring wells were installed and TCE-contaminated groundwater under the leach field on Lot 19-11 was identified.

- March 1999: January 2000 – HSI Geo Trans performed an SI within the AIP and adjacent residential areas on behalf of Mitec. Results of the SI confirmed the presence of PCE, TCE, and BTEX-contaminated groundwater, surface water, and sediments throughout the area. The SI also identified Mitec's leased property (Lot 19-11) and Lot 19-23 (clay depression or sink hole) as likely sources of groundwater contamination (Geo Trans, 2000).

- July 1999: A limited groundwater investigation was completed by the Johnson Company for the VTDEC. TCE was the primary contaminant noted with concentrations up to 91,000 µg/L measured in groundwater. Johnson reported that based on the observed concentrations, the presence of non-aqueous phase liquids (NAPL) at or upgradient of profile samples T1-2, T1-3, and T2-2 was possible.

- April 2005: The Study Area was placed on EPA's National Priorities List (NPL).

- December 2007: Consulting Environmental Sciences, Inc. (CES) drafted a letter summarizing their review of VTDEC documents regarding the AIP properties. The letter suggests the Mitec property could not be the source of TCE groundwater contamination

based on a lack of evidence documenting any historic use of TCE at the property and that TCE is present in locations hydraulically upgradient (e.g., Lot 19-2) of the property. The letter further states that there was an insufficient amount data (i.e. lack of monitoring points) upgradient of the Mitec property (to the north and northeast) to make an informed evaluation of potential contaminant sources.

- December 2008: Nobis Engineering, Inc. conducted a well survey to locate historic wells and re-develop those deemed viable for groundwater sampling use. Nobis also conducted a round of groundwater elevation measurements and sampling, and later produced a Data Summary Report and updated Conceptual Site Model (CSM (Nobis, 2009a)).

1.6 Study Area Contaminants of Concern

Groundwater contaminants of concern (COCs) for the Study Area include contaminants that were found to have concentrations exceeding the MCLs in place during previous investigations. The groundwater COCs are listed in Table 1-1 along with applicable GWPR and MCL concentrations. TCE and PCE are the primary groundwater COCs for the Study Area although other VOCs and metals have been historically detected at the Study Area. COCs for soil have not been officially established.

2.0 2010 FIELD INVESTIGATION SAMPLING

The following sections describe sampling tasks performed at the Study Area in 2010. The basis and rationale for the 2010 field investigation was presented in the Final CSM Technical Memorandum (Nobis, 2009a). All field tasks were performed in accordance with the procedures described in the Final Quality Assurance Project Plan (QAPP) for Subsurface Investigations dated December 1, 2010 (Nobis, 2010). Refer to Sections 8 and 9 of the QAPP for task-specific sampling design rationale and procedure requirements. Sample results are summarized in Sections 3.0 and 4.0 of this report.

2.1 May 2010 Groundwater Sampling

The following sections present details of the May 2010 groundwater sampling event.

2.1.1 Potentiometric Surfaces

Prior to groundwater sampling, a potentiometric surface survey was completed throughout AIP and adjacent residential areas. Groundwater level measurements were collected from 23 shallow overburden wells, 20 intermediate/deep overburden wells, and 1 bedrock well using a Geotech® electronic water level meter in general accordance with SOP-HYD-003 (QAPP). Table 2-1 presents the groundwater potentiometric surface survey data in ft msl. The gaging data set was coupled with the monitoring well elevation survey data to determine groundwater elevations. The interpreted potentiometric surfaces for the shallow and intermediate/deep overburden aquifer units are presented on Figures 2-1 and 2-2, respectively. An assessment of groundwater elevation data is presented in Section 4.1.

2.1.2 Groundwater Sampling

From May 17, 2010 through May 21, 2010, 29 groundwater samples (including duplicates) were collected via EPA low-flow sampling protocol from 27 monitoring wells at the locations shown in Figure 2-3. The wells consisted of 13 shallow overburden, 6 intermediate overburden, 7 deep overburden, and 1 bedrock well. In addition to the 23 wells sampled previously in December 2008, groundwater samples were collected from 4 additional wells (AL-2, AL-12, ASI-3D2, and AIP-01) discovered on-site during the May event. The groundwater samples were submitted for Contract Laboratory Program (CLP) analysis of VOCs, semi-volatile organic compounds (SVOCs), and target analyte (TAL) metals (total only). Groundwater sampling details are summarized in Table 2-2. Sample field log sheets are located in Appendix A.

Additionally, as part of the low-flow sampling protocol, geochemical parameters were recorded for temperature, pH, conductivity, DO, ORP, and turbidity with the applicable meters. Table 2-3 displays the results of the final geochemical parameter reading prior to sample collection.

2.2 Geophysical Survey

From June 7, 2010 to June 17, 2010, a geophysical survey was performed by Hager GeoSciences, Inc. (Hager) of Woburn, Massachusetts with the objective of identifying the depth to the clay and bedrock surfaces throughout AIP and adjacent residential areas. The survey primarily used low frequency ground penetrating radar (GPR) and seismic reflection/refraction

methods. The information was subsequently used to help select locations for groundwater vertical profiling and soil boring/monitoring well installation locations.

In all, twenty-seven GPR transects totaling 9,093 feet and four seismic profiles totaling 3,335 feet were made in the project area. Figure 2-4 displays the GPR and seismic transect lines. Refer to Section 4.2 of this report and Appendix B (Hager report) for further results and discussions on the geophysical survey.

2.3 Porewater Sampling

On June 28, 2010 and June 29, 2010, Nobis performed temperature profiling throughout the unnamed stream to identify potential groundwater infiltration points along the stream channel. Measured temperature differences between porewater and surface water ranged from 1.9 degrees Celsius to 9.8 degrees Celsius. The average temperature variation was 6.1 degrees. Temperature variations for the final porewater sample locations are included in Table 2.4. Measurements at or greater than that average were considered potential groundwater infiltration points.

On July 7, 2010 and July 8, 2010, 20 porewater samplers were placed in the potential infiltrations points as well as other evenly distributed locations to cover the stream channel. Porewater sample locations are depicted on Figure 2-5. A 3-inch diameter stainless steel hand auger was used to create borings to depths ranging from 12 to 18 inches below the bottom of the stream channel. Passive diffuser bags (PDBs) were then placed in each boring by hand and tied to a wooden stake for retrieval. The PDBs are 2 inches in diameter when full and were filled with deionized water in the field prior to each installation. T he PDBs were enclosed in a hard plastic mesh to protect against puncturing. Once the PDBs were installed the boring was filled in with native material and the PDBs were allowed to equilibrate for 14 days. On July 22, 2010 25 porewater samples, including quality control samples were collected and submitted for CLP analysis of VOCs. In addition, 22 samples were provided to the EPA mobile laboratory for screening of a selected group of VOCs including cis-1,2-DCE and TCE. These results are discussed on Section 3.2 and are included in Appendix C.

The porewater sampling was performed in accordance with the Site-Specific Porewater Sampling SOP (QAPP, Appendix A, 2010 [Nobis, 2010]). Data from porewater sampling was

used to assess the potential impact of groundwater on the unnamed stream. Porewater sampling details are summarized in Table 2-4 and results are discussed in Section 3.2.

2.4 Groundwater Vertical Profile Sampling

From July 12, 2010 through July 24, 2010 samples were collected from 27 vertical profiling locations throughout AIP and adjacent private properties. Form August 23, 2010 through August 25, 2010 groundwater samples were collected from an additional 3 locations. All vertical profiling locations are shown on Figure 2-6. Upon collection, one 40 milliliter (mL) VOA vial was transferred to the on-site EPA Office of Environmental Measurement and Evaluation (OEME) mobile laboratory for screening analysis of select VOCs including the COCs TCE and PCE. As results became available from the EPA mobile laboratory, representatives from Nobis and EPA held discussions to determine the most appropriate locations of subsequent profiling locations in order to maximize coverage and to effectively delineate the extent of contamination

During sample collection, three additional 40 mL vials (four total) were collected in case they would need to be sent to an off-site CLP laboratory for confirmation analysis based on the OEME screening results. In total, approximately one interval per profile location (about 30) was selected for off-site CLP analysis for the full suite of VOC compounds. In general, the interval demonstrating the highest OEME TCE concentration was selected from each profiling location. Results of the OEME screening are included in Appendix C and discussed in Section 3.3.

The vertical profiling points were advanced to the top of the clay layer encountered at depths ranging from 36 ft-bgs to 54 ft-bgs. Due to the conditions at and into the clay layer, groundwater samples could not be effectively retrieved, therefore the Geoprobe® direct push equipment was pulled back into the silty sand material just above the clay layer, such that a water sample could be collected.

2.5 Soil Boring and DNAPL Testing

From August 25, 2010 through August 27, 2010, 7 soil borings were advanced via Geoprobe® direct push technology in the locations displayed in Figure 2-7. The purpose of the soil borings was to study subsurface conditions (e.g. lithology, water table location, etc.) and investigate any potential zones of dense non-aqueous phase liquid (DNAPL). Locations were chosen based on the geophysical survey and groundwater vertical profiling results. Several locations (e.g. SB-02

and SB-03) were selected to provide further information at locations where the highest TCE concentrations were encountered during vertical profiling. Others locations were chosen to explore conditions adjacent to the unnamed stream (e.g. SB-05) and suspected source areas based on historical results (e.g. SB-01 and SB-06). At each location, five foot length, 2-inch diameter Macrocores® were advanced and collected continuously from the ground surface to the top of the clay layer (approximately 40 feet below ground surface [ft bgs]). Several locations were advanced two to three feet into the clay to confirm the depths reported in the Hager report.

Upon retrieval of the cores, recovery, lithology, and photoionization detector (PID) readings were recorded on the appropriate field logs (Appendix B). In one location (SB-02/S-8) where the PID reading was greater than 100 parts per million (ppm), the Oil-Red-O shake tests was performed to confirm the presence/absence of DNAPL at that location. Finalized boring logs are included in Appendix D.

A total of 52 soil samples were collected and submitted to the on-site EPA OEME mobile laboratory for screening analysis of TCE, PCE, and cis-1,2-DCE. For risk assessment purposes, in the first 0-5 ft-bgs core, one sample was collected from 0-1 ft-bgs at the interval displaying the highest PID reading; a second sample was collected from 1-5 ft bgs at the interval displaying the highest PID reading. One additional sample from each subsequent core deeper than 5 ft-bgs was collected at the location displaying the highest PID reading. Due to the running sand conditions, samples were not retrieved from 25 feet to 40 ft-bgs in SB-01 and from 30 to 40 ft-bgs in SB-04. A total of 7 samples were collected during the boring program for VOC analysis by an EPA CLP laboratory. The results of this analysis are discussed in Section 3.4 and depicted in parentheses on Figure 3.4.

Additional discussion of the observations and lithology of the subsurface are discussed in Section 4.2 of this report.

2.6 Monitoring Well Installations

From November 9, 2010 through November 12, 2010, 15 overburden monitoring wells were installed utilizing direct push methods throughout AIP and the adjacent residential areas at the locations displayed in Figure 2-8. On November 23, 2010, well MW-8S was replaced since the initial well was not set at the proper depth. The purpose of the wells was to address data gaps

identified by the previous 2010 investigations and to help delineate the extent of groundwater contamination. Prior to mobilization, representatives from Nobis, EPA, and VTDEC discussed and approved the proposed well locations.

The wells consisted of 2 shallow overburden (< 20 ft-bgs), 5 intermediate overburden (20-30 ft-bgs), and 8 deep overburden (> 30 ft-bgs). All wells were constructed using 2-inch diameter schedule 40 PVC with 5 feet of 0.010-inch slotted pre-pack sand pack screen. Due to the presence of running sands and fines, pre-pack screens were used to help minimize screen clogging and eliminate any potential for hole collapse that may occur while pulling steel casing from the hole. Table 2-5 presents well construction details for the new wells.

2.7 November/December 2010 Groundwater Sampling

The following sections present details of the November/December 2010 groundwater sampling event.

2.7.1 Potentiometric Surfaces

Prior to groundwater sampling, a potentiometric surface survey was completed throughout AIP and adjacent residential areas. Groundwater level measurements were collected from 16 shallow overburden wells, 28 intermediate/deep overburden wells, and 1 bedrock well using a Geotech® electronic water level meter in general accordance with SOP-HYD-003 (QAPP). Table 2-1 presents the groundwater potentiometric surface survey data in ft-msl. The gaging data set was coupled with the monitoring well elevation survey data to determine groundwater elevations. The interpreted potentiometric surfaces for the shallow and intermediate/deep overburden aquifer units are presented on Figures 2-9 and 2-10, respectively. An assessment of groundwater elevation data is presented in Section 4.1.

2.7.2 Groundwater Sampling

From November 28, 2010 through December 3, 2010, 45 groundwater samples (including duplicates) were collected via EPA low-flow sampling protocol from 42 monitoring wells at the locations shown in Figure 2-11. The wells consisted of the 27 wells sampled in May in addition to the 15 newly installed wells as described in Section 2.6. The groundwater samples were submitted for CLP analysis of VOCs, SVOCs, and TAL metals (total only). Additionally,

samples from each well were collected and submitted for 1,4-dioxane analysis to the OEME fixed laboratory in Chelmsford, Massachusetts. Groundwater sampling details are summarized in Table 2-2. Sample field log sheets are located in Appendix A.

Additionally, as part of the low-flow sampling protocol, geochemical parameters were recorded for temperature, pH, conductivity, DO, ORP, and turbidity with the applicable meters. Table 2-3 displays the results of the final geochemical parameter reading prior to sample collection.

3.0 LABORATORY ANALYTICAL RESULTS

The following sections present a summary of the analytical results for samples collected during the 2010 field investigations. A discussion of the results is included in Section 4. Groundwater concentrations are compared to the GWPRs and MCLs; soil concentrations are compared to the Oak Ridge National Laboratory's Regional Screening Levels for Chemical Contaminants at Superfund Sites for residential soils.

3.1 May 2010 Groundwater

3.1.1 Shallow Overburden Groundwater

VOCs detected in the shallow overburden aquifer (0-20 ft-bgs) include TCE, PCE, chloroform, dichlorodifluoromethane, and 1,4-dichlorobenzene (1,4-DCB). Of the VOCs detected in the shallow overburden groundwater, none were present at concentrations exceeding their respective GWPR/MCL. A total of 4 out of 13 samples contained the COC TCE, with concentrations ranging between 0.15 µg/L (MI-08) and 0.44 µg/L (ASI-23S). PCE (another COC) was detected in only one sample at a concentration 0.63 µg/L (MI-08). A summary of the other compounds detected in shallow overburden groundwater and associated concentrations are listed in Table 3-1a.

Several SVOCs (Table 3-2a) were detected in multiple shallow overburden wells at the Study Area. However, all detected SVOCs were present below their respective GWPRs/MCLs.

Several metals (Table 3-3a) were detected in multiple shallow overburden wells at the Study Area. Of the metals detected only cadmium and manganese were present above GWPRs/MCLs.

- Cadmium was detected in 6 out of 13 wells with concentrations ranging from 0.13 µg/L (ASI-23S) to 11.3 µg/L (MI-08); 1 of the 6 wells contained concentrations of cadmium exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 2.1 µg/L.

- Manganese was detected in 12 out of 13 wells with concentrations ranging from 2.3 µg/L (MI-02) to 2,206 µg/L (ASI-23S); 2 of the 12 wells contained concentrations of manganese exceeding the GWPR/MCL of 840 µg/L; the average detectable concentration was 367 µg/L.

3.1.2 Intermediate/Deep Overburden Groundwater

VOCs detected in the intermediate/deep overburden groundwater aquifer (> 20 ft bgs) during the May 2010 monitoring round include TCE, PCE, cis-1,2-dichloroethene (cis-1,2-DCE), cyclohexane, dichlorodifluromethane, methyl-tert-butyl-ether (MTBE), and trans-1,2-dichloroethene (trans-1,2-DCE) (Table 3-1b). Of the VOCs detected, TCE and cis-1,2-DCE were present above their respective GWPRs/MCLs. Figure 3-1 depicts the estimated magnitudes of TCE in intermediate/deep overburden groundwater during the May 2010 sampling round with comparisons to the December 2008 round (where applicable).

- TCE was detected in 10 out of 13 wells with concentrations ranging from 3.8 µg/L (AL-02) to 6,100 µg/L (ASI-03D2); 9 of the 10 wells contained concentrations of TCE exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 2,129 µg/L.

- Cis-1,2-DCE was detected in 9 out of 13 wells with concentrations ranging from 0.46 µg/L (AIP-01) to 2,500 µg/L (ASI-03D2); 1 (ASI-03D2) of the 9 wells contained concentrations of cis-1,2-DCE exceeding the GWPR/MCL of 70 µg/L; the average detectable concentration was 291 µg/L.

Several SVOCs (Table 3-2b) were detected in multiple deep overburden wells at the Study Area. However, all detected SVOCs were present below their respective GWPRs/MCLs.

Several metals (Table 3-3b) were detected in multiple intermediate/deep overburden wells at the Study Area. Of the metals detected, arsenic, cadmium, manganese, and mercury were present above their respective GWPRs/MCLs.

- Arsenic was detected in 9 out of 13 wells with concentrations ranging from 3.4 µg/L (BM-03D) to 11.7 µg/L (OE-02A); 3 of the 9 wells contained concentrations of arsenic exceeding the GWPR/MCL of 10 µg/L; the average detectable concentration was 6.9 µg/L.

- Cadmium was detected in 9 out of 13 wells with concentrations ranging from 0.08 µg/L (ASI-16D2) to 46 µg/L (AL-02); 1 of the 9 wells contained concentrations of cadmium exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 5.5 µg/L.

- Manganese was detected in 13 out of 13 wells with concentrations ranging from 343 µg/L (ASI-23D2) to 4,793 µg/L (AL-02); 7 of the 13 wells contained concentrations of manganese exceeding the GWPR/MCL of 840 µg/L; the average detectable concentration was 1,251 µg/L.

- Mercury was detected in 3 out of 13 wells with concentrations ranging from 0.09 µg/L (OE-02A) to 2.3 µg/L (ASI-02D2); 1 of the 3 wells contained concentrations of mercury exceeding the GWPR/MCL of 2 µg/L; the average detectable concentration was 0.84 µg/L.

3.1.3 Bedrock Groundwater

Currently, BR-1 is the only bedrock well in the Study Area (residential portion), located hydraulically downgradient and southwest of the potential source areas discussed in Section 2 (Figure 2-1). VOCs detected in BR-1 during the May 2010 monitoring round include TCE, cis-1,2-DCE, acetone, and toluene (Table 3-1b). TCE was the only compound present above its respective GWPR/MCL at a concentration of 57 µg/L.

Several SVOCs (Table 3-2b) were detected in BR-1. However, of the SVOCs detected in the bedrock groundwater, none were present above their respective GWPR/MCL.

As is the case for the overburden groundwater, several metals (Table 3-3b) were detected in BR-1. Of the metals detected, only barium was present at a concentration (2,893 µg/L) above applicable GWPRs/MCLs.

3.2 Porewater

VOCs detected in porewater along the unnamed stream during July 2010 include TCE, cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride (Table 3-4). Methylene chloride was also detected at very low concentrations but is considered to be a laboratory contaminant and not associated with the groundwater contamination at the Study Area. Of the VOCs detected, TCE, cis-1,2-DCE, and vinyl chloride were present above their respective GWPRs/MCLs. Figure 3-2 depicts the estimated magnitude and extent of TCE, cis-1,2-DCE, and vinyl chloride in porewater during the July 2010 sampling round.

- TCE was detected in 4 out of 20 locations with concentrations ranging from 3.7 µg/L (PW-04) to 1,100 µg/L (PW-11); 3 of the 4 locations contained concentrations of TCE exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 289 µg/L.

- Cis-1,2-DCE was detected in 8 out of 20 locations with concentrations ranging from 4.9 µg/L (PW-15) to 1,700 µg/L (PW-11); 1 of the 8 locations contained concentrations of cis-1,2-DCE exceeding the GWPR/MCL of 70 µg/L; the average detectable concentration was 414 µg/L.

- Vinyl chloride was detected in 5 out of 20 locations with concentrations ranging from 4.2 µg/L (PW-08) to 180 µg/L (PW-09); 5 of the 5 locations contained concentrations of vinyl chloride exceeding the GWPR/MCL of 2 µg/L; the average detectable concentration was 74 µg/L.

- Screening results from the EPA mobile laboratory (included in Appendix C) for cis-1,2 DCE and TCE were consistent with those observed above. Vinyl chloride was not part of this screening process.

3.3 Vertical Profiling Groundwater

Figure 3-3 displays all the EPA OEME mobile lab TCE screening results from the July and August 2010 vertical profiling event. Raw copies of all the mobile lab results are included in Appendix C. Results of the vertical profiling showed TCE concentrations ranging from 0.04 µg/L (VP-04 at 35 ft-bgs) to 61,000 µg/L (VP-16 at 40 ft-bgs). Table 3-5 provides a statistical summary of TCE at each vertical profiling location including maximum, minimum, and average concentrations as reported by the EPA mobile laboratory.

In general, the highest TCE concentrations were observed in the deep (> 30 ft-bgs) overburden groundwater along central portions of Commerce St. Locations VP-15, VP-16, and VP-19 demonstrated average TCE concentrations in access of 5,000 µg/L with VP-16 and VP-19, exceeding 10,000 µg/L. As displayed in Figure 3-3, the general trend in TCE shows concentrations increasing with depth at the majority of the vertical profiling locations. This trend is consistent with the denser than water nature of chlorinated VOCs as the TCE has migrated downward through the water table to the depths observed during the vertical profiling.

Additionally, high concentrations of TCE were observed in residential areas to the west/southwest (e.g. VP-21, VP-26, VP-27, and VP-28), consistent with previous investigations (e.g. Geo Trans) and recent intermediate/deep overburden groundwater sampling results from ASI-16D2 and ASI-23D2. The location of TCE in these areas is also consistent with groundwater flow direction to the southwest are described in Section 4.1.

As discussed, the interval demonstrating the highest OEME TCE concentration was selected from each profiling location for confirmation sampling by and EPA CLP Laboratory. In general, the fixed laboratory results were slightly higher, but within the same order of magnitude as the EPA mobile laboratory results. The fixed laboratory results are shown on Figure 3.3 in parentheses.

In addition to TCE, cis-1,2-DCE was observed in the vertical profiling results at concentrations from non-detect to 18,200 µg/L. The maximum concentration of cis-1,2-DCE was detected in VP-22 located adjacent to the unnamed stream. The results indicated some level of reductive dechlorination during which the anaerobic conditions presented by the stream cause TCE to

sequentially lose carbon atoms and form lesser chlorinated compounds such as cis-1,2-DCE. Refer to Section 4.3.3 for more information regarding reductive dechlorination at the Study Area.

3.4 Soil Boring and DNAPL Testing

TCE was the only VOC detected in the overburden soil by the OEME mobile laboratory. TCE was detected in at least one sample from each of the seven soil borings. A total of 19 out of 52 samples had detections of TCE. Detectable concentrations of TCE ranged from 1 µg/Kg (SB-03 from 17 to 17.5 ft-bgs) to 12,500 µg/Kg (SB-02 from 37.5 to 38 ft-bgs) with an average detectable concentration of 1,844 µg/Kg. Three (3) of the 19 samples containing TCE had concentration exceeding the Oak Ridge National Laboratory Screening Level of 2,800 µg/Kg.

Two surficial soil samples in the upper 3.5 feet of the overburden were collected from borings SB-01, SB-02, and SB-03 for confirmation analysis by an EPA CLP laboratory. No VOCs were detected in these samples, which is consistent with the results from the mobile laboratory. One sample was collected from 34.5 to 35 ft-bgs in SB-03, where the mobile laboratory reported a TCE concentration of 7,900 µg/Kg. The CLP conformation sample was approximately 6 orders of magnitude higher at a concentration of 46,000 µg/Kg. Figure 3-4 displays TCE results for each boring; Table 3-6 provides a statistical summary of TCE at each boring location including maximum, minimum, and average concentrations. Complete screening results are located in Appendix C.

In addition to the laboratory VOC results, one soil sample, collected from SB-02/S-8 at a depth of 35 to 40 ft-bgs demonstrated a PID reading greater than 100 parts per million (ppm). The Oil-Red-O shake test was performed in this sample to determine the presence of absence of DNAPL. The test was negative for DNAPL.

3.5 November/December 2010 Groundwater

3.5.1 Shallow Overburden Groundwater

VOCs detected in the shallow overburden aquifer (0-20 ft-bgs) include TCE, PCE, 1,1,2-trichloroethane (1,1,2-TCA), acetone, cis-1,2-DCE, cyclohexane, isopropylbenzene, and methylene chloride. Of the VOCs detected, only TCE and PCE were present above their

respective GWPRs/MCLs. A summary of the compounds detected in shallow overburden groundwater and associated concentrations are presented in Table 3-1a.

- TCE was detected in 3 out of 15 wells with concentrations ranging from 3.2 µg/L (ARC-03) to 3,400 µg/L (MW-08S); 1 of the 3 wells contained concentrations of TCE exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 1,136 µg/L.

- PCE was only detected in MW-08S; the concentration was of 25 µg/L, exceeding the GWPR/MCL of 5 µg/L.

Naphthalene was the only SVOC detected in the shallow overburden groundwater (in BF-04 only). Table 3-2a summarizes all the 2010 shallow overburden SVOC results.

Several metals (Table 3-3a) were detected in multiple shallow overburden wells at the Study Area. Of the metals detected only arsenic, cadmium and manganese were present above GWPRs/MCLs.

- Arsenic was detected in 3 out of 15 wells with concentrations ranging from 2.8 µg/L (MW-11S) to 11.8 µg/L (BF-04); 1 of the 3 wells contained concentrations of arsenic exceeding the GWPR/MCL of 1 µg/L; the average detectable concentration was 6.1 µg/L.

- Cadmium was only detected in MI-08; the concentration was 13.6 µg/L, exceeding the GWPR/MCL of 5 µg/L.

- Manganese was detected in 15 out of 15 wells with concentrations ranging from 1.7 µg/L (MI-02) to 1,780 µg/L (ASI-23S); 2 of the 15 wells contained concentrations of manganese exceeding the GWPR/MCL of 840 µg/L; the average detectable concentration was 380 µg/L.

3.5.2 Intermediate/Deep Overburden Groundwater

VOCs detected in the intermediate/deep overburden groundwater aquifer (> 20 ft-bgs) during the November/December 2010 monitoring round include TCE, PCE, 1,1,2-TCA, 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethane (1,2-DCA),

1,2-dichloropropane (1,2-DCPA), acetone, cis-1,2-DCE, dichlorodifluromethane, ethylbenzene, xylene, MTBE, methylene chloride, trans-1,2-DCE, and vinyl chloride (Table 3-1b). Of the VOCs detected, TCE, PCE, 1,2-DCA, 1,2-DCPA, cis-1,2-DCE, methylene chloride, and vinyl chloride were present above their respective GWPRs/MCLs. Figure 3-5 depicts the estimated magnitude of TCE concentrations in intermediate/deep overburden groundwater during the November/December 2010 sampling round with comparisons to the May 2010 round (where applicable).

- TCE was detected in 24 out of 26 wells with concentrations ranging from 0.79 µg/L (ASI-04D2) to 75,000 µg/L (MW-04D); 24 of the 24 wells contained concentrations of TCE exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 9,809 µg/L.

- PCE was detected in 5 out of 26 wells with concentrations ranging from 0.94 µg/L (BM-03D) to 28 µg/L (MW-08M); 1 of the 5 wells contained concentrations of PCE exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 7.3 µg/L.

- 1,2-DCA was detected in 4 out of 26 wells with concentrations ranging from 4.6 µg/L (MW-05D) to 8.9 µg/L (MW-06M); 3 of the 4 wells contained concentrations of 1,2-DCA exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 7.1 µg/L.

- 1,2-DCPA was only detected in ASI-16D2; the concentration was 1,200 µg/L, exceeding the GWPR/MCL of 5 µg/L.

- Cis-1,2-DCE was detected in 13 out of 26 wells with concentrations ranging from 1.1 µg/L (MW-01D) to 2,200 µg/L (ASI-03D2); 4 of the 13 wells contained concentrations of cis-1,2-DCE exceeding the GWPR/MCL of 70 µg/L; the average detectable concentration was 215 µg/L.

- Methylene chloride was detected in 4 out of 26 wells with concentrations ranging from 1.2 µg/L (ASI-05D2) to 590 µg/L (ASI-04D); 3 of the 4 wells contained concentrations of methylene chloride exceeding the GWPR/MCL of 5 µg/L; the average detectable concentration was 293 µg/L. Based on evaluation of the analytical data, the presence of methylene chloride does not appear related to cross contamination from the laboratory.

- Vinyl chloride was only detected in MW-6D; the concentration was 3.7 µg/L, exceeding the GWPR/MCL of 2 µg/L.

Several SVOCs (Table 3-2b) were detected in multiple deep overburden wells at the Study Area. However, all detected SVOCs were present below their respective GWPRs/MCLs.

Several metals (Table 3-3b) were detected in multiple intermediate/deep overburden wells at the Study Area. Of the metals detected, arsenic, cadmium, lead, manganese, and nickel were present above their respective GWPRs/MCLs.

- Arsenic was detected in 24 out of 26 wells with concentrations ranging from 3.1 µg/L (MW-08M) to 23.7 µg/L (MW-07M); 10 of the 24 wells contained concentrations of arsenic exceeding the GWPR/MCL of 10 µg/L; the average detectable concentration was 10.5 µg/L.

- Cadmium was only detected in AL-02; the concentration was 45.5 µg/L, exceeding the GWPR/MCL of 5 µg/L.

- Lead was detected in 4 out of 26 wells with concentrations ranging from 5.9 µg/L (MW-3D) to 25.1 µg/L (MW-10D); 1 of the 4 wells contained concentrations of lead exceeding the GWPR/MCL of 15 µg/L; the average detectable concentration was 13.3 µg/L.

- Manganese was detected in 26 out of 26 wells with concentrations ranging from 375 µg/L (ASI-23D2) to 4,320 µg/L (AL-02); 19 of the 26 wells contained concentrations of manganese exceeding the GWPR/MCL of 840 µg/L; the average detectable concentration was 1,298 µg/L.

- Nickel was detected in 22 out of 26 wells with concentrations ranging from 1 µg/L (ASI-2D2) to 122 µg/L (MW-2M); 1 of the 22 wells contained concentrations of nickel exceeding the GWPR/MCL of 100 µg/L; the average detectable concentration was 26.4 µg/L.

Figure 4-8 depicts cadmium concentrations that exceed the MCL in both the shallow and deeper aquifer.

3.5.3 Bedrock Groundwater

Currently, BR-1 is the only bedrock well in the Study Area (residential portion), located hydraulically southwest of the potential source areas discussed in Section 2 (Figure 2-1). VOCs detected in BR-1 during the November/December 2010 monitoring round include TCE, cis-1,2-DCE, acetone, and methylene chloride (Table 3-1b). TCE was the only compound present above its respective GWPR/MCL at a concentration of 56 µg/L.

Phenol was the only SVOC detected in the bedrock groundwater and was present at a concentration well below its GWPR/MCL. Table 3-2b summarizes all the 2010 bedrock SVOC results.

As is the case for the overburden groundwater, several metals (Table 3-3b) were detected in BR-1. Of the metals detected, only barium was present at a concentration (3,150 µg/L) above applicable GWPRs/MCLs.

3.6 Data Quality Assessment and Limitations

In accordance with the QAPP, a data quality assessment was performed to evaluate whether the groundwater data acquired during the May and December 2010 sampling events; vertical profiling data from July and August 2010 sampling events; and porewater data from July 2010 were suitable for use in assessing the current nature and extent of groundwater contamination. The assessment consisted of the following:

- Review of the PQOs and the sampling design.
- Review of sample collection logs.
- Review of the data validation criteria (all data was subjected to Tier I level data validation).

- Correlation of data results to expected values and comparison with historical data results.

- Compare results against applicable State and Federal criteria, including Vermont's Groundwater Protection Rule (GWPR), primary groundwater quality standards, and EPA Maximum Contaminant Levels (MCLs).

3.6.1 Project Quality Objectives and Sample Design

The purpose of this groundwater monitoring data collection was to characterize the current nature and extent of groundwater contamination in support of developing a revised CSM and identifying potential data gaps.

Groundwater

Groundwater wells were located on-site and sampled for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and total metals. For the first round in May, the 27 pre-existing wells were sampled. For the second round in December, the initial 27 samples, plus 15 new wells were sampled. In addition to VOCs, SVOCs, and total metals, the second round of samples were also tested for 1,4-dioxane.

The analytical methods selected were CLP SOWs: SOM01.2 for VOCs and SVOCs; and ILM05.4 for metals. The method for 1,4-dioxane was based on a published and established procedure, EPA Method 524.2, and was performed by EPA Region I's Office of Environmental Measures and Evaluation (OEME) Laboratory. This was done to provide comparable results to historical data.

Porewater

Porewater samples were tested for VOCs only using CLP SOW SOM01.2. Samples were collected using passive diffusion bags (PDBs).

Vertical Profiling

Samples were screened on-site using EPA Region I's mobile laboratory for VOCs using a gas chromatograph (GC) equipped with a photo-ionization detector (PID) and electron capture

detector (ECD). Twenty-four samples were sent to off-site CLP laboratories for VOC and total metals analyses.

All sample results for both groundwater sample rounds, porewater, and vertical profiling were compared with the VTGWPR and MCLs and are presented in Table 1-1. Accuracy and precision calculations and criteria were established based on the SOWs and procedures selected. Although complete evaluation of the precision and accuracy results were not performed during the Tier I data validation for this project, the laboratories data for organics and metals testing (except for 1,4-dioxane data) do get screened for contract compliance, which does include meeting various criteria for accuracy and precision. All criteria were screened successfully.

The Study Area COCs are listed in Table 1-1 and were discussed in Section 1.6 of this report. Action Limits used to evaluate environmental data for COCs are the numerical GWPRs and MCLs. Currently, no response action for COCs exceeding the GWPRs and MCLs has been established.

3.6.2 Data Validation

Data validation of the all 2010 groundwater monitoring, porewater, and vertical profiling CLP analytical results was conducted following the Region 1 EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses (Dec. 1996).

VOCs, SVOCs, and total dissolved metals underwent a Tier I data validation only. A Tier I data validation review consists of checking for data completeness (CSF Audit – Tier I), including the complete set of analytical results with supporting information and performance evaluation sample result assessment. As specified in the Tier I data validation guidelines, no qualifications are made to the laboratory-reported values to account for field or laboratory QA/QC issues (i.e., holding times, instrument calibrations, blank contamination, matrix spikes, recoveries, etc.). Low concentrations of common laboratory or field contaminants could result in false positive values. Qualification of data based on high or low bias is not performed.

On-site VOC data and 1,4-dioxane data were not validated. Full data packages were not provided for review; however, data were reviewed by EPA staff.

3.6.3 Data Quality Assessment

Based on this assessment it was determined that the data, as reported by the laboratory, are complete and usable for this and subsequent reports.

However, several samples (ASI-14D2, ASI-15D2, ASI-16D2, ASI-23D2, MW-04D, MW-06D, and MW-07M) were analyzed for VOCs at a diluted level only due to elevated concentrations of TCE. As a result, the required project quantitation limits listed in the Quality Assurance Project Plan (QAPP) were not achieved for these samples for all VOC analytes.

The PE sample results for SDG A2PZ7 (collected in May 2010) indicated that because of a action low result for naphthalene, the positive results for this analyte would be estimated (J) and non-detect results would be rejected (R) if a Tier II or III validation had been done. This indicates a low bias in the analysis of this analyte for the groundwater samples in this SDG (AL-14, ASI-02D2, ASI-03D2, ASI-11D2, ASI-14D2, ASI-14S, ASI-23D2, MI-02, OE-2A, OE-2B, AL-12, and ASI-04D2).

The PE sample results for SDG MA2PZ3 (collected in May 2010) indicated that because of a action low result for mercury, the positive results for this analyte would be estimated (J) and non-detect results would be rejected (R) if a Tier II or III validation had been done. This indicates a low bias in the analysis of this analyte for the groundwater samples in this SDG (AL-14, AL-15, ARC-3, ASI-02D2, ASI-03D2, ASI-11D2, ASI-14D2, ASI-14S, ASI-23D2, ASI-23S, BM-3D, MI-01, MI-02, MI-08, AIP-01, and ASI-04D2).

The PE sample results for SDG A3M30 (collected in December 2010) indicated that because of action low results for acetophenone and 1,1'-biphenyl, the positive results for these analytes would be estimated (J) and non-detect results would be rejected (R) if a Tier II or III validation had been done. This indicates a low bias in the analysis of these analytes for the groundwater samples in this SDG (OE-2B, AL-15, ARC-3, ASI-14D2, ASI-14S, ASI-23D2, ASI-23S, BF-4, MW-01D, MW-11S, OE-2A, OE-2B, AL-2, AL-12, and ASI-16D2).

The PE sample results for SDG A3M31 (collected in December 2010) indicated that because of action high results for acetone, tetrachloroethene, and ethylbenzene, the positive results for

these analytes would be estimated (J) if a Tier II or III validation had been done. This indicates a high bias in the analysis of these analytes for the groundwater samples in this SDG (MW-03D, MW-05D, MW-05D2, MW-08M, BM-3D, MW-06M, and MW-08S).

The PE sample results for SDG A3M31 (collected in December 2010) indicated that because of a missed analyte for 2,4-dinitrophenol, the positive results for this analyte would be estimated (J) and non-detect results would be rejected (R) if a Tier II or III validation had been done. This indicates a low bias and unreliability in the analysis of this analyte for the groundwater samples in this SDG (AL-14, ASI-02D2, ASI-04D2, ASI-11D2, BM-3D, BM-3S, MI-01, MI-02, MW-02M, MW-03D, MW-05D, MW-05D2, MW-06D, MW-06M, MW-08M, MW-08S, and ASI-03D2).

All other PE sample results were within acceptable limits. Tier I Data Validation Memoranda for each SDG were produced under separate cover letters for submittal to the EPA.

3.6.4 Data Limitations

A review of field sampling techniques, sample preparation and handling methods and the analytical results has been completed.

May 2010 Groundwater Event

Field duplicates were taken at ASI-02D2 and ASI-05D2. The relative percent difference performance criteria of 30 percent for organics and 20 percent for metals were met for all analytes and for both sample duplicate pairs. Equipment blanks were taken and analyzed in each SDG. No analytes were reported above the reporting limits except for 2-butanone and acetone in the equipment blank collected May 20, 2010 in SDG A2PZ7. Associated samples were non-detect for these analytes.

Two trip blanks were collected for volatile organics analysis. The trip blank collected on May 17, 2010 in SDG A2PZ7 had a detection of acetone above the reporting limit. Associated samples were non-detect for this analyte. The other trip blank was non-detect or less than the reporting limit for all target analytes.

Vertical Profiling

Field duplicates were taken at VP-09, VP-31, and VP-18 for VOCs. The relative percent difference performance criteria of 30 percent for organics were met for all samples and analytes except for trichloroethene in VP-18. For this analyte, the field duplicates required a 50-fold dilution in each of the samples to obtain the result within the calibration range of the instrument. It is possible that an error in the dilution preparation caused increased variability of the results for this analyte. If a tier II or III validation were done on these data, this analyte in VP-18 would be estimated (J) in VP-18. Field duplicates were taken at VP-10, VP-14, and VP-25 for total metals analysis. The relative percent difference performance criteria of 20 percent for metals were met for all samples and except for calcium, iron, and magnesium in sample VP-10. The sample concentrations for these analytes are high. If a tier II or III validation were done on these data, these analytes would be estimated (J) in VP-10. No equipment blanks were taken during this sampling activity.

Four trip blanks were collected for volatile organics analysis. All trip blanks were non-detect or less than the reporting limit for all target analytes.

December 2010 Groundwater Event

Field duplicates were taken at ASI-02D2, MW-04D, and OE-2B. The relative percent difference performance criteria of 30 percent for organics and 20 percent for metals were met for all analytes and for both sample duplicate pairs, except for iron in sample OE-2B. If a tier II or III validation were performed, iron in sample OE-2B would be estimated (J) due to this variability. Equipment blanks were taken and analyzed in each SDG. No analytes were reported above the reporting limits except for 2-butanone and acetone in the equipment blank collected December 2, 2010 in SDG A3M29. Associated samples were non-detect for these analytes, except for samples MW-10D and BR-1 for acetone. Acetone in these two samples would be reported as non-detect as a result of the equipment blank contamination.

Three trip blanks were collected for volatile organics analysis. All trip blanks were non-detect or less than the reporting limit for all target analytes.

The PQO sample design limitations include:

- Data set may not represent the plume extent completely due to the number of wells sampled during the sampling event and the spatial extent of those wells. Deep overburden groundwater data, where the majority of the contamination resides, is limited to only select central and southern portions of the Study Area. Limited data in northern (upgradient) portions of the Study Area is available to accurately assess background conditions and potential source areas.

- Assessment of the plume is limited by the number of recent sampling rounds.

- Several samples were analyzed at a diluted level for VOCs only due to elevated concentrations of target analytes (TCE). As a result, the required project quantitation limits listed in the QAPP were not achieved for these samples for all analytes.

No other significant data limitations have been identified through the data validation process for the data evaluated in this report. As discussed these limitations do not limit the usability or completeness of the obtained data.

3.6.5 Field Sampling Technical Systems Audit (TSA)

On December 2, 2010 Nobis performed a Technical Systems Audit (TSA) during the November/December sampling event. Findings and observations of this audit are detailed in the TSA Report included in Appendix F. The results of the audit did not result in an impact to the quality or usefulness of the data collected during the sampling event. However, one finding is noted as deviation from the QAPP. Well ASI-14S was slated to be sampled after purging three well volumes due to the small diameter construction of the well. Since there was an adequate recharge in the well, a sample was collected using a modified low-stress procedure, with a peristaltic pump. This sampling method is not considered to impact the quality of the data and in the future, this well will be sampling in accordance with the approved QAPP.

4.0 RESULTS DISCUSSION AND CONCEPTUAL SITE MODEL UPDATE SUMMARY

Presented below is a summary and interpretation of the data collected during the 2010 investigations. This data is used to help update the Draft CSM Report (Nobis, 2009b) with

respect to groundwater flow direction, geology/hydrogeology, and nature and extent of contamination for various media.

4.1 Groundwater Flow Directions and Properties

With respect to groundwater flow directions in the shallow and deep overburden, the 2010 measurements (Figures 2-1 and 2-2) continue to demonstrate overburden groundwater to the west of the Study Area flowing generally southwesterly, and groundwater to the east flowing in a south/southeasterly direction toward the unnamed stream (discharge boundary), as previously reported in the CSM and historical evaluations. This data set is consistent with previous interpretations including the most recent set of data from December 2008. It appears the unnamed stream is a discharge zone for at least shallow groundwater, as noted by the elevated concentrations of TCE and DCE in surface water in the unnamed stream during past sampling events and the 2010 porewater sampling results. There remains only one bedrock well at the Study Area, thus making it difficult to interpret groundwater flow direction within the bedrock. Bedrock groundwater flow direction interpretation in the region is based on literature interpretations and is presented in the CSM.

Additionally, based on the 2010 groundwater elevation measurements and using average conductivities calculated by Geo Trans in 2000, deep overburden groundwater velocities and vertical gradients were calculated for the Study Area. Using a geometric mean value of 3.8 ft/day for conductivity (K), 6 different groundwater velocities (v) in the intermediate/deep overburden were calculated in the direction of groundwater flow along several portions of the Study Area using the following formula:

$$v = \frac{K\ dh}{n_e\ dl}$$

Where an effective porosity (n_e) of 0.20 for fine sand/silt was assumed and the hydraulic gradient (dh/dl) calculated as the difference in groundwater elevation between two wells divided by the linear distance between them. The calculations produced an average velocity of 0.108 feet/day, or 39.4 feet/year, across the Study Area. Table 4-1 lists the properties used for each calculation and the corresponding groundwater velocities.

Additionally, using the Spring and Fall 2010 measured groundwater elevations, vertical gradients were calculated at each point where a shallow and intermediate/deep overburden well

couplet exists. In general, as shown in Table 4-2 and displayed on Figure 4-1, there is no consistent trend from couplet to couplet moving across the Study Area. At several locations, the gradient reversed direction between Spring and Fall 2010, but the gradients are so small as to be of minor significance at most locations and demonstrating that vertical flow has little influence on TCE migration through the aquifer. This suggests gravity and the denser-than-water properties of the contaminants at the Study Area still remain the primary drivers for carrying dissolved contamination to deeper portions of the overburden aquifer. Horizontal groundwater potentiometric surface gradients are also very small, varying over an order of magnitude, from 0.00171 to 0.01373 (Table 4-1). These very low gradients reflect the subdued topography, relatively uniform geologic stratigraphy, and lack of known pumping or injection in the Study Area (with the possible exception of a domestic sump pump in the far southwestern portion of the Study Area).

4.2 Geophysical Survey and Geology

The 2010 geophysical investigation helped to characterize three stratigraphic horizons consisting of, in descending order, the top of a clay layer, the top of a till layer, and the bedrock surface. Of these horizons, information pertaining to the clay layer was of most use during the 2010 investigations as it was used to help determine locations and depths of vertical profile points, soil borings, and monitoring wells.

According to Hager's report (Appendix B), the depth to the clay layer ranged from 36 to 54 ft-bgs across the Study Area, with localized lows along Commerce Street and larger depressions in the east and west portions of the survey area (Figure 4-5). These depths translate to observed elevations of 281 and 305 feet above sea level. The range of relief of the clay layer is approximately 28 feet, and its thickness varies from an estimated 7 to 29 feet.

Hager's data generally correlates with Geo Trans' geophysical observations and interpretations in 1999/2000, which was used originally in the draft CSM. Similar to the previous results, the top of the clay layer (referred to in the previous survey as silt), according to Hager, occurs as an elevation high trending southwest through the northern edge of the survey area. The results also indicate low clay elevations at the southern, eastern, and western limits of the survey area where the previous results show low elevations surrounding the ridge (Figure 4-5). A depression in the upper surface of the clay layer in Lot 19-23, according to GeoTrans, appears

to be a much broader feature in Hager's interpretation. Detailed cross sections and contour maps displaying clay (as well as till and bedrock) surface depths and elevations are included in Appendix B.

Additionally, clay depths observed by Nobis personnel during the August soil boring advancements (Figure 3-4) were compared to Hager's results. In general, Nobis observations corresponded will Hager's results with fine to medium sands with varying amounts of silt found above the clay layer. Increasing amounts of silt were present as borings were advanced towards the clay layer In several borings (e.g. SB-03 and SB-06) the clay layer was found to be 3+/- feet lower or higher than what was approximated in the geophysical survey. Such discrepancies did not affect the outcome of any of the investigations and were merely noted on the soil boring logs (Appendix D). The characteristics of the sand and silt layers observed during soil boring advancements were also consistent with historical interpretations confirming the relatively homogeneous nature of the fine sand and silt units at the Site.

4.3 Nature and Extent of Contamination

4.3.1 Overburden Groundwater

4.3.1.1 Commerce Street

The groundwater analytical data presented in this report confirms the presence of a large TCE plume in the overburden groundwater along Commerce Street and throughout the majority of AIP. The current lateral and vertical extent of the plume indicates the highest concentrations on Lots 19-23, 19-29, and 19-32 (Figure 1-2) as demonstrated with the vertical profiling results (e.g. VP-16, VP-19, and VP-20) and groundwater analytical data from the newly installed wells (e.g. MW-04D, MW-05D/D2, and MW-06M/D). The data set also demonstrates that the majority of the contamination resides in the intermediate and deep overburden groundwater with little to none in the shallow overburden (< 20 ft-bgs). The observation of contamination in the deep overburden is consistent with the dense nature (i.e. heavier than water) of dissolved phase chlorinated VOCs as they have had sufficient time to migrate vertically downward through the aquifer from the time of any ground surface release (likely decades in this case).

Figures 4-2, 4-3, and 4-4 display cross-sectional contaminant plume outlines based on the geophysical survey and TCE results from the vertical profiling and monitoring well sampling data

along transects A-A' , B-B' and C-C' (see Figure 1-2), respectively. These cross-sections clearly depict the highest concentrations of TCE in the intermediate/deep overburden groundwater, especially in central portions along Commerce Street. In Figure 4-2, of particular interest are the high concentrations in the vicinity of VP-16 (MW-04D) and VP-19 (MW-05D/D2). Both locations are situated within an apparent broad clay depression with a relief in the top surface of the clay of 9 feet between VP-13 and VP-18. TCE results of these magnitudes are similar to those observed by Geo Trans in the same areas during 1999 and 2000. The TCE results and depression together suggests the clay depression is acting to not only retard vertical migration of contaminants, but to at least partially limit horizontal migration as well, as indicated by concentrations of far lesser magnitudes in southerly situated wells (e.g. MW-07M). It should be noted that elevated TCE concentrations are also observed in areas outside of the interpreted clay depression (e.g. MW-06M/D), thus indicating that other pathways and mechanisms exist to carry the contaminated groundwater away from the suspected source area(s).

Figure 4-5 displays the 2010 intermediate/deep overburden monitoring well TCE results projected over Hager's depth to clay contours (ft-bgs). In general, the figure shows that elevated TCE concentrations are associated with a depression in the clay surface in some locations (MW-05D/D2, MW-04D). However, at other locations (MW-06M/D), elevated TCE concentrations occur where the top of the clay layer is relatively high. In addition, elevated TCE at ASI-03D2 and ASI-14D2 occurs south and west of an east-west high in the top of the clay. These conditions indicate that the TCE plume has migrated towards and across the clays highs and is not completely contained by the high. This migration is consistent with groundwater flow directions.

Figure 4-6 displays the lateral extent of the intermediate/deep overburden TCE plume at the Study Area based on the November/December 2010 groundwater monitoring round. As previously stated, the majority of the contamination is observed along central portions of Commerce Street in the vicinity of monitoring wells MW-04D and MW-05D/D2. A comparison between Figure 4-6 and Figure 4-9 in the GeoTrans report (Appendix E), in general, shows the current lateral extent of the TCE plume to be similar in size to that characterized by Geo Trans' previous investigation. Additionally, elevated concentrations of TCE are observed in the new monitoring wells MD-06M and MW-06D along the banks of the unnamed stream (Figure 4-5). As stated in previous GeoTrans and Nobis reports, these results, coupled with groundwater flow direction to the southeast in this area of the Study Area, indicate contaminated

groundwater is likely discharging into the surface water of the unnamed stream (see Section 4.4).

Charts 4-1 and 4-2 display groundwater TCE concentration trends for select intermediate/deep wells, including data from the 2000 extending back to GeoTrans investigation. In general, wells adjacent to Commerce Street (e.g. ASI-11D2, ASI-15D2, and BM-03D) demonstrate reductions in TCE since 1999/2000. Conversely, wells to the west/southwest of Commerce Street (AL-02, ASI-14D2, and ASI-23D2) show overall increases. Table 4-3 shows the percent increase/decrease for each of the wells between 1999 and the Fall of 2010. Although the extent of contamination remains relatively unchanged since the 2000 Geo Trans SI, these trends suggest a west/southwest shift in plume magnitude resulting in reduced concentrations in areas in the vicinity of the suspected plume origin.

DNAPL is suspected in areas where dissolved groundwater concentrations exceed 1 percent of the theoretical solubility of a particular compound. At 20° C the solubility of TCE is approximately 1,100,000 µg/L in water. Thus, with concentrations exceeding the 1 percent value of 11,000 µg/L at monitoring wells MW-04D, MW-05D/D2, and MW-06M/D, it becomes reasonable to suspect the presence of DNAPL in the vicinity of these wells. While DNAPL was not observed during the August 2010 soil boring event (see Section 4.3.4), a more comprehensive DNAPL investigation may be warranted to determine if DNAPL is present, with the potential of identifying a suspected source.

4.3.1.2 West/Southwest Areas

The 2010 overburden groundwater results also demonstrate significant TCE contamination to the west/south-west of Commerce Street, in particular the residential areas along Kirby Lane. Similar to areas along Commerce Street, the vertical profiling and monitoring well results indicate the majority of the dissolved TCE contamination in this portion of the Study Area also resides in the intermediate/deep overburden groundwater, particularly to the south. Although concentrations are one to three orders of magnitude less than observations along central portions of Commerce Street, results still remain well above GWPR/MCL standards with localized highs well in excess of 1,000 µg/L in ASI-16D2 and ASI-23D2.

As stated in previous reports, contamination in this area is consistent with groundwater flow to the south/south-west resulting in advective transport of dissolved VOCs to this portion of the Study Area.

In general, the latest groundwater results from this area are consistent with previous monitoring rounds. However, it should be noted that high TCE concentrations are present within the intermediate and shallow groundwater in the vicinity of newly installed/sampled wells MW-08S and MW-08M as demonstrated with the vertical profiling results (VP-24: Figure 3-3) and the November/December groundwater sampling round (Figures 3-5 and 4-3; Tables 3-1a and 3-1b). Figure 4-7 depicts the estimated lateral extent of VOC contamination in the shallow aquifer. While TCE detections in the intermediate groundwater are consistent with groundwater conditions across the Study Area, TCE in the shallow groundwater presents an anomaly in comparison to other shallow results from 2010. With the exception of VP-22 at 15 ft-bgs, TCE concentrations from VP-24 and MW-08S are the only instances in 2010 where levels have exceeded GWPR/MCL standards in shallow groundwater (< 20 ft-bgs). Shallow groundwater contamination in this area suggests a source(s) separate from the one(s) contributing to contamination along Commerce Street and adjacent Kirby Lane residences.

A zero vertical groundwater gradient (Table 4-2) at the MW-08 couplet suggests that TCE did not move upward at this location and that there may be a source distinct from that at the AIP. However, GeoTrans mapped the AIP plume as continuing westward to the area of MW-08. Intervening between Kirby Lane and the MW-08 area were 6 former domestic wells along the east side of Brownell Avenue (VT AEC, 1986). The wells were in the shallow aquifer and were contaminated with VOCs, as measured in the 1980s. Four wells had TCE at levels above the "safe health advisory limit," six wells had low levels of chloroform, one had low levels of PCE, and one had TCE and chloroform in a flooded cellar (VT AEC, 1986). Six other wells tested at the time showed no detection for VOCs. The six homes with contaminated wells were connected to municipal water, although at least one of the wells may have remained in service for watering a garden. The six contaminated wells represent data points that could support continuity between the AIP plume and the MW-08 area.

With the exception of the MW-08 area, the extent of the plume to the west and southwest (Figure 4-6) is similar to that mapped by GeoTrans. However, in some areas within the mapped

plume, concentrations have increased over time, suggesting advection of dissolved phase TCE since the GeoTrans study.

Monitoring well ASI-23D2 continues to exhibit TCE concentrations well in excess of GWPR/MCL standards. While the installation of new monitoring well MW-10D, in conjunction with TCE non-detects in VP-30, has helped delineate the TCE to the south, areas west/southwest of ASI-23D2 remain data gaps for fully delineating the entire extent of TCE groundwater contamination in the area. Additionally, the extent of the TCE impacted groundwater south of Commerce Street appears to terminate somewhere between MW-07D and OE-2A. However, due to the lack of monitoring stations between the wells, it is not clear where. Due to MW-07M exhibiting concentrations 60 times applicable standards, additional wells between the two points may be warranted in the future to fully delineate the southern extent of the plume.

Metals continue to be observed throughout the Study Area at concentrations above their respective GWPRs/MCLs. The most prevalent metal detected above the respective GWPR/MCL is cadmium. Figure 4-8 depicts the area to the southwest of the former Mitec property that contains cadmium concentrations greater than the MCL of 5 µg/L. Figure 4-9 displays the cross-sectional contaminant plume outline for cadmium based on Fall 2010 groundwater results along transect D-D' (see Figure 1-2).

4.3.2 Bedrock Groundwater

Bedrock monitoring well BR-01 continues to exhibit TCE concentrations in excess of GWPR/MCL standards. According to the Geo Trans SI conducted in 2000, no VOCs were present in BR-01 above laboratory MDLs when sampled in 1999. The presence of VOCs (especially TCE) during the December 2008 and both of the 2010 rounds suggest deeper vertical migration of the plume and/or leakage from the casing in the overburden. In addition to TCE, cis-1,2-DCE and toluene were detected at low concentrations in BR-1 during 2010. A bedrock investigation may be warranted to determine the source(s) of this contamination in the bedrock groundwater and delineate its extent.

4.3.3 Unnamed Stream/Porewater

Based on Figure 4-6 and the porewater results (Table 3-4 and Figure 3-2), it is reasonable to conclude that VOC contaminated groundwater is discharging into the unnamed stream along

certain stretches. The bulk of the plume appears to be discharging between PW-06 and PW-11 as evidenced by VOC results for these samples as well as the extremely elevated concentration of TCE observed in the newly installed wells MW-06M and MW-06D. Contaminated groundwater entering the stream at these locations is also consistent with the established regional groundwater flow direction, demonstrating the stream's strong hydraulic influence on groundwater flow.

Of particular interest are the elevated concentrations of cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride observed between PW-06 and PW-11 compared with the relatively low to non-detect concentrations of TCE. Vinyl chloride and cis-1,2-DCE are considered degradation products formed by reductive dechlorination of PCE and/or TCE during which reducing conditions cause toxic chloride atoms to be replaced with hydrogen atoms. The general process results in PCE reducing to TCE, TCE to cis-1,2-DCE, cis-1,2-DCE to vinyl chloride, and vinyl chloride to non-toxic ethene, with each step resulting in the replacement of a chlorine atom with a hydrogen atom. Such reductive dechlorination processes are generally observed in anaerobic environments such as swamps, marshland, and other aquatic systems. Environments such as these often contain certain species of bacteria (e.g. dehalococcoides) capable of acting as electron donors by which they use hydrogen, produced as a natural byproduct of various fermentation reactions by other microorganisms at the contaminated site, to replace chlorine atoms. This scenario in which the unnamed stream is acting to naturally attenuate TCE discharging into the stream is supported by a comparison of the TCE concentrations detected at MW-06M/D (44,000–50,000 µg/L) and the porewater results at the two closest sampling points, PW-08 and PW-09 (41 µg/L and non-detect TCE shown on Figure 3-2). The scenario is also supported by the fact that at PW-08 and PW-09, porewater concentrations of cis-1,2-DCE are higher than the TCE concentrations, whereas at MW-06, the DCE concentrations are much lower than the TCE concentrations (Figure 3-2 and Table 3-1b).

Reductive dechlorination may explain why trace to no VOC detects are observed in ASI-04D2 and ASI-05D2 on the east side of the stream. It may also be reasonable to conclude that little if any of the contaminated groundwater is traveling beneath the stream, with the bulk of it discharging into the stream where it is encountering dilution effects aiding in concentration reduction. Regardless, it appears that the TCE contaminated groundwater originating along Commerce Street is having little to no impact on groundwater quality to the east of the unnamed stream in the general direction of groundwater flow.

The observation that the unnamed stream may form a hydraulic/hydrogeologic discharge boundary at the eastern edge of the site and that the unnamed stream may essentially mark the eastern limit of the extent of groundwater contamination at the Site is a key element of the conceptual site model and is consistent with previous interpretations (e. g. Geo Trans, 2000). Groundwater flow directions alone are not enough to confirm that the unnamed stream acts as a discharge boundary, because southeasterly groundwater flow may continue east of the Stream. Nobis' 2010 data set does not include sufficient data locations east of the brook to map the groundwater potentiometric surface in that area (Figures 2-1, 2-2, 2-9, and 2-10). However, GeoTrans, 2000, Figures 3-1 and 3-2 (as presented in Nobis, 2009b Appendix A) show groundwater potentiometric surface contours that indicate groundwater flow toward the unnamed stream from the east side of the stream as well as the west. The key evidence in the 2010 data set that the unnamed stream acts as a discharge boundary includes:

- Intermediate/deep overburden groundwater TCE concentrations for May 2010 (Figure 3-1) depict high concentrations west of the Stream and absent in two wells east of the Stream;

- Porewater TCE concentrations for July 2010 (Figure 3-2) include cis-1,2-DCE and/or vinyl chloride in stream porewater from PW-6 to PW-11;

- Vertical profiling TCE groundwater concentrations for July/August 2010 (Figure 3-3) in VP-22 east of stream has maximum TCE concentration 10 feet shallower and one to two orders of magnitude lower than VP-20 and 18 located west of the Stream; and

- Intermediate/deep overburden groundwater TCE concentrations for May and November 2010 (Figure 3-5, 4-5 and 4-6) includes high concentrations west of the Stream and nearly always absent in two wells east of the Stream.

Additional investigations to confirm that the unnamed stream is a discharge boundary are recommended below.

4.3.4 Soil

2010 soil sample analyses are summarized in Section 3.4 and illustrated in Figure 3-4. In general, VOC impacted soil at the Study Area appears to be minimal. Only SB-02 (37.5-38 ft-bgs) and SB-03 (34.5-35 and 36.5-37 ft-bgs) demonstrated TCE concentrations in excess of EPA Regional Screening Levels. The soil results are similar to groundwater results in that the highest TCE concentrations tend to occur beneath Commerce Street in the central part of the site and at depths below 35 feet. The borings reached the bottom of the sand layer and sometimes penetrated the top foot of the clay, but no evidence of NAPL was found. SB-02 was the only boring that exhibited a PID reading over 100 ppm (at 37 ft-bgs). Soil from this interval underwent an Oil-Red-O shake test to determine if DNAPL was present, producing a negative result.

Except in the westerly direction, there is an insufficient number of data points to delineate the outer limits of soil contamination by TCE (Figure 3-4). Soil boring SB-05, located immediately east of the unnamed stream, shows a small concentration of TCE at 25-35 feet in depth (non-detect for all shallower samples). Higher values are found at nearby SB-04, located west of the stream. Although TCE appears to be decreasing eastward, there is not enough data to determine if the unnamed stream approximately coincides with the eastern extent of TCE contamination.

4.3.5 Contaminant Mass Estimation

Based on the available data, a rough estimate of the total mass of dissolved-phase TCE beneath the Commerce Street site was calculated by Nobis. The estimate was based on the following assumptions:

- The plume's area is assumed to be the area within the 5 µg/L contour for dissolved-phase TCE, as shown on Figure 4-6. The area to the west of South Brownell Avenue is not included. This area is approximately 2,500,000 square feet.

- The plume thickness is assumed to be about 25 feet for an Outer Zone (defined below) and about 20 feet for an Inner Zone (also defined below), based on cross-sections A-A', B-B', and C-C'.

- The aquifer material generally consists of silty sand; the porosity is assumed to be 20 percent.

- TCE that may be present in unsaturated soil, NAPL (if present), TCE to the west of South Brownell Road and other detected VOCs were not included in this calculation.

Calculations were performed for two zones within the 5 µg/L contour and then added together to obtain a total contaminant mass estimate:

Inner Zone: the Inner Zone consists of all the area inside the 1,000 µg/L contour shown on Figure 4-6. The average concentration of TCE in groundwater was assumed to equal the median of 1,000 µg/L and 75,000 µg/L (the maximum TCE concentration). This value is 38,000 µg/L.

Outer Zone: The Outer Zone consists of all the area between the 5 µg/L and the 1,000 µg/L contours shown on Figure 4-6, but not including the area west of South Brownell Avenue. The average concentration of TCE in groundwater was assumed to equal the median of 5 µg/L and 1,000 µg/L. This value is 503 µg/L.

To perform the calculation, the area of each zone was estimated (1,500,000 sq ft for the Outer Zone; 1,002,300 sq ft for the Inner Zone); volume was obtained by multiplying the areas by the average plume thickness for each zone. These volumes were then multiplied by the assumed porosity, 20 percent, to obtain the volume of groundwater in each of the zones (assuming full saturation). After converting cubic feet to liters, the groundwater volumes were multiplied by the median TCE dissolved phase concentration (as described above) for each zone to obtain estimates for contaminant mass. The estimated mass for the Inner Zone is 4,314 kg, and the estimated mass for the Outer Zone is 107 kg, for a total of 4,421 kg.

Inaccuracies in the above calculations result from uncertainties in the northern and southern plume boundaries shown on Figure 4-6, the fact that contaminant mass may exist west of South Brownell Avenue, and the assumption that the median concentrations estimated for the two mapped zones apply to the entire estimated plume thickness beneath each mapped zone.

4.3.6 Vapor Intrusion Evaluation

In March 2011, Nobis performed and evaluation the shallow groundwater results in accordance with the EPA, OSWER's *Draft Guidance for Evaluating the Vapor Intrusion Indoor Air Pathway from Groundwater and Soil*. Three compounds were detected at concentrations above their respective Indoor Air Screening Levels (TCE, PCE, and Dichlorodifluoromethane). Exceedances were detected in five monitoring wells, with the highest concentrations detected in MW-08S (TCE at 3,400 µg/L). As discussed in this report, the presence of TCE in this location could be associated with another release and not the Commerce Street Plume Site. Other wells, within the Study Area (AL-15, ARC-03, MI-08, and AL-12) also exhibited contaminant concentrations that exceeded screening levels. Additional details are included in the Technical Memorandum that was submitted to EPA on March 22, 2011. This Memorandum is included in Appendix G of this Report.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The data collected during 2010 provided useful information and the ability to update the Conceptual Site Model for the Site. The addition of the 15 new overburden monitoring points successfully addressed data gaps, particularly along central portions of Commerce Street, presented in the 2008 Data Summary Report.

5.1 Summary and Conclusions

- Results from the geophysical survey indicate the presence of a dense clay unit occurring at an average of 40 ft-bgs at an average thickness of approximately 18 feet.

- Groundwater potentiometric surfaces indicate that overburden groundwater east of Commerce Street flows to the south/southeast toward the unnamed stream, and groundwater west of Commerce Street flows generally to the southwest.

- Groundwater analytical results from vertical profiling and monitoring well sampling continue to confirm the presence of a large dissolved TCE plume throughout AIP and adjacent residential areas to the west/southwest.

- Groundwater vertical profiling results indicate that the majority of the contaminated groundwater resides in the intermediate/deep overburden (> 20 ft-bgs) but above the clay layer.

- Porewater sampling results indicate that contaminated groundwater is discharging into the unnamed stream. The presence of DCE and vinyl chloride in groundwater and porewater adjacent to the stream are evidence that anaerobic conditions, related to the unnamed stream, are contributing to reductive dechlorination of TCE.

- Elevated TCE concentrations were detected in VP-16 and newly installed monitoring wells MW-04D and MW-05D/D2, in the vicinity of Lots 19-19, 19-23, and 19-25. The limits of higher-concentrations of TCE are well constrained. The extent of TCE contamination appears to be delineated to the East of Commerce Street. However, in areas to the south and west/southwest, the extent of TCE contamination has not been fully delineated in the intermediate/deep overburden groundwater (downgradient of well ASI-23D2).

- While the extent of the plume remains relatively unchanged since the GeoTrans investigation, the magnitude appears to be shifting to the west/southwest based on TCE concentration decreases in monitoring wells along Commerce Street and TCE increases in residential areas to the west/southwest. Based on a limited amount of sampling locations, it appears that the dissolved plume has not migrated past the unnamed stream, in the southeastward direction.

- Elevated TCE concentrations detected in the shallow groundwater of MW-08S suggests a source separate from the Commerce Street Plume could exist in the vicinity of MW-08S.

- The concentrations of TCE in groundwater are elevated in the range (above about 1 percent of the theoretical solubility concentration of 1,100,000 µg/L) which usually indicates the presence of a DNAPL in the area and is indicative of the presence of DNAPL at the Site. However, no direct evidence of NAPL has been found to date.

- A rough estimate of the contaminant mass, based on the current data and some general assumptions, indicates that approximately 4,400 kg of TCE is present in the groundwater beneath the Commerce Street Plume Site.

- Based on the available data a continuing source contributing to the dissolved TCE plume is not readily apparent. One possible explanation is that that the clay contains NAPL which is dissolving into the aquifer just above the clay layer.

- Metals continue to be observed throughout the Study Area at concentrations above their respective GWPRs/MCLs. The most prevalent metal detected above the respective GWPR/MCL is cadmium.

- Based on a review of the shallow groundwater data for a potential vapor intrusion pathway, three compounds were detected at concentrations above their respective Indoor Air Screening Levels (TCE, PCE, and Dichlorodifluoromethane).

- At this time, potential data gaps include: 1) unknown history of operations and chemical usage at some of the Commerce Street properties and properties to the east of South Brownell Avenue in the vicinity of MW-08; 2) soil conditions and presence or absence of NAPL in the upper portion of the clay layer; 3) plume conditions to the south, southwest, and western portions of the Site; and 4) comprehensive hydrogeologic conditions and connections of the unnamed stream.

5.2 Recommendations

Recommended measures to address the potential data gaps are presented below:

- A thorough review of the history of operations and chemical usage should be undertaken at Lots 19-23 and 19-25 because of the highest TCE concentrations in the study area are located there. Any available aerial photos should also be evaluated for evidence of outside storage of drums or other containers.

- Confirmation that no private wells within a half-mile of the Site should be performed. If so, each well should be field located if possible, and a determination should be made as

to whether a potential hydraulic connection between the well and groundwater beneath the Study Area exists.

- An effort should be made to locate and map 6 former residential wells located along Brownell Avenue that were taken out of service in 1985. This can probably be done by means of "windshield survey" using a topographic map-based figure that shows the locations in the report by Vermont AEC (1986); interviews with local residents or reconnaissance in the residents' yards may be required. If any of the wells still exist and are accessible, permission should be sought to obtain samples and water level measurements from the wells.

- The installation of up to 2 bedrock monitoring wells should be performed based on the detected concentrations (up to 57 µg/L) in the existing bedrock well BR-1. The number of wells and locations would be determined based on the results of the well surveys recommended above. If viable wells are located and can be sampled, then those results would be used to confirm if additional bedrock wells are necessary at the Site.

- Additional investigations should be performed in the vicinity of the unnamed stream to help determine if groundwater is in fact discharging to the stream. This could include the installation of piezometer pairs in the stream bank, staff gauges, and the installation of well couplets to the east of the stream to evaluate gradients and contaminant levels. In addition, a round of surface water sampling should be performed to evaluate the current conditions to evaluate potential impacts to the surrounding ecosystem.

- Additional investigations to locate the continuing source of the dissolved plume should be performed. Investigations should include additional soil samples in the vicinity of suspected areas where residual DNAPL could be present, specifically in the upper clay layer, as well as a review of the history of waste disposal at the Site.

- Additional deep overburden wells should be considered to the south, southwest and west of the study areas to delineate the plume in the vicinity of and downgradient of wells ASI-23D2 and MW-08.

- Continue to perform bi-annual groundwater sampling to monitor conditions and migrations trends.

- In order to complete the Remedial Investigation process, the Human Health and Ecological Risk Assessments should be performed. To complete the Human Health Risk Assessment Nobis recommends the following:

    - To have a complete soil data set, collection and analysis of 20 surface samples and 20 samples just above the water table is recommended. 10 borings would be installed in the residential area and 10 in the commercial area with at least 2 samples collected from each boring.

    - Additional shallow groundwater wells are recommended: 3 to 4 in the residential area and 3 to 4 in the area of the highest TCE concentrations at depth to assist with the vapor intrusion evaluation. Wells could be installed as part of the boring program described above.

    - Perform another round of shallow groundwater sampling with low reporting limits to help assist vapor intrusion screening for all potential chemicals of concern.

    - If warranted by the additional shallow groundwater results, perform sub-slab and/or indoor air sampling to see if there are any impacts in those areas where shallow groundwater has exceedances of the screening levels.

    - It is recommended to use a fixed laboratory for these analyses to obtain proper reporting limits and defensible data.

- To complete the Ecological Risk Assessment, Nobis recommends the following actions:

    - Collection of 8 to 10 porewater samples for analytical and aquatic toxicity tests.

    - Collection of 8 to 10 surface water and sediment samples for a benthic evaluation including analytical testing.

- Based on the somewhat contained nature of the dissolved plume (no evidence of migration past the unnamed stream) and the concentrations present consideration of potential remedial options should be considered. A screening and evaluation of remedial options could be performed based on the current data and presented to EPA in a Technical Memorandum for consideration.

- Discontinue sampling for SVOCs based on no GWPR/MCL exceedances in groundwater during the past three sampling events.

6.0 REFERENCES

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TABLES

Table 1-1
Groundwater Contaminants of Concern
Commerce Street Plume Superfund Site
Williston, Vermont

Contaminant of Concern	VT GWPR (µg/L)	MCL (µg/L)
Trichlorethene	5	5
Tetrachloroethene	5	5
Benzene	5	5
Toluene	1000	1000
Ethylbenzene	700	700
Xylenes (Total)	600	600

Notes:
All concentrations listed in micrograms per liter (µg/L).
MCL – Federal Maximum Contaminant Level: EPA 816-F-02-013 (July 2002)
VT GWPR - Vermont Groundwater Protection Rule Goal (February 1, 2005)

Table 2-1
2010 Groundwater Elevation Measurements
Commerce Street Plume Superfund Site
Williston, Vermont
Page 1 of 2

Well ID	Reference Elevation (ft msl)	Spring 2010		Fall 2010	
		Depth to Water (ft TOC)	Water Elevation (ft msl)	Depth to Water (ft TOC)	Water Elevation (ft msl)
Shallow Overburden					
ASI-02S	338.6	5.91	332.69	6.56	332.04
ASI-03S	338.7	5.54	333.16	6.14	332.56
ASI-04S	338.5	6.49	332.01	7.03	331.47
ASI-05S	338.2	5.98	332.22	6.61	331.59
ASI-08S	337.7	6.33	331.37	7.03	330.67
ASI-11S	339.7	2.09	337.61	2.74	336.96
ASI-13S	341.0	5.47	335.53	5.98	335.02
ASI-14S	339.7	4.87	334.83	5.50	334.20
ASI-15S	341.0	8.81	332.19	9.41	331.59
ASI-16S	343.2	7.80	335.40	8.47	334.73
ASI-22S	337.1	6.97	330.13	7.66	329.44
ASI-23S	341.7	8.42	333.28	8.33	333.37
AL-12	345.6	8.27	337.32	8.72	336.87
AL-14	343.3	6.53	336.77	7.22	336.08
AL-15	342.9	7.00	335.90	7.58	335.32
ARC-3	340.2	3.92	336.28	4.46	335.74
BF-4	340.5	7.78	332.72	8.44	332.06
BM-3S	342.5	6.81	335.69	7.39	335.11
BW-13S	340.8	5.14	335.66	5.11	335.69
MI-1	342.6	6.15	336.41	6.91	335.65
MI-2	342.3	5.89	336.41	6.62	335.68
MI-8	341.6	5.68	335.92	6.31	335.29
OE-2B	337.9	6.78	331.12	7.03	330.87
PH-3A	337.7	4.57	333.13	4.82	332.88
MW-08S	334.6	--	--	1.84	332.80
MW-11S	343.5	--	--	7.06	336.43
Intermediate/Deep Overburden					
AL-02	341.9	--	--	7.81	334.04
ASI-02D2	339.0	6.59	332.41	4.86	334.14
ASI-03D	338.3	5.82	332.48	--	--
ASI-03D2	337.3	5.10	332.16	5.34	331.92
ASI-04D2	338.2	7.13	331.07	7.14	331.06
ASI-05D2	338.4	6.48	331.92	6.42	331.98
ASI-08D	336.3	7.41	328.89	8.25	328.05
ASI-10D	335.3	7.71	327.59	8.52	326.78
ASI-11D2	337.8	2.00	335.80	2.88	334.92
ASI-13D	340.4	5.19	335.21	6.06	334.34
ASI-14D2	339.8	6.01	333.79	6.53	333.27
ASI-15D2	341.3	6.27	335.03	9.75	331.55
ASI-16D2	342.3	7.93	334.37	8.37	333.93
ASI-22D	336.0	4.87	331.13	5.12	330.88
ASI-23D2	340.3	6.71	333.59	7.07	333.23
BW-5D	341.1	7.09	334.01	--	--
BW-7D	339.7	5.88	333.82	--	--
BM-3D	341.9	5.89	336.01	6.44	335.46

Table 2-1
2010 Groundwater Elevation Measurements
Commerce Street Plume Superfund Site
Williston, Vermont

Well ID	Reference Elevation (ft msl)	Spring 2010		Fall 2010	
		Depth to Water (ft TOC)	Water Elevation (ft msl)	Depth to Water (ft TOC)	Water Elevation (ft msl)
Intermediate/Deep Overburden (cont'd)					
BW-8D	341.0	5.14	335.86	--	--
BW-11D	342.7	9.41	333.29	--	--
BW-13D	340.9	5.12	335.78	--	--
MW-01D	339.4	--	--	2.89	336.54
MW-02M	339.1	--	--	3.23	335.84
MW-03D	342.9	--	--	7.33	335.57
MW-04D	338.6	--	--	4.02	334.62
MW-05D	339.1	--	--	5.19	333.92
MW-05D2	338.9	--	--	4.56	334.31
MW-06M	337.2	--	--	5.54	331.69
MW-06D	337.3	--	--	5.58	331.72
MW-07M	334.6	--	--	5.95	328.69
MW-08M	334.6	--	--	1.84	332.75
MW-09M	343.2	--	--	9.52	333.66
MW-09D	343.3	--	--	9.59	333.67
MW-10D	336.1	--	--	3.41	332.70
OE-2A	337.9	3.82	334.08	7.11	330.79
Bedrock					
BR-1	343.5	18.24	325.26	18.07	325.43

Notes:
ft TOC = feet below top of casing
ft MSL = feet above mean sea level
"--" = not measured

Table 2-2
2010 Groundwater Sample Location Details
Commerce Street Plume Superfund Site
Williston, Vermont

Station ID	Sample Location	Setting	Aquifer	Sample Type	Analysis	Sample Date	Sample Class
AIP-001-051910A	AIP-01	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
AL-002-051910A	AL-02	Residential	Intermediate Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
AL-012-052010A	AL-12	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
AL-014-051810A	AL-14	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
AL-015-051910A	AL-15	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
ARC-003-051910A	ARC-03	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
ASI-002D2-051810A	ASI-02D2	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
ASI-002D2-051810D	ASI-02D2	Industrial Park	Intermediate Overburden	Field Duplicate	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Field QC
ASI-003D2-051810A	ASI-03D2	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
ASI-004D2-051710A	ASI-04D2	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/17/2010	Groundwater Monitoring
ASI-005D2-052010A	ASI-05D2	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
ASI-005D2-052010D	ASI-05D2	Industrial Park	Deep Overburden	Field Duplicate	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Field QC
ASI-011D2-051710A	ASI-11D2	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/17/2010	Groundwater Monitoring
ASI-014S-051810A	ASI-14S	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
ASI-014D2-051810A	ASI-14D2	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
ASI-015D2-052010A	ASI-15D2	Residential	Deep Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
ASI-016D2-051910A	ASI-16D2	Residential	Deep Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
ASI-023S-051810A	ASI-23S	Residential	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
ASI-023D2-051810A	ASI-23D2	Residential	Intermediate Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
BF-004-052010A	BF-04	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
BM-003S-051910A	BM-03	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
BM-003D-051910A	BM-03D	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
BW-013S-052010A	BW-13S	Residential	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
MI-001-051910A	MI-01	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Groundwater Monitoring
MI-002-051810A	MI-02	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/18/2010	Groundwater Monitoring
MI-008-052010A	MI-08	Residential	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
OE-02A-052010A	OE-02A	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
OE-02B-052010A	OE-02B	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
BR-001-052110A	BR-01	Residential	Bedrock	Field Sample	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Groundwater Monitoring
AIP-001-1110A	AIP-01	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
AL-002-1110A	AL-02	Residential	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring

Table 2-2
2010 Groundwater Sample Location Details
Commerce Street Plume Superfund Site
Williston, Vermont

Station ID	Sample Location	Setting	Aquifer	Sample Type	Analysis	Sample Date	Sample Class
AL-012-1110A	AL-12	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
AL-014-1110A	AL-14	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
AL-015-1110A	AL-15	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
ARC-003-1110A	ARC-03	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
ASI-002D2-1110A	ASI-02D2	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
DUP-1110B	ASI-02D2	Industrial Park	Intermediate Overburden	Field Duplicate	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Field QC
ASI-003D2-1110A	ASI-03D2	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
ASI-004D2-1110A	ASI-04D2	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
ASI-005D2-1110A	ASI-05D2	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
ASI-011D2-1110A	ASI-11D2	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
ASI-014S-1110A	ASI-14S	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
ASI-014D2-1110A	ASI-14D2	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
ASI-015D2-1110A	ASI-15D2	Residential	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
ASI-016D2-1110A	ASI-16D2	Residential	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
ASI-023S-1110A	ASI-23S	Residential	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
ASI-023D2-1110A	ASI-23D2	Residential	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
BF-004-1110A	BF-04	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
BM-003S-1110A	BM-03	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
BM-003D-1110A	BM-03D	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
BW-013S-1110A	BW-13S	Residential	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
MI-001-1110A	MI-01	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
MI-002-1110A	MI-02	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
MI-008-1110A	MI-08	Residential	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
OE-02A-052010A	OE-02A	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
OE-02B-1110A	OE-02B	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
DUP-1110A	OE-02B	Industrial Park	Shallow Overburden	Field Duplicate	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Field QC
BR-001-1110A	BR-01	Residential	Bedrock	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
MW-001D-1110A	MW-01D	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
MW-002M-1110A	MW-02M	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
MW-003D-1110A	MW-03D	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/29/2010	Groundwater Monitoring
MW-004D-1110A	MW-04D	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring

Table 2-2
2010 Groundwater Sample Location Details
Commerce Street Plume Superfund Site
Williston, Vermont

Station ID	Sample Location	Setting	Aquifer	Sample Type	Analysis	Sample Date	Sample Class
DUP-1110C	MW-04D	Industrial Park	Deep Overburden	Field Duplicate	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Field QC
MW-005D-1110A	MW-05D	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
MW-005D2-1110A	MW-05D2	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
MW-006M-1110A	MW-06M	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
MW-006D-1110A	MW-06D	Industrial Park	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
MW-007M-1110A	MW-07M	Industrial Park	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
MW-008S-1110A	MW-08S	Residential	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
MW-008M-1110A	MW-08M	Residential	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Groundwater Monitoring
MW-009M-1110A	MW-09M	Residential	Intermediate Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
MW-009D-1110A	MW-09D	Residential	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
MW-010D-1110A	MW-10D	Residential	Deep Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Groundwater Monitoring
MW-011S-1110A	MW-11S	Industrial Park	Shallow Overburden	Field Sample	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Groundwater Monitoring
TP-001-051710A				Trip Blank	VOA	5/17/2010	Field QC
TP-002-051910A				Trip Blank	VOA	5/19/2010	Field QC
TP-003-051910B				Trip Blank	VOA	5/19/2010	Field QC
EB-001-051910A				EB	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/19/2010	Field QC
EB-002-052010A				EB	VOA, SVOA, ICP-AES/MS Metals (total only), HG	5/20/2010	Field QC
HG5825				PES	HG	5/18/2010	Lab QC
HG5829				PES	HG	5/19/2010	Lab QC
IS1305				PES	ICP-AES	5/18/2010	Lab QC
IS6100				PES	ICP-AES	5/19/2010	Lab QC
MS03162				PES	ICP-MS	5/18/2010	Lab QC
MS03174				PES	ICP-MS	5/19/2010	Lab QC
SV0228				PES	SVOA	5/20/2010	Lab QC
SV0321				PES	SVOA	5/18/2010	Lab QC
VLM0175				PES	VOA	5/17/2010	Lab QC
VLM0422				PES	VOA	5/18/2010	Lab QC
TP-1110A				Trip Blank	VOA	11/30/2010	Field QC
TP-1110B				Trip Blank	VOA	12/1/2010	Field QC
TP-1110C				Trip Blank	VOA	12/2/2010	Field QC
EB-1110A				EB	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	11/30/2010	Field QC

Table 2-2
2010 Groundwater Sample Location Details
Commerce Street Plume Superfund Site
Williston, Vermont

Station ID	Sample Location	Setting	Aquifer	Sample Type	Analysis	Sample Date	Sample Class
EB-1110B				EB	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/1/2010	Field QC
EB-1110C				EB	VOA, SVOA, 1,4-dioxane, ICP-AES/MS Metals (total only), HG	12/2/2010	Field QC
HG5863				PES	HG	11/30/2010	Lab QC
HG5855				PES	HG	12/1/2010	Lab QC
HG5826				PES	HG	12/2/2010	Lab QC
IS1316				PES	ICP-AES	11/30/2010	Lab QC
IS1304				PES	ICP-AES	12/1/2010	Lab QC
IS6521				PES	ICP-AES	12/2/2010	Lab QC
MS03235				PES	ICP-MS	11/30/2010	Lab QC
MS03175				PES	ICP-MS	12/1/2010	Lab QC
MS02980				PES	ICP-MS	12/2/2010	Lab QC
SV0535				PES	SVOA	11/30/2010	Lab QC
SV0362				PES	SVOA	12/1/2010	Lab QC
SV0356				PES	SVOA	12/2/2010	Lab QC
VLM0229				PES	VOA	11/30/2010	Lab QC
VLM0529				PES	VOA	12/1/2010	Lab QC
VLM0554				PES	VOA	12/2/2010	Lab QC

Notes:
EB = Equipment Blank
PES = Performance Evaluation Sample
VOA = Volatile Organic Analysis
SVOA = Semivolatile Organic Analysis
ICP-AES = Inductively-Coupled Plasma-Atomic Emission Spectroscopy
ICP-MS = Inductively-Coupled Plasma-Mass Spectrometer
HG = Mercury Analysis
QC = Quality Control

Table 2-3
2010 Groundwater Field Parameter Measurements
Commerce Street Plume Superfund Site
Williston, Vermont

Sample Location	Initial DTW (ft.)	Pump Type	Sample Date	Beginning Time	Ending Time	Purge Rate (mL/min)	Temperature (°C)	Conductivity (µS/cm)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
Spring 2010												
AIP-01	11.95	Bladder	5/19/2010	10:40	11:35	225	10.80	629	7.04	-132.3	0.33	3.5
AL-02	7.57	Bladder	5/19/2010	15:45	16:35	200	10.40	682	6.01	97.5	0.64	4.9
AL-12	8.34	Bladder	5/20/2010	8:46	9:50	250	10.34	630	5.59	60.1	0.59	19.9
AL-14	6.26	Bladder	5/18/2010	15:05	16:35	400	8.60	313	6.01	118.1	6.38	4.5
AL-15	7.09	Peristaltic	5/19/2010	15:26	16:20	150	9.78	1001	5.58	93.6	1.53	2.4
ARC-03	4.03	Bladder	5/19/2010	14:15	15:50	200	9.95	79	5.07	63.7	8.09	4.9
ASI-02D2	6.66	Peristaltic	5/18/2010	8:30	9:30	350	10.57	2044	6.99	-102.1	0.28	21.0
ASI-03D2	5.49	Peristaltic	5/18/2010	12:50	13:50	100	11.11	1503	7.20	-100.1	0.69	2.3
ASI-04D2	7.56	Peristaltic	5/17/2010	15:50	16:35	150	10.29	626	7.08	-110.4	0.57	0.8
ASI-05D2	6.55	Peristaltic	5/20/2010	14:25	15:20	200	11.11	1044	7.23	-118.3	0.36	2.7
ASI-11D2	2.33	Peristaltic	5/17/2010	15:58	16:58	350	11.20	1384	7.06	-128.8	0.50	1.1
ASI-14S	4.87	Peristaltic	5/18/2010	10:05	11:40	100	8.58	220	6.21	-14.1	1.02	5.0
ASI-14D2	6.11	Peristaltic	5/18/2010	8:20	8:55	150	8.17	841	6.96	-78.3	0.46	1.1
ASI-15D2	6.42	Peristaltic	5/20/2010	11:06	12:00	150	10.06	1417	6.84	-103.4	0.42	3.0
ASI-16D2	8.02	Peristaltic	5/19/2010	12:32	13:30	200	11.21	785	7.21	-125.7	0.31	1.3
ASI-23S	NA	Peristaltic	5/18/2010	11:45	12:05	100	11.09	497	6.65	-39.8	7.23	5.5
ASI-23D2	6.88	Peristaltic	5/18/2010	10:17	11:10	375	9.17	1207	6.55	1.3	0.49	1.5
BF-04	8.04	Bladder	5/20/2010	14:53	15:58	300	8.22	196	6.24	4.8	0.73	53.9
BM-03S	6.93	Bladder	5/19/2010	12:15	13:40	150	9.87	491	6.59	69.9	4.42	6.0
BM-03D	5.88	Bladder	5/19/2010	8:55	11:00	200	10.10	992	6.44	-59.4	0.32	54.9
BW-13S	5.55	Peristaltic	5/20/2010	9:02	10:05	100	10.67	737	5.89	218.7	2.15	1.4
MI-01	6.29	Bladder	5/19/2010	9:00	9:45	250	7.86	483	6.20	193.4	4.25	1.9
MI-02	5.98	Bladder	5/18/2010	14:46	15:38	175	9.72	195	6.11	126.1	5.62	9.3
MI-08	5.81	Bladder	5/20/2010	8:55	9:45	150	8.77	175	5.52	177.4	0.82	2.5
OE-02B	6.95	Bladder	5/20/2010	11:15	12:23	250	8.20	68	4.54	67.0	3.38	11.2
BR-01	17.25	Peristaltic	5/20/2010	14:55	16:45	100	15.20	4831	13.28	-124.7	2.57	19.5

Table 2-3
2010 Groundwater Field Parameter Measurements
Commerce Street Plume Superfund Site
Williston, Vermont

Sample Location	Initial DTW (ft.)	Pump Type	Sample Date	Beginning Time	Ending Time	Purge Rate (mL/min)	Temperature (°C)	Conductivity (µS/cm)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
Fall 2010												
AIP-01	5.40	Bladder	12/2/2010	13:50	15:15	100	10.94	646	7.45	-135.8	0.88	1.0
AL-02	8.10	Bladder	12/1/2010	11:50	12:55	300	12.17	805	6.15	88.8	0.51	3.2
AL-12	8.36	Bladder	12/1/2010	9:15	10:35	200	12.64	1251	5.54	140.1	85.00	6.5
AL-14	7.25	Bladder	11/30/2010	9:00	9:55	240	10.87	327	6.30	171.3	0.36	1.1
AL-15	7.30	Peristaltic	12/1/2010	12:33	14:05	300	11.46	432	5.57	2.2	4.43	0.7
ARC-03	4.85	Bladder	12/1/2010	12:27	13:10	180	11.90	55	5.87	150.4	10.13	3.7
ASI-02D2	4.86	Peristaltic	11/29/2010	14:15	15:05	225	11.08	2608	7.00	-127.4	0.61	1.6
ASI-03D2	5.34	Peristaltic	11/29/2010	13:55	15:20	150	11.09	1590	7.08	-123.0	0.60	3.8
ASI-04D2	7.14	Peristaltic	11/30/2010	10:52	11:45	120	9.55	641	10.24	-118.3	0.45	1.1
ASI-05D2	5.77	Peristaltic	12/2/2010	9:50	13:30	200	10.48	939	7.33	-35.8	0.47	0.6
ASI-11D2	2.88	Peristaltic	11/30/2010	13:18	14:15	180	11.13	2270	9.38	-115.5	0.45	1.4
ASI-14S	5.50	Peristaltic	11/30/2010	14:35	15:30	150	9.66	393	5.87	-24.8	2.15	1.3
ASI-14D2	6.53	Peristaltic	11/30/2010	14:55	15:40	200	8.59	816	6.88	-99.9	0.49	0.2
ASI-15D2	6.20	Peristaltic	12/1/2010	14:28	15:10	200	10.09	1284	7.13	-146.3	0.53	0.8
ASI-16D2	8.05	Peristaltic	12/1/2010	11:43	12:35	225	12.02	850	7.43	-166.0	0.25	0.3
ASI-23S	8.10	Peristaltic	12/1/2010	8:45	9:45	100	10.11	541	6.33	-37.0	3.00	21.1
ASI-23D2	6.67	Peristaltic	12/1/2010	8:55	10:05	200	9.83	1313	6.49	-34.1	0.26	0.0
BF-04	8.15	Bladder	12/1/2010	12:00	13:25	200	12.09	394	6.42	-74.0	0.41	7.8
BM-03S	7.41	Bladder	11/29/2010	13:25	15:10	300	11.37	699	6.64	90.9	2.19	0.0
BM-03D	6.46	Bladder	11/29/2010	13:25	15:25	200	10.86	976	6.63	-92.7	0.85	16.5
BW-13S	4.62	Peristaltic	12/2/2010	12:05	13:00	100	8.42	593	6.43	44.5	2.95	0.3
MI-01	6.91	Bladder	11/29/2010	10:20	11:20	190	10.84	1217	7.75	112.1	4.52	2.2
MI-02	6.62	Bladder	11/29/2010	10:25	11:55	220	12.10	328	6.11	187.7	3.94	0.6
MI-08	5.61	Bladder	12/2/2010	13:33	14:15	325	9.84	249	5.91	148.6	1.30	0.3
OE-02A	7.09	Bladder	11/30/2010	12:40	13:55	100	8.97	1895	7.57	-157.8	0.17	45.7
OE-02B	7.09	Bladder	11/30/2010	12:50	14:05	250	9.49	90	5.32	128.8	3.23	3.1
BR-01	17.85	Peristaltic	12/2/2010	8:42	9:45	75	9.47	5555	12.27	57.2	2.02	3.3

Table 2-3
2010 Groundwater Field Parameter Measurements
Commerce Street Plume Superfund Site
Williston, Vermont

Sample Location	Initial DTW (ft.)	Pump Type	Sample Date	Beginning Time	Ending Time	Purge Rate (mL/min)	Temperature (°C)	Conductivity (µS/cm)	pH	ORP (mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)
Fall 2010 (cont.)												
MW-01D	2.62	Bladder	12/1/2010	9:02	10:40	220	11.29	754	7.26	-238.7	1.35	75.4
MW-02M	3.22	Bladder	11/29/2010	13:57	15:25	250	10.09	809	8.45	-20.7	0.21	27.9
MW-03D	7.33	Bladder	11/29/2010	10:25	11:45	200	11.42	622	7.45	-303.2	4.02	179
MW-04D	3.26	Bladder	12/2/2010	9:18	11:15	150	11.08	1111	7.47	-246.0	0.50	71.6
MW-05D	8.20	Bladder	11/30/2010	8:50	11:00	120	11.66	1081	7.12	-338.9	0.10	202
MW-05D2	6.50	Bladder	11/30/2010	9:00	10:15	400	11.35	422	7.75	-117.4	5.76	144
MW-06M	5.55	Bladder	11/30/2010	9:15	15:15	220	11.74	1167	7.02	-158.9	0.94	87.8
MW-06D	5.35	Bladder	11/30/2010	9:15	10:20	150	11.27	661	7.66	-247.4	0.49	117
MW-07M	5.41	Bladder	12/2/2010	8:57	10:10	250	10.82	1148	7.40	-125.2	3.20	178
MW-08S	1.85	Bladder	11/30/2010	12:10	13:15	300	11.48	881	5.54	10.3	1.97	7.9
MW-08M	1.83	Bladder	11/30/2010	12:16	13:15	200	10.77	561	6.74	-82.9	0.35	34
MW-09M	9.08	Bladder	12/1/2010	14:35	15:55	250	11.65	1912	6.85	-133.3	1.30	13.8
MW-09D	8.78	Bladder	12/2/2010	9:10	10:55	250	10.61	321	8.45	-337.1	0.27	218
MW-10D	2.59	Bladder	12/2/2010	12:17	13:25	100	11.03	454	7.87	-258.2	0.23	482
MW-11S	6.95	Bladder	12/1/2010	9:24	10:20	340	13.13	1132	6.43	89.4	5.44	8.8

Table 2-4
July 2010 Porewater Sample Location Details
Commerce Street Plume Superfund Site
Williston, Vermont

Station ID	Sample Location	Sample Type	Sample Date	Surface Water Temp °C	Porewater Temp. °C	Variation °C
PW-01-072210AX	PW-01	Field Sample	7/22/2010	22.9	13.1	-9.8
PW-02-072210AX	PW-02	Field Sample	7/22/2010	23.0	15.1	-7.9
PW-03-072210AX	PW-03	Field Sample	7/22/2010	22.9	17.7	-5.2
PW-04-072210AX	PW-04	Field Sample	7/22/2010	22.3	13.3	-9.0
PW-05-072210AX	PW-05	Field Sample	7/22/2010	22.4	17.5	-4.9
PW-06-072210AX	PW-06	Field Sample	7/22/2010	23.0	18.2	-4.8
PW-07-072210AX	PW-07	Field Sample	7/22/2010	23.0	16.2	-6.8
PW-08-072210AX	PW-08	Field Sample	7/22/2010	23.0	15.1	-7.9
PW-09-072210AX	PW-09	Field Sample	7/22/2010	23.0	14.2	-8.8
PW-09-072210AD	PW-09	Field Duplicate	7/22/2010	23.0	14.2	-8.8
PW-10-072210AX	PW-10	Field Sample	7/22/2010	23.1	19.6	-3.5
PW-11-072210AX	PW-11	Field Sample	7/22/2010	23.0	17.3	-5.7
PW-12-072210AX	PW-12	Field Sample	7/22/2010	23.1	18.4	-4.7
PW-13-072210AX	PW-13	Field Sample	7/22/2010	23.1	19.1	-4.0
PW-14-072210AX	PW-14	Field Sample	7/22/2010	23.1	18.3	-4.8
PW-15-072210AX	PW-15	Field Sample	7/22/2010	23.0	14.7	-8.3
PW-16-072210AX	PW-16	Field Sample	7/22/2010	24.4	15.7	-8.7
PW-17-072210AX	PW-17	Field Sample	7/22/2010	23.5	18.7	-4.8
PW-18-072210AX	PW-18	Field Sample	7/22/2010	24.0	20.6	-3.4
PW-19-072210AX	PW-19	Field Sample	7/22/2010	23.4	21.5	-1.9
PW-20-072210AX	PW-20	Field Sample	7/22/2010	22.0	18.4	-3.6

Table 2-5
New Well Construction Details
Commerce Street Plume Superfund Site
Williston, Vermont

Well ID	Aquifer	Casing/Screen Material	Diameter (inches)	Total Depth (ft-bgs)	Screen Interval (ft-bgs)	Screen Length (feet)	Easting	Northing
MW-01D	DOB	PVC	2	39.4	34.4 - 39.4	5	1478587.7	712392.5
MW-02M	IOB	PVC	2	29.3	24.3 - 29.3	5	1478536.4	712140.9
MW-03D	DOB	PVC	2	40.2	35.2 - 40.2	5	1478146.6	712193.6
MW-04D	DOB	PVC	2	39.5	34.5 - 39.5	5	1478068.4	711717.2
MW-05D	DOB	PVC	2	33.5	28.5 - 33.5	5	1477990.5	711512.6
MW-05D2	DOB	PVC	2	44.4	39.4 - 44.4	5	1477994.7	711509.8
MW-06M	IOB	PVC	2	28.9	23.9 - 28.9	5	1478251.0	711250.4
MW-06D	DOB	PVC	2	37.9	32.9 - 37.9	5	1478249.4	711246.4
MW-07M	IOB	PVC	2	34.3	29.3 - 34.3	5	1477808.6	710810.9
MW-08S	SOB	PVC	2	19.0	14.0 - 19.0	5	1477131.4	712012.9
MW-08M	IOB	PVC	2	24.0	19.0 - 24.0	5	1477129.2	712014.5
MW-09M	IOB	PVC	2	29.5	24.5 - 29.5	5	1477423.6	711678.7
MW-09D	DOB	PVC	2	39.6	34.6 - 39.6	5	1477425.2	711678.8
MW-10D	DOB	PVC	2	35.0	30.0 - 35.0	5	1477097.9	711128.9
MW-11S	SOB	PVC	2	19.3	14.3 - 19.3	5	1478352.3	712497.0

Notes:
1. SOB = shallow overburden; IOB = intermediate overburden; DOB = deep overburden.
2. ft-bgs = feet below ground surface.

Table 3-1a
2010 Shallow Overburden Groundwater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AL-12		AL-14		AL-15		ARC-03		ASI-14S		ASI-23S		BF-04		BM-03S	
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.
			Sample Name:	A2Q29	A42R1	A2PZ7	A3M31	A2PZ8	A3M32	A2PZ9	A3M33	A2Q07	A3M40	A2Q11	A3M43	A2Q06	A3M44	A2Q13	A3M46
			Station ID:	AL-012-052010A	AL-012-1110A	AL-014-051810A	AL-014-1110A	AL-015-051910A	AL-015-1110A	ARC-003-051910A	ARC-003-1110A	ASI-014S-051810A	ASI-014S-1110A	ASI-023S-051810A	ASI-023S-1110A	BF-004-052010A	BF-004-1110A	BM-003S-051910A	BM-003S-1110A
Chemical	**CRQL**	**VT**	**MCL**																
1,1,1-Trichloroethane	0.5	200	200	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,1,2,2-Tetrachloroethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,1,2-Trichloroethane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,1-Dichloroethane	0.5	70		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,1-Dichloroethene	0.5	7	7	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,2,3-Trichlorobenzene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,2,4-Trichlorobenzene	0.5	70	70	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,2-Dibromo-3-chloropropane	0.5		0.2	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,2-Dibromoethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,2-Dichlorobenzene	0.5	600	600	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,2-Dichloroethane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,2-Dichloropropane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,3-Dichlorobenzene	0.5	600		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,4-Dichlorobenzene	0.5	75	75	0.5 U	5 U	0.22 J	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
1,4-Dioxane	100				100 U		100 U		100 U		100 U		100 U		100 U		100 U		100 U
2-Butanone	5	4200		5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U
2-Hexanone	5			5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U
4-Methyl-2-pentanone	5			5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U
Acetone	5	700		5 U	4.3 JB	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	6.4 J	5 U	10 U
Benzene	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Bromochloromethane	0.5	90		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Bromodichloromethane	0.5	80		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Bromoform	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Bromomethane	0.5	10		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Carbon disulfide	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.38 J	5 U	0.5 U	5 U	0.5 U	5 U
Carbon tetrachloride	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Chlorobenzene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Chloroethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Chloroform	0.5	80	80	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.46 J	5 U	0.5 U	5 U	0.5 U	5 U
Chloromethane	0.5	30		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
cis-1,2-Dichloroethene	0.5	70	70	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
cis-1,3-Dichloropropene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Cyclohexane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	9.7	0.5 U	5 U
Dibromochloromethane	0.5	80		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Dichlorodifluoromethane	0.5	1000		2.7	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Ethylbenzene	0.5	700	700	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Isopropylbenzene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	1 J	0.5 U	5 U
m,p-Xylene	0.5	10000	10000	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Methyl acetate	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Methyl tert-butyl ether	0.5	40	35	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Methylcyclohexane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Methylene chloride	0.5	5		0.5 U	1.2 J	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
o-Xylene	0.5	10000	10000	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Styrene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Tetrachloroethene	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Toluene	0.5	1000	1000	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
trans-1,2-Dichloroethene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
trans-1,3-Dichloropropene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Trichloroethene	0.5	5	5	0.5 U	5 U	0.24 J	5 U	0.5 U	4.8 J	0.5 U	3.2 J	0.5 U	5 U	0.44 J	5 U	0.5 U	5 U	0.5 U	5 U
Trichlorofluoromethane	0.5	2100		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
Vinyl chloride	0.5	2	2	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sample Date:	20 May 10	01 Dec 10	18 May 10	30 Nov 10	19 May 10	01 Dec 10	19 May 10	01 Dec 10	18 May 10	30 Nov 10	18 May 10	01 Dec 10	20 May 10	01 Dec 10	19 May 10	29 Nov 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-1a
2010 Shallow Overburden Groundwater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	BW-13S		MI-01		MI-02		MI-08		OE-2B			MW-08S	MW-11S
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.		Nov./Dec.	Nov./Dec.
			Sample Name:	A2Q15	A3M29	A2Q16	A3M49	A2Q17	A3M50	A2Q18	A3M51	A2Q20	A3M68	A3M30	A3M62	A3M66
			Station ID:	BW-013S-052010A	BW-013S-1110A	MI-001-051910A	MI-001-1110A	MI-002-051810A	MI-002-1110A	MI-008-052010A	MI-008-1110A	OE-02B-052010A	OE-02B-1110A	DUP-1110A	MW-008S-1110A	MW-011S-1110A
Chemical	**CRQL**	**VT**	**MCL**													
1,1,1-Trichloroethane	0.5	200	200	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	0.68 J	5 U
1,1-Dichloroethane	0.5	70		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	0.5	7	7	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2,3-Trichlorobenzene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	0.5	70	70	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	0.5		0.2	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	0.5	600	600	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	0.5	600		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	0.5	75	75	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,4-Dioxane	100				100 U		100 U		100 U		100 U		100 U	100 U	100 U	100 U
2-Butanone	5	4200		5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	10 U	10 U	10 U
2-Hexanone	5			5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	5			5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	10 U	10 U	10 U
Acetone	5	700		5 U	5.9 JB	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	4.7 J	10 U	4.1 J
Benzene	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromochloromethane	0.5	90		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	0.5	80		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromoform	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromomethane	0.5	10		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Carbon disulfide	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chlorobenzene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chloroethane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chloroform	0.5	80	80	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chloromethane	0.5	30		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	0.5	70	70	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	4.1 J	5 U
cis-1,3-Dichloropropene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Cyclohexane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	0.5	80		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	0.5	1000		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Ethylbenzene	0.5	700	700	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Isopropylbenzene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
m,p-Xylene	0.5	10000	10000	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methyl acetate	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methyl tert-butyl ether	0.5	40	35	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methylene chloride	0.5	5		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	4.8 J	0.5 U	5 U	5 U	5 U	5 U
o-Xylene	0.5	10000	10000	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Styrene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	0.5	5	5	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.63	5 U	0.5 U	5 U	5 U	**25**	5 U
Toluene	0.5	1000	1000	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	0.5			0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Trichloroethene	0.5	5	5	0.5 U	5 U	0.15 J	5 U	0.5 U	5 U	0.19 J	5 U	0.5 U	5 U	5 U	**3400 D**	5 U
Trichlorofluoromethane	0.5	2100		0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Vinyl chloride	0.5	2	2	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1/25	1
			Sample Date:	20 May 10	02 Dec 10	19 May 10	29 Nov 10	18 May 10	29 Nov 10	20 May 10	02 Dec 10	20 May 10	30 Nov 10	30 Nov 10	30 Nov 10	01 Dec 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-1b
2010 Intermediate/Deep Overburden and Bedrock Groundwater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AIP-01		AL-02		ASI-02D2				ASI-03D2		ASI-04D2		ASI-05D2		
			Month:	May	Nov./Dec.	May	Nov./Dec.	May		Nov./Dec.		May	Nov./Dec.	May	Nov./Dec.	May		Nov./Dec.
			Sample Name:	A2Q30	A42S6	A2Q32	A42R0	A2Q00	A2Q01	A3M34	A3M35	A2Q02	A42Q1	A2Q31	A3M36	A2Q03	A2Q09	A3M37
			Station ID:	AIP-001-0519108A	AIP-001-1110A	AL-002-051910A	AL-002-1110A	ASI-002D2-051810A	ASI-002D2-051810D	ASI-002D2-1110A	DUP-1110B	ASI-003D2-051810A	ASI-003D2-1110A	ASI-004D2-051710A	ASI-004D2-1110A	ASI-005D2-052010A	ASI-005D2-052010D	ASI-005D2-1110A
			Aquifer:	DOB		IOB		IOB				IOB				DOB		
Chemical	**CRQL**	**VT**	**MCL**															
1,1,1-Trichloroethane	0.5	200	200	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,1,2,2-Tetrachloroethane	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,1,2-Trichloroethane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	0.99 J	0.5 U	5 U	0.5 U	0.5 U	5 U
1,1-Dichloroethane	0.5	70		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,1-Dichloroethene	0.5	7	7	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	6.7	0.5 U	5 U	0.5 U	0.5 U	5 U
1,2,3-Trichlorobenzene	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,2,4-Trichlorobenzene	0.5	70	70	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,2-Dibromo-3-chloropropane	0.5		0.2	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,2-Dibromoethane	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,2-Dichlorobenzene	0.5	600	600	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,2-Dichloroethane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	**8.2**	0.5 U	5 U	0.5 U	0.5 U	5 U
1,2-Dichloropropane	0.5	5	5	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,3-Dichlorobenzene	0.5	600		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,4-Dichlorobenzene	0.5	75	75	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
1,4-Dioxane	100				100 U		100 U			100 U	100 U		100 U		100 U			100 U
2-Butanone	5	4200		5 U	10 U	5 U	10 U	50 U	50 U	10 U	10 U	500 U	10 U	5 U	10 U	5 U	5 U	10 U
2-Hexanone	5			5 U	10 U	5 U	10 U	50 U	50 U	10 U	10 U	500 U	10 U	5 U	10 U	5 U	5 U	10 U
4-Methyl-2-pentanone	5			5 U	10 U	5 U	10 U	50 U	50 U	10 U	10 U	500 U	10 U	5 U	10 U	5 U	5 U	10 U
Acetone	5	700		5 U	10 U	5 U	10 U	50 U	50 U	10 U	10 U	500 U	10 U	5 U	10 U	5 U	5 U	10 U
Benzene	0.5	5	5	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Bromochloromethane	0.5	90		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Bromodichloromethane	0.5	80		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Bromoform	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Bromomethane	0.5	10		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Carbon disulfide	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Carbon tetrachloride	0.5	5	5	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Chlorobenzene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Chloroethane	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Chloroform	0.5	80	80	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Chloromethane	0.5	30		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
cis-1,2-Dichloroethene	0.5	70	70	0.46 J	5 U	0.5 U	5 U	8.1	7.6	43	41	**2500 D**	**2200 D**	0.5 U	5 U	0.5 U	0.5 U	5 U
cis-1,3-Dichloropropene	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Cyclohexane	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Dibromochloromethane	0.5	80		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Dichlorodifluoromethane	0.5	1000		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Ethylbenzene	0.5	700	700	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Isopropylbenzene	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
m,p-Xylene	0.5	10000	10000	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Methyl acetate	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Methyl tert-butyl ether	0.5	40	35	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Methylcyclohexane	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Methylene chloride	0.5	5		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	1.2 J
o-Xylene	0.5	10000	10000	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Styrene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Tetrachloroethene	0.5	5	5	0.5 U	5 U	0.64	1.4 J	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Toluene	0.5	1000	1000	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
trans-1,2-Dichloroethene	0.5	100	100	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	13 J	9.9	0.5 U	5 U	0.5 U	0.5 U	5 U
trans-1,3-Dichloropropene	0.5			0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Trichloroethene	0.5	5	5	**11**	**13**	3.8	**16**	**860 D**	**730 D**	**460 D**	**410 D**	**6100 D**	**8900 D**	0.5 U	0.79 J	0.5 U	0.5 U	5 U
Trichlorofluoromethane	0.5	2100		0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
Vinyl chloride	0.5	2	2	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	0.5 U	5 U	0.5 U	0.5 U	5 U
			Dilution Factor:	1	1	1	1	10/100	10/100	1/7.1	1/6.3	100/1000	1/76.9	1	1	1	1	1
			Sample Date:	19 May 10	02 Dec 10	19 May 10	01 Dec 10	18 May 10	18 May 10	29 Nov 10	29 Nov 10	18 May 10	29 Nov 10	17 May 10	30 Nov 10	20 May 10	20 May 10	02 Dec 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-1b
2010 Intermediate/Deep Overburden and Bedrock Groundwater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	ASI-11D2		ASI-14D2		ASI-15D2		ASI-16D2		ASI-23D2		BM-03D		OE-2A		MW-01D	MW-02M
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	Nov./Dec.	Nov./Dec.
			Sample Name:	A2Q04	A3M38	A2Q05	A3M39	A2Q08	A3M41	A2Q33	A42R2	A2Q10	A3M42	A2Q12	A3M45	A2Q19	A3M67	A3M52	A3M53
			Station ID:	ASI-011D2-051710A	ASI-011D2-1110A	ASI-014D2-051810A	ASI-014D2-1110A	ASI-015D2-052010A	ASI-015D2-1110A	ASI-016D2-051910A	ASI-016D2-1110A	ASI-023D2-051810A	ASI-023D2-1110A	BM-003D-051910A	BM-003D-1110A	OE-02A-052010A	OE-02A-1110A	MW-001D-1110A	MW-002M-1110A
			Aquifer:	DOB		IOB		DOB		DOB		IOB		IOB		DOB		DOB	DOB
Chemical	**CRQL**	**VT**	**MCL**																
1,1,1-Trichloroethane	0.5	200	200	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	0.5	5	5	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,1-Dichloroethane	0.5	70		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,1-Dichloroethene	0.5	7	7	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,2,3-Trichlorobenzene	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	0.5	70	70	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	0.5		0.2	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,2-Dibromoethane	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	0.5	600	600	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,2-Dichloroethane	0.5	5	5	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,2-Dichloropropane	0.5	5	5	10 U	5 U	10 U	130 U	25 U	250 U	25 U	**1200**	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	0.5	600		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	0.5	75	75	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
1,4-Dioxane	100				100 U		2500 U		5000 U		10000 U		3300 U		100 U		100 U	100 U	100 U
2-Butanone	5	4200		100 U	10 U	100 U	250 U	250 U	500 U	250 U	1000 U	200 U	330 U	5 U	10 U	5 U	10 U	10 U	10 U
2-Hexanone	5			100 U	10 U	100 U	250 U	250 U	500 U	250 U	1000 U	200 U	330 U	5 U	10 U	5 U	10 U	10 U	10 U
4-Methyl-2-pentanone	5			100 U	10 U	100 U	250 U	250 U	500 U	250 U	1000 U	200 U	330 U	5 U	10 U	5 U	10 U	10 U	10 U
Acetone	5	700		100 U	10 U	100 U	250 U	250 U	260 JB	250 U	1000 U	200 U	330 U	5 U	10 U	5 U	4.7 JB	10 U	10 U
Benzene	0.5	5	5	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Bromochloromethane	0.5	90		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Bromodichloromethane	0.5	80		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Bromoform	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Bromomethane	0.5	10		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Carbon disulfide	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Carbon tetrachloride	0.5	5	5	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Chlorobenzene	0.5	100	100	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Chloroethane	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Chloroform	0.5	80	80	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Chloromethane	0.5	30		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	0.5	70	70	37	44	24	40 JD	22 J	26 J	15 J	500 U	4.6 J	170 U	3.3	4 J	0.5 U	5 U	1.1 J	5 U
cis-1,3-Dichloropropene	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Cyclohexane	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.16 J	5 U	0.5 U	5 U	5 U	5 U
Dibromochloromethane	0.5	80		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Dichlorodifluoromethane	0.5	1000		10 U	0.74 J	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	1.2	1.7 J	0.5 U	5 U	5 U	5 U
Ethylbenzene	0.5	700	700	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Isopropylbenzene	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
m,p-Xylene	0.5	10000	10000	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Methyl acetate	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Methyl tert-butyl ether	0.5	40	35	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.86	0.45 J	0.5 U	5 U	0.74 J	7.7
Methylcyclohexane	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Methylene chloride	0.5	5		10 U	5 U	10 U	130 U	25 U	**460**	25 U	**120 J**	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
o-Xylene	0.5	10000	10000	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Styrene	0.5	100	100	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Tetrachloroethene	0.5	5	5	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.56	0.94 J	0.5 U	5 U	5 U	5 U
Toluene	0.5	1000	1000	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	0.5	100	100	10 U	0.61 J	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.28 J	5 U	0.5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	0.5			10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Trichloroethene	0.5	5	5	**2100 D**	**1700 D**	**2000 D**	**3200 D**	**3400 D**	**5700**	**4300 D**	**5400**	**2400 D**	**3300**	**120 D**	**170 D**	0.5 U	5 U	**5.6**	**7.6**
Trichlorofluoromethane	0.5	2100		10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
Vinyl chloride	0.5	2	2	10 U	5 U	10 U	130 U	25 U	250 U	25 U	500 U	20 U	170 U	0.5 U	5 U	0.5 U	5 U	5 U	5 U
			Dilution Factor:	20/200	1/16.7	20/200	25	50/500	50	50/500	100	40/400	33.3	1/10	1/2	1	1	1	1
			Sample Date:	17 May 10	30 Nov 10	18 May 10	30 Nov 10	20 May 10	01 Dec 10	19 May 10	01 Dec 10	18 May 10	01 Dec 10	19 May 10	29 Nov 10	20 May 10	30 Nov 10	01 Dec 10	29 Nov 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-1b
2010 Intermediate/Deep Overburden and Bedrock Groundwater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	MW-03D	MW-04D	MW-04D	MW-05D	MW-05D2	MW-06M	MW-06D	MW-07M	MW-08M	MW-09M	MW-09D	MW-10D	BR-01	
			Month:	Nov./Dec.	Nov./Dec.		Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	May	Nov./Dec.
			Sample Name:	A3M54	A3M55	A42Q0	A3M56	A3M57	A3M59	A3M58	A3M60	A3M61	A3M64	A3M63	A3M65	A2Q14	A3M47
			Station ID:	MW-003D-1110A	MW-004D-1110A	DUP-1110C	MW-005D-1110A	MW-005D2-1110A	MW-006M-1110A	MW-006D-1110A	MW-007M-1110A	MW-008M-1110A	MW-009M-1110A	MW-009D-1110A	MW-010D-1110A	BR-001-052110A	BR-001-1110A
			Aquifer:	DOB	DOB	DOB	DOB	DOB	DOB	DOB	DOB	DOB	DOB	DOB	DOB	BR	BR
Chemical	**CRQL**	**VT**	**MCL**														
1,1,1-Trichloroethane	0.5	200	200	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,1,2,2-Tetrachloroethane	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,1,2-Trichloroethane	0.5	5	5	5 U	500 U	5000 U	0.47 J	0.47 J	0.77 J	1700 U	13 U	0.93 J	5 U	5 U	5 U	0.5 U	5 U
1,1-Dichloroethane	0.5	70		5 U	500 U	5000 U	5 U	5 U	0.62 J	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,1-Dichloroethene	0.5	7	7	5 U	500 U	5000 U	5 U	5 U	5.9	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,2,3-Trichlorobenzene	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,2,4-Trichlorobenzene	0.5	70	70	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,2-Dibromo-3-chloropropane	0.5		0.2	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,2-Dibromoethane	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,2-Dichlorobenzene	0.5	600	600	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,2-Dichloroethane	0.5	5	5	5 U	500 U	5000 U	4.6 J	**6.5**	**8.9**	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,2-Dichloropropane	0.5	5	5	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,3-Dichlorobenzene	0.5	600		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,4-Dichlorobenzene	0.5	75	75	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
1,4-Dioxane	100			100 U	10000 U	1E+05 U	100 U	100 U	100 U	33000 U	250 U	100 U	100 U	100 U	100 U		100 U
2-Butanone	5	4200		10 U	1000 U	10000 U	10 U	10 U	10 U	3300 U	25 U	10 U	10 U	10 U	10 U	5 U	10 U
2-Hexanone	5			10 U	1000 U	10000 U	10 U	10 U	10 U	3300 U	25 U	10 U	10 U	10 U	10 U	5 U	10 U
4-Methyl-2-pentanone	5			10 U	1000 U	10000 U	10 U	10 U	10 U	3300 U	25 U	10 U	10 U	10 U	10 U	5 U	10 U
Acetone	5	700		5.4 J	420 JB	10000 U	3.8 J	4.8 J	10 U	3300 U	11 J	4 J	9.7 J	9.5 J	12	7.2	25 B
Benzene	0.5	5	5	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Bromochloromethane	0.5	90		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Bromodichloromethane	0.5	80		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Bromoform	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Bromomethane	0.5	10		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Carbon disulfide	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Carbon tetrachloride	0.5	5	5	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Chlorobenzene	0.5	100	100	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Chloroethane	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Chloroform	0.5	80	80	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Chloromethane	0.5	30		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
cis-1,2-Dichloroethene	0.5	70	70	1.4 J	**100 J**	5000 U	**170**	20	**140**	1700 U	13 U	8.5	5 U	5 U	5 U	26 D	41
cis-1,3-Dichloropropene	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Cyclohexane	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Dibromochloromethane	0.5	80		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Dichlorodifluoromethane	0.5	1000		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	1.5 J	5 U	2.2 J	0.5 U	5 U
Ethylbenzene	0.5	700	700	5 U	500 U	5000 U	0.61 J	5 U	0.58 J	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Isopropylbenzene	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
m,p-Xylene	0.5	10000	10000	5 U	500 U	5000 U	1.3 J	5 U	0.63 J	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Methyl acetate	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Methyl tert-butyl ether	0.5	40	35	0.42 J	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Methylcyclohexane	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Methylene chloride	0.5	5		5 U	**590**	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	4.6 J
o-Xylene	0.5	10000	10000	5 U	500 U	5000 U	0.65 J	5 U	5 U	1700 U	13 U	0.48 J	5 U	5 U	5 U	0.5 U	5 U
Styrene	0.5	100	100	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Tetrachloroethene	0.5	5	5	5 U	500 U	5000 U	2.6 J	5 U	3.5 J	1700 U	13 U	**28**	5 U	5 U	5 U	0.5 U	5 U
Toluene	0.5	1000	1000	5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.17 J	5 U
trans-1,2-Dichloroethene	0.5	100	100	5 U	500 U	5000 U	2 J	5 U	0.97 J	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
trans-1,3-Dichloropropene	0.5			5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Trichloroethene	0.5	5	5	**450 D**	**75000 D**	**77000**	**19000 D**	**12000 D**	**44000 D**	**50000**	**300**	**5600 D**	**120**	**9.9**	**55**	**57 D**	**56**
Trichlorofluoromethane	0.5	2100		5 U	500 U	5000 U	5 U	5 U	5 U	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
Vinyl chloride	0.5	2	2	5 U	500 U	5000 U	5 U	5 U	**3.7 J**	1700 U	13 U	5 U	5 U	5 U	5 U	0.5 U	5 U
			Dilution Factor:	1/4.2	100/1000	1000	1/200	1/125	1/250	333.3	2.5	1/50	1	1	1	1/4	1
			Sample Date:	29 Nov 10	02 Dec 10	02 Dec 10	30 Nov 10	30 Nov 10	30 Nov 10	30 Nov 10	02 Dec 10	30 Nov 10	01 Dec 10	02 Dec 10	02 Dec 10	21 May 10	02 Dec 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-2a
2010 Shallow Overburden Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AL-12		AL-14		AL-15		ARC-03		ASI-14S		ASI-23S		BF-04		BM-03S	
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.
			Sample Name:	A2Q29	A42R1	A2PZ7	A3M31	A2PZ8	A3M32	A2PZ9	A3M33	A2Q07	A3M40	A2Q11	A3M43	A2Q06	A3M44	A2Q13	A3M46
			Station ID:	AL-012-052010A	AL-012-1110A	AL-014-051810A	AL-014-1110A	AL-015-051910A	AL-015-1110A	ARC-003-051910A	ARC-003-1110A	ASI-014S-051810A	ASI-014S1110A	ASI-023S-051810A	ASI-023S-1110A	BF-004-052010A	BF-004-1110A	BM-003S-051910A	BM-003S-1110A
Chemical	**CRQL**	**VT**	**MCL**																
1,1'-Biphenyl	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,4,5-Trichlorophenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,4,6-Trichlorophenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,4-Dichlorophenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,4-Dimethylphenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,4-Dinitrophenol	10			10 U	9.3 U	10 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U	9.1 U	10 U	9.7 U	10 U	10 U
2,4-Dinitrotoluene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2,6-Dinitrotoluene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2-Chloronaphthalene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2-Chlorophenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2-Methylnaphthalene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2-Methylphenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
2-Nitroaniline	10			10 U	9.3 U	10 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U	9.1 U	10 U	9.7 U	10 U	10 U
2-Nitrophenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
3,3'-Dichlorobenzidine	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
3-Nitroaniline	10			10 U	9.3 U	10 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U	9.1 U	10 U	9.7 U	10 U	10 U
4,6-Dinitro-2-methylphenol	10			10 U	9.3 U	10 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U	9.1 U	10 U	9.7 U	10 U	10 U
4-Bromophenyl-phenylether	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
4-Chloro-3-methylphenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
4-Chloroaniline	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
4-Chlorophenyl-phenylether	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
4-Methylphenol	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
4-Nitroaniline	10			10 U	9.3 U	10 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U	9.1 U	10 U	9.7 U	10 U	10 U
4-Nitrophenol	10			10 U	9.3 U	10 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U	9.1 U	10 U	9.7 U	10 U	10 U
Acenaphthene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Acenaphthylene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Acetophenone	5			0.21 J	4.6 U	0.25 J	4.5 U	0.4 J	4.6 U	0.51 J	4.8 U	0.28 J	5 U	0.3 J	4.5 U	0.4 J	4.9 U	0.75 J	5 U
Anthracene	5	2100		5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Atrazine	5	3	3	5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Benzaldehyde	5			0.2 J	4.6 U	0.19 J	4.5 U	0.38 J	4.6 U	0.52 J	4.8 U	0.23 J	5 U	0.3 J	4.5 U	0.36 J	4.9 U	0.94 J	5 U
Benzo(a)anthracene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Benzo(a)pyrene	5	0.2	0.2	5 U	4.6 U	0.15 J	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Benzo(b)fluoranthene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Benzo(g,h,i)perylene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Benzo(k)fluoranthene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Bis(2-chloroethoxy)methane	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Bis(2-chloroethyl)ether	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Bis(2-ethylhexyl)phthalate	5			1.2 J	4.6 U	0.67 J	4.5 U	0.59 J	4.6 U	1.5 J	4.8 U	0.53 J	5 U	1.6 J	4.5 U	0.76 J	4.9 U	0.75 J	5 U
Butylbenzylphthalate	5			0.29 J	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Caprolactam	5			0.22 J	4.6 U	0.49 J	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	0.41 J	4.5 U	0.16 J	4.9 U	0.15 J	5 U
Carbazole	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Chrysene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U

Table 3-2a
2010 Shallow Overburden Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AL-12		AL-14		AL-15		ARC-03		ASI-14S		ASI-23S		BF-04		BM-03S	
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.
			Sample Name:	A2Q29	A42R1	A2PZ7	A3M31	A2PZ8	A3M32	A2PZ9	A3M33	A2Q07	A3M40	A2Q11	A3M43	A2Q06	A3M44	A2Q13	A3M46
			Station ID:	AL-012-052010A	AL-012-1110A	AL-014-051810A	AL-014-1110A	AL-015-051910A	AL-015-1110A	ARC-003-051910A	ARC-003-1110A	ASI-014S-051810A	ASI-014S1110A	ASI-023S-051810A	ASI-023S-1110A	BF-004-052010A	BF-004-1110A	BM-003S-051910A	BM-003S-1110A
Chemical	**CRQL**	**VT**	**MCL**																
Dibenzo(a,h)anthracene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Dibenzofuran	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Diethylphthalate	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Dimethylphthalate	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Di-n-butylphthalate	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Di-n-octylphthalate	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Fluoranthene	5	280		5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Fluorene	5	280		5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Hexachlorobenzene	5	1	1	5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Hexachlorobutadiene	5	1		5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Hexachlorocyclopentadiene	5	50	50	5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Hexachloroethane	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Isophorone	5	100		5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Naphthalene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	1.8 J	5 U	5 U
Nitrobenzene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
N-Nitroso-di-n-propylamine	5	20		5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
N-Nitrosodiphenylamine	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Pentachlorophenol	10	1	1	10 U	9.3 U	10 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U	9.1 U	10 U	9.7 U	10 U	10 U
Phenanthrene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Phenol	5	2100		5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
Pyrene	5			5 U	4.6 U	5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U	4.5 U	5 U	4.9 U	5 U	5 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sample Date:	20 May 10	01 Dec 10	18 May 10	30 Nov 10	19 May 10	01 Dec 10	19 May 10	01 Dec 10	18 May 10	30 Nov 10	18 May 10	01 Dec 10	20 May 10	01 Dec 10	19 May 10	29 Nov 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-2a
2010 Shallow Overburden Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	BW-13S		MI-01		MI-02		MI-08		OE-2B			MW-08S	MW-11S
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.
			Sample Name:	A2Q15	A3M29	A2Q16	A3M49	A2Q17	A3M50	A2Q18	A3M51	A2Q20	A3M68	A3M68	A3M62	A3M66
			Station ID:	BW-013S-052010A	BW-013S-1110A	MI-001-051910A	MI-001-1110A	MI-002-051810A	MI-002-1110A	MI-008-052010A	MI-008-1110A	OE-02B-052010A	OE-02B-1110	DUP-1110A	MW-008S-1110A	MW-011S-1110A
Chemical	**CRQL**	**VT**	**MCL**													
1,1'-Biphenyl	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
1,2,4,5-Tetrachlorobenzene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,2'-Oxybis(1-chloropropane)	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,3,4,6-Tetrachlorophenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,4,5-Trichlorophenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,4,6-Trichlorophenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,4-Dichlorophenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,4-Dimethylphenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,4-Dinitrophenol	10			10 U	9.3 U	10 U	9.5 U	10 U	9.5 U	10 U	9.3 U	10 U	9.3 U	9.1 U	9.3 U	9.3 U
2,4-Dinitrotoluene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2,6-Dinitrotoluene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2-Chloronaphthalene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2-Chlorophenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2-Methylnaphthalene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2-Methylphenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
2-Nitroaniline	10			10 U	9.3 U	10 U	9.5 U	10 U	9.5 U	10 U	9.3 U	10 U	9.3 U	9.1 U	9.3 U	9.3 U
2-Nitrophenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
3,3'-Dichlorobenzidine	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
3-Nitroaniline	10			10 U	9.3 U	10 U	9.5 U	10 U	9.5 U	10 U	9.3 U	10 U	9.3 U	9.1 U	9.3 U	9.3 U
4,6-Dinitro-2-methylphenol	10			10 U	9.3 U	10 U	9.5 U	10 U	9.5 U	10 U	9.3 U	10 U	9.3 U	9.1 U	9.3 U	9.3 U
4-Bromophenyl-phenylether	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
4-Chloro-3-methylphenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
4-Chloroaniline	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
4-Chlorophenyl-phenylether	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
4-Methylphenol	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
4-Nitroaniline	10			10 U	9.3 U	10 U	9.5 U	10 U	9.5 U	10 U	9.3 U	10 U	9.3 U	9.1 U	9.3 U	9.3 U
4-Nitrophenol	10			10 U	9.3 U	10 U	9.5 U	10 U	9.5 U	10 U	9.3 U	10 U	9.3 U	9.1 U	9.3 U	9.3 U
Acenaphthene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Acenaphthylene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Acetophenone	5			0.81 J	4.6 U	0.35 J	4.8 U	0.27 J	4.8 U	1.1 J	4.6 U	0.27 J	4.6 U	4.5 U	4.6 U	4.6 U
Anthracene	5	2100		5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Atrazine	5	3	3	5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Benzaldehyde	5			0.46 J	4.6 U	0.38 J	4.8 U	0.31 J	4.8 U	1.4 J	4.6 U	0.29 J	4.6 U	4.5 U	4.6 U	4.6 U
Benzo(a)anthracene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Benzo(a)pyrene	5	0.2	0.2	5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Benzo(b)fluoranthene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Benzo(g,h,i)perylene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Benzo(k)fluoranthene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Bis(2-chloroethoxy)methane	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Bis(2-chloroethyl)ether	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Bis(2-ethylhexyl)phthalate	5			1.1 J	4.6 U	2 J	4.8 U	0.73 J	4.8 U	1.1 J	4.6 U	0.89 J	4.6 U	4.5 U	4.6 U	4.6 U
Butylbenzylphthalate	5			0.21 J	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Caprolactam	5			0.51 J	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Carbazole	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Chrysene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U

Table 3-2a
2010 Shallow Overburden Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	BW-13S		MI-01		MI-02		MI-08		OE-2B			MW-08S	MW-11S
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.
			Sample Name:	A2Q15	A3M29	A2Q16	A3M49	A2Q17	A3M50	A2Q18	A3M51	A2Q20	A3M68	A3M68	A3M62	A3M66
			Station ID:	BW-013S-052010A	BW-013S-1110A	MI-001-051910A	MI-001-1110A	MI-002-051810A	MI-002-1110A	MI-008-052010A	MI-008-1110A	OE-02B-052010A	OE-02B-1110	DUP-1110A	MW-008S-1110A	MW-011S-1110A
Chemical	**CRQL**	**VT**	**MCL**													
Dibenzo(a,h)anthracene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Dibenzofuran	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Diethylphthalate	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Dimethylphthalate	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Di-n-butylphthalate	5			0.22 J	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Di-n-octylphthalate	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Fluoranthene	5	280		5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Fluorene	5	280		5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Hexachlorobenzene	5	1	1	5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Hexachlorobutadiene	5	1		5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Hexachlorocyclopentadiene	5	50	50	5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Hexachloroethane	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Indeno(1,2,3-cd)pyrene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Isophorone	5	100		5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Naphthalene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Nitrobenzene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
N-Nitroso-di-n-propylamine	5	20		5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
N-Nitrosodiphenylamine	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Pentachlorophenol	10	1	1	10 U	9.3 U	10 U	9.5 U	10 U	9.5 U	10 U	9.3 U	10 U	9.3 U	9.1 U	9.3 U	9.3 U
Phenanthrene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Phenol	5	2100		0.21 J	4.6 U	5 U	4.8 U	5 U	4.8 U	0.15 J	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
Pyrene	5			5 U	4.6 U	5 U	4.8 U	5 U	4.8 U	5 U	4.6 U	5 U	4.6 U	4.5 U	4.6 U	4.6 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sample Date:	20 May 10	02 Dec 10	19 May 10	29 Nov 10	18 May 10	29 Nov 10	20 May 10	02 Dec 10	20 May 10	30 Nov 10	30 Nov 10	30 Nov 10	01 Dec 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-2b
2010 Intermediate/Deep Overburden and Bedrock Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AIP-01		AL-02		ASI-02D2				ASI-03D2		ASI-04D2		ASI-05D2		
			Month:	May	Nov./Dec.	May	Nov./Dec.	May		Nov./Dec.		May	Nov./Dec.	May	Nov./Dec.	May		Nov./Dec.
			Sample Name:	A2Q30	A42S6	A2Q32	A42R0	A2Q00	A2Q01	A3M34	A3M35	A2Q02	A42Q1	A2Q31	A3M36	A2Q03	A2Q09	A3M37
			Station ID:	AIP-001-0519108A	AIP-001-1110A	AL-002-051910A	AL-002-1110A	ASI-002D2-051810A	ASI-002D2-051810D	ASI-002D2-1110A	DUP-1110B	ASI-003D2-051810A	ASI-003D2-1110A	ASI-004D2-051710A	ASI-004D2-1110A	ASI-005D2-052010A	ASI-005D2-052010D	ASI-005D2-1110A
			Aquifer:	DOB		IOB		IOB				IOB				DOB		
Chemical	**CRQL**	**VT**	**MCL**															
1,1'-Biphenyl	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,4,5-Trichlorophenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,4-Dichlorophenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,4-Dimethylphenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,4-Dinitrophenol	10			10 U	10 U	10 U	9.3 U	10 U	10 U	9.1 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U
2,4-Dinitrotoluene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2,6-Dinitrotoluene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2-Chloronaphthalene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2-Chlorophenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2-Methylnaphthalene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2-Methylphenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
2-Nitroaniline	10			10 U	10 U	10 U	9.3 U	10 U	10 U	9.1 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U
2-Nitrophenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
3-Nitroaniline	10			10 U	10 U	10 U	9.3 U	10 U	10 U	9.1 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U
4,6-Dinitro-2-methylphenol	10			10 U	10 U	10 U	9.3 U	10 U	10 U	9.1 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U
4-Bromophenyl-phenylether	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
4-Chloro-3-methylphenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
4-Chloroaniline	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
4-Chlorophenyl-phenylether	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
4-Methylphenol	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
4-Nitroaniline	10			10 U	10 U	10 U	9.3 U	10 U	10 U	9.1 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U
4-Nitrophenol	10			10 U	10 U	10 U	9.3 U	10 U	10 U	9.1 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U
Acenaphthene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Acenaphthylene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Acetophenone	5			0.39 J	5 U	0.41 J	4.6 U	0.32 J	0.31 J	4.5 U	4.5 U	0.46 J	4.6 U	0.24 J	4.8 U	0.52 J	0.37 J	5 U
Anthracene	5	2100		5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Atrazine	5	3	3	5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Benzaldehyde	5			0.35 J	5 U	0.46 J	4.6 U	0.35 J	0.37 J	4.5 U	4.5 U	0.44 J	4.6 U	0.26 J	4.8 U	0.54 J	0.33 J	5 U
Benzo(a)anthracene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Benzo(a)pyrene	5	0.2	0.2	5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Benzo(b)fluoranthene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Benzo(g,h,i)perylene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Benzo(k)fluoranthene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Bis(2-chloroethoxy)methane	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Bis(2-chloroethyl)ether	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Bis(2-ethylhexyl)phthalate	5			1 J	2.5 J	12	4.6 U	0.83 J	0.88 J	4.5 U	4.5 U	1.2 J	4.6 U	1 J	4.8 U	0.27 J	0.76 J	5 U
Butylbenzylphthalate	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U

Table 3-2b
2010 Intermediate/Deep Overburden and Bedrock Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AIP-01		AL-02		ASI-02D2				ASI-03D2		ASI-04D2		ASI-05D2		
			Month:	May	Nov./Dec.	May	Nov./Dec.	May		Nov./Dec.		May	Nov./Dec.	May	Nov./Dec.	May		Nov./Dec.
			Sample Name:	A2Q30	A42S6	A2Q32	A42R0	A2Q00	A2Q01	A3M34	A3M35	A2Q02	A42Q1	A2Q31	A3M36	A2Q03	A2Q09	A3M37
			Station ID:	AIP-001-0519108A	AIP-001-1110A	AL-002-051910A	AL-002-1110A	ASI-002D2-051810A	ASI-002D2-051810D	ASI-002D2-1110A	DUP-1110B	ASI-003D2-051810A	ASI-003D2-1110A	ASI-004D2-051710A	ASI-004D2-1110A	ASI-005D2-052010A	ASI-005D2-052010D	ASI-005D2-1110A
			Aquifer:	DOB		IOB		IOB				IOB				DOB		
Chemical	**CRQL**	**VT**	**MCL**															
Caprolactam	5			5 U	5 U	0.58 J	4.6 U	0.18 J	5 U	4.5 U	4.5 U	0.26 J	4.6 U	0.18 J	4.8 U	5 U	0.22 J	5 U
Carbazole	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Chrysene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Dibenzo(a,h)anthracene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Dibenzofuran	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Diethylphthalate	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Dimethylphthalate	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Di-n-butylphthalate	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Di-n-octylphthalate	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Fluoranthene	5	280		5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Fluorene	5	280		5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Hexachlorobenzene	5	1	1	5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Hexachlorobutadiene	5	1		5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Hexachlorocyclopentadiene	5	50	50	5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Hexachloroethane	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Isophorone	5	100		5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Naphthalene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Nitrobenzene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
N-Nitroso-di-n-propylamine	5	20		5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
N-Nitrosodiphenylamine	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Pentachlorophenol	10	1	1	10 U	10 U	10 U	9.3 U	10 U	10 U	9.1 U	9.1 U	10 U	9.3 U	10 U	9.5 U	10 U	10 U	10 U
Phenanthrene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Phenol	5	2100		5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
Pyrene	5			5 U	5 U	5 U	4.6 U	5 U	5 U	4.5 U	4.5 U	5 U	4.6 U	5 U	4.8 U	5 U	5 U	5 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sample Date:	19 May 10	02 Dec 10	19 May 10	01 Dec 10	18 May 10	18 May 10	29 Nov 10	29 Nov 10	18 May 10	29 Nov 10	17 May 10	30 Nov 10	20 May 10	20 May 10	02 Dec 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate Overburden; DOB = Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-2b
2010 Intermediate/Deep Overburden and Bedrock Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	ASI-11D2		ASI-14D2		ASI-15D2		ASI-16D2		ASI-23D2		BM-03D		OE-2A		MW-01D	MW-02M
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	Nov./Dec.	Nov./Dec.
			Sample Name:	A2Q04	A3M38	A2Q05	A3M39	A2Q08	A3M41	A2Q33	A42R2	A2Q10	A3M42	A2Q12	A3M45	A2Q19	A3M67	A3M52	A3M53
			Station ID:	ASI-011D2-051710A	ASI-011D2-1110A	ASI-014D2-051810A	ASI-014D2-1110A	ASI-015D2-052010A	ASI-015D2-1110A	ASI-016D2-051910A	ASI-016D2-1110A	ASI-023D2-051810A	ASI-023D2-1110A	BM-003D-051910A	BM-003D-1110A	OE-02A-052010A	OE-02A-1110A	MW-001D-1110A	MW-002M-1110A
			Aquifer:	DOB		IOB		DOB		DOB		IOB		IOB		DOB		DOB	IOB
Chemical	**CRQL**	**VT**	**MCL**																
1,1'-Biphenyl	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
1,2,4,5-Tetrachlorobenzene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,2'-Oxybis(1-chloropropane)	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,3,4,6-Tetrachlorophenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,4,5-Trichlorophenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,4,6-Trichlorophenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,4-Dichlorophenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,4-Dimethylphenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,4-Dinitrophenol	10			10 U	9.1 U	10 U	9.5 U	10 U	9.3 U	10 U	9.1 U	10 U	10 U	10 U	9.5 U	10 U	9.1 U	9.7 U	9.1 U
2,4-Dinitrotoluene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2,6-Dinitrotoluene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2-Chloronaphthalene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2-Chlorophenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2-Methylnaphthalene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2-Methylphenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
2-Nitroaniline	10			10 U	9.1 U	10 U	9.5 U	10 U	9.3 U	10 U	9.1 U	10 U	10 U	10 U	9.5 U	10 U	9.1 U	9.7 U	9.1 U
2-Nitrophenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
3,3'-Dichlorobenzidine	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
3-Nitroaniline	10			10 U	9.1 U	10 U	9.5 U	10 U	9.3 U	10 U	9.1 U	10 U	10 U	10 U	9.5 U	10 U	9.1 U	9.7 U	9.1 U
4,6-Dinitro-2-methylphenol	10			10 U	9.1 U	10 U	9.5 U	10 U	9.3 U	10 U	9.1 U	10 U	10 U	10 U	9.5 U	10 U	2.8 J	9.7 U	9.1 U
4-Bromophenyl-phenylether	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
4-Chloro-3-methylphenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
4-Chloroaniline	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
4-Chlorophenyl-phenylether	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
4-Methylphenol	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
4-Nitroaniline	10			10 U	9.1 U	10 U	9.5 U	10 U	9.3 U	10 U	9.1 U	10 U	10 U	10 U	9.5 U	10 U	9.1 U	9.7 U	9.1 U
4-Nitrophenol	10			10 U	9.1 U	10 U	9.5 U	10 U	9.3 U	10 U	9.1 U	10 U	10 U	10 U	9.5 U	10 U	9.1 U	9.7 U	9.1 U
Acenaphthene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Acenaphthylene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Acetophenone	5			0.36 J	4.5 U	0.26 J	4.8 U	0.43 J	4.6 U	0.25 J	4.5 U	0.3 J	5 U	0.42 J	4.8 U	0.29 J	4.5 U	4.9 U	4.5 U
Anthracene	5	2100		5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Atrazine	5	3	3	5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Benzaldehyde	5			0.44 J	4.5 U	0.32 J	4.8 U	0.33 J	4.6 U	0.22 J	4.5 U	0.27 J	5 U	0.25 J	4.8 U	0.33 J	4.5 U	4.9 U	4.5 U
Benzo(a)anthracene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Benzo(a)pyrene	5	0.2	0.2	5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Benzo(b)fluoranthene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Benzo(g,h,i)perylene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Benzo(k)fluoranthene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Bis(2-chloroethoxy)methane	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Bis(2-chloroethyl)ether	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Bis(2-ethylhexyl)phthalate	5			0.59 J	4.5 U	1 J	4.8 U	0.33 J	4.6 U	1.9 J	4.5 U	0.83 J	5 U	0.93 J	4.8 U	1.2 J	4.5 U	4.9 U	4.5 U
Butylbenzylphthalate	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U

Table 3-2b
2010 Intermediate/Deep Overburden and Bedrock Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	ASI-11D2		ASI-14D2		ASI-15D2		ASI-16D2		ASI-23D2		BM-03D		OE-2A		MW-01D	MW-02M
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	Nov./Dec.	Nov./Dec.
			Sample Name:	A2Q04	A3M38	A2Q05	A3M39	A2Q08	A3M41	A2Q33	A42R2	A2Q10	A3M42	A2Q12	A3M45	A2Q19	A3M67	A3M52	A3M53
			Station ID:	ASI-011D2-051710A	ASI-011D2-1110A	ASI-014D2-051810A	ASI-014D2-1110A	ASI-015D2-052010A	ASI-015D2-1110A	ASI-016D2-051910A	ASI-016D2-1110A	ASI-023D2-051810A	ASI-023D2-1110A	BM-003D-051910A	BM-003D-1110A	OE-02A-052010A	OE-02A-1110A	MW-001D-1110A	MW-002M-1110A
			Aquifer:	DOB		IOB		DOB		DOB		IOB		IOB		DOB		DOB	IOB
Chemical	**CRQL**	**VT**	**MCL**																
Caprolactam	5			0.38 J	4.5 U	0.22 J	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	0.56 J	4.5 U	4.9 U	4.5 U
Carbazole	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Chrysene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Dibenzo(a,h)anthracene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Dibenzofuran	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Diethylphthalate	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Dimethylphthalate	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Di-n-butylphthalate	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Di-n-octylphthalate	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Fluoranthene	5	280		5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Fluorene	5	280		5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Hexachlorobenzene	5	1	1	5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Hexachlorobutadiene	5	1		5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Hexachlorocyclopentadiene	5	50	50	5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Hexachloroethane	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Indeno(1,2,3-cd)pyrene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Isophorone	5	100		5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Naphthalene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Nitrobenzene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
N-Nitroso-di-n-propylamine	5	20		5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
N-Nitrosodiphenylamine	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Pentachlorophenol	10	1	1	10 U	9.1 U	10 U	9.5 U	10 U	9.3 U	10 U	9.1 U	10 U	10 U	10 U	9.5 U	10 U	9.1 U	9.7 U	9.1 U
Phenanthrene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Phenol	5	2100		5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
Pyrene	5			5 U	4.5 U	5 U	4.8 U	5 U	4.6 U	5 U	4.5 U	5 U	5 U	5 U	4.8 U	5 U	4.5 U	4.9 U	4.5 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sample Date:	17 May 10	30 Nov 10	18 May 10	30 Nov 10	20 May 10	01 Dec 10	19 May 10	01 Dec 10	18 May 10	01 Dec 10	19 May 10	29 Nov 10	20 May 10	30 Nov 10	01 Dec 10	29 Nov 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate Overburden; DOB = Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-2b
2010 Intermediate/Deep Overburden and Bedrock Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	MW-03D	MW-04D		MW-05D	MW-05D2	MW-06M	MW-06D	MW-07M	MW-08M	MW-09M	MW-09D	MW-10D	BR-01	
			Month:	Nov./Dec.	Nov./Dec.		Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	May	Nov./Dec.
			Sample Name:	A3M54	A3M55	A42Q0	A3M56	A3M57	A3M59	A3M58	A3M60	A3M61	A3M64	A3M63	A3M65	A2Q14	A3M47
			Station ID:	MW-003D-1110A	MW-004D-1110A	DUP-1110C	MW-005D-1110A	MW-005D2-1110A	MW-006M-1110A	MW-006D-1110A	MW-007M-1110A	MW-008M-1110A	MW-009M-1110A	MW-009D-1110A	MW-010D-1110A	BR-001-052110A	BR-001-1110A
			Aquifer:	DOB	DOB		DOB	DOB	IOB	DOB	IOB	IOB	IOB	DOB	DOB	BR	
Chemical	**CRQL**	**VT**	**MCL**														
1,1'-Biphenyl	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
1,2,4,5-Tetrachlorobenzene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,2'-Oxybis(1-chloropropane)	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,3,4,6-Tetrachlorophenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,4,5-Trichlorophenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,4,6-Trichlorophenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,4-Dichlorophenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,4-Dimethylphenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,4-Dinitrophenol	10			9.7 U	9.6 U	9.5 U	9.5 U	10 U	9.1 U	9.1 U	10 U	10 U	9.1 U	9.1 U	9.7 U	10 U	10 U
2,4-Dinitrotoluene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2,6-Dinitrotoluene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2-Chloronaphthalene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2-Chlorophenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2-Methylnaphthalene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2-Methylphenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
2-Nitroaniline	10			9.7 U	9.6 U	9.5 U	9.5 U	10 U	9.1 U	9.1 U	10 U	10 U	9.1 U	9.1 U	9.7 U	10 U	10 U
2-Nitrophenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
3,3'-Dichlorobenzidine	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
3-Nitroaniline	10			9.7 U	9.6 U	9.5 U	9.5 U	10 U	9.1 U	9.1 U	10 U	10 U	9.1 U	9.1 U	9.7 U	10 U	10 U
4,6-Dinitro-2-methylphenol	10			9.7 U	9.6 U	9.5 U	9.5 U	10 U	9.1 U	9.1 U	10 U	10 U	9.1 U	9.1 U	9.7 U	10 U	10 U
4-Bromophenyl-phenylether	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
4-Chloro-3-methylphenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
4-Chloroaniline	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
4-Chlorophenyl-phenylether	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
4-Methylphenol	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	0.32 J	5 U
4-Nitroaniline	10			9.7 U	9.6 U	9.5 U	9.5 U	10 U	9.1 U	9.1 U	10 U	10 U	9.1 U	9.1 U	9.7 U	10 U	10 U
4-Nitrophenol	10			9.7 U	9.6 U	9.5 U	9.5 U	10 U	9.1 U	9.1 U	10 U	10 U	9.1 U	9.1 U	9.7 U	10 U	10 U
Acenaphthene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Acenaphthylene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Acetophenone	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	1.2 J	5 U
Anthracene	5	2100		4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Atrazine	5	3	3	4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Benzaldehyde	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	1.4 J	5 U
Benzo(a)anthracene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Benzo(a)pyrene	5	0.2	0.2	4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Benzo(b)fluoranthene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Benzo(g,h,i)perylene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Benzo(k)fluoranthene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Bis(2-chloroethoxy)methane	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Bis(2-chloroethyl)ether	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Bis(2-ethylhexyl)phthalate	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	0.31 J	5 U
Butylbenzylphthalate	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U

Table 3-2b
2010 Intermediate/Deep Overburden and Bedrock Groundwater SVOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	MW-03D	MW-04D		MW-05D	MW-05D2	MW-06M	MW-06D	MW-07M	MW-08M	MW-09M	MW-09D	MW-10D	BR-01	
			Month:	Nov./Dec.	Nov./Dec.		Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	May	Nov./Dec.
			Sample Name:	A3M54	A3M55	A42Q0	A3M56	A3M57	A3M59	A3M58	A3M60	A3M61	A3M64	A3M63	A3M65	A2Q14	A3M47
			Station ID:	MW-003D-1110A	MW-004D-1110A	DUP-1110C	MW-005D-1110A	MW-005D2-1110A	MW-006M-1110A	MW-006D-1110A	MW-007M-1110A	MW-008M-1110A	MW-009M-1110A	MW-009D-1110A	MW-010D-1110A	BR-001-052110A	BR-001-1110A
			Aquifer:	DOB	DOB		DOB	DOB	IOB	DOB	IOB	IOB	IOB	DOB	DOB	BR	
Chemical	**CRQL**	**VT**	**MCL**														
Caprolactam	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	0.43 J	5 U
Carbazole	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Chrysene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Dibenzo(a,h)anthracene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Dibenzofuran	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Diethylphthalate	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Dimethylphthalate	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Di-n-butylphthalate	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Di-n-octylphthalate	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Fluoranthene	5	280		4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Fluorene	5	280		4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Hexachlorobenzene	5	1	1	4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Hexachlorobutadiene	5	1		4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Hexachlorocyclopentadiene	5	50	50	4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Hexachloroethane	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Isophorone	5	100		4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Naphthalene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Nitrobenzene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
N-Nitroso-di-n-propylamine	5	20		4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
N-Nitrosodiphenylamine	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Pentachlorophenol	10	1	1	9.7 U	9.6 U	9.5 U	9.5 U	10 U	9.1 U	9.1 U	10 U	10 U	9.1 U	9.1 U	9.7 U	10 U	10 U
Phenanthrene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
Phenol	5	2100		4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	2.1 J	2 J
Pyrene	5			4.9 U	4.8 U	4.8 U	4.8 U	5 U	4.5 U	4.5 U	5 U	5 U	4.5 U	4.5 U	4.9 U	5 U	5 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sample Date:	29 Nov 10	02 Dec 10	02 Dec 10	30 Nov 10	30 Nov 10	30 Nov 10	30 Nov 10	02 Dec 10	30 Nov 10	01 Dec 10	02 Dec 10	02 Dec 10	21 May 10	02 Dec 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate Overburden; DOB = Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-3a
2010 Shallow Overburden Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AL-12		AL-14		AL-15		ARC-03		ASI-14S	
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.
			Sample Name:	MA2Q25	MA42R1	MA2PZ3	MA3M31	MA2PZ4	MA3M32	MA2PZ5	MA3M33	MA2Q03	MA3M40
			Station ID:	AL-012-052010A	AL-012-1110A	AL-014-051810A	AL-014-1110A	AL-015-051910A	AL-0151110A	ARC-003-051910A	ARC-003-1110A	ASI-014S-051810A	ASI-014S-1110A
Chemical	**CRQL**	**VT**	**MCL**										
Aluminum	200			195 J	102 J	50.7 J	200 U	148 J	93 J	443	116 J	573	200 U
Antimony	2	6	6	0.7 J	2 U	0.31 J	2 U	0.39 J	2 U	0.35 J	2 U	0.25 J	2 U
Arsenic	10	10	10	10 U	10 U	10 U	3.8 J	10 U	10 U	10 U	10 U	10 U	10 U
Barium	200	2000	2000	61.3 J	104 J	35.2 J	32.7 J	324	130 J	13 J	7.5 J	86.8 J	156 J
Beryllium	1	4	4	1 U	1 U	1 U	1 U	0.065 J	1 U	0.035 J	1 U	0.062 J	1 U
Cadmium	5	5	5	0.34 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.26 J	5 U
Calcium	5000			24203	42700	18022	21900	24322	12800	9657	6820	4387 J	6930
Chromium (total)	10	100	100	2.1 J	10 U	0.29 J	10 U	10 U	10 U	0.75 J	10 U	0.96 J	10 U
Cobalt	50			6.1 J	7.1 J	50 U	50 U	2.2 J	50 U	50 U	50 U	50 U	50 U
Copper	25	1300	1300	20.7 J	13.3 J	4.5 J	3.3 J	1.3 J	25 U	1 J	25 U	1.3 J	25 U
Iron	100			2694	1380	430	47.4 J	114	198	460	68.3 J	18055	13300
Lead	10	15	15	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Magnesium	5000			5978	12300	2710 J	2800 J	7536	4020 J	1069 J	828 J	1413 J	1660 J
Manganese	15	840		**982**	**1230**	55.1	53.9	268	216	79	28	281	279
Mercury	0.2	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	40	100		4.3 J	6.3 J	40 U	40 U	2 J	3.2 J	0.56 J	40 U	2.4 J	1.7 J
Potasium	5000			5427	8630	2024 J	3150 J	957 J	242 J	376 J	347 J	523 J	801 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			88522	2E+05	39643	42000	1E+05	67100	3882 J	1920 J	21105	54900
Thallium	1	2	2	0.08 J	0.032 J	0.29 J	1 U	0.096 J	1 U	0.03 J	1 U	1 U	1 U
Vanadium	50			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	2.2 J	50 U
Zinc	60			4.7 J	3.8 J	0.75 J	3 J	0.7 J	3.7 J	2.6 J	1.7 J	4.6 J	60 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1
			Sample Date:	20 May 10	01 Dec 10	18 May 10	30 Nov 10	19 May 10	01 Dec 10	19 May 10	01 Dec 10	18 May 10	30 Nov 10

Notes:
1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-3a
2010 Shallow Overburden Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	ASI-23S		BF-04		BM-03S		BW-13S		MI-01	
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.
			Sample Name:	MA2Q07	MA3M43	MA2Q02	MA3M44	MA2Q09	MA3M46	MA2Q11	MA3M29	MA2Q12	MA3M49
			Station ID:	ASI-023S-051810A	ASI-023S-1110A	BF-004-052010A	BF-004-1110A	BM-003S-051910A	BM-003S-1110A	BW-013S-052010A	BW-013S-1110A	MI-001-051910A	MI-001-1110A
Chemical	**CRQL**	**VT**	**MCL**										
Aluminum	200			200 U	200 U	1985	262	48.7 J	200 U	23.2 J	177 J	200 U	48.5 J
Antimony	2	6	6	0.49 J	1.4 J	2 U	2 U	0.25 J	2 U	0.36 J	2 U	0.36 J	2 U
Arsenic	10	10	10	10 U	10 U	9.6 J	**11.8**	10 U	10 U	10 U	10 U	10 U	10 U
Barium	200	2000	2000	64.6 J	46.4 J	22 J	23.1 J	24 J	31.2 J	52 J	14.5 J	53.2 J	172 J
Beryllium	1	4	4	0.03 J	1 U	0.051 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5	5	5	0.13 J	5 U	0.34 J	5 U	5 U	5 U	0.15 J	5 U	5 U	5 U
Calcium	5000			10583	10600	25364	41100	29571	33100	23360	22800	18203	35500
Chromium (total)	10	100	100	10 U	10 U	3.5 J	10 U	0.69 J	10 U	0.3 J	10 U	0.38 J	10 U
Cobalt	50			50 U	50 U	2.5 J	2.4 J	0.95 J	50 U	50 U	50 U	50 U	50 U
Copper	25	1300	1300	25 U	25 U	5 J	25 U	2.2 J	25 U	1.3 J	25 U	25 U	25 U
Iron	100			12963	34400	10760	21200	785	131	42 J	648	16.6 J	61.4 J
Lead	10	15	15	10 U	10 U	1.9 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Magnesium	5000			2548 J	2460 J	6873	10600	10772	11600	5956	5380	3190 J	5740
Manganese	15	840		**2206**	**1780**	270	861	85.2	17.4	30.8	37.2	15 U	5.4 J
Mercury	0.2	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.064 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	40	100		0.86 J	1.5 J	4.8 J	1.6 J	1 J	1.3 J	3.1 J	1.3 J	40 U	40 U
Potasium	5000			817 J	891 J	1086 J	2000 J	351 J	802 J	832 J	734 J	1818 J	4320 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			57122	43000	5227	25700	62438	1E+05	1E+05	87100	76907	2E+05
Thallium	1	2	2	0.027 J	1 U	0.03 J	1 U	1 U	1 U	1 U	1 U	0.22 J	1 U
Vanadium	50			50 U	50 U	2.7 J	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	60			60 U	6 J	6.6 J	2.3 J	2.5 J	1.9 J	2.1 J	1.4 J	0.72 J	4.4 J
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1
			Sample Date:	18 May 10	01 Dec 10	20 May 10	01 Dec 10	19 May 10	29 Nov 10	20 May 10	02 Dec 10	19 May 10	29 Nov 10

Notes:
1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-3a
2010 Shallow Overburden Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	MI-02		MI-08		OE-2B		MW-08S	MW-11S
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	Nov./Dec.	Nov./Dec.
			Sample Name:	MA2Q13	MA3M50	MA2Q14	MA3M51	MA2Q16	MA2Q16	MA3M62	MA3M66
			Station ID:	MI-002-051810A	MI-002-1110A	MI-008-052010A	MI-008-1110A	OE-02B-052010A	OE-02B-052010A	MW-008S-1110A	MW-011S-1110A
Chemical	**CRQL**	**VT**	**MCL**								
Aluminum	200			70.1 J	200 U	54.6 J	200 U	258	149 J	226	203
Antimony	2	6	6	0.41 J	2 U	0.34 J	2 U	0.27 J	2 U	2 U	2 U
Arsenic	10	10	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	2.8 J
Barium	200	2000	2000	17.9 J	44.8 J	32.2 J	55.1 J	50.3 J	30.6 J	144 J	45.4 J
Beryllium	1	4	4	1 U	1 U	1 U	1 U	0.048 J	1 U	1 U	1 U
Cadmium	5	5	5	5 U	5 U	**11.3**	**13.6**	5 U	5 U	5 U	5 U
Calcium	5000			18578	28500	5173	8960	2634 J	4450 J	44700	29700
Chromium (total)	10	100	100	1.6 J	10 U	27.1	11.9	10 U	10 U	10 U	10 U
Cobalt	50			50 U	50 U	1.4 J	2.6 J	1.4 J	3.6 J	4.4 J	50 U
Copper	25	1300	1300	25 U	25 U	2.2 J	25 U	1.4 J	25 U	25 U	2.8 J
Iron	100			109	29.6 J	12.2 J	100 U	467	1030	645	471
Lead	10	15	15	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Magnesium	5000			2495 J	4330 J	1665 J	3190 J	769 J	892 J	12100	4650 J
Manganese	15	840		2.3 J	1.7 J	99.9	165	38.7	285	706	35
Mercury	0.2	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	40	100		0.89 J	40 U	2.6 J	3.7 J	1.6 J	2.9 J	35.3 J	3.8 J
Potasium	5000			875 J	1650 J	684 J	1030 J	1540 J	771 J	4300 J	2370 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			19709	58000	26185	31400	7740	11100	90700	2E+05
Thallium	1	2	2	1 U	1 U	0.068 J	1 U	0.22 J	1 U	1 U	1 U
Vanadium	50			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	60			1.5 J	2.9 J	4.6 J	6.2 J	2.6 J	2.6 J	7.3 J	5.7 J
			Dilution Factor:	1	1	1	1	1	1	1	1
			Sample Date:	18 May 10	29 Nov 10	20 May 10	02 Dec 10	20 May 10	30 Nov 10	30 Nov 10	01 Dec 10

Notes: 1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-3b
2010 Intermediate/Deep Oerburden and Bedrock Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	AIP-01		AL-02		ASI-02D2				ASI-03D2	
			Month:	May	Nov./Dec.	May	Nov./Dec.	May		Nov./Dec.		May	Nov./Dec.
			Sample Name:	MA2Q30	MA42S6	MA2Q32	MA42R0	MA2Q00	MA2Q01	MA3M34	MA3M35	MA2Q02	MA42Q1
			Station ID:	AIP-001-0519108A	AIP-001-1110A	AL-002-051910A	AL-002-1110A	ASI-002D2-051810A	ASI-002D2-051810D	ASI-002D2-1110A	DUP-1110B	ASI-003D2-051810A	ASI-003D2-1110A
			Aquifer:	DOB		IOB		IOB				IOB	
Chemical	**CRQL**	**VT**	**MCL**										
Aluminum	200			200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	28.2 J	200 U
Antimony	2	6	6	0.36 J	2 U	0.3 J	2 U	0.42 J	0.3 J	2 U	2 U	0.28 J	2 U
Arsenic	10	10	10	4.4 J	8.4 J	10 U	10 U	10 U	10 U	4.4 J	5.7 J	7.7 J	**12.3**
Barium	200	2000	2000	50.8 J	52 J	62.6 J	52.2 J	169 J	175 J	198 J	194 J	102 J	114 J
Beryllium	1	4	4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5	5	5	5 U	5 U	**45.8**	**45.5**	0.3 J	0.26 J	5 U	5 U	5 U	5 U
Calcium	5000			57146	60600	28693	25300	135405	139910	135000	134000	154980	165000
Chromium (total)	10	100	100	10 U	10 U	0.85 J	10 U	10 U	0.35 J	10 U	10 U	0.55 J	10 U
Cobalt	50			50 U	50 U	2 J	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Copper	25	1300	1300	25 U	25 U	1.4 J	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Iron	100			7462	7920	317	32.8 J	15028	15487	15600	15500	6167	7090
Lead	10	15	15	10 U	10 U	10 U	10 U	1.3 J	1.2 J	10 U	10 U	1.5 J	10 U
Magnesium	5000			13124	14600	8188	7030	24358	25078	25500	25200	20738	22700
Manganese	15	840		442	476	**4793**	**4320**	669	689	621	619	**1511**	**1480**
Mercury	0.2	2	2	0.12 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	40	100		40 U	40 U	2.6 J	3.8 J	40 U	40 U	1 J	1.1 J	40 U	1.3 J
Potasium	5000			1485 J	1940 J	1446 J	2060 J	2397 J	2466 J	4190 J	4080 J	1780 J	2560 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	0.41 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			47115	53600	98002	1E+05	230585	239760	398000	361000	90181	119000
Thallium	1	2	2	0.022 J	1 U	0.15 J	1 U	0.086 J	0.043 J	1 U	1 U	0.027 J	1 U
Vanadium	50			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	60			60 U	60 U	3.2 J	1.4 J	60 U	60 U	5.4 J	60 U	0.31 J	60 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1
			Sample Date:	19 May 10	02 Dec 10	19 May 10	01 Dec 10	18 May 10	18 May 10	29 Nov 10	29 Nov 10	18 May 10	29 Nov 10

Notes:
1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate/Deep Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-3b
2010 Intermediate/Deep Oerburden and Bedrock Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	ASI-04D2		ASI-05D2			ASI-11D2		ASI-14D2	
			Month:	May	Nov./Dec.	May		Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.
			Sample Name:	MA2Q31	MA3M36	MA2Q03	MA2Q09	MA3M37	MA2Q04	MA3M38	MA2Q05	MA3M39
			Station ID:	ASI-004D2-051710A	ASI-004D2-1110A	ASI-005D2-052010A	ASI-005D2-052010D	ASI-005D2-1110A	ASI-011D2-051710A	ASI-011D2-1110A	ASI-014D2-051810A	ASI-014D2-1110A
			Aquifer:			DOB			DOB		IOB	
Chemical	**CRQL**	**VT**	**MCL**									
Aluminum	200			200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U
Antimony	2	6	6	0.37 J	2 U	2 U	2 U	2 U	0.28 J	2 U	0.48 J	2 U
Arsenic	10	10	10	9.9 J	**11**	**10.4**	**10.8**	**11.7**	4.6 J	6.3 J	10 U	4.9 J
Barium	200	2000	2000	36.8 J	34.2 J	105 J	106 J	97.6 J	133 J	227	38.2 J	40.7 J
Beryllium	1	4	4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5	5	5	5 U	5 U	0.22 J	0.21 J	5 U	0.5 J	5 U	5 U	5 U
Calcium	5000			63284	62100	85667	86844	72400	81982	125000	76410	80700
Chromium (total)	10	100	100	10 U	10 U	0.63 J	0.38 J	10 U	10 U	10 U	10 U	10 U
Cobalt	50			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Copper	25	1300	1300	25 U	25 U	0.85 J	0.91 J	25 U	25 U	25 U	25 U	25 U
Iron	100			1668	1780	6923	6987	4410	21697	32300	6019	6300
Lead	10	15	15	10 U	10 U	1.3 J	1.6 J	10 U	2.1 J	10 U	10 U	10 U
Magnesium	5000			16323	16600	21988	22037	19100	15276	24600	16747	17900
Manganese	15	840		583	563	**1155**	**1163**	**961**	**1274**	**1760**	585	569
Mercury	0.2	2	2	**2.3**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	40	100		40 U	40 U	40 U	40 U	1.1 J	40 U	1.5 J	40 U	1.1 J
Potasium	5000			1057 J	1290 J	2621 J	2627 J	2920 J	2644 J	5000 J	1305 J	1730 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			46916	51400	101755	103085	91900	157605	299000	58553	68900
Thallium	1	2	2	1 U	1 U	0.028 J	1 U	1 U	0.018 J	1 U	1 U	1 U
Vanadium	50			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Zinc	60			2.3 J	4.7 J	1.8 J	1.1 J	60 U	7.5 J	3.8 J	0.69 J	60 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1
			Sample Date:	17 May 10	30 Nov 10	20 May 10	20 May 10	02 Dec 10	17 May 10	30 Nov 10	18 May 10	30 Nov 10

Notes:
1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate/Deep Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-3b
2010 Intermediate/Deep Oerburden and Bedrock Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	ASI-15D2		ASI-16D2		ASI-23D2		BM-03D		OE-2A	
			Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.
			Sample Name:	MA2Q08	MA3M41	MA2Q33	MA42R2	MA2Q10	MA3M42	MA2Q12	MA3M45	MA2Q19	MA3M67
			Station ID:	ASI-015D2-052010A	ASI-015D2-1110A	ASI-016D2-051910A	ASI-016D2-1110A	ASI-023D2-051810A	ASI-023D2-1110A	BM-003D-051910A	BM-003D-1110A	OE-02A-052010A	OE-02A-1110A
			Aquifer:	DOB		DOB		IOB		IOB		DOB	
Chemical	**CRQL**	**VT**	**MCL**										
Aluminum	200			200 U	200 U	200 U	200 U	200 U	200 U	121 J	94.9 J	404	1180
Antimony	2	6	6	2 U	2 U	2 U	2 U	0.32 J	2 U	0.38 J	2 U	0.45 J	2 U
Arsenic	10	10	10	5 J	5.7 J	4.8 J	3.5 J	10 U	10 U	3.4 J	5.4 J	**11.7**	**15.9**
Barium	200	2000	2000	140 J	110 J	63.6 J	62.1 J	19.8 J	18 J	59.7 J	57.4 J	113 J	69.8 J
Beryllium	1	4	4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	5	5	5	0.65 J	5 U	0.075 J	5 U	5 U	5 U	1.4 J	5 U	0.12 J	5 U
Calcium	5000			93041	79700	79535	80900	94302	115000	63709	61600	136115	106000
Chromium (total)	10	100	100	0.42 J	10 U	0.31 J	10 U	0.28 J	10 U	0.51 J	10 U	1.5 J	2.3 J
Cobalt	50			50 U	50 U	50 U	50 U	0.8 J	2.1 J	2 J	50 U	50 U	50 U
Copper	25	1300	1300	25 U	25 U	1.1 J	25 U	25 U	13.5 J	25 U	25 U	2.7 J	5.2 J
Iron	100			18604	17600	2976	4150	1186	1970	49698	53700	2000	3660
Lead	10	15	15	3.5 J	10 U	10 U	10 U	1.8 J	10 U	10 U	10 U	2.5 J	10 U
Magnesium	5000			15969	14200	12420	13200	24800	31100	8316	8480	23949	19300
Manganese	15	840		**1785**	**1430**	808	759	343	375	**1177**	**1010**	**1138**	**874**
Mercury	0.2	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.088 J	0.2 U
Nickel	40	100		40 U	40 U	40 U	40 U	15.9 J	50.6	1.7 J	1.7 J	1.5 J	5.5 J
Potasium	5000			2377 J	2800 J	1600 J	2080 J	1406 J	1880 J	2333 J	2920 J	2348 J	2660 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			2E+05	1E+05	56366	66100	1E+05	92500	1E+05	1E+05	386415	249000
Thallium	1	2	2	1 U	1 U	0.05 J	1 U	1 U	1 U	0.018 J	1 U	1 U	1 U
Vanadium	50			50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	1.5 J
Zinc	60			0.81 J	3.6 J	4.4 J	60 U	1.3 J	6.8 J	3.4 J	2.9 J	7 J	9.4 J
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1
			Sample Date:	20 May 10	01 Dec 10	19 May 10	01 Dec 10	18 May 10	01 Dec 10	19 May 10	29 Nov 10	20 May 10	30 Nov 10

Notes:
1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate/Deep Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-3b
2010 Intermediate/Deep Oerburden and Bedrock Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	MW-01D	MW-02M	MW-03D	MW-04D		MW-05D	MW-05D2	MW-06M	MW-06D
			Month:	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.		Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.
			Sample Name:	MA3M52	MA3M53	MA3M54	MA3M55	MA42Q0	MA3M56	MA3M57	MA3M59	MA3M58
			Station ID:	MW-001D-1110A	MW-002M-1110A	MW-003D-1110A	MW-004D-1110A	DUP-1110C	MW-005D-1110A	MW-005D2-1110A	MW-006M-1110A	MW-006D-1110A
			Aquifer:	DOB	IOB	DOB	DOB		DOB	DOB	IOB	DOB
Chemical	**CRQL**	**VT**	**MCL**									
Aluminum	200			3160	1920	6140	3500	3340	5230	3400	12300	7310
Antimony	2	6	6	2 U	2 U	0.3 J	2 U	2 U	2 U	2 U	2 U	2 U
Arsenic	10	10	10	9.1 J	3.3 J	6.9 J	7.8 J	4.3 J	8.6 J	**15.7**	**17.2**	**21.1**
Barium	200	2000	2000	45.6 J	101 J	43 J	65.9 J	67.5 J	101 J	27.6 J	102 J	56.1 J
Beryllium	1	4	4	0.097 J	1 U	0.16 J	0.053 J	0.079 J	0.11 J	0.1 J	0.2 J	0.1 J
Cadmium	5	5	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Calcium	5000			76600	49300	45300	132000	138000	95300	65400	135000	92100
Chromium (total)	10	100	100	14.6	5.7 J	34.7	18.2	18	36.5	9.3 J	21.7	26
Cobalt	50			4.3 J	82.2	7.4 J	3.8 J	3.9 J	6.8 J	5.4 J	13.2 J	6.6 J
Copper	25	1300	1300	27.2	6.5 J	39.4	18.3 J	18.5 J	26.8	11.7 J	27.5	22.4 J
Iron	100			19100	15900	29000	19000	19000	36200	10500	39200	19000
Lead	10	15	15	10 U	10 U	5.9 J	10 U	10 U	10 U	10 U	8.3 J	10 U
Magnesium	5000			19900	15400	12700	32300	33700	15700	12000	28600	21200
Manganese	15	840		**864**	739	**958**	**1640**	**1700**	**1180**	**849**	**2950**	**1650**
Mercury	0.2	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	40	100		17.2 J	**122**	26.2 J	14.9 J	15.1 J	22.3 J	15.4 J	38.7 J	23.4 J
Potasium	5000			3150 J	6710	4330 J	3880 J	3960 J	6140	2110 J	4550 J	2810 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			59100	95000	77500	33100	34000	101000	33200	62800	28300
Thallium	1	2	2	1 U	1 U	1 U	1 U	0.028 J	1 U	1 U	0.046 J	0.02 J
Vanadium	50			5.5 J	4.5 J	11.6 J	5.4 J	5.2 J	8.1 J	5.9 J	18.2 J	11 J
Zinc	60			19 J	25.5 J	28.4 J	16.3 J	21.8 J	29.2 J	21.2 J	63.9	45 J
			Dilution Factor:	1	1	1	1	1	1	1	1	1
			Sample Date:	01 Dec 10	29 Nov 10	29 Nov 10	02 Dec 10	02 Dec 10	30 Nov 10	30 Nov 10	30 Nov 10	30 Nov 10

Notes:
1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate/Deep Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-3b
2010 Intermediate/Deep Oerburden and Bedrock Groundwater Total Metals Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Location:	MW-07M	MW-08M	MW-09M	MW-09D	MW-10D	BR-01	
			Month:	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	Nov./Dec.	May	Nov./Dec.
			Sample Name:	MA3M60	MA3M61	MA3M64	MA3M63	MA3M65	MA2Q14	MA3M47
			Station ID:	MW-007M-1110A	MW-008M-1110A	MW-009M-1110A	MW-009D-1110A	MW-010D-1110A	BR-001-052110A	BR-001-1110A
			Aquifer:	IOB	IOB	IOB	DOB	DOB	BR	
Chemical	**CRQL**	**VT**	**MCL**							
Aluminum	200			19800	1470	402	15000	28000	122 J	114 J
Antimony	2	6	6	2 U	0.39 J	2 U	2 U	2 U	0.53 J	2 U
Arsenic	10	10	10	**23.7**	3.1 J	10 U	**13**	**22.3**	10 U	10 U
Barium	200	2000	2000	123 J	19.4 J	70.1 J	60.7 J	110 J	**2893**	**3150**
Beryllium	1	4	4	0.37 J	0.051 J	1 U	0.29 J	0.63 J	1 U	1 U
Cadmium	5	5	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Calcium	5000			113000	50400	50700	63900	90100	359555	428000
Chromium (total)	10	100	100	49.9	5.4 J	10 U	54.6	62.3	0.7 J	10 U
Cobalt	50			20.2 J	5.2 J	2 J	17 J	31.9 J	50 U	50 U
Copper	25	1300	1300	60.4	6.7 J	2.5 J	51.2	92.8	2.8 J	8 J
Iron	100			44400	8510	8040	37800	64500	43.3 J	31 J
Lead	10	15	15	13.8	10 U	10 U	10.9	**25.1**	2.3 J	10 U
Magnesium	5000			29400	12900	18400	16700	31400	706 J	358 J
Manganese	15	840		**1940**	**1020**	**1210**	**1440**	**2100**	1.8 J	5.7 J
Mercury	0.2	2	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	40	100		58.5	28.2 J	7 J	51	90.3	3.7 J	3 J
Potasium	5000			5830	1770 J	3510 J	4390 J	5530	35558	36300 J
Selenium	35	50	50	35 U	35 U	35 U	35 U	35 U	35 U	35 U
Silver	10			10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	5000			115000	50100	333000	12100	44400	41217	46000
Thallium	1	2	2	0.11 J	0.18 J	1 U	0.077 J	0.19 J	0.03 J	1 U
Vanadium	50			28.9 J	3.1 J	0.62 J	22.9 J	43.5 J	50 U	50 U
Zinc	60			91.7	12.2 J	5.5 J	71.2	134	2.3 J	3.3 J
			Dilution Factor:	1	1	1	1	1	1	1
			Sample Date:	02 Dec 10	30 Nov 10	01 Dec 10	02 Dec 10	02 Dec 10	21 May 10	02 Dec 10

Notes:
1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantit
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. IOB = Intermediate/Deep Overburden; DOB = Intermediate/Deep Overburden; BR = Bedrock.
5. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
6. All concentrations listed in micrograms per liter (µg/L).

Table 3-4
July 2010 Porewater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

			Sample Name:	A3M00	A3M01	A3M02	A3M03	A3M04	A3M05	A3M06	A3M07	A3M08	A3M09	A3M10	A3M11	A3M12	A3M13	A3M14	A3M15	A3M16	A3M17	A3M18	A3M19	A3M20
			Sample Location:	PW-01	PW-02	PW-03	PW-04	PW-05	PW-06	PW-07	PW-08	PW-09	PW-09	PW-10	PW-11	PW-12	PW-13	PW-14	PW-15	PW-16	PW-17	PW-18	PW-19	PW-20
			Station ID:	PW-01-072210AX	PW-02-072210AX	PW-03-072210AX	PW-04-072210AX	PW-05-072210AX	PW-06-072210AX	PW-07-072210AX	PW-08-072210AX	PW-09-072210AD	PW-09-072210AX	PW-10-072210AX	PW-11-072210AX	PW-12-072210AX	PW-13-072210AX	PW-14-072210AX	PW-15-072210AX	PW-16-072210AX	PW-17-072210AX	PW-18-072210AX	PW-19-072210AX	PW-20-072210AX
Chemical	**CRQL**	**VT**	**MCL**																					
1,1,1-Trichloroethane	5	200	200	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	5	5	5	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5	70		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	7	7	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-Trichlorobenzene	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	5	70	70	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	5		0.2	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	5	600	600	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	5	5	5	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	5	5	5	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	5	600		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	5	75	75	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dioxane	100			100 U	100 U	100 U	100 U	100 U	200 U	100 U	100 U	100 U	100 U	100 U	400 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
2-Butanone	10	4200		10 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10			10 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10			10 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10	700		10 U	10 U	10 U	10 U	10 U	20 U	10 U	10 U	10 U	10 U	10 U	40 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	5	5	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromochloromethane	5	90		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	5	80		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromomethane	5	10		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5	5	5	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	100	100	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	5	80	80	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	5	30		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	5	70	70	5 U	5 U	5 U	5 U	5 U	**830 D**	13	**260 D**	**120**	**210 D**	21	**1700 D**	5 U	5 U	5 U	4.9 J	**270 D**	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyclohexane	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	5	80		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	5	1000		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	5	700	700	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Isopropylbenzene	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
m,p-Xylene	5	10000	10000	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl acetate	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl tert-butyl ether	5	40	35	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene chloride	5	5		3.7 JB	3.8 JB	4.1 JB	4.2 JB	4.7 JB	**8.3 JB**	3.6 JB	4.9 JB	2.8 JB	5 U	5 U	**13 JB**	5 U	5 U	2.7 JB	3 JB	2.5 JB	3.4 JB	5 U	**5.6 B**	5 JB
o-Xylene	5	10000	10000	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5	100	100	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	5	5	5	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	5	1000	1000	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	5	100	100	5 U	5 U	5 U	5 U	5 U	8.8 J	5 U	5 U	5 U	5 U	5 U	10 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	5			5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene	5	5	5	5 U	5 U	5 U	3.7 J	5 U	**9.1 J**	5 U	**41**	5 U	5 U	5 U	**1100 D**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5	2100		5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	5 U	5 U	20 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	5	2	2	5 U	5 U	5 U	5 U	5 U	10 U	**88**	**4.2 J**	**170**	**180**	5 U	**33**	5 U	5 U	5 U	5 U	**64**	5 U	5 U	5 U	5 U
			Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
			Sample Date:	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10	22-Jul-10

Notes:
1. U = below detection limit, J = quantitation approximate, B = compound found in associated lab blank, D = diluted sample result, CRQL = Contract Required Quantitation Limit.
2. VT GWPR = Vermont Groundwater Protection Rule standard.
3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.
4. **Bold** and shaded indicates exceedance of VT GWPR/MCL.
5. All concentrations listed in micrograms per liter (µg/L).

Table 3-5
2010 Groundwater Vertical Profiling TCE Statistical Summary by Location
Commerce Street Plume Superfund Site
Williston, Vermont

	Freq. Det.	% Detect	Average Detection	Max (depth)	Min (depth)	St. Dev.
VP-01	7 / 7	100%	89	229 (40)	5.5 (20)	91
VP-02	0 / 7	0%				
VP-03	7 / 7	100%	1.2	2.3 (30)	0.1 (10)	0.9
VP-04	7 / 7	100%	37	200 (40)	0.7 (12)	73
VP-05	6 / 7	86%	2.1	4.9 (20)	0.04 (35)	2.2
VP-06	6 / 6	100%	34	121 (35)	0.4 (15)	51
VP-07	6 / 7	86%	11	29 (30)	0.3 (35)	13
VP-08	6 / 7	86%	12	35 (35)	1.3 (20)	14
VP-09	6 / 7	86%	70	206 (35)	1.5 (15)	98
VP-10	5 / 7	71%	72	254 (40)	0.2 (20)	106
VP-11	6 / 6	100%	332	1,590 (35)	0.2 (15)	625
VP-12	6 / 6	100%	143	544 (30)	0.4 (15)	208
VP-13	6 / 7	86%	431	1,525 (40)	0.6 (15)	606
VP-14	5 / 6	83%	1,283	5,980 (40)	0.8 (20)	2,629
VP-15	5 / 7	71%	5,218	20,000 (40)	0.8 (20)	8,661
VP-16	5 / 7	71%	16,173	61,000 (40)	4.7 (20)	26,339
VP-17	5 / 7	71%	1,243	4,400 (35)	0.5 (20)	1,822
VP-18	4 / 5	80%	2,044	5,400 (35)	9.1 (20)	2,579
VP-19	7 / 7	100%	7,430	29,000 (35)	0.2 (15)	10,813
VP-20	5 / 6	83%	18,489	44,000 (35)	5.8 (20)	22,394
VP-21	4 / 6	67%	311	1,210 (30)	0.2 (35)	600
VP-22	6 / 6	100%	71	261 (25)	2.1 (35)	103
VP-23	6 / 7	86%	79	463 (30)	0.2 (41)	188
VP-24	6 / 6	100%	1,547	3,920 (25)	1.4 (40)	1,814
VP-25	4 / 7	57%	10	20 (35)	0.48 (20)	10
VP-26	7 / 7	100%	1,236	5,700 (35)	0.26 (15)	2,091
VP-27	6 / 7	86%	430	1,400 (40)	1.2 (20)	542
VP-28	5 / 6	83%	1,232	4,900 (35)	9 (20)	2,100
VP-29	1 / 6	17%	2.4	2.4 (30)	2.4 (30)	
VP-30	0 / 7	0%				
VP-31	6 / 6	100%	3.1	10 (40)	0.7 (30)	3.5

Notes:
1. All concentrations in micrograms per liter (ug/L)
2. All depths in feet below ground surface (ft-bgs)

Table 3-6
2010 Soil Sampling TCE Statistical Summary by Location
Commerce Street Plume Superfund Site
Williston, Vermont

	Freq. Det.	% Detect	Average Detection	Max (depth)	Min (depth)	St. Dev.
SB-01	2 / 7	29%	36	66 (44.5 - 45)	6 (22 - 22.5)	42
SB-02	4 / 9	44%	3,926	12,500 (37.5 - 38)	2 (22.5 - 23)	5,808
SB-03	5 / 9	56%	3,606	7,900 (34.5 - 35)	1 (17 - 17.5)	3,671
SB-04	2 / 7	29%	1,445	1,710 (40.5 - 41)	1,180 (24.5 - 25)	375
SB-05	1 / 6	17%	690	690 (25 - 35)	690 (25 - 35)	
SB-06	4 / 10	40%	16	22 (23 - 23.5)	7 (32.5 - 33)	6
SB-07	1 / 5	20%	1,200	1,200 (15 - 45)*	1,200 (15 - 45)	

Notes:
1. All concentrations in micrograms per killigram (µg/Kg)
2. All depths in feet below ground surface (ft-bgs)
3. * = composite sample due to very poor recovery throughout boring.

Table 4-1
Groundwater Velocities in Intermediate/Deep Overburden Groundwater
Commerce Street Plume Superfund Site
Williston, Vermont

Location	Groundwater Parameters					Groundwater Velocity	
	dh (ft)	dl (ft)	dh/dl	K (ft/day)	ne	(ft/day)	(ft/yr)
Between MW-01D and BM-03D	1.08	630	0.001714	3.8	0.2	0.033	11.9
Between MW-03D and ASI-16D2	2.9	502	0.005777	3.8	0.2	0.110	40.1
Between MW-04D and MW-06D	1.64	669	0.002451	3.8	0.2	0.047	17.0
Between ASI-05D2 and ASI-08D	3.93	541	0.007264	3.8	0.2	0.138	50.4
Between ASI-02D2 and MW-07M	5.45	397	0.013728	3.8	0.2	0.261	95.2
Between MW-10D and OE-02A	1.91	608	0.003141	3.8	0.2	0.060	21.8
					Average:	***0.108***	***39.4***

Notes:
dh = change in hydraulic head
dl = change in linear distance
dh/dl = hydraulic gradient
K = hydraulic conductivity
ne = effective porosity

Table 4-2
2010 Vertical Gradients in Overburden Groundwater
Commerce Street Plume Superfund Site
Williston, Vermont

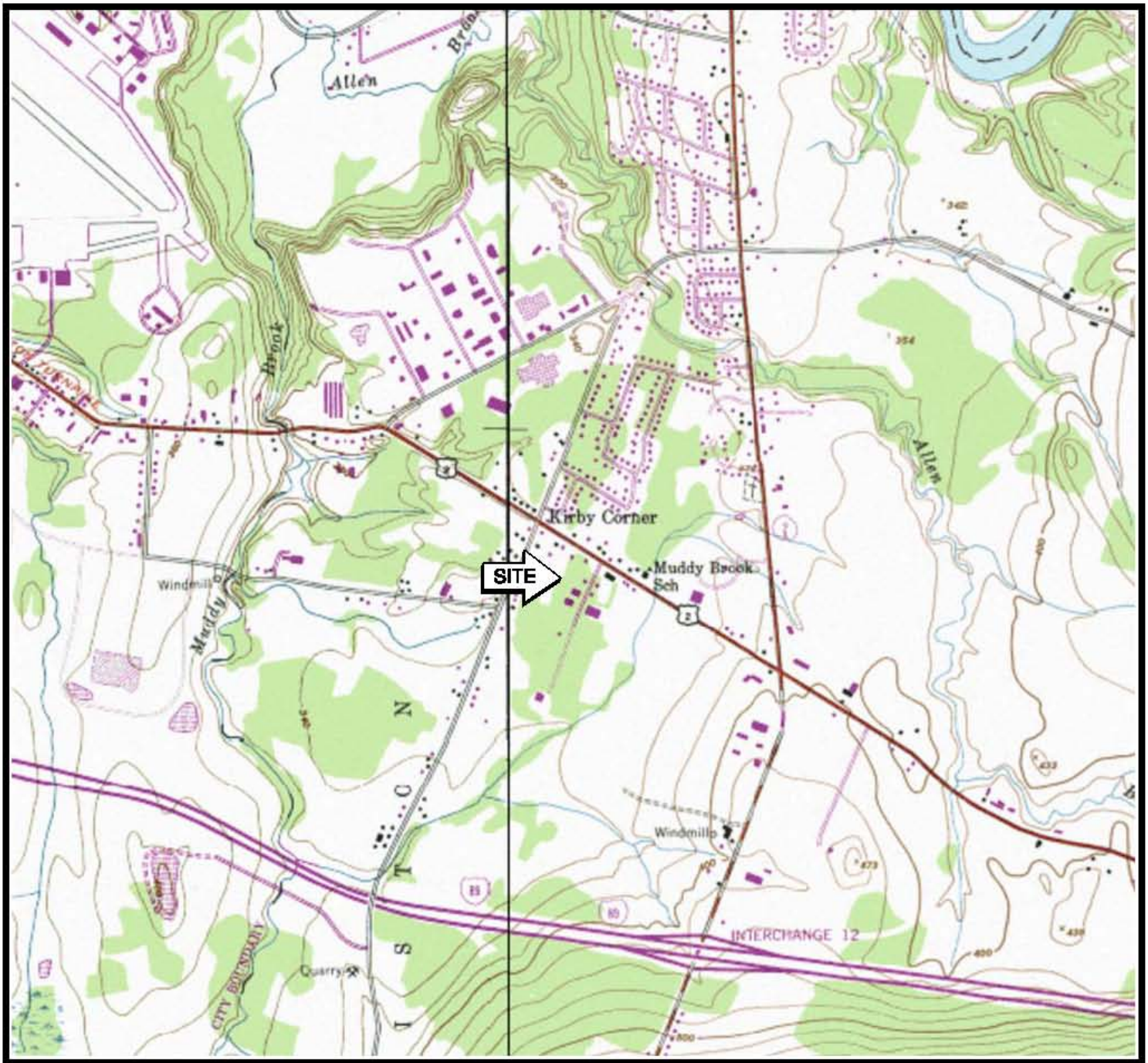
Couplet	Spring 2010		Fall 2010	
	Magnitude	Direction	Magnitude	Direction
ASI-02S/D2	0.03758	down	0.09567	up
ASI-03S/D2	0.02514	up	0.05544	up
ASI-04S/D2	0.02942	down	0.00512	down
ASI-05S/D2	0.02273	down	0.00876	up
ASI-08S/D	0.05143	down	0.05810	down
ASI-11S/D2	0.00887	up	0.00102	up
ASI-13S/D	0.01244	up	0.00356	down
ASI-14S/D2	0.08143	down	0.07357	down
ASI-15S/D2	0.09924	up	0.01344	down
ASI-16S/D2	0.00703	down	0.00541	up
ASI-22S/D	0.08046	up	0.09856	up
ASI-23S/D2	0.11970	up	0.08790	up
MW-08S/D	--	--	0.00000	down

Table 4-3
Historic TCE Concentration Changes in Intermediate/Deep Overburden and Bedrock Groundwater
Commerce Street Plume Superfund Site
Williston, Vermont

	1999/2000	Fall 2010	% Increase/Decrease
AL-02	0	16	100%
ASI-02D2	15,000	460	(97%)
ASI-03D2	900	8,900	889%
ASI-11D2	4,595	1,700	(63%)
ASI-14D2	2,000	3,200	60%
ASI-15D2	11,000	5,700	(48%)
ASI-16D2	11,000	5,400	(51%)
ASI-23D2	1,400	3,300	136%
BM-03D	1,900	170	(91%)
BR-01	2	56	2700%

Notes:
1. All concentrations in micrograms per liter (µg/L)
2. Numbers is parentheses indicate a decrease

FIGURES



NORTH

USGS TOPOGRAPHIC MAP

ESSEX JUNCTION, VERMONT

1987

APPROXIMATE SCALE
1 INCH = 2,000 FEET

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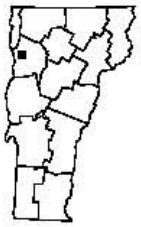

QUADRANGLE LOCATION

FIGURE 1-1

LOCUS MAP
96 COMMERCE STREET
SUPERFUND SITE
WILLISTON, VERMONT

PREPARED BY: ML	CHECKED BY: SH
PROJECT NO: 80036	DATE: June 2011 Rev 00

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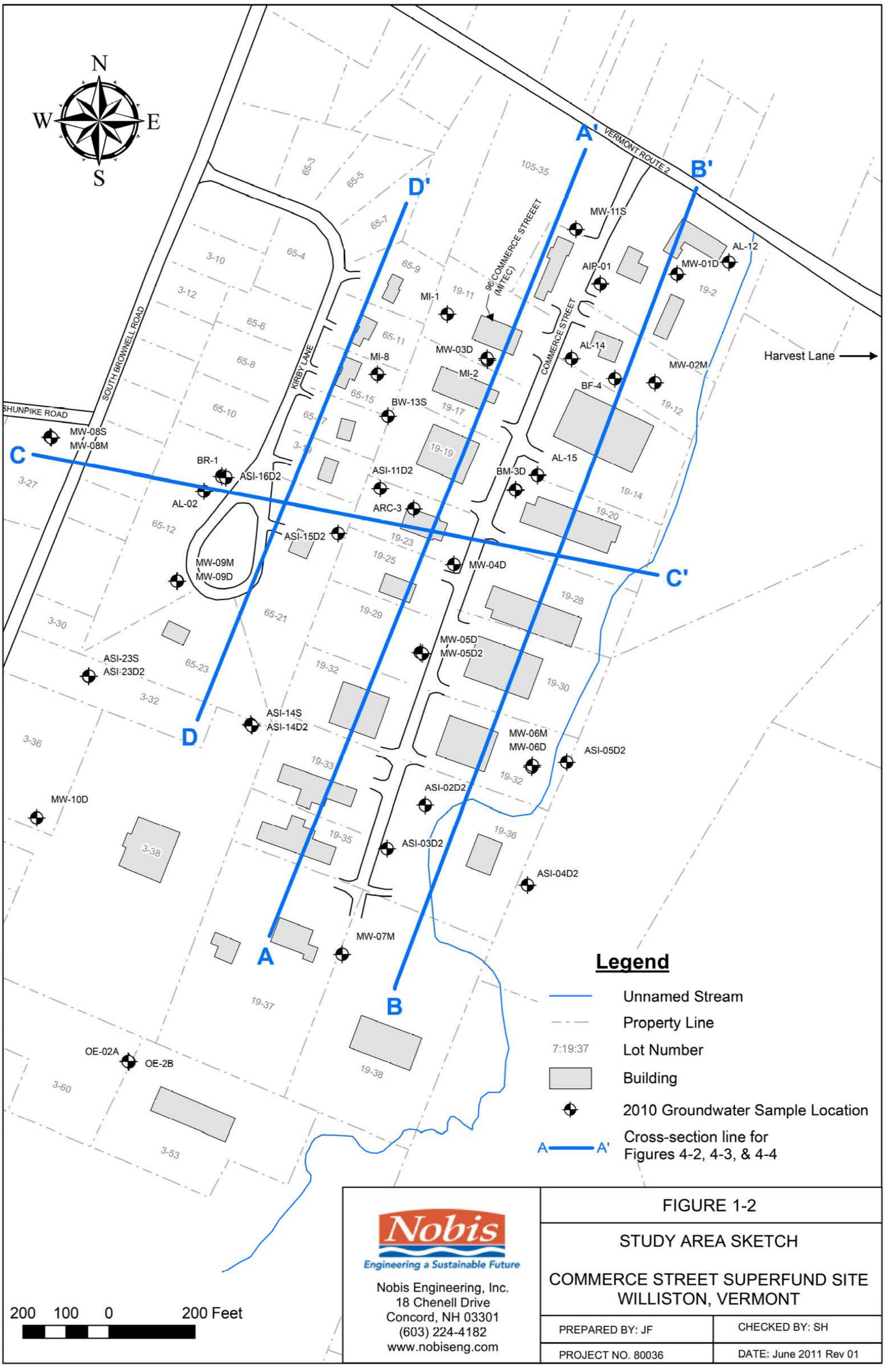

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FIGURE 1-2

STUDY AREA SKETCH

COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

PREPARED BY: JF	CHECKED BY: SH
PROJECT NO. 80036	DATE: June 2011 Rev 01

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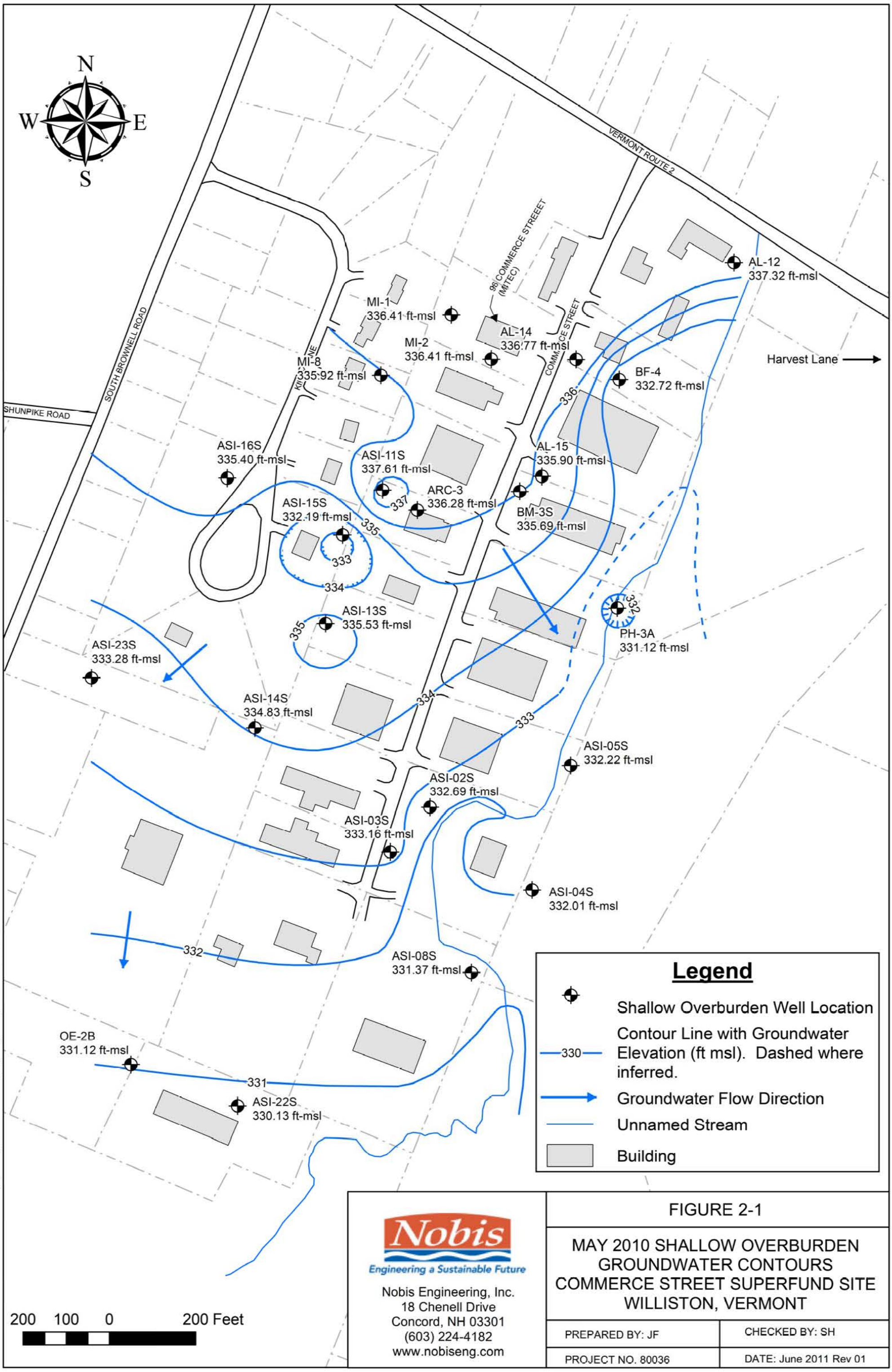
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VERMONT ROUTE 2
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
Harvest Lane
AL-12
337.32 ft-msl
MI-1
336.41 ft-msl
MI-2
336.41 ft-msl
AL-14
336.77 ft-msl
MI-8
335.92 ft-msl
BF-4
332.72 ft-msl
ASI-16S
335.40 ft-msl
ASI-11S
337.61 ft-msl
AL-15
335.90 ft-msl
ARC-3
336.28 ft-msl
ASI-15S
332.19 ft-msl
BM-3S
335.69 ft-msl
ASI-13S
335.53 ft-msl
PH-3A
331.12 ft-msl
ASI-23S
333.28 ft-msl
ASI-14S
334.83 ft-msl
ASI-05S
332.22 ft-msl
ASI-02S
332.69 ft-msl
ASI-03S
333.16 ft-msl
ASI-04S
332.01 ft-msl
ASI-08S
331.37 ft-msl
OE-2B
331.12 ft-msl
ASI-22S
330.13 ft-msl
336
337
335
333
334
332
331
Legend
Shallow Overburden Well Location
330
Contour Line with Groundwater Elevation (ft msl). Dashed where inferred.
Groundwater Flow Direction
Unnamed Stream
Building
200 100 0 200 Feet
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FIGURE 2-1
MAY 2010 SHALLOW OVERBURDEN GROUNDWATER CONTOURS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
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CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 01
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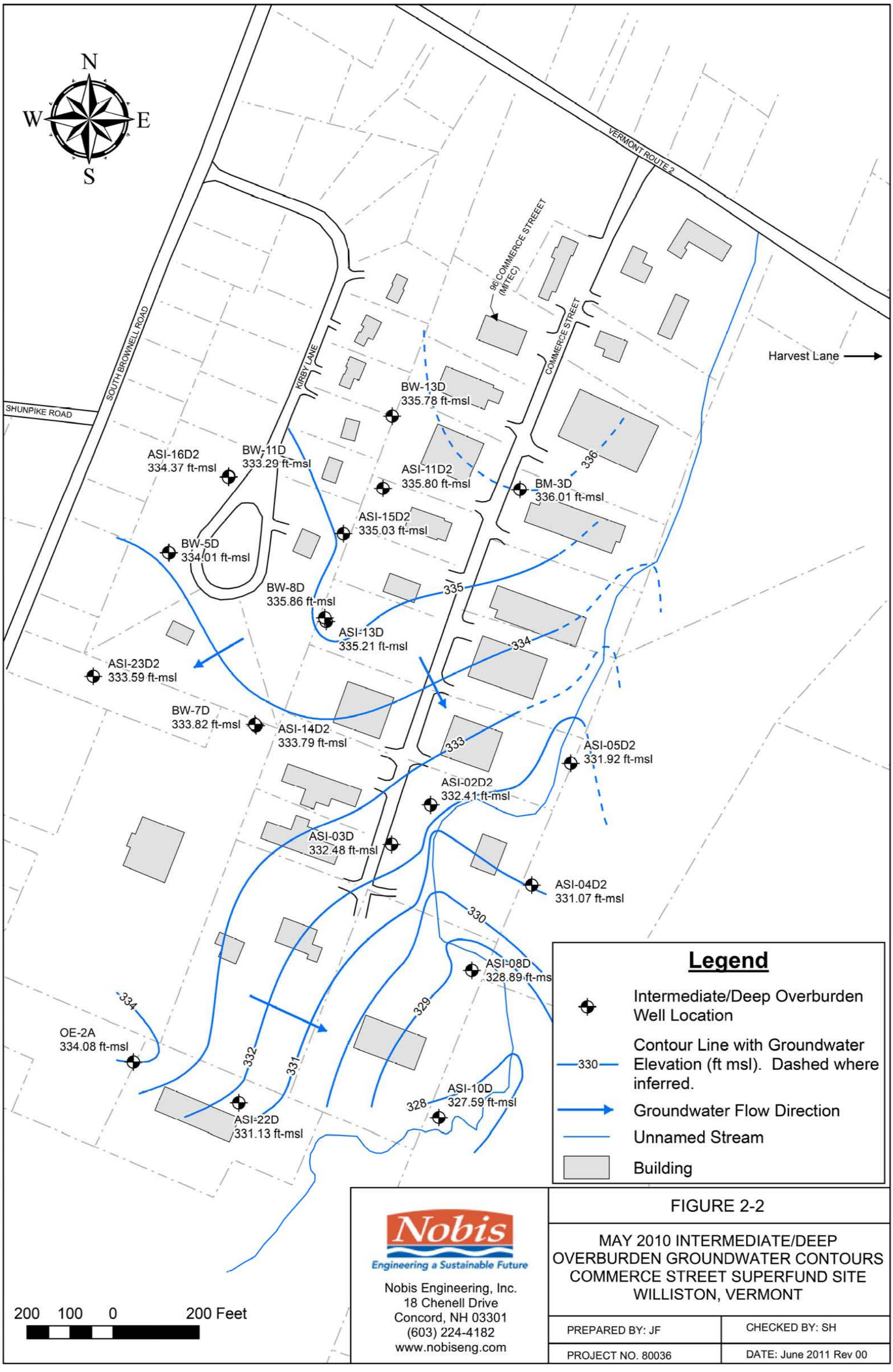
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VERMONT ROUTE 2
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
KIRBY LANE
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
Harvest Lane
BW-13D
335.78 ft-msl
ASI-16D2
334.37 ft-msl
BW-11D
333.29 ft-msl
ASI-11D2
335.80 ft-msl
BM-3D
336.01 ft-msl
ASI-15D2
335.03 ft-msl
BW-5D
334.01 ft-msl
BW-8D
335.86 ft-msl
ASI-13D
335.21 ft-msl
ASI-23D2
333.59 ft-msl
BW-7D
333.82 ft-msl
ASI-14D2
333.79 ft-msl
ASI-05D2
331.92 ft-msl
ASI-02D2
332.41 ft-msl
ASI-03D
332.48 ft-msl
ASI-04D2
331.07 ft-msl
ASI-08D
328.89 ft-msl
OE-2A
334.08 ft-msl
ASI-22D
331.13 ft-msl
ASI-10D
327.59 ft-msl
336
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334
333
332
331
330
329
328
Legend
Intermediate/Deep Overburden Well Location
Contour Line with Groundwater Elevation (ft msl). Dashed where inferred.
Groundwater Flow Direction
Unnamed Stream
Building
200 100 0 200 Feet
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FIGURE 2-2
MAY 2010 INTERMEDIATE/DEEP OVERBURDEN GROUNDWATER CONTOURS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
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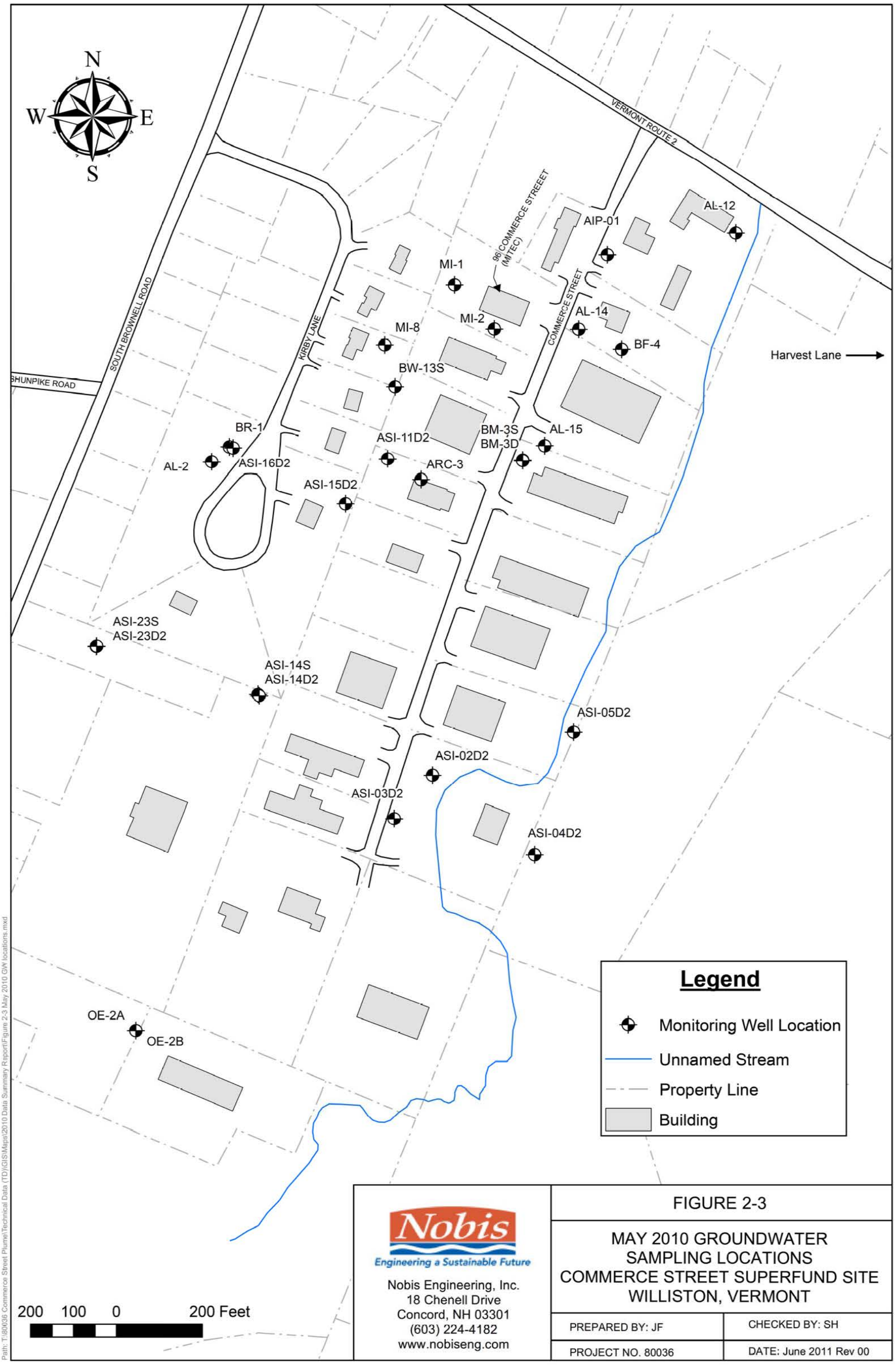
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VERMONT ROUTE 2
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
KIRBY LANE
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
Harvest Lane
AL-12
AIP-01
MI-1
MI-2
MI-8
AL-14
BF-4
BW-13S
BR-1
AL-2
ASI-16D2
ASI-11D2
BM-3S
BM-3D
AL-15
ARC-3
ASI-15D2
ASI-23S
ASI-23D2
ASI-14S
ASI-14D2
ASI-05D2
ASI-02D2
ASI-03D2
ASI-04D2
OE-2A
OE-2B
Legend
Monitoring Well Location
Unnamed Stream
Property Line
Building
200 100 0 200 Feet
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FIGURE 2-3
MAY 2010 GROUNDWATER SAMPLING LOCATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
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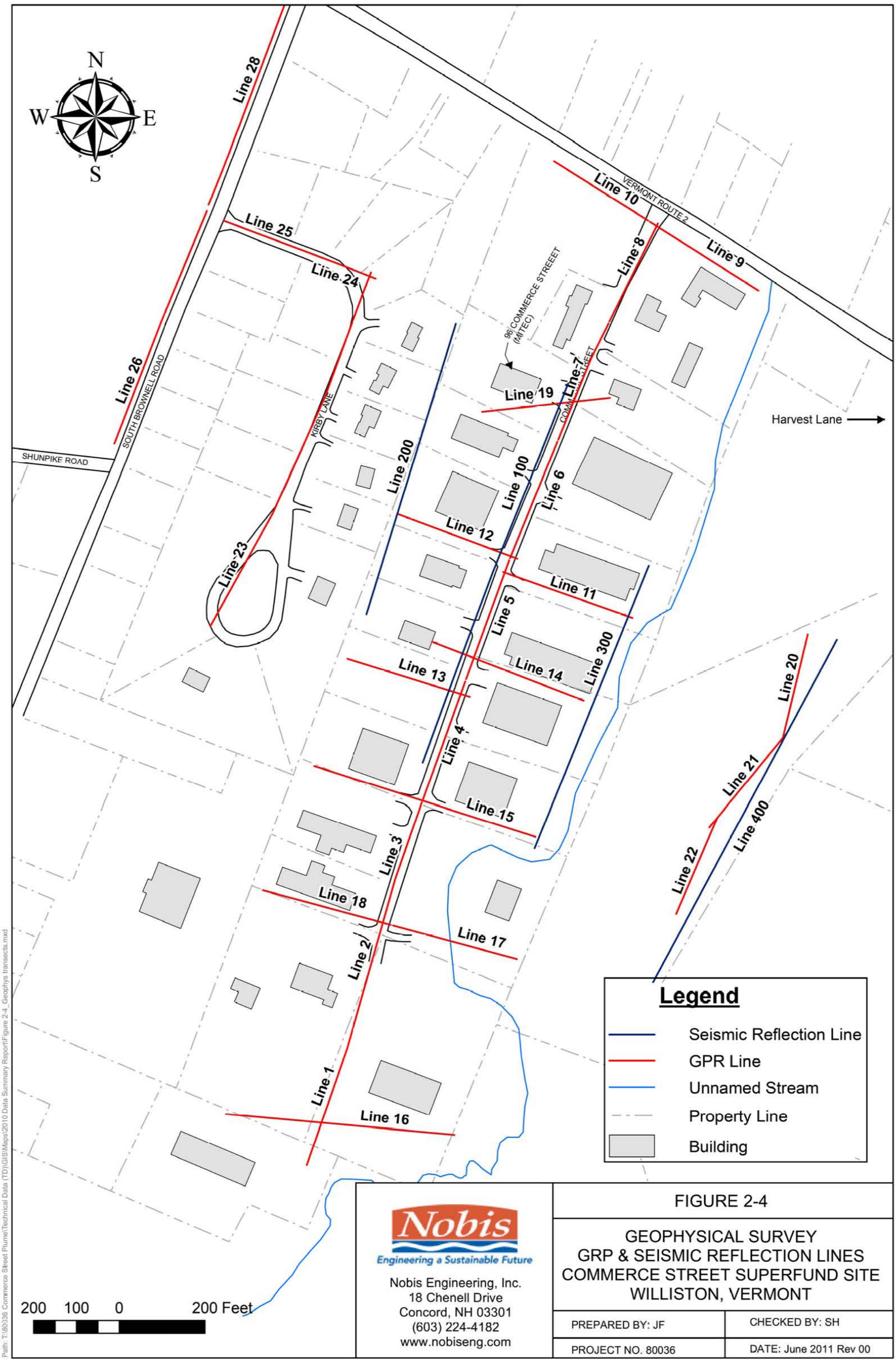

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FIGURE 2-4

GEOPHYSICAL SURVEY
GRP & SEISMIC REFLECTION LINES
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

PREPARED BY: JF	CHECKED BY: SH
PROJECT NO. 80036	DATE: June 2011 Rev 00

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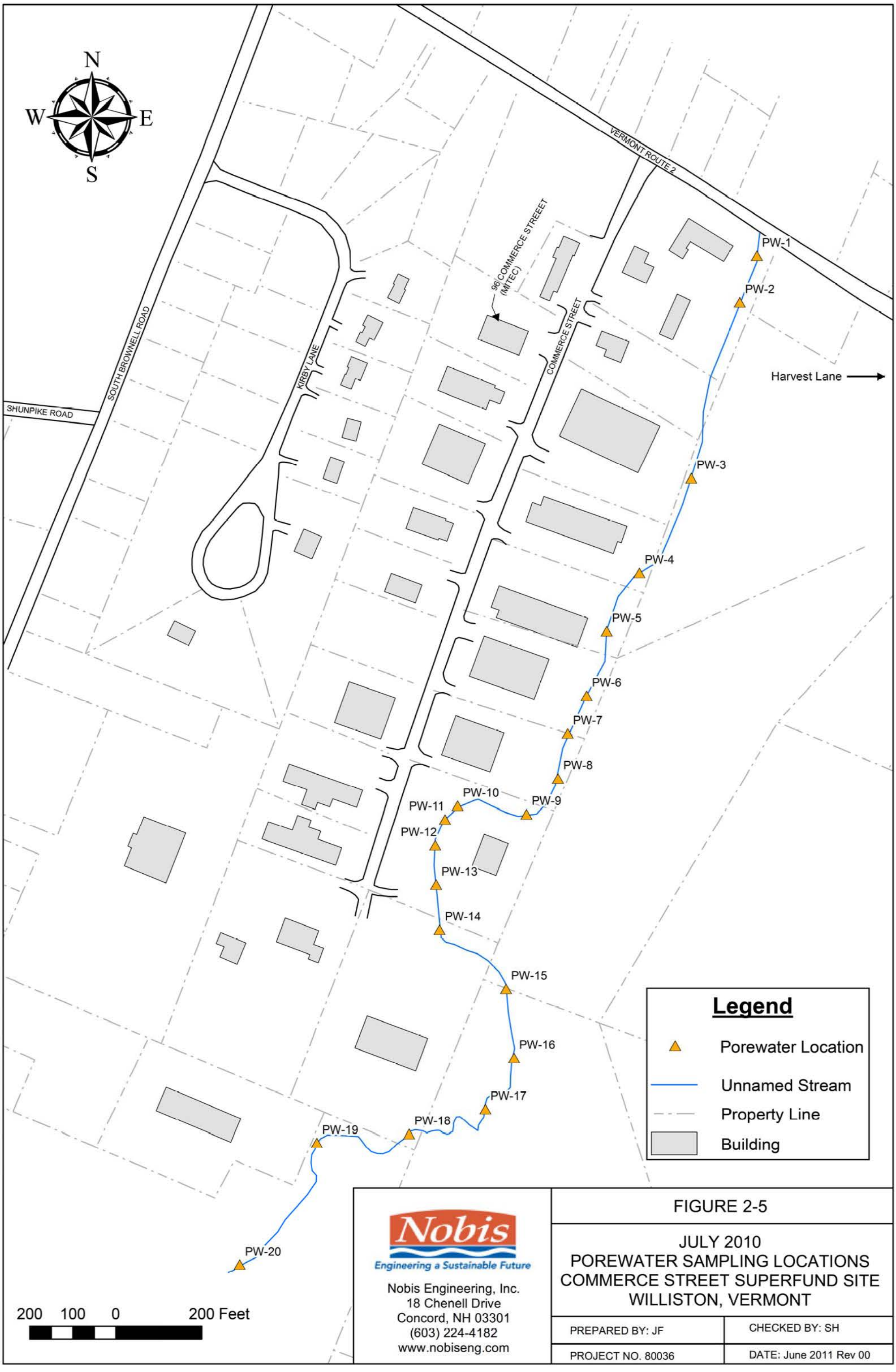
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VERMONT ROUTE 2
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
KIRBY LANE
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
Harvest Lane
PW-1
PW-2
PW-3
PW-4
PW-5
PW-6
PW-7
PW-8
PW-9
PW-10
PW-11
PW-12
PW-13
PW-14
PW-15
PW-16
PW-17
PW-18
PW-19
PW-20
Legend
Porewater Location
Unnamed Stream
Property Line
Building
200 100 0 200 Feet
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FIGURE 2-5
JULY 2010
POREWATER SAMPLING LOCATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
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CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 00
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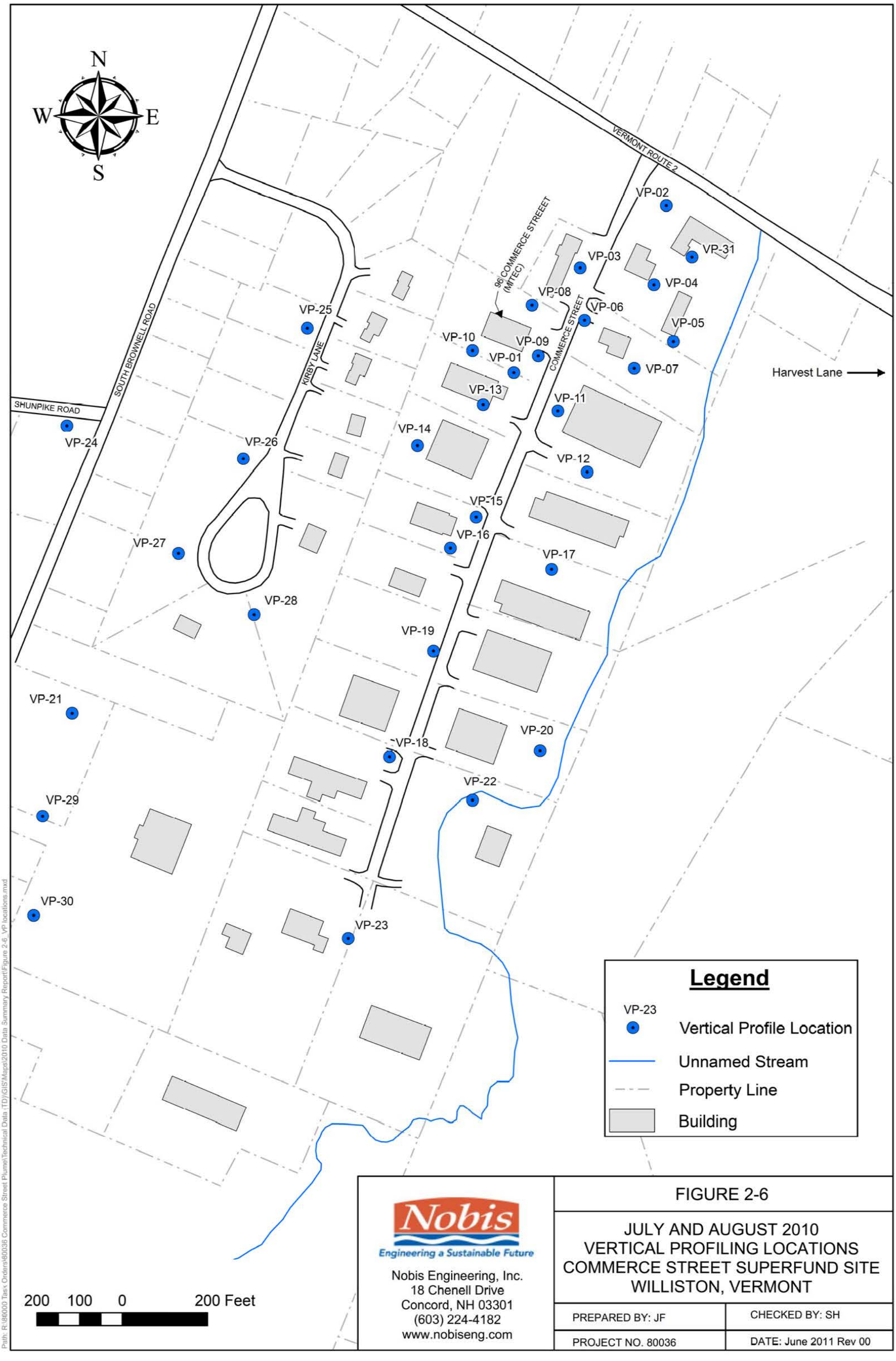
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VERMONT ROUTE 2
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
KIRBY LANE
COMMERCE STREEET
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
Harvest Lane
VP-01
VP-02
VP-03
VP-04
VP-05
VP-06
VP-07
VP-08
VP-09
VP-10
VP-11
VP-12
VP-13
VP-14
VP-15
VP-16
VP-17
VP-18
VP-19
VP-20
VP-21
VP-22
VP-23
VP-24
VP-25
VP-26
VP-27
VP-28
VP-29
VP-30
VP-31
Legend
VP-23
Vertical Profile Location
Unnamed Stream
Property Line
Building
200 100 0 200 Feet
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FIGURE 2-6
JULY AND AUGUST 2010
VERTICAL PROFILING LOCATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: R:\80000 Task Orders\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 2-6_VP locations.mxd

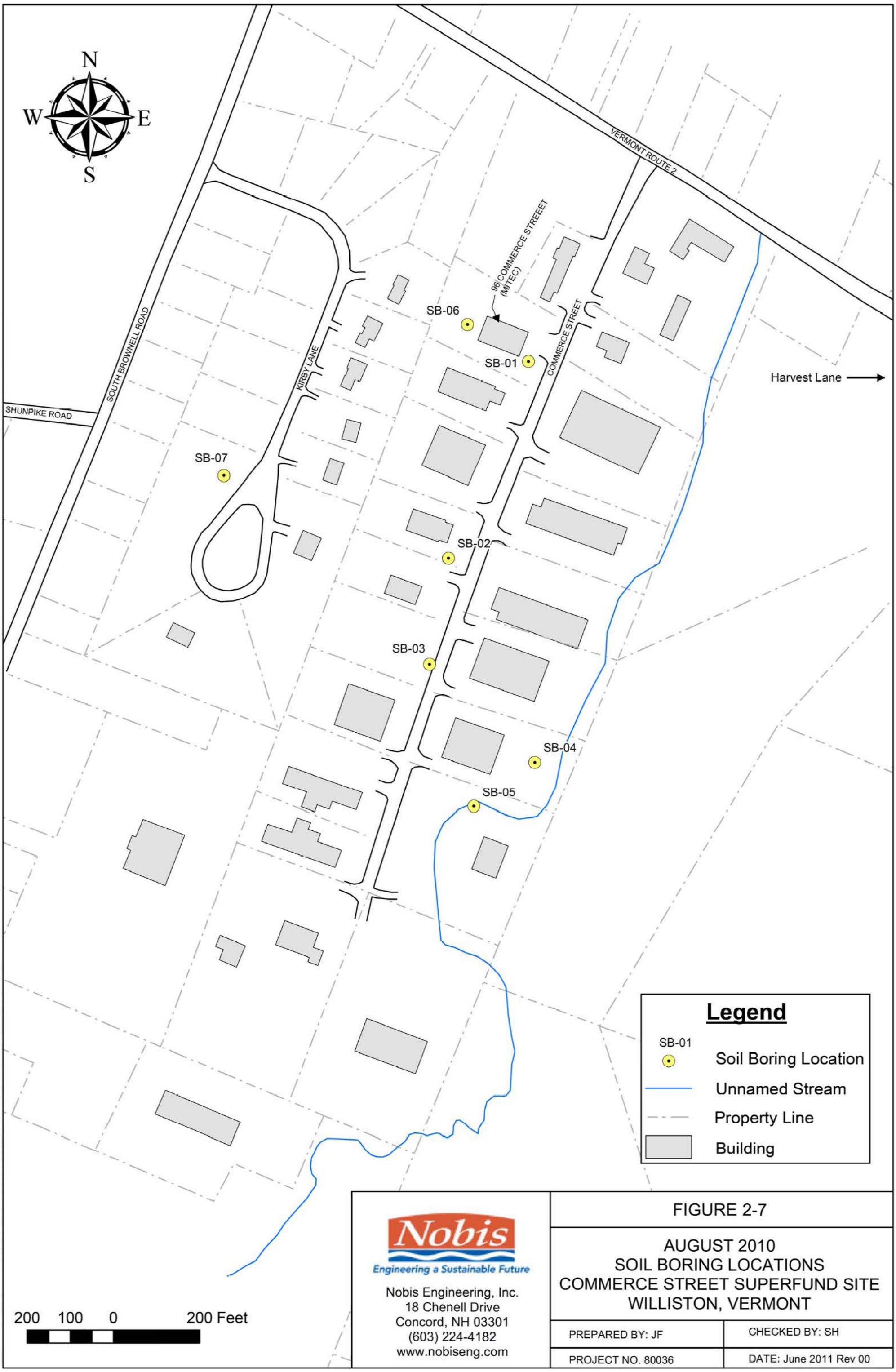

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FIGURE 2-7

AUGUST 2010
SOIL BORING LOCATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

PREPARED BY: JF	CHECKED BY: SH
PROJECT NO. 80036	DATE: June 2011 Rev 00

Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 2-7_SB locations.mxd

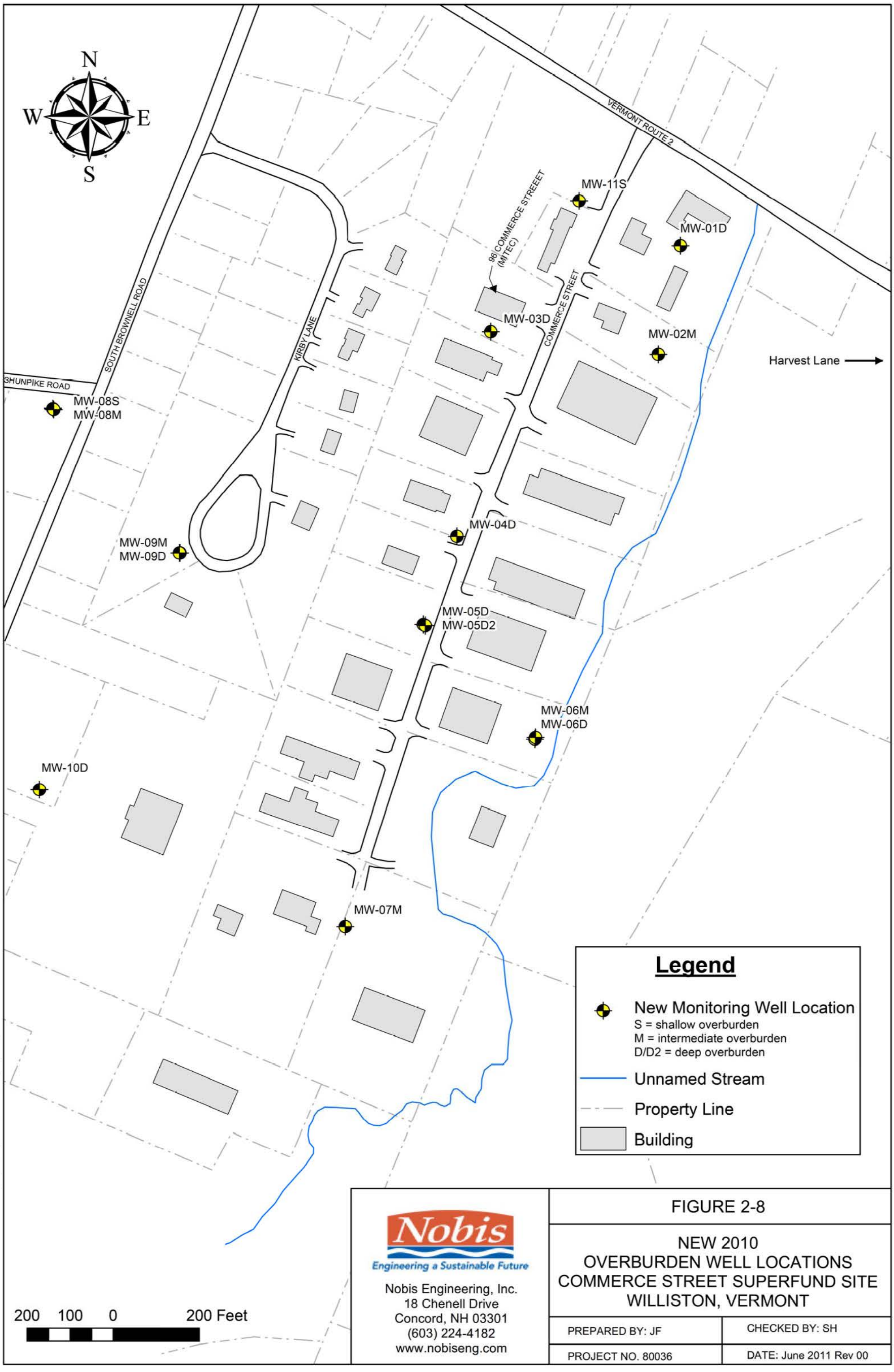
N
W
E
S
VERMONT ROUTE 2
96 COMMERCE STREEET (MITEC)
MW-11S
MW-01D
COMMERCE STREET
MW-03D
MW-02M
KIRBY LANE
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
Harvest Lane
MW-08S
MW-08M
MW-04D
MW-09M
MW-09D
MW-05D
MW-05D2
MW-06M
MW-06D
MW-10D
MW-07M
Legend
New Monitoring Well Location
S = shallow overburden
M = intermediate overburden
D/D2 = deep overburden
Unnamed Stream
Property Line
Building
200 100 0 200 Feet
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FIGURE 2-8
NEW 2010
OVERBURDEN WELL LOCATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Raport\Figure 2-8 New 2010 GW locations.mxd

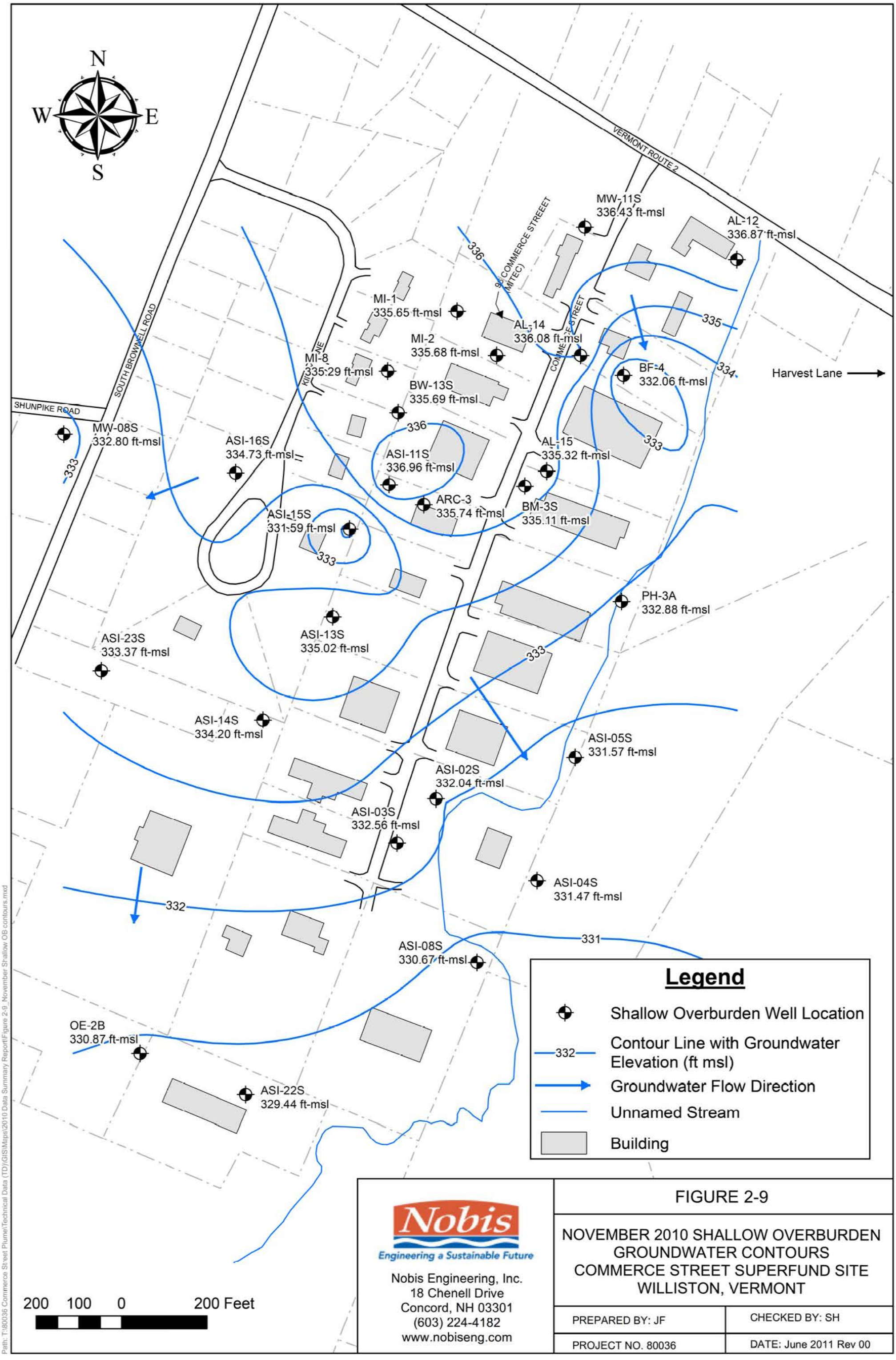
N
W
E
S
VERMONT ROUTE 2
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
COMMERCE STREEET
(MITEC)
COMMERCE STREET
Harvest Lane
MW-11S
336.43 ft-msl
AL-12
336.87 ft-msl
MI-1
335.65 ft-msl
AL-14
336.08 ft-msl
MI-2
335.68 ft-msl
MI-8
335.29 ft-msl
BW-13S
335.69 ft-msl
BF-4
332.06 ft-msl
MW-08S
332.80 ft-msl
ASI-16S
334.73 ft-msl
ASI-11S
336.96 ft-msl
AL-15
335.32 ft-msl
ARC-3
335.74 ft-msl
BM-3S
335.11 ft-msl
ASI-15S
331.59 ft-msl
PH-3A
332.88 ft-msl
ASI-13S
335.02 ft-msl
ASI-23S
333.37 ft-msl
ASI-14S
334.20 ft-msl
ASI-05S
331.57 ft-msl
ASI-02S
332.04 ft-msl
ASI-03S
332.56 ft-msl
ASI-04S
331.47 ft-msl
ASI-08S
330.67 ft-msl
OE-2B
330.87 ft-msl
ASI-22S
329.44 ft-msl
336
335
334
333
332
331
Legend
Shallow Overburden Well Location
Contour Line with Groundwater Elevation (ft msl)
Groundwater Flow Direction
Unnamed Stream
Building
200 100 0 200 Feet
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FIGURE 2-9
NOVEMBER 2010 SHALLOW OVERBURDEN GROUNDWATER CONTOURS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
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PROJECT NO. 80036
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Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 2-9_November Shallow OB contours.mxd

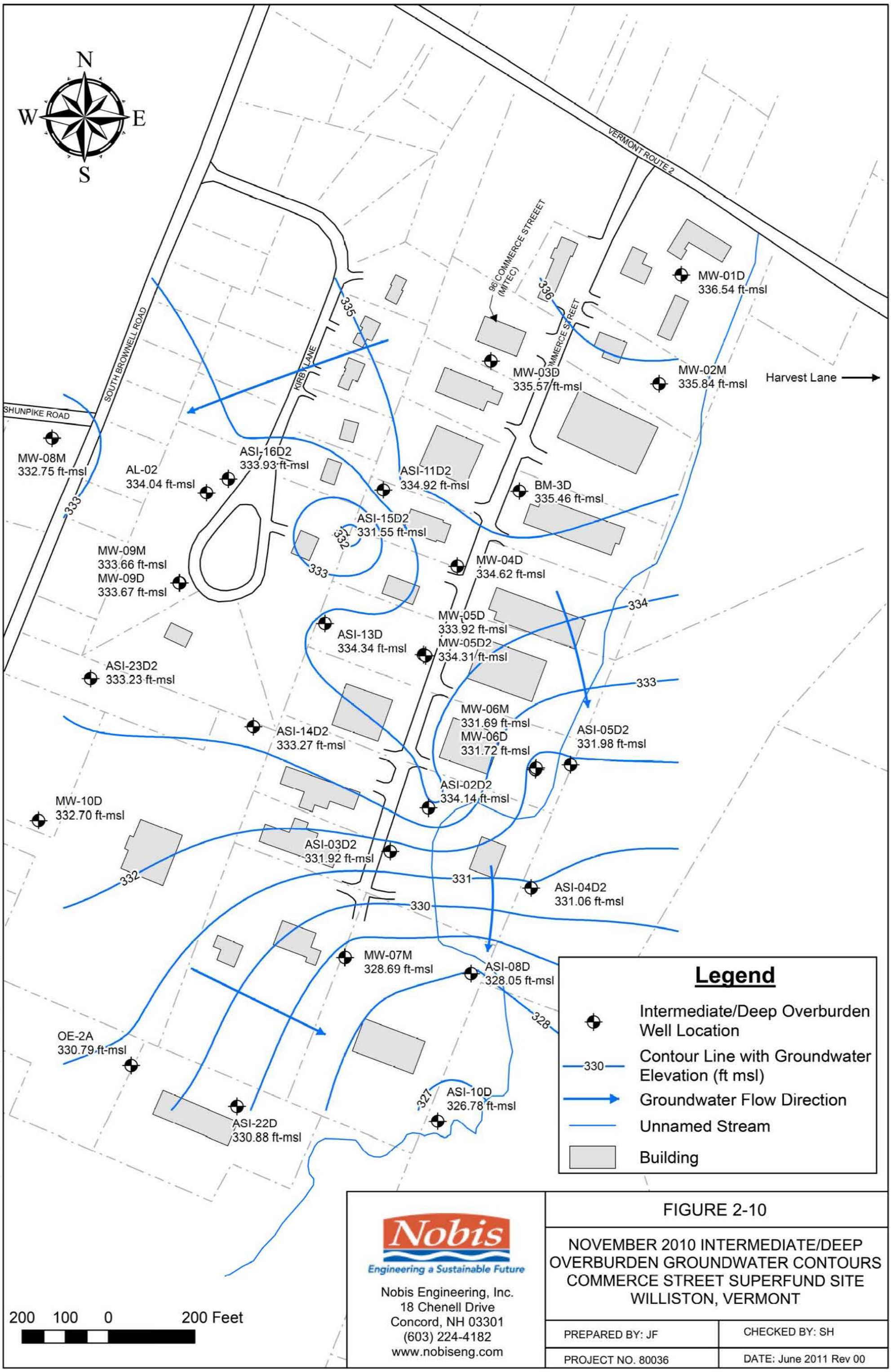
N
W
E
S
VERMONT ROUTE 2
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
KIRBY LANE
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
Harvest Lane
MW-01D
336.54 ft-msl
MW-02M
335.84 ft-msl
MW-03D
335.57 ft-msl
MW-08M
332.75 ft-msl
AL-02
334.04 ft-msl
ASI-16D2
333.93 ft-msl
ASI-11D2
334.92 ft-msl
BM-3D
335.46 ft-msl
ASI-15D2
331.55 ft-msl
MW-09M
333.66 ft-msl
MW-09D
333.67 ft-msl
MW-04D
334.62 ft-msl
MW-05D
333.92 ft-msl
MW-05D2
334.31 ft-msl
ASI-13D
334.34 ft-msl
ASI-23D2
333.23 ft-msl
MW-06M
331.69 ft-msl
MW-06D
331.72 ft-msl
ASI-14D2
333.27 ft-msl
ASI-05D2
331.98 ft-msl
ASI-02D2
334.14 ft-msl
MW-10D
332.70 ft-msl
ASI-03D2
331.92 ft-msl
ASI-04D2
331.06 ft-msl
MW-07M
328.69 ft-msl
ASI-08D
328.05 ft-msl
OE-2A
330.79 ft-msl
ASI-22D
330.88 ft-msl
ASI-10D
326.78 ft-msl
336
335
334
333
332
331
330
328
327
Legend
Intermediate/Deep Overburden Well Location
330 Contour Line with Groundwater Elevation (ft msl)
Groundwater Flow Direction
Unnamed Stream
Building
200 100 0 200 Feet
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FIGURE 2-10
NOVEMBER 2010 INTERMEDIATE/DEEP OVERBURDEN GROUNDWATER CONTOURS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
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PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 2-10_November Deep OB contours.mxd

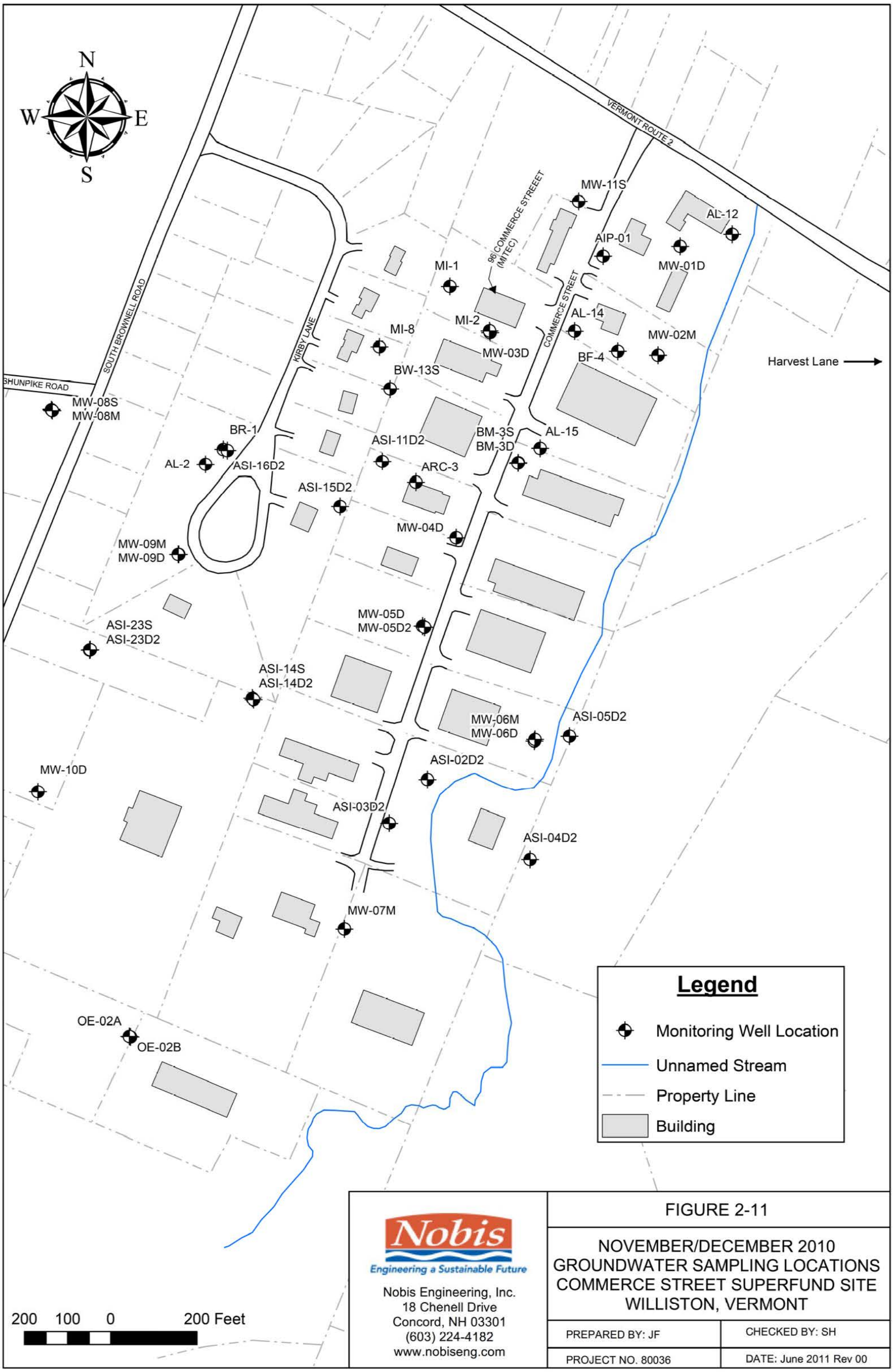
N
W
E
S
VERMONT ROUTE 2
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
KIRBY LANE
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
Harvest Lane
MW-11S
AL-12
AIP-01
MW-01D
MI-1
MI-2
MI-8
AL-14
MW-02M
MW-03D
BF-4
BW-13S
MW-08S
MW-08M
BR-1
ASI-11D2
BM-3S
BM-3D
AL-15
AL-2
ASI-16D2
ARC-3
ASI-15D2
MW-04D
MW-09M
MW-09D
MW-05D
MW-05D2
ASI-23S
ASI-23D2
ASI-14S
ASI-14D2
MW-06M
MW-06D
ASI-05D2
ASI-02D2
MW-10D
ASI-03D2
ASI-04D2
MW-07M
OE-02A
OE-02B
Legend
Monitoring Well Location
Unnamed Stream
Property Line
Building
200 100 0 200 Feet
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FIGURE 2-11
NOVEMBER/DECEMBER 2010
GROUNDWATER SAMPLING LOCATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
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PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 2-11 November 2010 GW locations.mxd

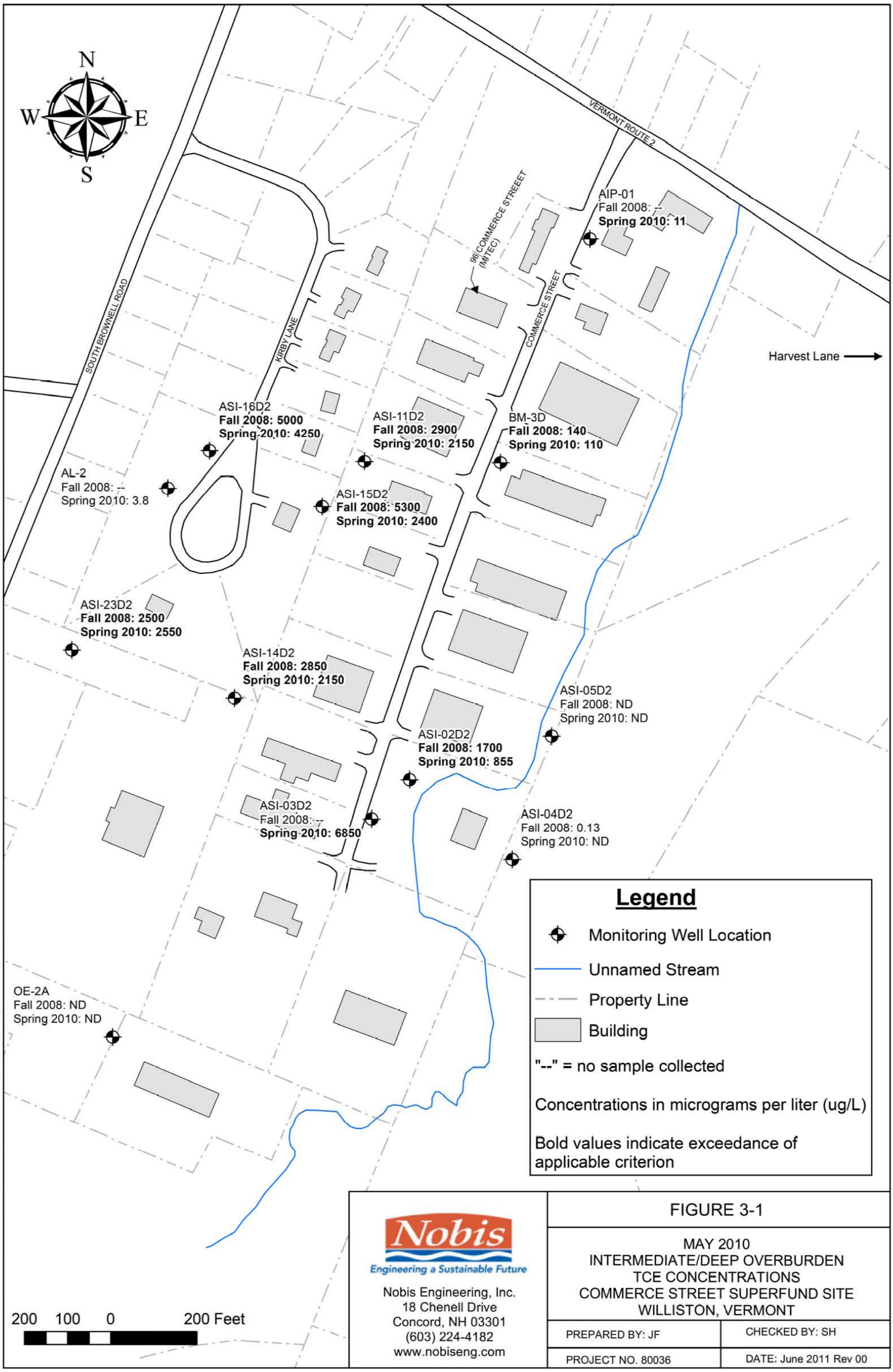
N
W
E
S
VERMONT ROUTE 2
SOUTH BROWNELL ROAD
KIRBY LANE
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
Harvest Lane
AIP-01
Fall 2008: --
Spring 2010: 11
ASI-16D2
Fall 2008: 5000
Spring 2010: 4250
ASI-11D2
Fall 2008: 2900
Spring 2010: 2150
BM-3D
Fall 2008: 140
Spring 2010: 110
AL-2
Fall 2008: --
Spring 2010: 3.8
ASI-15D2
Fall 2008: 5300
Spring 2010: 2400
ASI-23D2
Fall 2008: 2500
Spring 2010: 2550
ASI-14D2
Fall 2008: 2850
Spring 2010: 2150
ASI-05D2
Fall 2008: ND
Spring 2010: ND
ASI-02D2
Fall 2008: 1700
Spring 2010: 855
ASI-03D2
Fall 2008: --
Spring 2010: 6850
ASI-04D2
Fall 2008: 0.13
Spring 2010: ND
OE-2A
Fall 2008: ND
Spring 2010: ND
Legend
Monitoring Well Location
Unnamed Stream
Property Line
Building
"--" = no sample collected
Concentrations in micrograms per liter (ug/L)
Bold values indicate exceedance of applicable criterion
200 100 0 200 Feet
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FIGURE 3-1
MAY 2010
INTERMEDIATE/DEEP OVERBURDEN
TCE CONCENTRATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
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PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 3-1_May 2010 Deep OB TCE.mxd

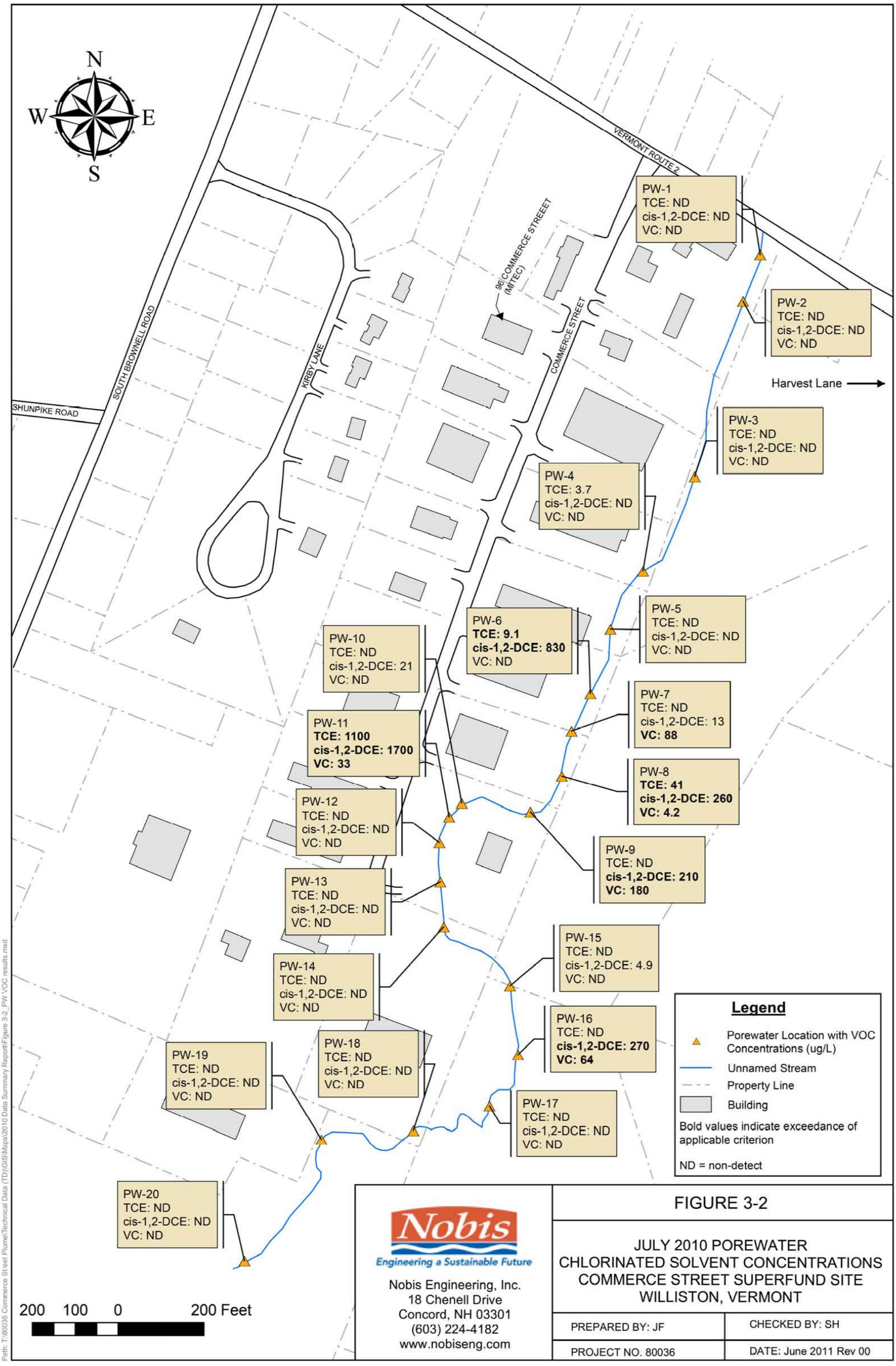
N
W
E
S
VERMONT ROUTE 2
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
KIRBY LANE
COMMERCE STREEET
96 COMMERCE STREET (MTEC)
COMMERCE STREET
Harvest Lane
PW-1
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-2
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-3
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-4
TCE: 3.7
cis-1,2-DCE: ND
VC: ND
PW-5
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-6
TCE: 9.1
cis-1,2-DCE: 830
VC: ND
PW-7
TCE: ND
cis-1,2-DCE: 13
VC: 88
PW-8
TCE: 41
cis-1,2-DCE: 260
VC: 4.2
PW-9
TCE: ND
cis-1,2-DCE: 210
VC: 180
PW-10
TCE: ND
cis-1,2-DCE: 21
VC: ND
PW-11
TCE: 1100
cis-1,2-DCE: 1700
VC: 33
PW-12
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-13
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-14
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-15
TCE: ND
cis-1,2-DCE: 4.9
VC: ND
PW-16
TCE: ND
cis-1,2-DCE: 270
VC: 64
PW-17
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-18
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-19
TCE: ND
cis-1,2-DCE: ND
VC: ND
PW-20
TCE: ND
cis-1,2-DCE: ND
VC: ND
Legend
Porewater Location with VOC Concentrations (ug/L)
Unnamed Stream
Property Line
Building
Bold values indicate exceedance of applicable criterion
ND = non-detect
200 100 0 200 Feet
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FIGURE 3-2
JULY 2010 POREWATER
CHLORINATED SOLVENT CONCENTRATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
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PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 3-2_PW VOC results.mxd

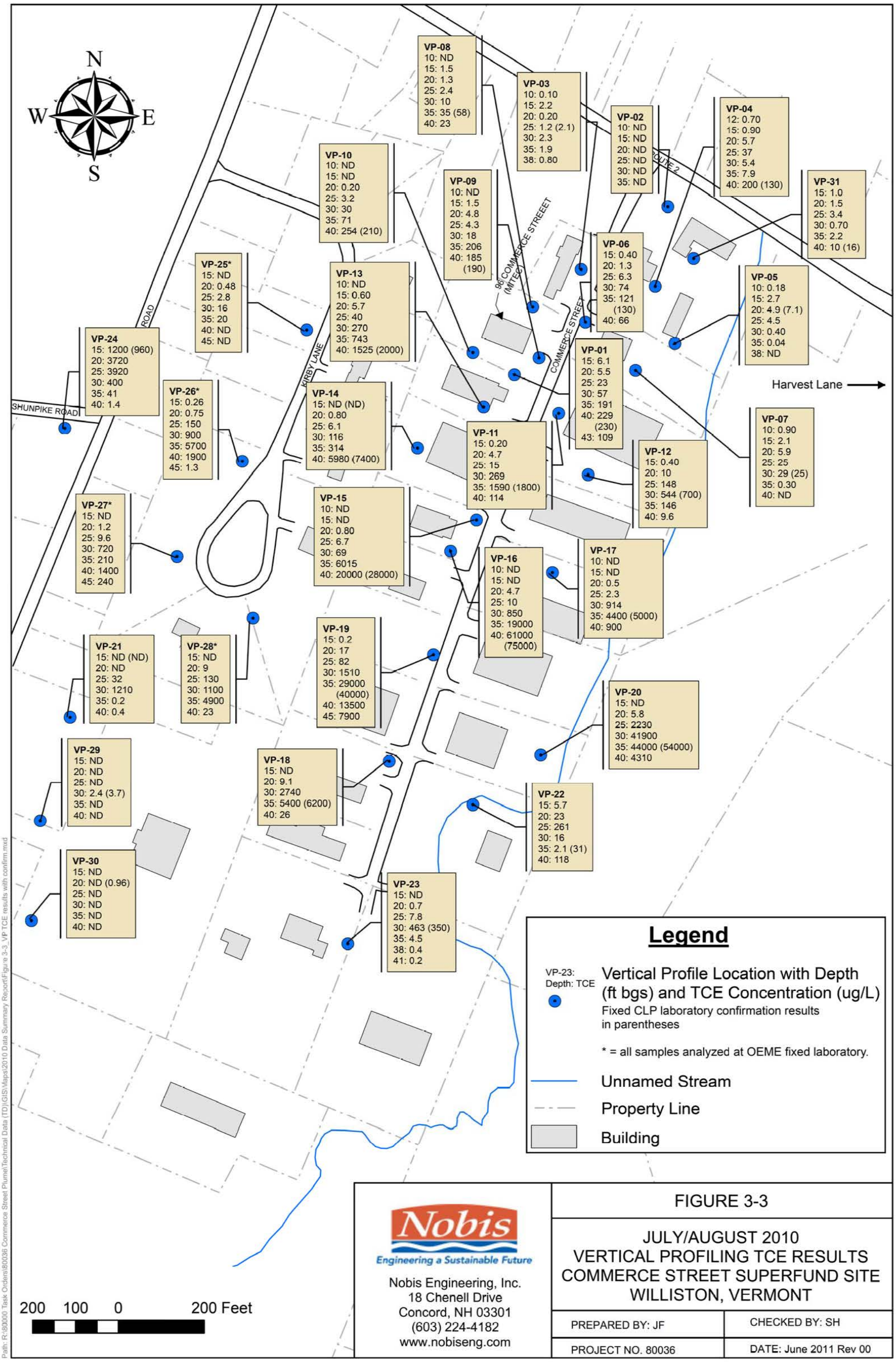

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FIGURE 3-3

JULY/AUGUST 2010
VERTICAL PROFILING TCE RESULTS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

PREPARED BY: JF	CHECKED BY: SH
PROJECT NO. 80036	DATE: June 2011 Rev 00

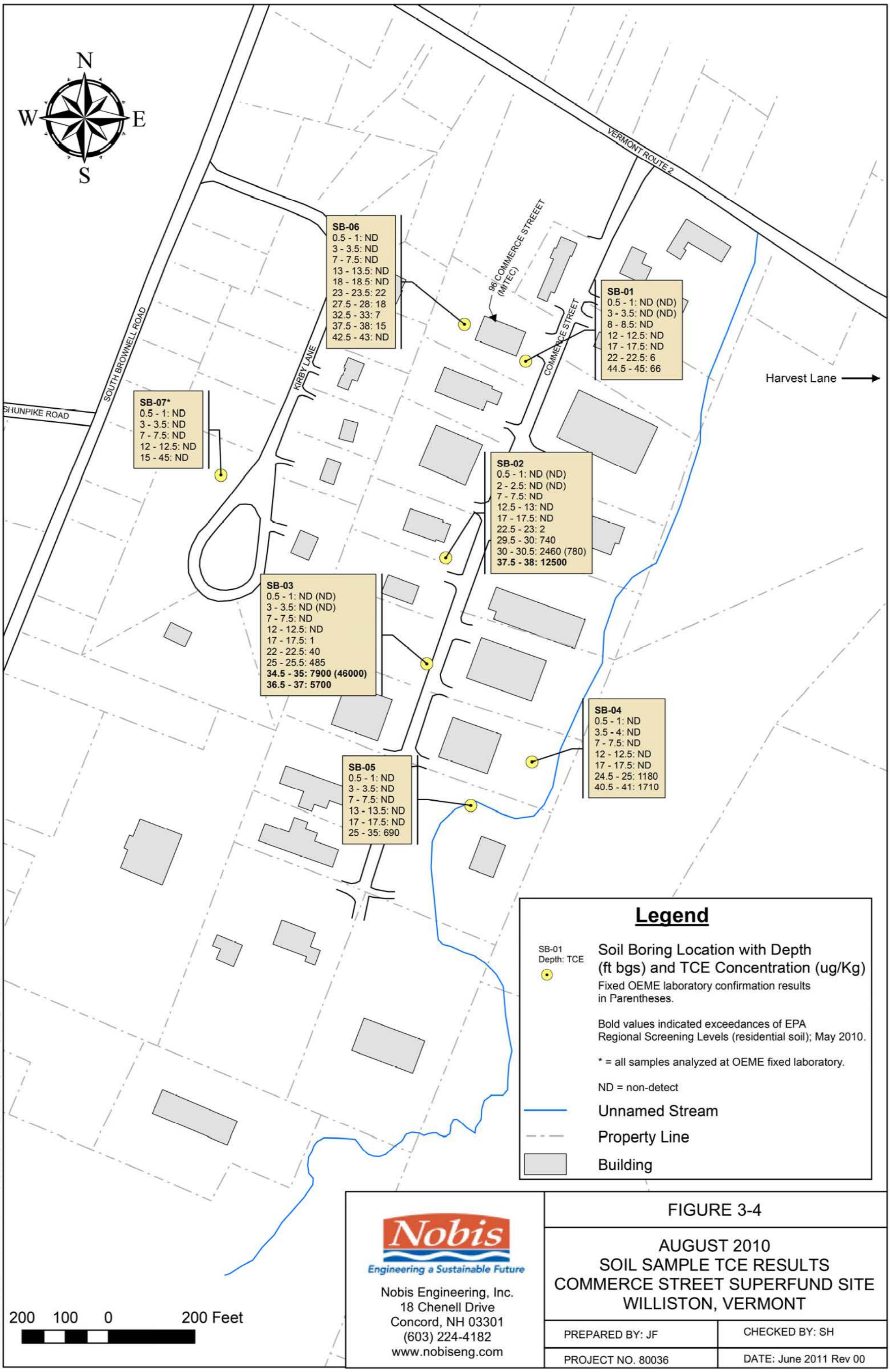
N
W
E
S
VERMONT ROUTE 2
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
KIRBY LANE
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
Harvest Lane
SB-06
0.5 - 1: ND
3 - 3.5: ND
7 - 7.5: ND
13 - 13.5: ND
18 - 18.5: ND
23 - 23.5: 22
27.5 - 28: 18
32.5 - 33: 7
37.5 - 38: 15
42.5 - 43: ND
SB-01
0.5 - 1: ND (ND)
3 - 3.5: ND (ND)
8 - 8.5: ND
12 - 12.5: ND
17 - 17.5: ND
22 - 22.5: 6
44.5 - 45: 66
SB-07*
0.5 - 1: ND
3 - 3.5: ND
7 - 7.5: ND
12 - 12.5: ND
15 - 45: ND
SB-02
0.5 - 1: ND (ND)
2 - 2.5: ND (ND)
7 - 7.5: ND
12.5 - 13: ND
17 - 17.5: ND
22.5 - 23: 2
29.5 - 30: 740
30 - 30.5: 2460 (780)
37.5 - 38: 12500
SB-03
0.5 - 1: ND (ND)
3 - 3.5: ND (ND)
7 - 7.5: ND
12 - 12.5: ND
17 - 17.5: 1
22 - 22.5: 40
25 - 25.5: 485
34.5 - 35: 7900 (46000)
36.5 - 37: 5700
SB-04
0.5 - 1: ND
3.5 - 4: ND
7 - 7.5: ND
12 - 12.5: ND
17 - 17.5: ND
24.5 - 25: 1180
40.5 - 41: 1710
SB-05
0.5 - 1: ND
3 - 3.5: ND
7 - 7.5: ND
13 - 13.5: ND
17 - 17.5: ND
25 - 35: 690
Legend
SB-01
Depth: TCE
Soil Boring Location with Depth (ft bgs) and TCE Concentration (ug/Kg)
Fixed OEME laboratory confirmation results in Parentheses.
Bold values indicated exceedances of EPA Regional Screening Levels (residential soil); May 2010.
* = all samples analyzed at OEME fixed laboratory.
ND = non-detect
Unnamed Stream
Property Line
Building
200 100 0 200 Feet
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FIGURE 3-4
AUGUST 2010
SOIL SAMPLE TCE RESULTS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
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PROJECT NO. 80036
DATE: June 2011 Rev 00
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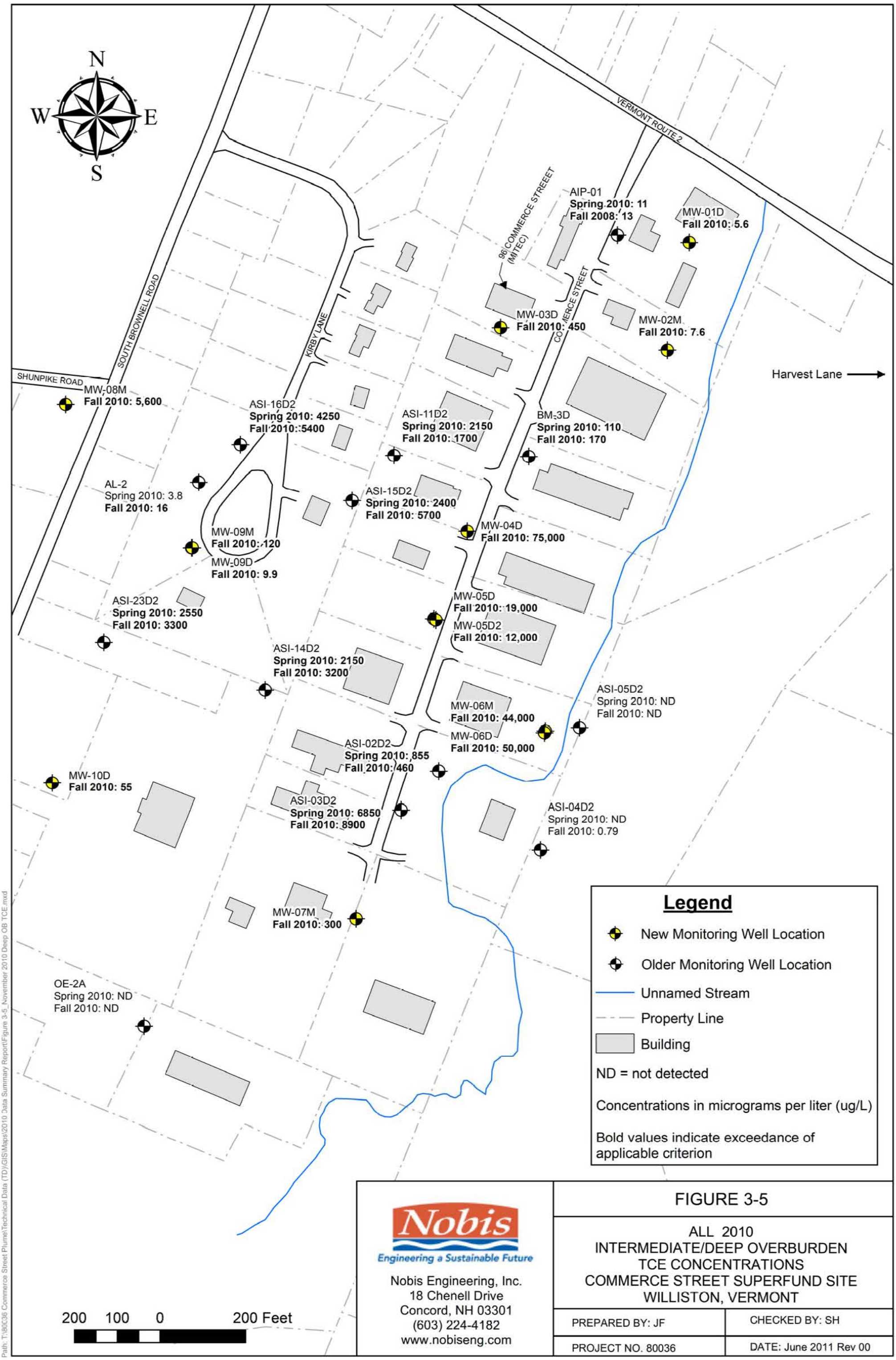
N
W
E
S
VERMONT ROUTE 2
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
KIRBY LANE
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
Harvest Lane
AIP-01
Spring 2010: 11
Fall 2008: 13
MW-01D
Fall 2010: 5.6
MW-03D
Fall 2010: 450
MW-02M
Fall 2010: 7.6
MW-08M
Fall 2010: 5,600
ASI-16D2
Spring 2010: 4250
Fall 2010: 5400
ASI-11D2
Spring 2010: 2150
Fall 2010: 1700
BM-3D
Spring 2010: 110
Fall 2010: 170
AL-2
Spring 2010: 3.8
Fall 2010: 16
ASI-15D2
Spring 2010: 2400
Fall 2010: 5700
MW-04D
Fall 2010: 75,000
MW-09M
Fall 2010: 120
MW-09D
Fall 2010: 9.9
ASI-23D2
Spring 2010: 2550
Fall 2010: 3300
MW-05D
Fall 2010: 19,000
MW-05D2
Fall 2010: 12,000
ASI-14D2
Spring 2010: 2150
Fall 2010: 3200
ASI-05D2
Spring 2010: ND
Fall 2010: ND
MW-06M
Fall 2010: 44,000
MW-06D
Fall 2010: 50,000
ASI-02D2
Spring 2010: 855
Fall 2010: 460
MW-10D
Fall 2010: 55
ASI-03D2
Spring 2010: 6850
Fall 2010: 8900
ASI-04D2
Spring 2010: ND
Fall 2010: 0.79
MW-07M
Fall 2010: 300
OE-2A
Spring 2010: ND
Fall 2010: ND
Legend
New Monitoring Well Location
Older Monitoring Well Location
Unnamed Stream
Property Line
Building
ND = not detected
Concentrations in micrograms per liter (ug/L)
Bold values indicate exceedance of applicable criterion
200 100 0 200 Feet
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FIGURE 3-5
ALL 2010
INTERMEDIATE/DEEP OVERBURDEN
TCE CONCENTRATIONS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 3-5_November 2010 Deep OB TCE.mxd

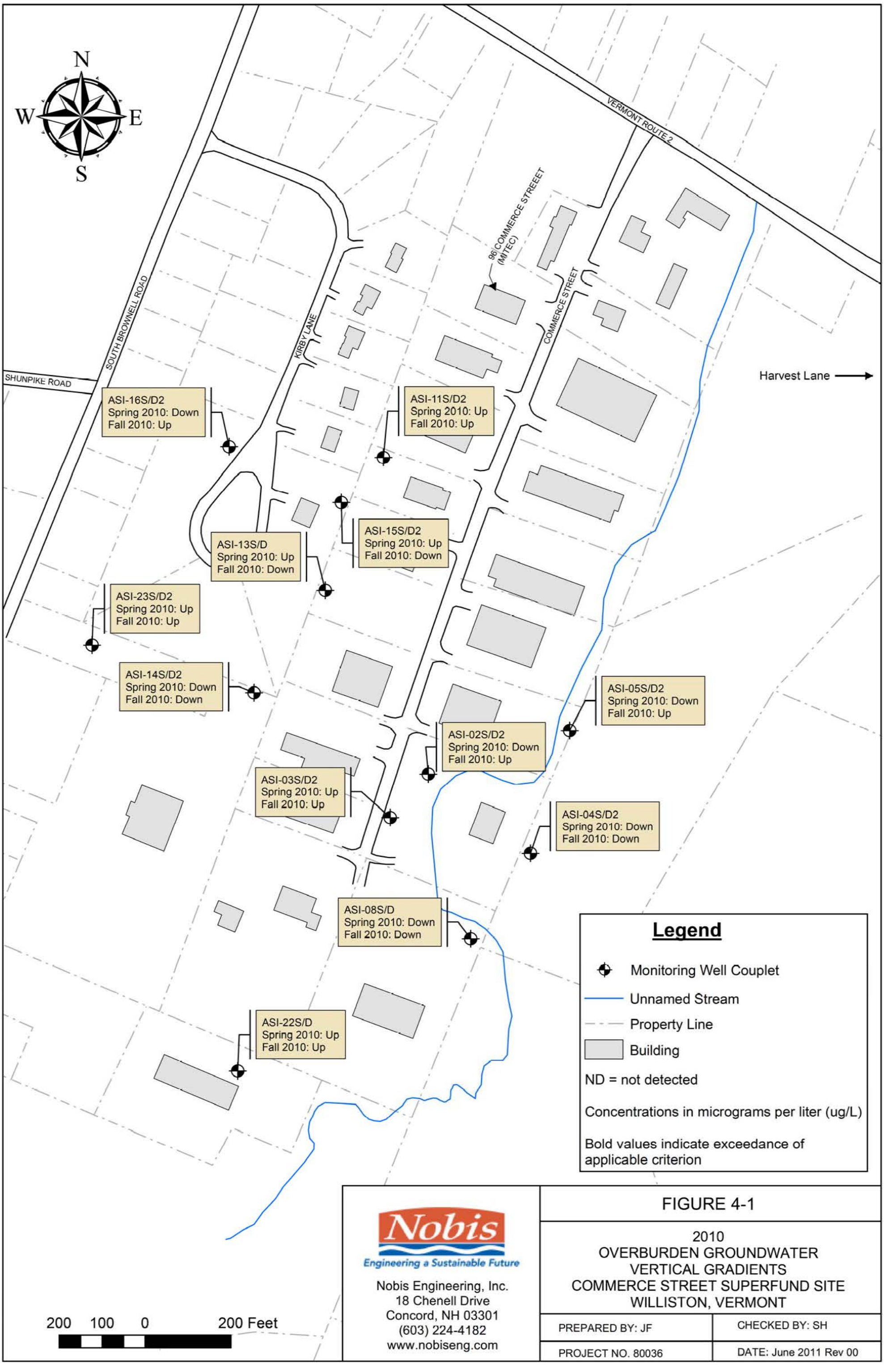
N
W
E
S
VERMONT ROUTE 2
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
KIRBY LANE
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
Harvest Lane
ASI-16S/D2
Spring 2010: Down
Fall 2010: Up
ASI-11S/D2
Spring 2010: Up
Fall 2010: Up
ASI-15S/D2
Spring 2010: Up
Fall 2010: Down
ASI-13S/D
Spring 2010: Up
Fall 2010: Down
ASI-23S/D2
Spring 2010: Up
Fall 2010: Up
ASI-14S/D2
Spring 2010: Down
Fall 2010: Down
ASI-05S/D2
Spring 2010: Down
Fall 2010: Up
ASI-02S/D2
Spring 2010: Down
Fall 2010: Up
ASI-03S/D2
Spring 2010: Up
Fall 2010: Up
ASI-04S/D2
Spring 2010: Down
Fall 2010: Down
ASI-08S/D
Spring 2010: Down
Fall 2010: Down
ASI-22S/D
Spring 2010: Up
Fall 2010: Up
Legend
Monitoring Well Couplet
Unnamed Stream
Property Line
Building
ND = not detected
Concentrations in micrograms per liter (ug/L)
Bold values indicate exceedance of applicable criterion
200 100 0 200 Feet
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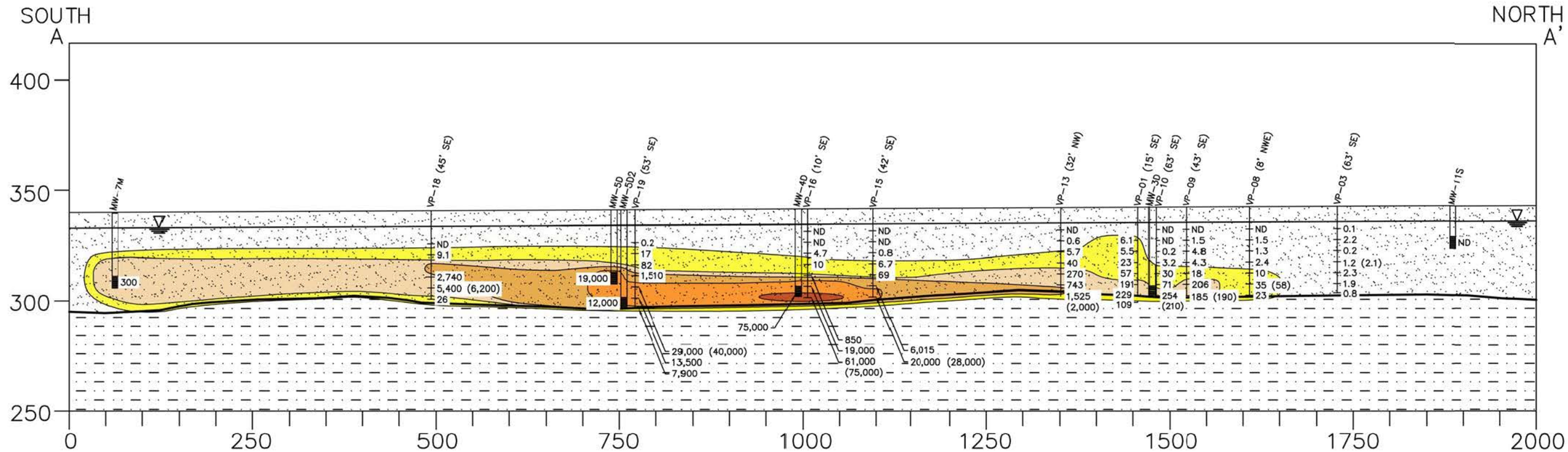
FIGURE 4-1
2010
OVERBURDEN GROUNDWATER
VERTICAL GRADIENTS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JF
CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 00
Path: T:\80C36 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 4-1_201C vertical gradients.mxd



VP-18 (45' SE): Vertical pole location with offset and direction.

Vertical Profile Location with dissolved TCE concentration (ug/L). Fixed CLP laboratory confirmation results in parenthesis.

AL-02 (67' SW): Monitoring well location with offset and direction.

Monitoring well location with dissolved TCE concentration (ug/L).

TCE CONCENTRATION RANGES (ug/L)
NOV./DEC. 2010 ANALYTICAL RESULTS

- 5 – 100
- 101 – 1,000
- 1,001 – 10,000
- 10,001 – 25,000
- > 25,000

Approximate Scale
50 feet
150 feet

3X VERTICAL EXAGGERATION

LEGEND

- SAND
- CLAY
- DEPTH TO GROUNDWATER

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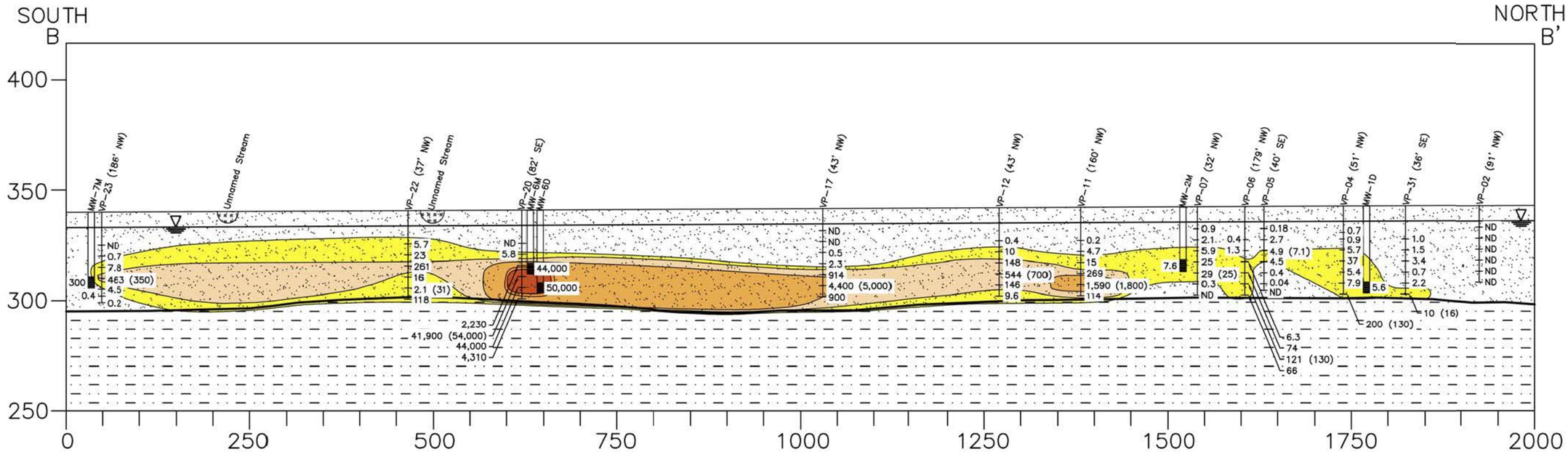
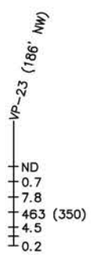
FIGURE 4-2

A-A' CROSS-SECTION: TCE PLUME
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

DRAWN BY:	JF	APPROVED BY:	SH
PROJECT NO.	80036	DATE:	June 2011 Rev 01

R:\80000 Task Orders\80036 Commerce Street Plume\Technical Data (TD)\CAD\dwg\80036 X-sect.dwg





VP–23 (186' NW): Vertical pole location with offset and direction.

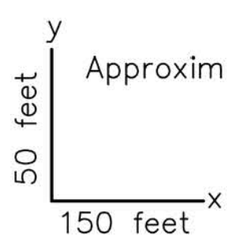
Vertical Profile Location with dissolved TCE concentration (ug/L). Fixed CLP laboratory confirmation results in parenthesis.

AL–02 (67' SW): Monitoring well location with offset and direction.

Monitoring well location with dissolved TCE concentration (ug/L).

TCE CONCENTRATION RANGES (ug/L)
NOV./DEC. 2010 ANALYTICAL RESULTS

- 5 – 100
- 101 – 1,000
- 1,001 – 10,000
- 10,001 – 25,000
- > 25,000



3X VERTICAL EXAGGERATION

LEGEND

- SAND
- CLAY
- DEPTH TO GROUNDWATER

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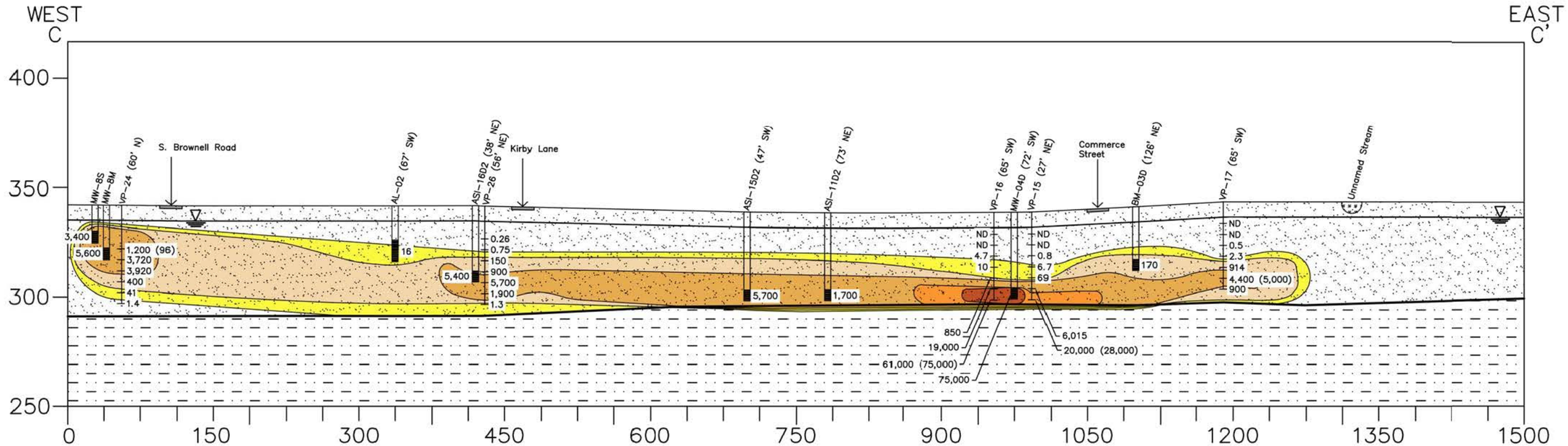
FIGURE 4-3

B-B' CROSS-SECTION: TCE PLUME
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

DRAWN BY:	JF	APPROVED BY:	SH
PROJECT NO.	80036	DATE:	June 2011 Rev 01

R:\80000 Task Orders\80036 Commerce Street Plume\Technical Data (TD)\CAD\dwg\80036 X-sect.dwg



VP-24 (60' N): Vertical pole location with offset and direction.

Vertical Profile Location with dissolved TCE concentration (ug/L). Fixed CLP laboratory confirmation results in parenthesis.

AL-02 (67' SW): Monitoring well location with offset and direction.

Monitoring well location with dissolved TCE concentration (ug/L).

TCE CONCENTRATION RANGES (ug/L)
NOV./DEC. 2010 ANALYTICAL RESULTS

- 5 – 100
- 101 – 1,000
- 1,001 – 10,000
- 10,001 – 25,000
- > 25,000

Approximate Scale
50 feet (y)
150 feet (x)

3X VERTICAL EXAGGERATION

LEGEND

- SAND
- CLAY
- DEPTH TO GROUNDWATER

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FIGURE 4-4

C-C' CROSS-SECTION: TCE PLUME
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

DRAWN BY:	JF	APPROVED BY:	SH
PROJECT NO.	80036	DATE:	June 2011 Rev 01

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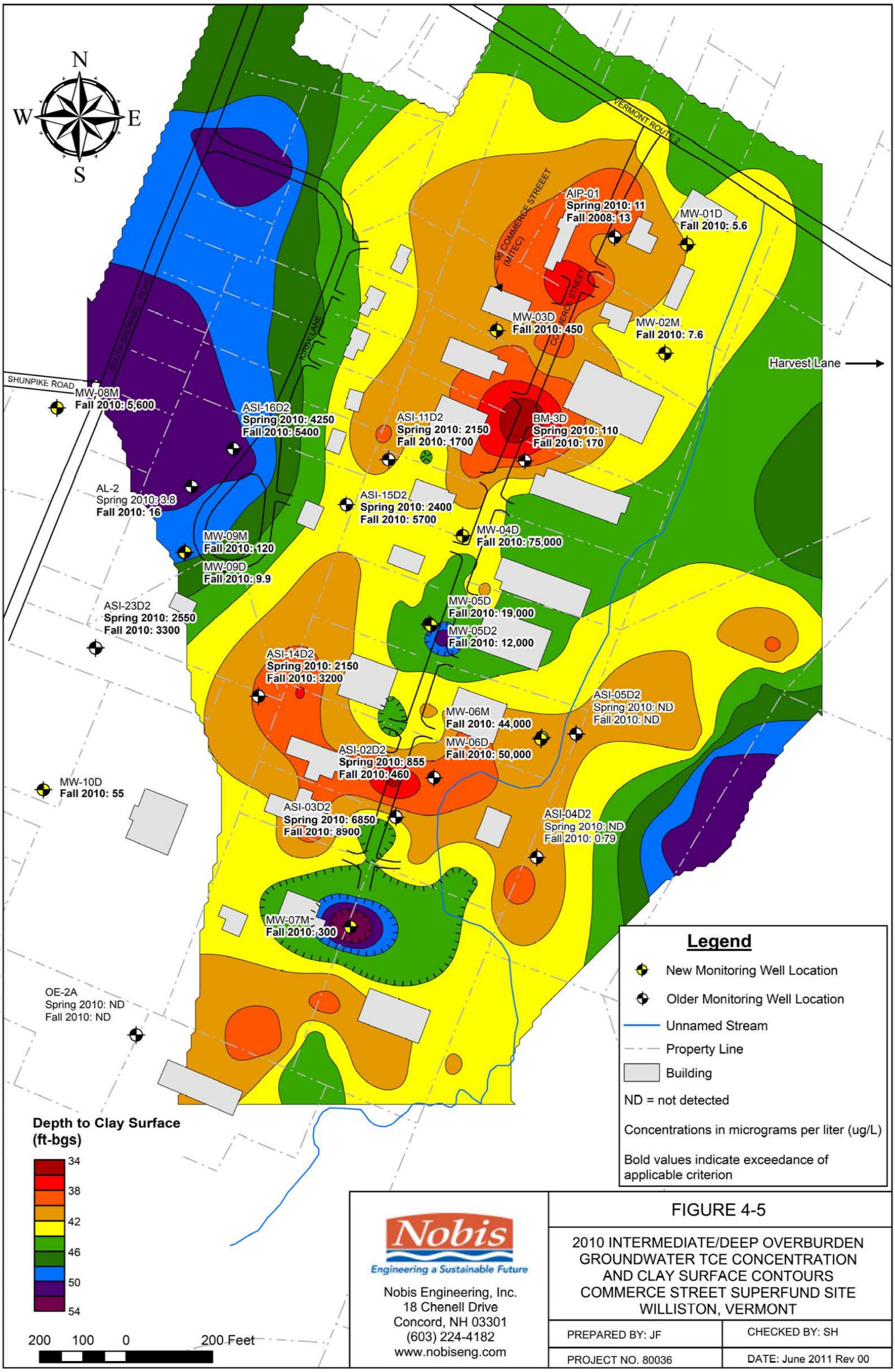

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FIGURE 4-5

2010 INTERMEDIATE/DEEP OVERBURDEN GROUNDWATER TCE CONCENTRATION AND CLAY SURFACE CONTOURS
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

PREPARED BY: JF	CHECKED BY: SH
PROJECT NO. 80036	DATE: June 2011 Rev 00

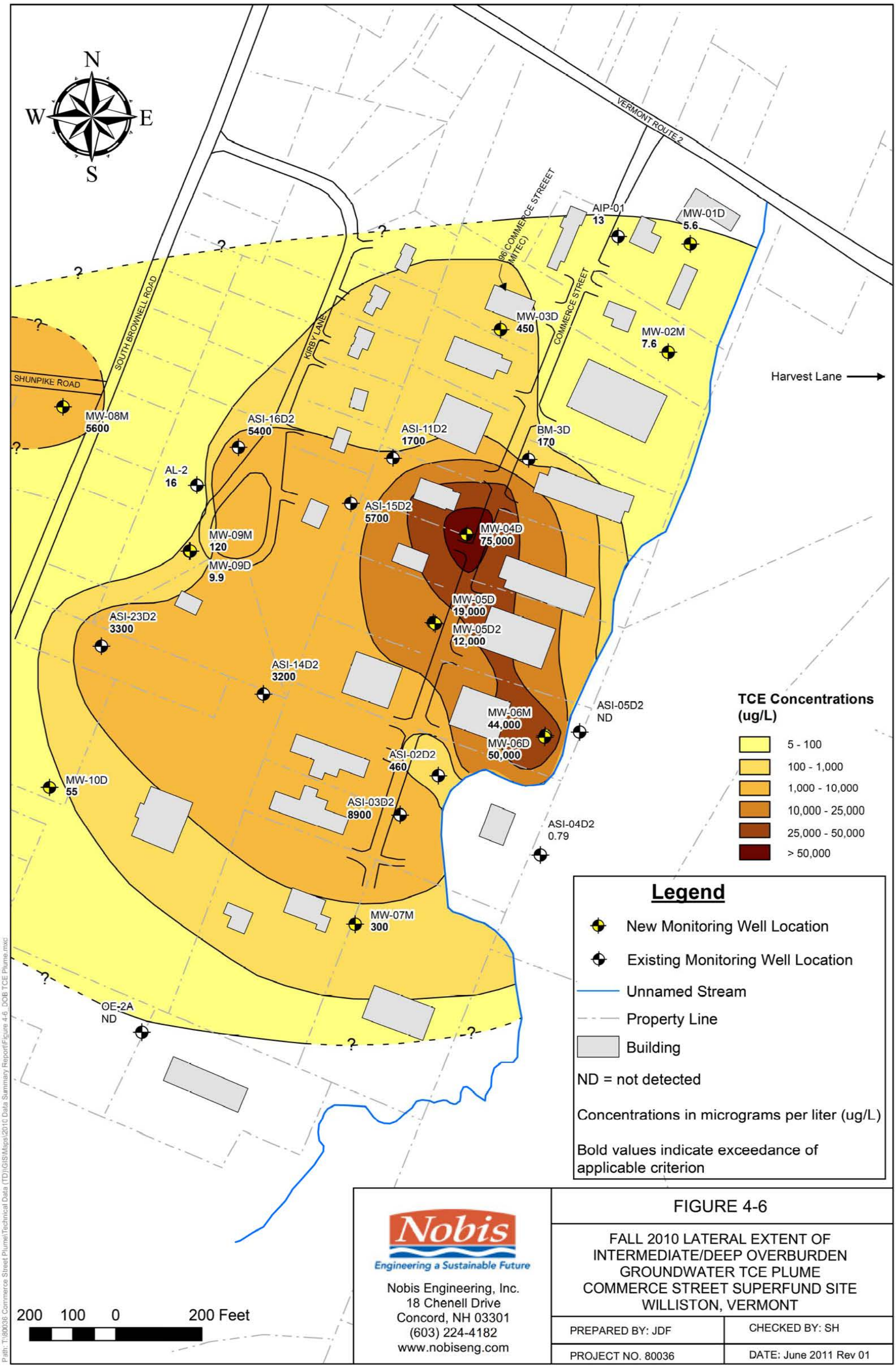
N
W
E
S
VERMONT ROUTE 2
96 COMMERCE STREEET (MITEC)
COMMERCE STREET
KIRBY LANE
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
Harvest Lane
AIP-01
13
MW-01D
5.6
MW-03D
450
MW-02M
7.6
MW-08M
5600
ASI-16D2
5400
ASI-11D2
1700
BM-3D
170
AL-2
16
ASI-15D2
5700
MW-04D
75,000
MW-09M
120
MW-09D
9.9
MW-05D
19,000
MW-05D2
12,000
ASI-23D2
3300
ASI-14D2
3200
ASI-05D2
ND
MW-06M
44,000
MW-06D
50,000
ASI-02D2
460
MW-10D
55
ASI-03D2
8900
ASI-04D2
0.79
MW-07M
300
OE-2A
ND
TCE Concentrations (ug/L)
5 - 100
100 - 1,000
1,000 - 10,000
10,000 - 25,000
25,000 - 50,000
> 50,000
Legend
New Monitoring Well Location
Existing Monitoring Well Location
Unnamed Stream
Property Line
Building
ND = not detected
Concentrations in micrograms per liter (ug/L)
Bold values indicate exceedance of applicable criterion
200 100 0 200 Feet
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FIGURE 4-6
FALL 2010 LATERAL EXTENT OF INTERMEDIATE/DEEP OVERBURDEN GROUNDWATER TCE PLUME
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JDF
CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 01
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 4-6_DOB TCE Plume.mxd

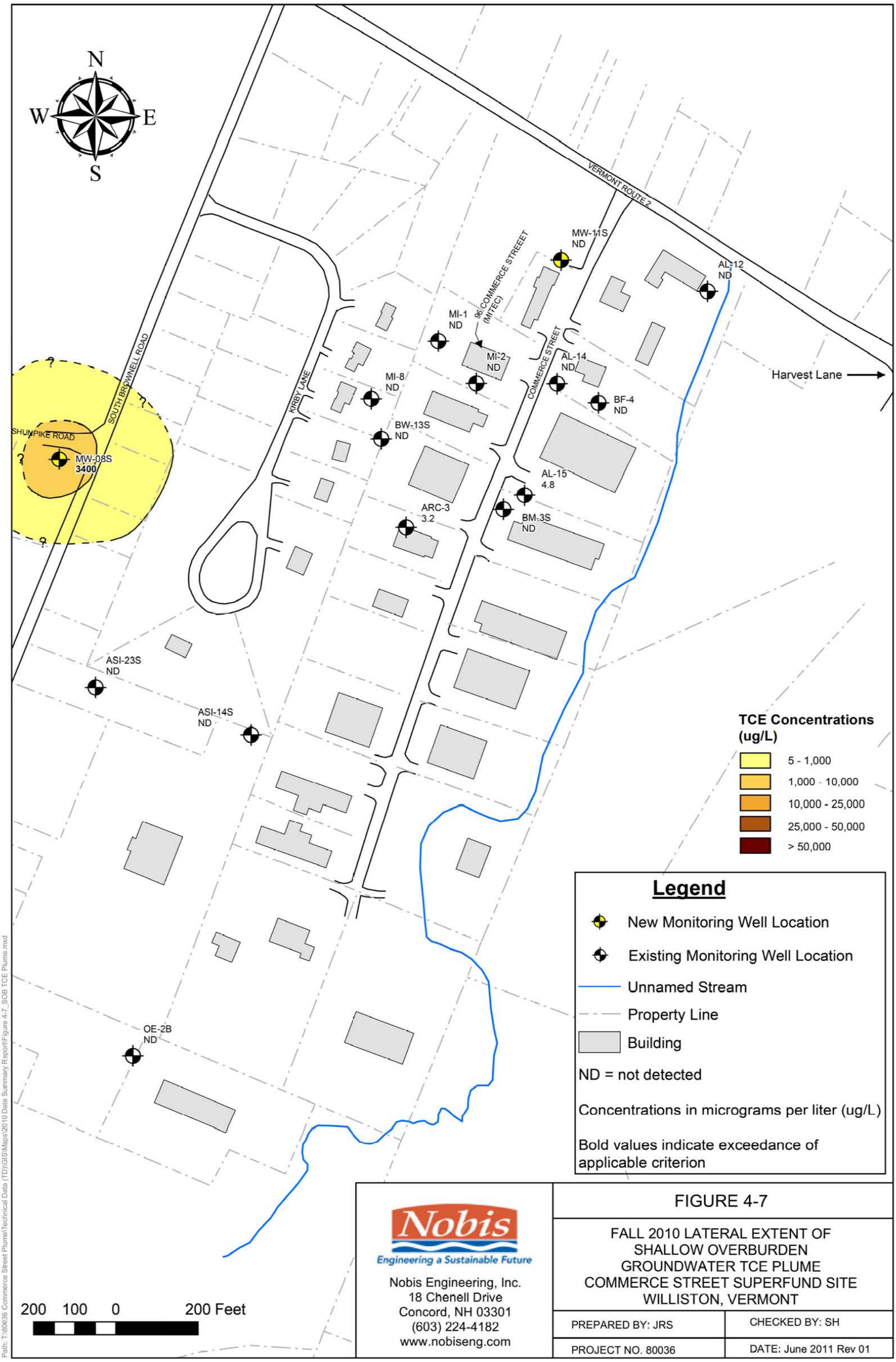
N
W
E
S
VERMONT ROUTE 2
MW-11S
ND
AL-12
ND
96 COMMERCE STREEET
(MITEC)
MI-1
ND
MI-2
ND
COMMERCE STREET
AL-14
ND
Harvest Lane
MI-8
ND
BF-4
ND
KIRBY LANE
BW-13S
ND
SOUTH BROWNELL ROAD
SHUNPIKE ROAD
MW-08S
3400
AL-15
4.8
ARC-3
3.2
BM-3S
ND
ASI-23S
ND
ASI-14S
ND
OE-2B
ND
TCE Concentrations
(ug/L)
5 - 1,000
1,000 - 10,000
10,000 - 25,000
25,000 - 50,000
> 50,000
Legend
New Monitoring Well Location
Existing Monitoring Well Location
Unnamed Stream
Property Line
Building
ND = not detected
Concentrations in micrograms per liter (ug/L)
Bold values indicate exceedance of applicable criterion
200 100 0 200 Feet
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FIGURE 4-7
FALL 2010 LATERAL EXTENT OF
SHALLOW OVERBURDEN
GROUNDWATER TCE PLUME
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT
PREPARED BY: JRS
CHECKED BY: SH
PROJECT NO. 80036
DATE: June 2011 Rev 01
Path: T:\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 4-7_SOB TCE Plume.mxd

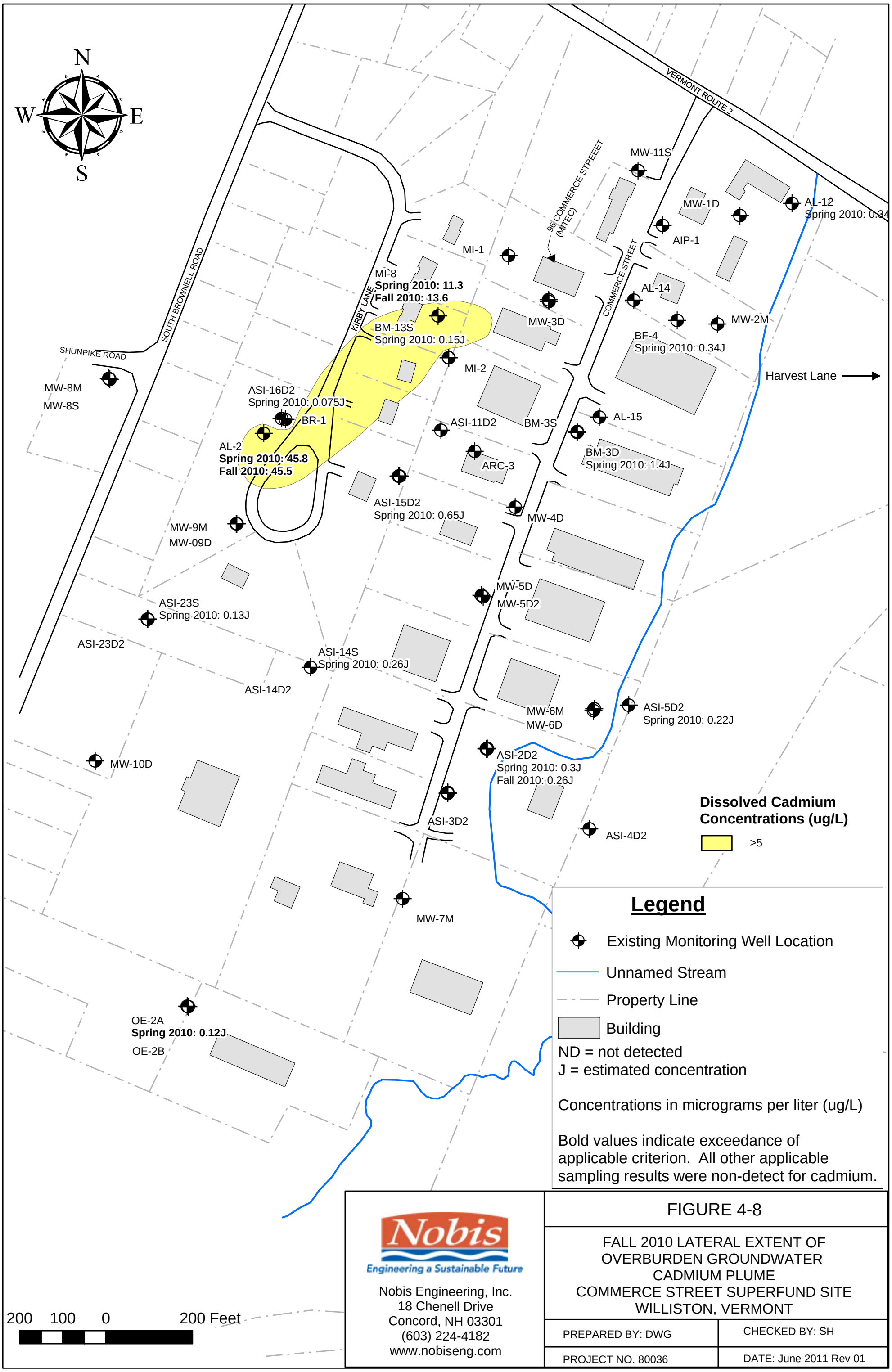

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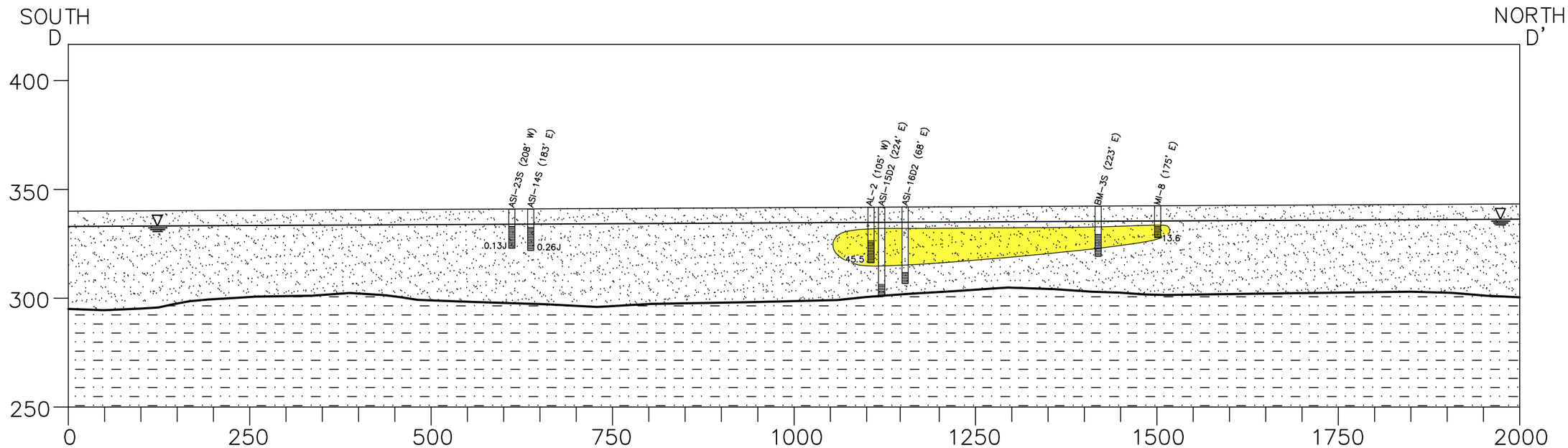
FIGURE 4-8

FALL 2010 LATERAL EXTENT OF OVERBURDEN GROUNDWATER CADMIUM PLUME
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

PREPARED BY: DWG	CHECKED BY: SH
PROJECT NO. 80036	DATE: June 2011 Rev 01

Path: R:\80000 Task Orders\80036 Commerce Street Plume\Technical Data (TD)\GIS\Maps\2010 Data Summary Report\Figure 4-8_OB Cadmium Plume.mxd



CADMIUM CONCENTRATION RANGES (ug/L)
NOV./DEC. 2010 ANALYTICAL RESULTS

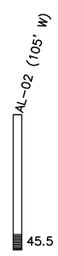
5 – 100

LEGEND

SAND

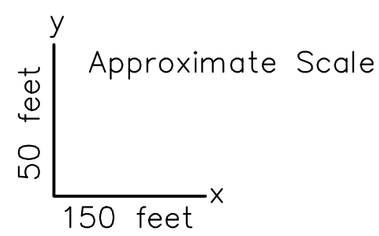
CLAY

DEPTH TO GROUNDWATER



AL–02 (105' W): Monitoring well location with offset and direction.

Monitoring well location with dissolved cadmium concentration (ug/L).



Approximate Scale

3X VERTICAL EXAGGERATION

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FIGURE 4-9

D-D' CROSS-SECTION: CADMIUM PLUME
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

DRAWN BY:	JF	APPROVED BY:	SH
PROJECT NO.	80036	DATE:	June 2011 Rev 00

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CHARTS

CHART 4-1
WELLS EXHIBITING
TCE CONCENTRATION DECREASES
FROM HISTORICAL MONITORING

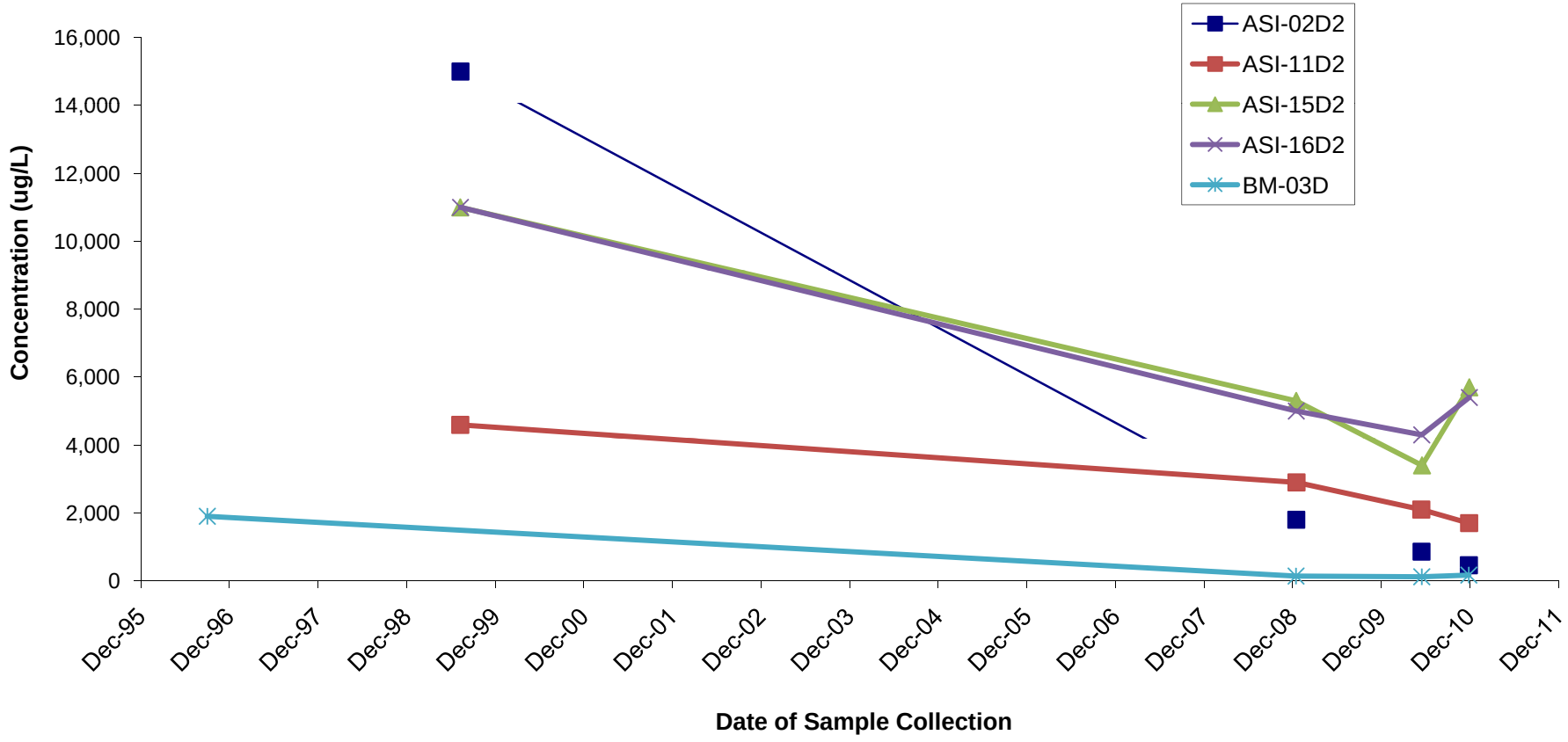
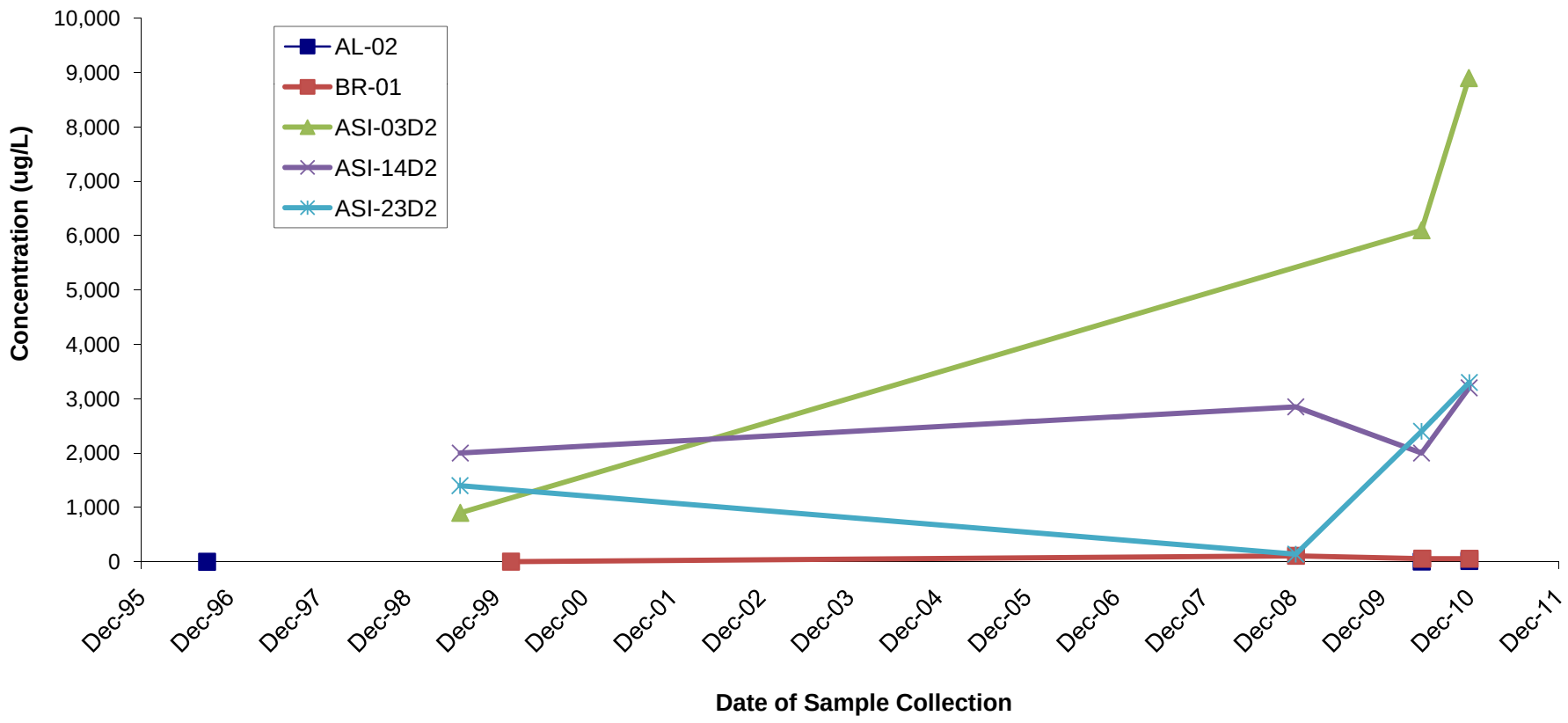


CHART 4-2
WELLS EXHIBITING
TCE CONCENTRATION INCREASES
FROM HISTORICAL MONITORING



APPENDIX A

Nobis Engineering, Inc. nobisengineering.com

Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-17-10 Page 1 of 1 **Well ID :** AS1-04D2 04D2

Field Personnel Ken Marks Purging Start Time : 1550

Well Depth as installed (ft.): 35.5 Measured Well Depth (ft.): ~~37.4~~ 35.95

Screen Length in ft. 5 Screen Depth in ft. 30.5 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 7.56 From: Top of PVC Two Hour Time Limit Reached ? (Circle) Yes No

Pump/Tubing Intake set (ft.): 33 From: Top of PVC Total Volume Purged, Including Drawdown (gallons): 1.5

Sample Designation AS1-04D2-051710A Time at Purge Completion: 1635

Sample Time 1640 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo-Pump 2 #

Multimeter model and serial number YSI 556 MPS-07H102056 Turbidity meter model and serial number Micro TPW 200805197

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Weather: Mostly Sunny 70°F Wind E 1 to 5 mph.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1600	N A	100	7.58	0.02	—	10.67	658	7.49	-106.3	6.24	3.21	Purge water clear. No odor.
1605		100	7.59	0.03	0.03	10.47	617	7.14	-118.1	4.04	3.11	
1610		150 ~~100~~	7.59	0.03	0.03	10.39	609	7.05	-114.4	1.92	3.07	
1615		150 ~~100~~	7.59	0.03	0.03	10.37	611	7.03	-109.8	0.98	2.91	
1620		150 ~~100~~	7.59	0.0	0.03	10.25	617	7.06	-107.9	0.76	1.07	
1625		150 ~~100~~	7.59	0.0	0.03	10.24	627	7.08	-108.5	0.62	0.96	
1630		150	7.59	0.0	0.03	10.26	627	7.07	-110.8	0.61	0.88	
1635		150	7.59	0.0	0.03	10.29	626	7.08	-110.4	0.57	0.81	

Ken Marks

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

Nobis Engineering, Inc. nobisengineering.com

Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/17/10 Page 1 of 1 **Well ID :** AS1-11D2
Field Personnel Josh Stewart Purging Start Time : 1558
Well Depth as installed (ft.): 40 Measured Well Depth (ft.): 39.89
Screen Length in ft. 5 Screen Depth in ft. 35 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 2.33 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 37.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 4.25
Sample Designation AS1-11D2-051710A Time at Purge Completion: 1658
Sample Time 1650 Signature: Josh S
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) geo pump
Multimeter model and serial number YSI geotech #2016 Turbidity meter model and serial number HF scientific micro TPW #1925
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1605												Problem with flex tubing size
1610		350	2.74	0.41	0.41	NR	NR	NR	NR	NR	NR	
1615		350	2.74	0	0.41	11.35	1380	6.91	-108.6	6.70	4.21	
1620		350	2.74	0	0.41	11.23	1395	6.98	-119.0	2.26	3.13	
1625		350	2.74	0	0.41	11.16	1397	7.00	-118.4	0.83	2.49	
1630		350	2.74	0	0.41	11.17	1393	7.04	-122.9	0.61	1.50	
1635		350	2.74	0	0.41	11.19	1387	7.05	-129.3	0.50	1.27	
1640		350	2.74	0	0.41	11.20	1387	7.06	-128.0	0.48	2.39	
1645		350	2.74	0	0.41	11.20	1384	7.06	-128.8	0.50	1.14	
1650						Sample						

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-18-10 Page 1 of 2 **Well ID :** AL-14

Field Personnel Ken Marks Purging Start Time : 1505

Well Depth as installed (ft.): 16 Measured Well Depth (ft.): 15.39

Screen Length in ft. 10 Screen Depth in ft. 6 - 16 Parameter Stabilization: (Circle) (Yes) / No

Depth to GW (ft.): 6.26 From: Top of PVC Two Hour Time Limit Reached ? (Circle) Yes / (No)

Pump/Tubing Intake set (ft.): 11 From: ↓ Total Volume Purged, Including Drawdown (gallons): 8

Sample Designation AL-14051810 Time at Purge Completion: 1635

Sample Time 1640 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder Pump

Multimeter model and serial number YSI 556 MPS #07H102056 ~~07H101~~ Turbidity meter model and serial number Micro TPW #20080519 7

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1510	N A	400	6.51	0.25	0.25	9.71	133	4.88	225.3	13.68	143.4	Cloudy Grayish No odor
1515		400	6.51	0.0	0.25	9.18	154	3.71	270.2	12.01	~~110.85~~ 110.5	Tinted ↓
1520		400	6.51	0.0	0.25	8.93	192	4.53	208.9	9.21	72.36	Slightly cloudy No odor
1525		400	6.51	0.0	0.25	8.86	216	4.56	215.9	9.24	43.54	
1530		400	6.51	0.0	0.25	8.97	238	4.8	201.1	8.33	27.37	
1535		400	6.51	0.0	0.25	8.75	245	5.22	164.2	6.92	18.09	
1540		400	6.51	0.0	0.25	8.81	259	5.60	140.1	6.92	11.52	Purge water clear No odor
1545		400	6.51	0.0	0.25	8.82	271	5.73	136.6	6.70	7.90	
1550		400	6.51	0.0	0.25	8.68	277	5.75	138.0	6.68	6.71	
1555		400	6.51	0.0	0.25	8.72	282	5.99	125.9	6.65	6.03	
1600		400	6.51	0.0	0.25	8.81	289	5.89	121.8	6.47	5.57	
1605	↓	400	6.51	0.0	0.25	8.77	291	5.84	128.7	6.51	5.07	↓

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-18-10 Page 2 of 2 **Well ID :** AL-14

Field Personnel Ken Marks Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): 8

Sample Designation AL-14051810 Time at Purge Completion: _____

Sample Time _____ Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder Pump

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	Page # 2 of 2
1610	N A	400	6.51	0.0	0.25	8.71	293	5.97	122.5	6.51	4.99	Well info see page #1
1615		400	6.51	0.0	0.25	8.70	295	5.89	126.7	6.49	4.97	Purge water clear. No odor.
1620		400	6.51	0.0	0.25	8.71	298	6.10	118.9	6.41	4.79	↓
1625		400	6.51	0.0	0.25	8.60	310	6.00	119.9	6.39	4.71	↓
1630		400	6.51	0.0	0.25	8.57	312	5.98	118.0	6.42	4.66	↓
1635		400	6.51	0.0	0.25	8.60	313	6.01	118.1	6.38	4.51	↓
						Ken Marks						

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-18-10 Page 1 of 2 **Well ID :** ASI-14S

Field Personnel Ken Marks Purging Start Time : 1005

Well Depth as installed (ft.): 18.5 Measured Well Depth (ft.): 18.53

Screen Length in ft. ~~10~~ 10 Screen Depth in ft. 8.5 to 18.5 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 4.87 From: Top of Steel well Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 13.5 From: ↓ Total Volume Purged, Including Drawdown (gallons): 2

Sample Designation ASI-14S 051810 Time at Purge Completion: 1140

Sample Time 1145 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo-Pump 2

Multimeter model and serial number YSI 556 MPS #07H102056 Turbidity meter model and serial number Micro TPW #200805197

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

~~Eckw~~ Weather: Mostly Cloudy 62°F wind light.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1015	N A	100	N/A	N/A	N/A	9.44	372	7.27	-116.0	17.84	41.12	slighty cloudy with black specks.
1020		100				8.67	315	6.96	-79.2	1.82	36.37	I could not fit water level
1025		100				8.72	300	6.71	-38.9	0.97	26.18	water in well with tubbing
1030		100				8.66	290	6.61	-35.2	0.90	26.11	
1035		100				8.75	274	6.52	-27.8	1.18	27.08	
1040		100				8.88	261	6.33	-23.4	1.98	26.31	
1045		100				8.70	249	6.38	-24.1	1.87	27.17	
1050		100				8.59	233	6.36	-19.3	1.52	23.37	
1055		100				8.53	229	6.33	-20.5	1.41	18.92	Purge water clear Strong odor?
1100		100				8.55	230	6.31	-21.0	1.30	17.58	
1105		100				8.56	227	6.28	-19.6	1.15	11.21	
1110		100				8.57	225	6.30	-16.3	1.13	8.01	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-18-10 Page 2 of 2 **Well ID :** ASI-14 S

Field Personnel Ken Marks Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: _____

Sample Time 1145 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Page # 2 of 2

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1115	N A	100	N/A	N/A	N/A	8.58	223	6.27	-13.8	1.10	7.22	Page # 2 of 2
1120		100				8.57	223	6.24	-14.0	1.06	5.61	see page #1 for well info
1125		100				8.52	222	6.20	-12.9	1.01	5.05	Purge water clear. strong odor.
1130		100				8.56	221	6.20	-13.5	1.08	4.97	
1135		100				8.57	220	6.21	-14.3	1.06	4.91	
1140		100				8.58	220	6.21	-14.1	1.02	4.98	

Ken Marks

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-18-10 Page 1 of 1 **Well ID :** ASI-03 D2

Field Personnel Ken Marks Purging Start Time : 1250

Well Depth as installed (ft.): 30.00 Measured Well Depth (ft.): 30.72

Screen Length in ft. 5 Screen Depth in ft. 25-30 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 5.49 From: Top of PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): From: ↓ Total Volume Purged, Including Drawdown (gallons): 2

Sample Designation ASI-03 D2 051810 Time at Purge Completion: 1350

Sample Time 1355 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo-pump 2

Multimeter model and serial number YSI-556 MPS #07H102056 Turbidity meter model and serial number Micro TPW #20080519 7

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1300	N / A	100	5.51	0.02	0.02	11.17	1615	6.82	-91.8	7.00	20.69	I pulled old tubbing and
1305		100	5.53	0.02	0.04	10.99	1635	6.73	-89.3	6.77	27.37	replaced with new tubbing
1310		100	5.53	0.0	0.04	11.00	1619	6.87	-91.4	5.55	26.11	Purge water slighty cloudy
1315		100	5.53	0.0	0.04	10.96	1627	6.99	-96.2	3.12	21.73	↓
1320		100	5.53	0.0	0.04	10.94	1594	7.06	-98.7	1.07	12.82	Purge water clear
1325		100	5.53	0.0	0.04	10.87	1597	7.07	-100.2	0.98	9.54	
1330		100	5.53	0.0	0.04	11.01	1589	7.11	-100.8	0.75	7.61	
1335		100	5.53	0.0	0.04	11.23	1535	7.15	-101.2	0.73	5.33	
1340		100	5.53	0.0	0.04	11.00	1514	7.18	-101.8	0.71	3.61	
1345		100	5.53	0.0	0.04	11.04	1503	7.21	-100.1	0.69	3.22	
1350		100	5.53	0.0	0.04	11.11	1503	7.20	-100.1	069	2.29	
							Ken Marks					

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/18/10 Page 1 of 1 **Well ID :** ASI-14D2

Field Personnel K. Marks Purging Start Time : 0820

Well Depth as installed (ft.): 30 Measured Well Depth (ft.): 32.52

Screen Length in ft. 5 Screen Depth in ft. 25 to 30 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.11 From: Top of PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 27.5 From: Top of PVC Total Volume Purged, Including Drawdown (gallons): 1.25

Sample Designation ASI-14D2051810 Time at Purge Completion: 0855

Sample Time 0900 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo-Pump 2 #1455

Multimeter model and serial number YSI 556 MPS #07H102056 Turbidity meter model and serial number Micro TPW 200805197

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Weather: Sun + Clouds 60°F Wind E 1 to 5 mph.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0830	N A	150	6.22	0.11	–	8.18	844	7.02	-67.2	1.34	5.39	Purge water clear
0835		150	6.25	0.13	0.24	8.06	841	6.94	-74.4	0.71	3.07	
0840		150	6.25	0.0	0.24	8.10	841	6.98	-80.2	0.66	2.21	
0845		150	6.25	0.0	0.24	8.11	841	6.99	-79.1	0.53	1.72	
0850		150	6.25	0.0	0.24	8.20	839	6.93	-77.8	0.48	1.22	
0855		150	6.25	0.0	0.24	8.17	841	6.96	-78.3	0.46	1.12	

Ken Marks

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/18/10 Page 1 of 1 **Well ID :** ASI-02D2 Field dup

Field Personnel J. Stewart Purging Start Time 0830

Well Depth as installed (ft.): 31 Measured Well Depth (ft.): 27.05

Screen Length in ft. 5 Screen Depth in ft. 26 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.66 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 28.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 4.00

Sample Designation ASI-02D2-051810AD / ASI-02D2-051810AX Time at Purge Completion: 0930

Sample Time 0905 / 0910 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo Pump

Multimeter model and serial number YSI #2016 Turbidity meter model and serial number HF Scientific micro TPW #1625

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0830	NA / NA	350	7.12	0.46	0.46	NR	NR	NR	NR	NR	NR	
0835		350	7.13	0.01	0.47	10.77	1825	6.96	-83.9	4.65	98.36	
0840		350	7.13	0	0.47	10.53	1930	6.95	-95.7	1.25	44.78	
0845		350	7.13	0	0.47	10.54	1992	6.98	-97.7	0.43	21.32	
0850		350	7.13	0	0.47	10.56	2039	6.98	-100.7	0.37	20.98	
0855		350	7.13	0	0.47	10.57	2038	7.00	-102.9	0.29	21.14	
0900		350	7.13	0	0.47	10.57	2044	6.99	-102.1	0.28	20.96	
0905						Sample						
0910						DUP						

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/18/10 Page 1 of 1 **Well ID :** ASI-23D2
Field Personnel Josh Stewart Purging Start Time : 1017
Well Depth as installed (ft.): 30 Measured Well Depth (ft.): 31.38
Screen Length in ft. 5 Screen Depth in ft. 25 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 6.88 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 27.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 4.25
Sample Designation ASI-23D2-051810A Time at Purge Completion: 1110
Sample Time 1055 Signature: [signature]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo PUMP
Multimeter model and serial number YSI #1 2016 Turbidity meter model and serial number HF Scientific MicroTPW #1925
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1020	NA NA	375	7.11	0.33	0.33	NR	NR	NR	NR	NR	NR	
1025		375	7.11	0.00	0.33	9.43	1217	6.86	-16.0	2.50	10.39	
1030		375	7.11	0	0.33	9.22	1203	6.71	-8.0	0.85	4.75	
1035		375	7.11	0	0.33	9.20	1203	6.64	-2.4	0.61	4.74	
1040		375	7.11	0	0.33	9.15	1204	6.57	0.6	0.50	1.94	
1045		375	7.11	0	0.33	9.17	1206	6.56	1.8	0.48	1.50	
1050		375	7.11	0	0.33	9.17	1207	6.55	1.3	0.49	1.48	
1055						Sample						

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/18/10 Page 1 of 1 **Well ID :** ASI-23S
Field Personnel Josh Stewart Purging Start Time : 1145
Well Depth as installed (ft.): 18 Measured Well Depth (ft.): ~~18.0~~ NA
Screen Length in ft. 10 Screen Depth in ft. 8 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): NA From: Steel Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 16 From: Steel Total Volume Purged, Including Drawdown (gallons): 0.50 (IS)
Sample Designation ASI-23S-051810A Time at Purge Completion: 1205
Sample Time 1310 Signature: [signature]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) geo pump
Multimeter model and serial number YSI # 2016 Turbidity meter model and serial number HF Scientific MICRO TPW 1925

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)
Well purged dry came back @ 1305 well had recovered sample collected at 1310; peristaltic pump used

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1150	NA / NA	200	NA	NA	NA	NR	NR	NR	NR	NR	NR	
1155	↓ / ↓	125	↓	↓	↓	10.89	507	7.36	-58.7	8.77	NR	
1200	↓ / ↓	115	↓	↓	↓	11.09	497	6.65	-37.8	7.23	5.47	
1205	↓ / ↓	100	↓	↓	↓	—	well	dry		—	—	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/18/10 Page 1 of 1 **Well ID :** MI-2
Field Personnel Josh Stewart Purging Start Time : 1446
Well Depth as installed (ft.): 15 Measured Well Depth (ft.): 14.94
Screen Length in ft. 5 Screen Depth in ft. 10 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 5.98 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 12.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 2.00
Sample Designation MI-2-051810A Time at Purge Completion: 1538
Sample Time 1525 Signature: Josh Sc
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder 12 PSI 10 R 5D
Multimeter model and serial number YSI #2016 Turbidity meter model and serial number HF Scientific Micro TPW # 1925

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)
Bladder pump used

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1450	5 / 10	150	6.10	0.12	0.12	NR	NR	NR	NR	NR	NR	15 PSI
1455		175	6.10	0	0.12	10.30	178	6.20	103.5	6.85	29.77	
1500		175	6.10	0	0.12	9.91	180	6.31	113.9	6.29	11.77	
1505		175	6.10	0	0.12	9.78	185	6.12	120.0	5.93	9.76	
1510		175	6.10	0	0.12	9.75	190	6.10	123.0	5.77	9.94	
1515		175	6.10	0	0.12	9.74	193	6.11	126.8	5.66	9.72	
1520		175	6.10	0	0.12	9.72	195	6.11	126.1	5.62	9.28	
1525		Sample										

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-19-10 Page 1 of 2 **Well ID :** BM-3D
Field Personnel Ken Marks Purging Start Time : 0855
Well Depth as installed (ft.): 29 Measured Well Depth (ft.): 30.39
Screen Length in ft. 5 Screen Depth in ft. 24-29 Parameter Stabilization: (Circle) Yes / (No)
Depth to GW (ft.): 5.88 From: Top of PVC Two Hour Time Limit Reached ? (Circle) (Yes) / No
Pump/Tubing Intake set (ft.): 26.5 From: ↓ Total Volume Purged, Including Drawdown (gallons): ~~3~~ 5 JF
Sample Designation BM-3D 051910 Time at Purge Completion: 1100
Sample Time 1105 Signature: Ken Marks
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder - PSI = 30 Refill = 9.5 Discharge = 5.5
Multimeter model and serial number YSI 556 MPS 70H102056 Turbidity meter model and serial number Micro TPW 200805197
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Weather: Cloudy 62°F Wind light on and off rain.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	MS/MSD
0905	N A	200	6.33	0.45	-	10.18	970	6.39	-50.9	0.75	612.5	Purge water cloudy orange.
0910		200	6.33	0.00	0.45	10.02	977	6.21	-48.1	0.58	601.1	
0915		200	6.33	0.00	0.45	9.98	981	6.17	-49.6	0.49	543.0	
0920		200	6.33	0.0	0.45	9.91	978	6.14	-50.2	0.51	276.0	
0925		200	6.33	0.0	0.45	9.94	984	6.16	-53.6	0.60	229.7	
0930		200	6.33	0.0	0.45	9.98	988	6.21	-56.9	0.64	321.1	
0935		200	6.33	0.0	0.45	10.06	989	6.26	-57.6	0.59	311.2	
0940		200	6.33	0.0	0.45	10.04	990	6.29	-58.1	0.57	325.1	
0945		200	6.33	0.0	0.45	10.05	990	6.25	-58.5	0.52	230.7	
0950		200	6.33	0.0	0.45	10.08	991	6.31	-59.1	0.52	221.9	
0955		200	6.33	0.0	0.45	10.11	993	6.36	-59.1	0.51	201.7	
1000		200	6.33	0.0	0.45	10.12	993	6.35	-58.9	0.57	191.2	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-19-10 Page 2 of 2 **Well ID :** BM-3D

Field Personnel Ken Marks Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / (No)

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) (Yes) / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: 1100

Sample Time 1105 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Page #2 of 2 Log info on page#1

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	Page 2 of 2
1005	N A	200	6.33	0.0	0.45	10.14	993	6.32	-58.8	0.61	178.9	Field log info on page#1
1010		200	6.33	0.0	0.45	10.11	991	6.38	-58.8	0.51	143.3	All readings stable but
1015		200	6.33	0.0	0.45	10.13	991	6.30	-57.6	0.45	126.7	turbidity
1020		200	6.33	0.0	0.45	10.06	991	6.35	-57.9	0.41	101.3	
1025		200	6.33	0.0	0.45	10.07	992	6.37	-59.1	0.37	90.87	
1030		200	6.33	0.0	0.45	10.05	992	6.37	-59.4	0.37	88.25	
1035		200	6.33	0.0	0.45	10.03	992	6.38	-59.2	0.35	73.55	
1040		200	6.33	0.0	0.45	10.03	992	6.40	-58.8	0.30	66.92	Purge water slightly cloudy. No odor,
1045		200	6.33	0.0	0.45	10.08	992	6.41	-59.0	0.31	59.98	
1050		200	6.33	0.0	0.45	10.07	992	6.41	-58.5	0.33	58.25	
1055		200	6.33	0.0	0.45	10.09	992	6.42	-58.9	0.33	56.96	
1100		200	6.33	0.0	0.45	10.10	992	6.44	-59.4	0.32	54.94	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/19/10 Page 1 of 1 **Well ID :** MI-1

Field Personnel Josh Stewart Purging Start Time : ~~1010~~ JS 0900

Well Depth as installed (ft.): 15 Measured Well Depth (ft.): 15.11

Screen Length in ft. 5 Screen Depth in ft. 10 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.29 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 12.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 3.00

Sample Designation MI-1-051910A Time at Purge Completion:

Sample Time 0945 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder 12 PSI 10 R 5d

Multimeter model and serial number YSI # 2016 Turbidity meter model and serial number HF Scientific MICRO TPW # 1925

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Bladder pump used

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0905	5 / 10	250	6.31	0.02	0.02	NR	NR	NR	NR	NR	NR	12 PSI
0910	5 / 10	250	6.31	0.00	0.02	8.47	217	6.75	208.2	6.89	2.57	12 PSI
0915	5 / 10	250	6.31	0	0.02	8.00	269	6.33	208.5	5.55	2.47	12 PSI
0920	5 / 10	250	6.31	0	0.02	7.90	357	6.28	202.6	4.96	1.52	12 PSI
0925	5 / 10	250	6.31	0	0.02	7.88	439	6.25	198.4	4.61	2.09	12 PSI
0930	5 / 10	250	6.31	0	0.02	7.87	474	6.23	195.8	4.40	0.98	12 PSI
0935	5 / 10	250	6.31	0	0.02	7.87	483	6.21	194.3	4.33	1.45	12 PSI
0940	5 / 10	250	6.31	0	0.02	7.86	483	6.20	193.4	4.25	1.92	12 PSI
0945						Sample						

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/19/10 Page 1 of 1 **Well ID :** ARC-3

Field Personnel Josh Stewart Purging Start Time : 1415

Well Depth as installed (ft.): 20 Measured Well Depth (ft.): 17.82

Screen Length in ft. 15 Screen Depth in ft. 5 Parameter Stabilization: (Circle) Yes No

Depth to GW (ft.): 4.03 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 12.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 4.00

Sample Designation ARC-3-051910A Time at Purge Completion: 1550

Sample Time ~~1525~~ 35 1525 Signature: Jos

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder 15 PSI

Multimeter model and serial number YSI # 1921 Turbidity meter model and serial number HF Scientific MicroTPW 1888

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Bladder pump used

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1420	5 / 10	200	4.05	0.02	0.02	NR	NR	NR	NR	NR	NR	15 PSI
1425	5 / 10	200	4.05	~~0.07~~ 0.08	0.02	10.41	0081	5.68	71.7	8.93	56.28	15 PSI
1430	5 / 10	200	4.05	0	0.02	10.22	0071	5.41	67.7	8.79	48.47	15 PSI
1435	5 / 10	200	4.05	0	0.02	10.16	0070	5.33	69.7	8.70	41.76	15 PSI
1440	5 / 10	200	4.05	0	0.02	10.20	0069	5.28	67.6	8.58	~~16.09~~ 16.09	15 PSI
1445	5 / 10	200	4.05	0	0.02	10.14	0070	5.21	65.6	8.49	19.08	15 PSI
1450	5 / 10	200	4.05	0	0.02	10.17	0075	5.18	64.2	8.37	15.42	15 PSI
1455	5 / 10	200	4.05	0	0.02	10.11	0077	5.15	63.4	8.34	11.45	15 PSI
1500	5 / 10	200	4.05	0	0.02	10.02	0078	5.14	62.9	8.27	9.98	15 PSI
1505	5 / 10	200	4.05	0	0.02	9.99	0078	5.10	63.3	8.02	7.43	15 PSI
1510	5 / 10	200	4.05	0	0.02	9.97	0077	5.09	63.1	7.95	4.98	15 PSI
1515	5 / 10	200	4.05	0	0.02	9.95	0078	5.07	63.9	8.08	4.92	15 PSI
1520		200	4.05	0	0.02	9.95	0079	5.07	63.7	8.09	4.86	15 PSI

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 05/19/10 Page 1 of 1 **Well ID :** ASI-16D2

Field Personnel PC Purging Start Time : 1232

Well Depth as installed (ft.): ~35.3(?) Measured Well Depth (ft.): 35.3

Screen Length in ft. 5 Screen Depth in ft. 35 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 8.02 From: 30 Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 32.5 From: 35 Total Volume Purged, Including Drawdown (gallons): ~10 liters

Sample Designation ASI-16D2-051910A Time at Purge Completion: 1330

Sample Time 1330 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geopump (Peristaltic) #3400 or #2

Multimeter model and serial number YSI 556 MPS 2016 Turbidity meter model and serial number 30060 7094 Geotech #1925

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1235	NA / NA	200	8.28	0.26	0.26	11.45	771	7.15	63.0	5.02	30.11	Peristaltic
1240		200	8.28	0	0.26	11.23	771	7.24	-0.8	2.45	20.88	
1245		200	8.29	0.01	0.27	11.18	775	7.19	-84.7	0.88	9.45	
1250		200	8.29	0.0	0.27	11.16	780	7.17	-98.6	0.62	3.37	
1255		200	8.29	0.0	0.27	11.18	784	7.21	-113.8	0.43	3.84	
1300		200	8.29	0.0	0.27	11.18	785	7.19	-117.0	0.39	3.15	
1305		200	8.29	0.0	0.27	11.18	784	7.22	-121.6	0.33	1.54	
1310		200	8.29	0.0	0.27	11.18	784	7.23	-122.3	0.31	1.73	
1315		200	8.29	0.0	0.27	11.19	785	7.23	-124.1	0.32	1.33	
1320		200	8.29	0.0	0.27	11.20	785	7.21	-127.8	0.30	1.13	
1325		200	8.29	0.0	0.27	11.21	785	7.21	-125.7	0.31	1.27	
1330		←			SAMPLE COLLECTED						→	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/19/10 Page 1 of 1 **Well ID :** ~~AS1~~ AIP-01

Field Personnel PC Purging Start Time : 1040

Well Depth as installed (ft.): 42.0 Measured Well Depth (ft.): 42

Screen Length in ft. Unknown Screen Depth in ft. Unknown Parameter Stabilization: (Circle) (Yes) / No

Depth to GW (ft.): ~~[illegible]~~ 1.95 From: — Two Hour Time Limit Reached ? (Circle) Yes / (No)

Pump/Tubing Intake set (ft.): 40.0 From: — Total Volume Purged, Including Drawdown (gallons): 4.0

Sample Designation AIP-01-051910A Time at Purge Completion: 1135

Sample Time 1145 Signature: C. Pe[illegible]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) GeoPump

Multimeter model and serial number YSI 556 MPS 2016 Turbidity meter model and serial number Scientific Micro TPW Geotech. (1925)

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Peristaltic pump used

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1045	NA NA	225	1.95	0	0	10.70	494	7.02	91.4	4.06	—	turbidimeter being Recalibrated
1050		225	1.96	0.01	0.01	10.66	560	6.64	~~68.0~~	0.83	—	
1055		225	1.99	0.05	0.06	10.68	576	6.72	-87.1	0.58	—	
1100		225	2.01	0	0.06	10.73	607	6.78	-107.5	0.42	—	
1105		225	2.03	0.02	0.08	10.80	624	6.92	-120.7	0.38	—	
1110		225	2.06	0.03	0.11	10.78	628	6.96	-123.7	~~1.00~~ 0.38	11.74	→ YSI switched off
1115		225	2.11	0.05	0.16	10.80	628	7.05	-128.7	(12) 0.37	3.54	
1120		225	2.14	0.03	0.19	10.82	629	7.05	-129.3	0.36	3.25	
1125		225	2.17	0.03	0.22	10.79	630	7.06	-130.0	0.35	3.42	
1130		225	2.18	0.01	0.23	10.80	629	7.04	-132.3	0.33	3.48	
1135		← SAMPLE COLLECTED →										

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 05/19/10 Page 1 of 1 **Well ID :** AL-15

Field Personnel PC Purging Start Time : 1528 JE

Well Depth as installed (ft.): ~~15~~ 16.5 Measured Well Depth (ft.): ~~≈15'~~ 14.23

Screen Length in ft. 10 Screen Depth in ft. 16.5 Parameter Stabilization: (Circle) Yes No

Depth to GW (ft.): 7.09 From: 6.5 Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): From: 16.5 Total Volume Purged, Including Drawdown (gallons): 2.5

Sample Designation AL-015-051910A Time at Purge Completion: 1620

Sample Time 1620 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo Pump (Geotech #340)

Multimeter model and serial number YSI 556 MPS (07C1046) or 2016 Turbidity meter model and serial number MicroTPW S.No: 30060 7094

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1530	N A	150	7.13	0.04	0.04	10.48	1248	6.06	127.1	4.30	17.29	
1535		150	7.13	0.0	0.04	10.22	1252	5.74	121.7	2.58	7.07	
1540		150	7.14	0.1	0.05	9.90	1235	5.60	109.1	1.43	3.00	
1545		150	7.14	0.0	0.05	9.83	1166	5.57	101.7	1.43	3.02	
1550		150	7.14	0.0	0.05	9.85	1105	5.55	98.3	1.50	2.59	
1555		150	7.14	0.0	0.05	9.83	1076	5.54	95.6	1.48	2.86	
1600		150	7.14	0.0	0.05	9.79	1013	5.56	94.0	1.53	2.77	
1605		150	7.14	0.0	0.05	9.77	1022	5.56	93.4	1.51	2.52	
1610		150	7.14	0.0	0.05	9.78	1009	5.58	93.4	1.54	2.31	
1615		150	7.14	0.0	0.05	9.78	1001	5.58	93.6	1.53	2.36	
1620		←		SAMPLE	COLLECTED						→	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-19-10 Page 1 of 1 **Well ID :** AL-2

Field Personnel Ken Marks Purging Start Time : 1545

Well Depth as installed (ft.): Unknown Measured Well Depth (ft.): 25.45

Screen Length in ft. Unknown Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 7.57 From: Top of PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: ↓ Total Volume Purged, Including Drawdown (gallons): 2

Sample Designation AL-2 051910 Time at Purge Completion: 1635

Sample Time 1640 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder PSI 25 Dis = 5 Rec = 10

Multimeter model and serial number YSI 556MPS #07H102056 Turbidity meter model and serial number Micro TPW #200805197

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting 25 PSI	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1550	5 10	200	7.59	0.02	–	11.16	678	6.91	78.1	2.80	13.83	Purge water clear. No odor.
1555		200	7.59	0.0	0.02	10.87	674	6.45	90.2	1.02	8.79	Purge water clear with some
1600		200	7.59	0.0	0.02	10.56	673	6.24	94.2	1.50	8.08	black specks floating. No odor.
1605		200	7.59	0.0	0.02	10.50	675	6.17	94.6	1.38	7.12	↓
1610		200	7.58	0.0	0.01	10.53	676	6.12	95.1	1.01	6.33	↓
1615		200	7.58	0.0	0.01	10.55	678	6.08	95.6	0.85	5.29	Purge water clear. No odor.
1620		200	7.58	0.0	0.01	10.51	680	6.06	96.1	0.81	5.03	↓
1625		200	7.58	0.0	0.01	10.49	681	6.02	96.9	0.77	4.97	↓
1630		200	7.57	0.0	0.0	10.39	682	6.01	97.2	0.65	4.83	↓
1635	↓	200	7.57	0.0	0.0	10.40	682	6.01	97.5	0.64	4.89	↓
						Ken Marks						

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-19-10 Page 1 of 2 **Well ID :** BM-3S

Field Personnel Ken Marks Purging Start Time : 1215

Well Depth as installed (ft.): 23 Measured Well Depth (ft.): 15.20

Screen Length in ft. 10 Screen Depth in ft. 13 to 23 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.93 From: Top of PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 18 From: ↓ Total Volume Purged, Including Drawdown (gallons): 4

Sample Designation BM-3S 051910 Time at Purge Completion: 1340

Sample Time 1350 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder PSI = 20 dis = 5 rec = 10

Multimeter model and serial number YSI 556 MPS #07410205 Turbidity meter model and serial number Micro TPW #200805197

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1225	N / A	150	7.30	0.37	–	9.76	365	6.64	60.4	5.99	44.71	Purge water slighty cloudy
1230	5 / 10	150	7.27	0.0	0.37	9.64	376	6.63	64.3	5.53	30.52	↓
1235	5 / 10	150	7.27	0.0	0.34	9.60	391	6.63	66.2	5.24	33.40	↓
1240	5 / 10	150	7.27	0.0	0.34	9.56	404	6.63	66.7	5.06	21.10	↓
1245	5 / 10	150	7.27	0.0	0.34	9.53	414	6.62	67.7	4.98	18.37	Purge water clear No odor
1250	5 / 10	150	7.27	0.0	0.34	9.53	427	6.62	68.1	4.96	14.24	↓
1255	5 / 10	150	7.27	0.0	0.34	9.57	436	6.61	69.8	4.92	12.34	↓
1300	5 / 10	150	7.27	0.0	0.34	9.59	425	6.64	68.3	4.81	11.79	↓
1305	5 / 10	150	7.27	0.0	0.34	9.54	456	6.61	68.8	4.66	10.07	↓
~~1307~~ 1310	5 / 10	150	7.27	0.0	0.34	9.49	462	6.59	69.9	4.66	7.59	↓
1315	5 / 10	150	7.27	0.0	0.34	9.59	465	6.59	70.2	4.53	8.31	↓
1320	5 / 10	150	7.27	0.0	0.34	9.61	470	6.59	70.9	5.46	7.48	↓

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-19-10 Page 2 of 2 **Well ID :** BM 3S

Field Personnel Ken Marks Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation See pg #1 Time at Purge Completion: _____

Sample Time ~~1343~~ 1350 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	Page 2 of 2
1325	5 / 10	150	7.27	0.0	0.34	9.62	477	6.58	71.1	5.01	6.53	Field log info ~~on~~ Page #1
1330	5 / 10	150	7.27	0.0	0.34	9.65	482	6.63	69.5	4.71	7.14	Purge water clear. No odor.
1335	5 / 10	150	7.27	0.0	0.34	9.76	483	6.58	70.7	4.51	6.51	↓
1340	5 / 10	150	7.27	0.0	0.34	9.87	491	6.59	69.9	4.42	6.03	↓

Ken Marks

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/20/10 Page 1 of 1 **Well ID :** AL-12

Field Personnel J. Stewart Purging Start Time : ~~15.08~~ 0846

Well Depth as installed (ft.): 15 Measured Well Depth (ft.): 15.08

Screen Length in ft. 5 Screen Depth in ft. 15 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 8.34 (5) PVC From: 10 Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 12.5 PVC From: 15 Total Volume Purged, Including Drawdown (gallons): 4.00

Sample Designation AL-12-052010A Time at Purge Completion: 0950

Sample Time 0935 Signature: [illegible]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder 15 PSI

Multimeter model and serial number YSI # 1921 Turbidity meter model and serial number HF Scientific Micro TPW # 1888

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	15 PSI
0850	5 / 10	250	8.45	0.11	0.11	NR	NR	NR	NR	NR	NR	Purge water Very silty brown color
0855	5 / 10	250	8.45	~~0.15~~	0.11	10.53	0670	5.84	149.0	0.90	109.5	15 PSI water brown color
0900	5 / 10	250	8.45	0	0.11	10.39	0644	5.63	83.0	0.71	75.60	15 PSI Water light brown color
0905	5 / 10	250	8.45	0	0.11	10.33	0640	5.54	73.0	0.64	50.62	15 PSI
0910	5 / 10	250	8.45	0	0.11	10.31	0639	5.55	65.1	0.60	36.31	15 PSI
0915	5 / 10	250	8.45	0	0.11	10.28	0636	5.55	63.0	0.54	27.92	15 PSI
0920	5 / 10	250	8.45	0	0.11	10.32	0635	5.57	61.8	0.54	21.08	15 PSI
0925	5 / 10	250	8.45	0	0.11	10.31	0633	5.58	60.5	0.55	20.01	15 PSI
0930	5 / 10	250	8.45	0	0.11	10.34	0630	5.59	60.1	0.59	19.85	15 PSI
0935		Sample										

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/20/10 Page 1 of 1 **Well ID :** BW-13S

Field Personnel PC Purging Start Time : 0902

Well Depth as installed (ft.): 6 Measured Well Depth (ft.): 7.50

Screen Length in ft. 1 Screen Depth in ft. 6 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): ~~5.13~~ 5.13 From: 5 Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 7.00 From: 6 Total Volume Purged, Including Drawdown (gallons): ≈1.5 gallons

Sample Designation BW-013S-052010A Time at Purge Completion: 1005

Sample Time 0940 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) ~~[illegible]~~ GeoPump

Multimeter model and serial number YSI 556 MPS #2016 Turbidity meter model and serial number ~~[illegible]~~ 300601094 Geotech #1925

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Intake 0.5' from bottom

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0905		150	5.55	0.42	0.42	11.35	791	6.83	214.7	6.24	34.19	
0910		100	5.59	0.04	0.46	10.80	767	6.35	233.7	3.93	12.11	
0915		100	5.59	0.0	0.46	10.79	745	~~2.53~~ 6.09	236.9	2.53	4.97	
0920		100	5.59	0.0	0.46	10.80	739	5.97	232.3	2.31	3.08	
0925		100	5.59	0.0	0.46	10.70	737	5.90	226.6	2.16	1.44	
0930		100	5.59	0.0	0.46	10.69	737	5.89	221.2	2.15	1.31	
0935		100	5.59	0.0	0.46	10.67	737	5.89	218.7	2.15	1.40	
0940		← SAMPLE COLLECTED →										

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-20-10 Page 1 of 1 **Well ID :** MI-8

Field Personnel K. Marks Purging Start Time : 0855

Well Depth as installed (ft.): 14.5 Measured Well Depth (ft.): 16.38

Screen Length in ft. 5 Screen Depth in ft. 14.5 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 5.81 From: 9.5 Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 12 From: 14.5 Total Volume Purged, Including Drawdown (gallons): 2

Sample Designation MI-8-052010-A Time at Purge Completion: 0945

Sample Time 0950 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder Pump

Multimeter model and serial number YSI 556 MPS #07H102056 Turbidity meter model and serial number Micro TPW #200805197

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Intake 2.5' from bottom

Clock Time	Discharge / Refill / Pump Setting PSI=15	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0905	11 / 4	150	5.81	0.0	0.0	9.89	191	6.72	201.8	5.00	6.88	Purge water clear No odor
0910	11 / 4	150	5.81	0.0	0.0	9.57	187	6.29	202.1	2.50	5.11	
0915	11 / 4	150	5.81	0.0	0.0	9.21	183	6.00	186.4	1.60	4.02	
0920	11 / 4	150	5.81	0.0	0.0	8.97	180	5.71	186.6	1.46	2.73	
0925	11 / 4	150	5.81	0.0	0.0	8.79	178	5.62	184.1	1.09	4.31	
0930	11 / 4	150	5.81	0.0	0.0	8.84	177	5.59	180.0	0.93	4.11	
0935	11 / 4	150	5.81	0.0	0.0	8.80	177	5.51	178.2	0.81	3.03	
0940	11 / 4	150	5.81	0.0	0.0	8.79	177	5.55	177.8	0.80	2.97	
0945	11 / 4	150	5.81	0.0	0.0	8.77	175	5.52	177.4	0.82	2.51	

Ken Marks

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 05/20/10 Page 1 of 1 **Well ID :** ASI-15D2

Field Personnel PC Purging Start Time : 1106

Well Depth as installed (ft.): 40.5 Measured Well Depth (ft.): 42.56

Screen Length in ft. 5 Screen Depth in ft. Parameter Stabilization: (Circle) Yes No

Depth to GW (ft.): 6.42 From: 35.5 Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 38 From: 40.5 Total Volume Purged, Including Drawdown (gallons): 2½ gallons

Sample Designation ASI-015D2-052010A Time at Purge Completion: 1200

Sample Time 1200 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) GeoPump

Multimeter model and serial number YSI 556MPS (2016) Turbidity meter model and serial number MICROTPW 1925

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1110		150	6.86	0.44	0.44	10.28	1366	6.66	-64.7	5.38	9.05	
1115		150	6.89	0.03	0.47	10.12	1409	6.73	-69.2	2.37	5.21	
1120		150	6.90	0.01	0.48	10.12	1412	6.79	-80.3	1.17	5.82	
1125		150	6.90	0.00	0.48	10.05	1416	6.81	-89.0	0.65	4.08	
1130		150	6.90	0.00	0.48	10.04	1419	6.83	-95.4	0.45	3.26	
1135		150	6.90	0.00	0.48	10.07	1421	6.83	-98.1	0.44	3.17	
1140		150	6.90	0.00	0.48	10.10	1417	6.84	-101.7	0.44	3.02	
1145		150	6.90	0.00	0.48	10.09	1416	6.84	-102.2	0.42	3.10	
1150		150	6.90	0.00	0.48	10.06	1415	6.84	-102.2	0.42	3.07	
1155		150	6.90	0.00	0.48	10.06	1417	6.84	-103.4	0.42	3.01	
1200		← SAMPLE COLLECTED →										

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/20/10 Page 1 of 1 **Well ID :** OE-2B

Field Personnel Josh Stewart Purging Start Time : 1115

Well Depth as installed (ft.): 13 Measured Well Depth (ft.): 15.31

Screen Length in ft. 10 Screen Depth in ft. 3 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.95 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 8 From: PVC Total Volume Purged, Including Drawdown (gallons): 4.00

Sample Designation OE-2B-052010A Time at Purge Completion: 1223

Sample Time 1205 Signature: Josh Stewart

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder

Multimeter model and serial number YSI # 1921 Turbidity meter model and serial number HF Scientific micro TPW # 1888

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3% NR	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1120	5 / 10	250	7.03	0.08	0.08	~~19.93~~	NR	NR	NR	NR	NR	15 PSI
1125	5 / 10	250	7.07	0.04	0.12	8.54	0071	4.92	82.0	3.53	60.79	15 PSI
1130	5 / 10	250	7.08	0.01	0.13	8.21	0067	4.74	85.8	3.43	53.66	15 PSI
1135	5 / 10	250	7.08	0.00	0.13	8.29	0064	4.65	87.4	3.38	40.82	15 PSI
1140	5 / 10	250	7.08	0	0.13	8.18	0064	4.60	85.1	3.41	29.06	15 PSI
1145	5 / 10	250	7.08	0	0.13	8.24	0066	4.56	73.8	3.40	13.39	15 PSI
1150	5 / 10	250	7.08	0	0.13	8.22	0067	4.55	69.1	3.39	12.02	15 PSI
1155	5 / 10	250	7.09	0.01	0.14	8.21	0068	4.56	68.1	3.39	11.12	15 PSI
1200	5 / 10	250	7.09	0	0.14	8.20	0068	4.54	67.0	3.38	11.20	15 PSI
1205		Sample										

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 05/20/10 Page ____ of ____ **Well ID :** ASI-05D2

Field Personnel FC Purging Start Time : 1425

Well Depth as installed (ft.): 35.5 Measured Well Depth (ft.): 36.85

Screen Length in ft. 5 Screen Depth in ft. 35.5 Parameter Stabilization: (Circle) Yes No

Depth to GW (ft.): 6.55 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): ? From: PVC Total Volume Purged, Including Drawdown (gallons): ≈3 gallons

Sample Designation ____ Time at Purge Completion: ____

Sample Time 1520 FD Time 1530 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geotech

Multimeter model and serial number YSI 556 MPS 2016 Turbidity meter model and serial number Micro TPW 1925

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1430		250	6.90	0.35	0.35	11.22	1043	7.41	-76.3	4.19	10.87	
1435		200	6.85	-0.05	0.30	11.26	1044	7.28	-96.3	1.72	4.38	
1440		200	6.85	0	0.30	11.00	1044	7.26	-107.6	0.65	3.14	
1445		200	6.87	0.02	0.32	10.99	1045	7.24	-111.1	0.45	2.96	
1450		200	6.87	0.0	0.32	11.02	1045	7.23	-114.9	0.42	2.54	
1455		200	6.87	0.0	0.32	11.05	1044	7.23	-116.0	0.39	2.80	
1500		200	6.87	0.0	0.32	11.08	1044	7.23	-113.1	0.37	2.59	
1505		200	6.87	0.0	0.32	11.10	1044	7.23	-116.4	0.37	2.65	
1510		200	6.87	0.0	0.32	11.11	1044	7.23	-117.5	0.36	2.72	
1515		200	6.87	0.0	0.32	11.11	1044	7.23	-118.3	0.36	2.68	
1520		←			SAMPLE	COLLECTED					→	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5/20/10 Page 1 of 1 **Well ID :** BF-4

Field Personnel Josh Stewart Purging Start Time : 1453

Well Depth as installed (ft.): 12 Measured Well Depth (ft.): 12.57

Screen Length in ft. 10 Screen Depth in ft. 1.5 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 8.04 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): ~~6.5~~ 10 From: PVC Total Volume Purged, Including Drawdown (gallons): 4.25

Sample Designation BF-4-052010A Time at Purge Completion: 1558

Sample Time 1540 Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder

Multimeter model and serial number YSI # 1921 Turbidity meter model and serial number HF Scientific micro TPW # 1888

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1455	5 / 10	300	8.16	0.12	0.12	NR	NR	NR	NR	NR	NR	15 PSI purge water orange
1500	5 / 10	300	8.16	0	0.12	9.19	0191	5.95	25.9	1.56	188.5	15 PSI water orange
1505	5 / 10	300	8.16	0	0.12	8.57	0192	6.10	10.0	1.12	105.5	15 PSI
1510	5 / 10	300	8.16	0	0.12	8.33	0193	6.14	6.9	0.89	77.38	15 PSI
1515	5 / 10	300	8.16	0	0.12	8.27	0194	6.19	4.6	0.93	78.91	15 PSI
1520	5 / 10	300	8.16	0	0.12	8.31	0195	6.22	4.0	0.76	67.67	15 PSI
1525	5 / 10	300	8.16	0	0.12	8.27	0195	6.24	4.1	0.79	54.76	15 PSI
1530	5 / 10	300	8.16	0	0.12	8.24	0195	6.25	4.6	0.75	59.67	15 PSI
1535	5 / 10	300	8.16	0	0.12	8.22	0196	6.24	4.8	0.73	53.86	15 PSI
1540						Sample						

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-20-10 Page 1 of 2 **Well ID :** BR-1

Field Personnel Ken Marks Purging Start Time : ~~FH~~ 1455

Well Depth as installed (ft.): 123 Measured Well Depth (ft.): 114.68

Screen Length in ft. 10 Screen Depth in ft. 123 Parameter Stabilization: (Circle) Yes / (No)

Depth to GW (ft.): 17.25 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / (No)

Pump/Tubing Intake set (ft.): 118 From: PVC Total Volume Purged, Including Drawdown (gallons): 2

Sample Designation ~~BR-1 052010~~ BR-001-052010A Time at Purge Completion:

Sample Time 0815 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) ~~Micro TPW #20080514 KM~~ Geo-Pump

Multimeter model and serial number YSI 556 MPS #07H102056 Turbidity meter model and serial number MicroTPW #20080519 7

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Max drawdown was reached w/ peristatic (~2 ft); recharge is slow so decide to let recover overnight and sample in AM (05/20/10)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	Geo-Pump											
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1505	N/A	100	17.93	0.68	–	13.77	5520	11.76	-2.4	4.07	296.7	Purge water cloudy. No odor.
1510	Low setting	100	18.55	0.62	1.3	13.96	5518	11.86	-1.5	3.93	202.7	↓
1515		100	19.47	0.92	2.22	14.09	5541	11.83	6.4	3.54	121.3	↓
1520		100	~~20~~ 20.33	0.86	3.08	14.15	5535	11.89	12.7	3.40	99.23	DTW = 20.33
1525		100	21.21	0.88	3.96	14.21	5541	11.94	20.3	3.09	115.5	Purge water cloudy. No odor.
1530		100	22.11	0.90	4.86	14.05	5527	11.98	22.1	2.88	101.7	↓
1535		100	23.07	0.96	5.82	13.88	5519	12.03	22.8	2.62	90.16	↓
1540		100	23.96	0.89	6.71	14.01	5401	12.17	11.9	2.60	89.11	↓
1545		100	24.75	0.79	7.50	14.29	5262	12.30	-8.6	2.61	88.96	↓
1550		100	25.29	0.54	8.04	14.34	5248	12.39	-6.2	2.58	86.66	↓
1555		100	26.11	0.82	8.86	14.40	5238	12.31	10.6	2.55	85.61	↓
1600		100	27.02	0.91	9.77	14.43	5210	12.34	11.8	2.48	85.01	↓

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 5-20-10 Page 2 of 2 **Well ID :** BR-1

Field Personnel Ken Marks Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: _____

Sample Time _____ Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Page # 2 of 2 Field log info ~~BR~~ page #1

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	Geo-Pump											Page 2 of 2
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1605	Low setting	100	27.90	0.88	10.65	14.37	5157	12.47	2.1	2.44	71.11	Well info see page #1
1610		100	28.82	0.92	11.57	14.53	5116	12.41	5.6	2.52	63.23	
1615		100	29.51	0.69	12.26	14.53	5091	12.41	10.3	2.63	58.24	
1620		100	30.32	0.81	13.07	14.57	5068	12.49	-13.9	2.50	51.50	
1625		100	31.13	0.81	13.88 ~~13.88~~	14.61	5008	12.53	-47.4	2.49	50.01	Cum draw down = 13.88
1630		100	31.86	0.73	14.61	14.93	4879	13.55	-128.3	2.45	31.71	No odor
1635		100	31.89	0.03	14.64	15.12	4838	13.30	-124.1	2.52	19.40	Purge water very slighty cloudy
1640		100	32.01	0.12	14.76	15.21	4833	13.30	-124.5	2.55	19.57	
1645		100	32.12	0.11	14.87	15.20	4831	13.28	-124.7	2.57	19.50	
												Purge stoped DTW To deep

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-2-10 Page 1 of 2 **Well ID :** AIP-01

Field Personnel Ken Marks Purging Start Time : 13.50

Well Depth as installed (ft.): Unknown Measured Well Depth (ft.): 8.42

Screen Length in ft. Unknown Screen Depth in ft. Unknown Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 5.40 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 40 From: gs Total Volume Purged, Including Drawdown (gallons): 2.5

Sample Designation AIP-001-1110A Time at Purge Completion: 1525

Sample Time 1515 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo-Pump Low

Multimeter model and serial number YSI 650 MDS #01C0853 Turbidity meter model and serial number LaMotte 2020 e# 12350 AA

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Page #1 of 2

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3% mS/cm	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	Geo-Pump											
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1400	Low Low	100	5.45	0.05	—	10.48	0.440	8.08	-69.2	9.28	11.9	Purge water slightly cloudy
1405		100	5.45	0.0	0.05	10.94	0.441	7.59	-51.3	7.63	8.14	
1410		100	5.45	0.0	0.05	11.02	0.441	7.49	-47.0	7.48	4.36	Purge water clear
1415		100	5.45	0.0	0.05	11.15	0.452	7.17	-31.7	5.80	4.10	p
1420		100	5.45	0.0	0.05	11.05	0.462	7.24	-28.4	5.15	4.15	
1425		100	5.45	0.0	0.05	11.08	0.516	7.21	-28.2	3.92	4.11	
1430		100	5.45	0.0	0.05	11.12	0.566	7.20	-43.9	3.40	3.12	
1435		100	5.45	0.0	0.05	11.13	0.582	7.22	-66.8	2.61	3.03	
1440		100	5.45	0.0	0.05	10.99	0.602	7.27	-90.0	1.91	2.51	
1445		100	5.45	0.0	0.05	10.99	0.615	7.34	-115.7	1.37	2.12	
1450		100	5.45	0.0	0.05	11.08	0.622	7.37	-127.2	1.23	2.13	
1455		100	5.45	0.0	0.05	11.02	0.638	7.39	-131.5	1.01	1.97	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-2-10 Page 2 of 2 **Well ID :** AIP-01

Field Personnel Ken Marks Purging Start Time : ~~15~~ KW

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: _____

Sample Time 1515 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

INFO on Page#1

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1500		100	5.45	0.0	0.05	10.97	0.643	7.41	-134.0	0.91	1.09	Page# 2 of 2
1505		100	5.45	0.0	0.05	10.93	0.645	7.43	-135.1	0.90	1.01	INFO on Page#1
1510		100	5.45	0.0	0.05	10.94	0.646	7.45	-135.8	0.88	1.00	S. Cond = 0.646

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-1-10 Page 1 of 1 **Well ID :** AL-2

Field Personnel Ken Marks Purging Start Time : 1150

Well Depth as installed (ft.): 25.4 bgs Measured Well Depth (ft.): 25.50 TOC

Screen Length in ft. 5 Screen Depth in ft. 20.4-25.4 bgs Parameter Stabilization: (Circle) (Yes) / No

Depth to GW (ft.): 8.10 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / (No)

Pump/Tubing Intake set (ft.): 22.9 From: bgs Total Volume Purged, Including Drawdown (gallons): 5.0

Sample Designation AL-002-1110A Time at Purge Completion: 1250

Sample Time 1255 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder PSI=20

Multimeter model and serial number YSI 650 MDS #01G0853 Turbidity meter model and serial number LaMotte 2020e # 12350 AA

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting PSI=20	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3% mS/cm	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	~~µS/cm~~		mV	mg/L	NTU	
1155	5.5 9.5	300	7.51	-	-	11.96	0.925	6.21	80.6	1.22	54.4	Purge water clear with lots
1200		300	7.60	-	-	11.99	0.827	6.16	82.1	0.61	30.1	of black specks floating.
1205		300	7.60	-	-	12.07	0.733	6.15	80.4	0.89	12.6	Good recharge.
1210		300	7.62	-	-	12.15	0.702	6.14	81.1	1.41	10.9	
1215		300	7.62	-	-	12.14	0.655	6.14	82.9	1.28	8.51	
1220		300	7.62	-	-	12.15	0.711	6.15	84.3	1.05	6.85	
1225		300	7.62	-	-	12.16	0.742	6.15	85.3	0.87	6.14	
1230		300	7.62	-	-	12.17	0.789	6.15	86.2	0.74	5.13	
1235		300	7.62	-	-	12.17	0.784	6.15	87.1	0.63	4.04	
1240		300	7.62	-	-	12.17	0.795	6.15	88.7	0.56	3.43	
1245		300	7.62	-	-	12.17	0.803	6.15	88.6	0.50	3.68	
1250		300	7.62	-	-	12.17	0.805	6.15	88.8	0.51	3.22	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 1 of 2 **Well ID :** ~~AL-12~~ AL-12
Field Personnel Sam Wan Purging Start Time : 9:15
Well Depth as installed (ft.): 13 Measured Well Depth (ft.): 15.05
Screen Length in ft. 10 Screen Depth in ft. 3-13' Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 8.36 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): ~~8'~~ 11.5' From: PVC Total Volume Purged, Including Drawdown (gallons): 4.0
Sample Designation AL-012-1110A Time at Purge Completion: 10:50
Sample Time 10:35 Signature:
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder 18PSE
Multimeter model and serial number 600XL 02A0874AE Turbidity meter model and serial number ME-10535 Backup
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Screen from 3 to 13 indicated on provided table, Notified Sample Manager
Says to Relocate Pump Intake to Midpoint of Water Column ~11.5' Bgs

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	225-Read w/Kelley's Meter
9:20	5 / 10	200	8.45	—	—	12.29	1272	5.79	80.3	1.30	NA	Erm Low Bat. Call for Replacement.
9:25	5 / 10	200	8.45	—	—	12.43	1271	5.63	106.0	1.05	123.0	Replaced Battery
9:30	5 / 10	200	8.45	—	—	12.46	1265	5.58	121.5	1.02	108.4	
9:35	5 / 10	200	8.45	—	—	12.49	1261	5.57	127.7	1.01	58.1	
9:40	5 / 10	200	8.45	—	—	12.51	1258	5.56	129.4	1.00	42.5	
9:45	5 / 10	200	8.45	—	—	12.53	1256	5.56	132.7	0.94	33.9	
9:50	5 / 10	200	8.45	—	—	12.56	1255	5.56	135.5	0.93	24.4	
9:55	5 / 10	200	8.45	—	—	12.58	1257	5.55	138.1	0.90	16.5	
10:00	5 / 10	200	8.45	—	—	12.58	1254	5.55	139.1	0.87	11.7	
10:05	↓	↓	↓	—	—	12.61	1255	5.54	141.0	0.85	9.13	
10:10	↓	↓	↓	—	—	12.61	1255	5.54	140.8	0.85	8.53	
10:15	↓	↓	↓	—	—	12.63	1254	5.54	140.5	0.86	7.15	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 2 of 2 **Well ID :** AL-12
Field Personnel JWJ Purging Start Time : 9:15
Well Depth as installed (ft.): 13 Measured Well Depth (ft.): 15.05
Screen Length in ft. 10 Screen Depth in ft. 3-13' Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 8.36 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 11.5' From: PVC Total Volume Purged, Including Drawdown (gallons): 4.0
Sample Designation AL-12 Time at Purge Completion: 10:50
Sample Time 10:35 Signature: JWJ
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments)
Multimeter model and serial number Turbidity meter model and serial number
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.) See P-1.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10:20	5 / 10	200	8.45	—	—	12.63	1253	5.54	140.5	0.86	~~7.25~~	Recheck = 0.71
10:25	5 / 10	200	8.45	—	—	12.64	1251	5.54	140.1	0.85	6.54	
												Sample Time 10:35

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** AL - 14

Field Personnel E. JOHNSON Purging Start Time : 900

Well Depth as installed (ft.): 16 bgs Measured Well Depth (ft.): 15.48

Screen Length in ft. 10 Screen Depth in ft. 6-16 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 7.25 From: TOP OF PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 11' From: GROUND SFC Total Volume Purged, Including Drawdown (gallons): 3

Sample Designation AL-014-1110A Time at Purge Completion: 950

Sample Time 955 Signature: [illegible]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) PERISTALTIC PUMP

Multimeter model and serial number YSI 600 XLM 12777 Turbidity meter model and serial number LAMOTTE 2020E 14820

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
905	NA / NA	240	7.28	–	–	10.08	270	6.07	213.9	4.31	NR	Purge water clear, no odor
910		240	7.28	0.0	0.0	10.41	270	6.13	206.4	2.91	4.45	detected.
915		240	7.28	0.0	0.0	10.63	277	6.15	200.7	1.92	3.39	
920		240	7.29	0.01	0.01	10.78	288	6.21	193.1	1.52	2.92	
925		240	7.29	0.0	0.01	10.82	297	6.24	188.2	1.04	1.78	
930		240	7.29	0.0	0.01	10.84	304	6.26	184.1	0.76	1.57	
935		240	7.29	0.0	0.01	10.83	312	6.28	179.9	0.66	1.58	
940		240	7.29	0.0	0.01	10.86	318	6.28	176.3	0.48	1.36	
945		240	7.30	0.01	0.02	10.89	323	6.29	173.9	0.40	1.04	
950		240	7.30	0.0	0.02	10.87	327	6.30	171.3	0.36	1.12	
												→ Readings stabilized, GW
												sampled @ 955

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 1 of 2 **Well ID :** AL-15

Field Personnel K. Armitage Purging Start Time : 1233

Well Depth as installed (ft.): 16.5 bgs Measured Well Depth (ft.): 16.5 bgs 14.32 TOC

Screen Length in ft. 10 Screen Depth in ft. 6.5-16.5 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 7.30 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 9.0 From: PVC Total Volume Purged, Including Drawdown (gallons): 5.3

Sample Designation AL-015-1110A Time at Purge Completion: 1418

Sample Time 1405 Signature: K. Armitage

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) peristaltic

Multimeter model and serial number YSI 650 MDS: PINE1782 Turbidity meter model and serial number LaMotte 2020e: ME14123

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

1235 stopped pumping - clean tubing/flow thru cell. 1243 restarted pumping

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1250	NA NA	~280	7.34	—	—	11.41	607	5.75	2.1	2.47	44.2	Iron flock settling in flow
1255		~330	7.35	0.01	0.01	11.39	532	5.64	-4.3	3.21	10.17	thru cell.
1300		~315	7.35	Ø	0.01	11.43	518	5.61	-2.6	4.30	4.86	
1305		~300	7.35	Ø	0.01	11.50	519	5.59	-4.8	4.49	3.66	
1310		~300	7.35	Ø	0.01	11.55	498	5.58	-1.6	4.51	1.56	
1315		~300	7.35	Ø	0.01	11.52	491	5.57	-3.3	4.48	1.69	
1320		~300	7.35	Ø	0.01	11.57	480	5.56	-6.0	4.40	1.28	
1325		~300	7.35	Ø	0.01	11.54	467	5.56	-5.6	4.43	0.84	DO ch is bouncing 17-33
1330		~300	7.35	Ø	0.01	11.54	463	5.56	-6.0	4.44	0.78	
1335		~300	7.35	Ø	0.01	11.56	454	5.56	-14.6	4.32	0.81	
1340		~300	7.35	Ø	0.01	11.52	449	5.56	-8.0	4.33	0.77	
1345	↓	~300	7.35	Ø	0.01	11.50	441	5.56	-6.1	4.31	0.69	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 1 of 1 **Well ID :** ARC-3
Field Personnel E. JOHNSON Purging Start Time : 1227
Well Depth as installed (ft.): 20 bgs Measured Well Depth (ft.): 17.73 bgs
Screen Length in ft. 15' Screen Depth in ft. 5'-20' Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 4.85 From: TOP OF ROADBOX/SGRADE Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): DEDICATED TUBING 17.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 1.5
Sample Designation ARC-003-1110A Time at Purge Completion: 1305
Sample Time 1310 Signature: Eric Johnson
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) BLADDER PUMP 13521
Multimeter model and serial number YSI 600XL 4309 Turbidity meter model and serial number LAMOTTE 2020E ME14820
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1230	4.5 / 10.5	~200	4.88	.03	.03	12.24	133	6.77	119.8	10.55	18.5	Pressure @ ~15-18 psi, clear
1235	4.5 / 10.5	160	4.88	.03		12.06	74	6.24	129.3	10.27	17.3	purge water
1240	5.0 / 10.0	180	4.88			12.02	60	6.06	135.3	10.21	12.3	
1245	5.0 / 10.0	180	4.88			11.98	58	5.96	141.1	10.15	9.60	
1250	5.0 / 10.0	180	4.88			11.93	56	5.91	144.4	10.14	7.91	
1255	5.0 / 10.0	180	4.88			11.91	55	5.89	147.0	10.12	6.93	
1300	5.0 / 10.0	180	4.88			11.89	55	5.88	149.0	10.13	4.26	
1305	5.0 / 10.0	180	4.88			11.90	55	5.87	150.4	10.13	3.71	
												Parameters stabilized, GW sampled @ 1310.
												Eric Johnson

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 2 of 2 **Well ID :** AL-15

Field Personnel K Armitage Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): 5.3

Sample Designation _____ Time at Purge Completion: _____

Sample Time 1405 Signature: K Armitage

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1350	NA NA	~300	7.35	∅	0.01	~~4~~ 11	436	5.56	1.8	4.45	0.63	Temp = 11.48°C
1355		~300	7.35	∅	0.01	11.45	434	5.56	1.4	4.47	0.70	
1400		~300	7.35	∅	0.01	11.46	432	5.57	2.2	4.43	0.74	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/2010 Page 1 of 1 **Well ID :** ~~ADZ~~ ~~302~~ ~~MW~~ 115 MW-2D2 ASI-02D2 / Dup.

Field Personnel Heidi Borchers Purging Start Time : 1415

Well Depth as installed (ft.): 31 bgs Measured Well Depth (ft.): 31.6

Screen Length in ft. 5 Screen Depth in ft. 26 - 31 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 4.86 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 28.5 From: SS Total Volume Purged, Including Drawdown (gallons): 3 1/2

Sample Designation ASI-02D2-1110A Time at Purge Completion: 1600

Sample Time 1505 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo Pump

Multimeter model and serial number YSI 600 XL SN# 10A100 Turbidity meter model and serial number LaMotte 2020e SN# ME11995

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1420	NA	200	7.20	2.34	0.00	11.11	2.308	6.93	-94.3	2.11	46.0	
1425		200	7.05	2.19	0.15	11.12	2.389	6.97	-115.2	1.38	36.2	
1430			7.10	2.24	0.05	11.18	2.463	6.99	-121.0	1.14	31.8	
1435			7.10	2.24	0.00	11.19	2.500	7.00	-122.2	1.14	4.33	
1445			7.10	2.24	0.00	11.13	2.587	7.00	-127.5	0.54	3.17	
1450		350	7.19	2.33	0.09	11.13	2.610	7.00	-124.0	0.62	1.52	
1455		~~300~~	7.10	2.24	0.09	11.11	2.608	7.01	-127.7	0.57	1.52	
1500		225	7.10	2.24	0.00	11.08	2.608	7.00	-127.4	0.61	1.60	
1505												Sampled @ 1505

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11 - 29 - 10 Page 1 of 2 **Well ID :** ASI 03D2 03D2

Field Personnel Ken Marks Purging Start Time : 1355

Well Depth as installed (ft.): 31 bgs Measured Well Depth (ft.): 30.69

Screen Length in ft. 5 Screen Depth in ft. 26-31 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 5.34 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 28.5 From: gs Total Volume Purged, Including Drawdown (gallons): 2.5

Sample Designation ASI-03D2-1110A Time at Purge Completion: 1515

Sample Time 1520 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo - Pump Low

Multimeter model and serial number YSI 650 MDS 1276 Turbidity meter model and serial number LaMotte 2020e # 12350

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

~~This well has a Field Dup BM~~

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	Low sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1405	Geo Pump	150	5.40	0.06	-	11.22	1.511	6.91	162.0	7.07	11.2	Purge water clear. No odor.
1410	Geo Pump	150	5.41	0.01	0.07	11.21	1.686	6.80	92.0	6.10	8.60	
1415		150	5.41	0.0	0.07	11.13	1.682	6.85	-19.6	2.30	5.35	
1420		150	5.41	0.0	0.07	11.18	1.643	6.92	-67.8	1.35	5.80	
1425		150	5.41	0.0	0.07	11.19	1.631	6.94	-86.4	1.07	5.31	
1430		150	5.41	0.0	0.07	11.28	1.623	6.96	-99.0	1.10	4.35	
1435		150	5.41	0.0	0.07	11.28	1.618	6.95	-101.1	1.03	4.22	
1440		150	5.41	0.0	0.07	11.26	1.612	6.99	-107.6	1.04	4.21	
1445		150	5.41	0.0	0.07	11.19	1.602	7.02	-114.1	0.96	4.64	
1450		150	5.41	0.0	0.07	11.15	1.598	7.03	-117.5	0.82	4.10	
1455		150	5.41	0.0	0.07	11.13	1.596	7.06	-120.9	0.81	4.03	
1500		150	5.41	0.0	0.07	11.14	1.595	7.07	-122.3	0.78	3.91	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11-29-10 Page 2 of 2 **Well ID :** ASF 03D2 03D2

Field Personnel Ken Marks Purging Start Time : 1355

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) (Yes) / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / (No)

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): 2.5

Sample Designation _____ Time at Purge Completion: _____

Sample Time 1520 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

INFO on Page#1

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1505	600 Pump	150	5.41	0.0	0.07	11.11	1.592	7.06	-124.0	0.72	3.83	Page#2 of 2
1510	↓	150	5.41	0.0	0.07	11.11	1.592	7.07	-123.8	0.61	3.81	INFO on Page#1
1515	↓	150	5.41	0.0	0.07	11.09	1.590	7.08	-123.0	0.60	3.77	Purge water Clear. No odor.

Ken Marks

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** ASI-04D2

Field Personnel E. JOHNSON Purging Start Time : 1052

Well Depth as installed (ft.): 35.5 bgs Measured Well Depth (ft.): NR

Screen Length in ft. ~~10~~ 5 Screen Depth in ft. 30.5 - 35.5 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 7.14 From: TOP OF PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): DEDICATED IN PLACE From: Total Volume Purged, Including Drawdown (gallons): 2

Sample Designation ASI-004D2-1110A Time at Purge Completion: 1135

Sample Time 1145 Signature: Eric Johnson

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) PERISTALTIC PUMP

Multimeter model and serial number YSI 600 XLM 12777 Turbidity meter model and serial number LAMOTTE 2020E ME 14820

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1105		140	7.49	–	–	9.64	621	10.13	-85.7	0.91	1.19	- EJ contacts JStewart/JFapiano
1110		140	~~7.51~~ NM (EJ)		NR	9.57	626	10.23	-95.1	0.68	1.07	RE: high pH value.
1115		140	7.51	0.02	0.02	9.60	630	10.35	-111.0	0.69	1.11	- Several high pH values
1120		140	7.55	0.04	0.06	9.59	632	10.36	-114.1	0.68	1.19	detected on Commerce St.
1125		130	7.58	0.03	0.09	9.59	633	10.30	-114.6	0.66	1.26	in past, not ASI-04D2.
1130		120	7.48	(0.10)	(0.01)	9.54	639	10.28	-117.3	0.62	1.01	- EJ to cont. pH readings,
1135		120	7.46	(0.02)	(0.03)	9.55	641	10.24	-118.3	0.45	1.07	cal check sonde upon
												return to support bldg
												per JS + JF.
					Eric Johnson							
												Parameters stabilized, GW sampled
												@ 1145.

EJ DRops FLOW RATE, OBTAINS ADDITIONAL READINGS BEFORE SAMPLING

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/2/10 Page 1 of 1 **Well ID :** ASI-05D2
Field Personnel S. Bonis Purging Start Time : 9:50
Well Depth as installed (ft.): 35.5' Measured Well Depth (ft.): 36.79
Screen Length in ft. 5' Screen Depth in ft. 30.5 → 35.5 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 5.77 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 33' From: PVC Total Volume Purged, Including Drawdown (gallons): 20 gal
Sample Designation ASI-05D2-1110A Time at Purge Completion: 11:10
Sample Time 10:40 Signature: [signature]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geotech Per. # 2959
Multimeter model and serial number YSI 600XL 02A374413 Turbidity meter model and serial number Lamotte 2020e ME-10539
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
9:55		200	5.96	—	—	8.47	954	7.21	-15.4	1.96	10.80	
10:00		200	5.98	.02	.02	9.96	949	7.29	-24.3	1.54	2.74	
10:05		200	6.00	.02	.04	10.35	943	7.31	-28.2	1.03	0.73	
10:10		200	6.00	—	.04	10.43	941	7.32	-29.1	0.74	1.37	
10:15		200	6.00	—	.04	10.52	938	7.33	-30.0	0.67	0.81	
10:20		200	6.00	—	.04	10.49	939	7.33	-31.3	0.65	0.80	
10:25		200	6.00	—	.04	10.49	939	7.33	-33.8	0.50	0.64	
10:30		200	6.00	—	.04	10.48	939	7.33	-35.8	0.47	0.57	Sample Time 10:40

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** AS1-11D2

Field Personnel E. JOHNSON Purging Start Time : 1318

Well Depth as installed (ft.): 40 bgs Measured Well Depth (ft.): NR

Screen Length in ft. 5 Screen Depth in ft. 35-40 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 2.88 From: TOP OF PVC (FLUSH MT) Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): DEDICATED IN PLACE 37.5 From: bgs Total Volume Purged, Including Drawdown (gallons): 1.8

Sample Designation AS1-011D2-1110A Time at Purge Completion: 1410

Sample Time 1415 Signature: J Lepiano for E. Johnson

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) PERISTALTIC PUMP

Multimeter model and serial number YSI 600 XLM 12777 Turbidity meter model and serial number LAMOTTE 2020E ME 14820

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1325		180	3.06	–	–	11.39	2,193	9.87	-103.5	1.68	5.13	Clear purge water, no odor
1330		180	3.06	0.0	0.0	11.35	2,198	10.16	-130.0	0.82	2.48	detected.
1335		180	3.04	+0.02	+0.02	11.35	2,206	9.84	-113.6	0.60	1.56	
1340		180	3.04	0.0	+0.02	11.31	2,234	9.71	-111.0	0.77	1.36	
1345		180	3.04	0.0	+0.02	11.26	2,246	9.60	-108.9	0.76	1.47	
1350		180	3.04	0.0	+0.02	11.25	2,251	9.54	-110.5	0.66	1.40	
1355		180	3.04	0.0	+0.02	11.25	2,257	9.53	-113.0	0.59	1.07	
1400		180	3.04	0.0	+0.02	11.22	2,261	9.46	-112.3	0.49	0.91	
1405		180	3.04	0.0	+0.02	11.15	2,269	9.39	-111.5	0.45	1.11	
1410		180	3.04	0.0	+0.02	11.13	2,270	9.38	~~-115~~ -115.5	0.45	1.37	
												PARAMETERS STABILIZED, GW
												SAMPLED @ 1415

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Attachment B, Page 1 of 1
Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1

Well ID : ASI-145

Field Personnel J. Ward Kelley Armitage

Purging Start Time : 1435

Well Depth as installed (ft.): 18.5 bgs

Measured Well Depth (ft.): 20.09 - Soft Bottom

Screen Length in ft. 10 Screen Depth in ft. 8.5-18.5 bgs

Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): ~~8.4~~ 5.5 From: standpipe

Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 18 From: standpipe

Total Volume Purged, Including Drawdown (gallons): 2.5

Sample Designation ASI-0145-1110A

Time at Purge Completion: 1540

Sample Time 1530

Signature:

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) peristaltic

Multimeter model and serial number YSI 650 MDS: 9 INE 1782 Turbidity meter model and serial number Lamotte 2020e: ME14/23

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1445	NA NA	150	NA	NA	NA	9.53	433	6.38	-58.1	1.98	15.4	
1450		150				9.47	427	6.26	-42.9	2.21	9.26	
1455		150				9.49	409	6.11	-29.4	2.02	8.22	
1500		150				9.53	403	6.05	-29.0	2.04	5.86	
1505		150				9.61	400	6.00	-31.5	2.03	3.59	
1510		150				9.65	397	5.94	-30.7	2.15	1.33	
1515		150				9.63	395	5.92	-29.9	2.17	1.14	
1520		150				9.64	394	5.88	-25.2	2.17	1.41	
1525		150				9.66	393	5.87	-24.8	2.15	1.29	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** ASI-14D2
Field Personnel J Ward Purging Start Time : 1455
Well Depth as installed (ft.): 30 bgs Measured Well Depth (ft.): NM
Screen Length in ft. 5 Screen Depth in ft. 25-30 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 6.53 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 27.5 From: ~~PVC~~ gs Total Volume Purged, Including Drawdown (gallons): 2.0
Sample Designation ASI-14D2 Time at Purge Completion: 3:45
Sample Time 15:40 Signature: [illegible]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) peristaltic.
Multimeter model and serial number Jay/YSI 650XL/02A08- Turbidity meter model and serial number Jay/LaMotte 2020 ME/0539
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.) 74AB

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1456	NA NA	~~2.65~~	6.65									purge rate = 200 mL/min.
1458		200	6.67									
1500		200	6.67	.02	.02	8.71	814	6.55	-105.8	152	9.65	
1505						8.63	812	6.88	-105.0	0.98	2.04	
1510						8.62	813	6.88	-104.5	0.82	0.43	
1515						8.58	814	6.86	-104.3	0.65	0.76	
1520						8.58	816	6.86	-101.8	0.58	0.13	
1525						8.57	816	6.87	-101.8	0.53	0.21	
1530			6.67			8.59	816	6.88	-99.9	0.49	0.19	Sample Time 15:40

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/7/2010 Page 1 of 1 **Well ID :** ~~MW-8~~ ASI-15D2 (SS)

Field Personnel Heidi Borchers Purging Start Time : 1428

Well Depth as installed (ft.): 14.5 Measured Well Depth (ft.): 42.67

Screen Length in ft. 5 Screen Depth in ft. 9.5-14.5 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.20 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 12 From: BGS Total Volume Purged, Including Drawdown (gallons): 3

Sample Designation ASI-015D2-1110A Time at Purge Completion: 1550

Sample Time 1510 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo-Pump

Multimeter model and serial number YSI 600 XL SN# 06A1D 1009 Turbidity meter model and serial number LaMotte 2020e SN# MG 11995

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1435	NA	200	6.60	0.40	0.00	10.23	1.304	7.09	-138.4	2.56	18.6	
1440			6.60	0.40	0.00	10.12	1.299	7.10	-139.6	1.31	8.4	
1445			6.60	0.40	0.00	10.17	1.295	7.11	-140.1	1.25	3.16	
1450			6.60	0.40	0.00	10.14	1.294	7.12	-137.9	0.94	3.13	
1455			6.60	0.40	0.00	10.07	1.290	7.13	-150.0	0.54	2.2	
1500			6.60	0.40	0.00	10.09	1.291	7.13	-148.5	0.56	1.5	
1505			6.60	0.40	0.00	10.09	1.284	7.13	-146.3	0.53	0.78	
1510												Sampled @ 1510

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/2010 Page 1 of 1 **Well ID :** ASI-16D2 ~~B2~~ 16D2

Field Personnel Heidi Borchers Purging Start Time : 1143

Well Depth as installed (ft.): 35 (BGS) Measured Well Depth (ft.): 36.23 TOC 41.2 - bladder

Screen Length in ft. 5 (HB) Screen Depth in ft. Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): ~~8.45~~ 8.05 From: ~~TOC~~ (HB) PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 32.5 From: BGS Total Volume Purged, Including Drawdown (gallons): 3

Sample Designation ASI-016D2-1110A Time at Purge Completion: 1301

Sample Time 1235 Signature:

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo Pump

Multimeter model and serial number YSI 600XL (Pine SN# 10012) Turbidity meter model and serial number Lamotte 2020e SN# MG-11995

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	mS/cm		mV	mg/L	NTU	
1145	NA	250	8.20	0.15	0.00	12.47	0.875	7.28	-114.9	4.27	4.82	
1150			8.20	0.15	0.00	12.22	0.869	7.35	-150.5	1.39	3.43	
1155			8.19	0.14	0.01	12.10	0.865	7.38	-137.7	0.44	2.26	
1200			8.15	0.10	0.04	12.13	0.859	7.40	-135.0	0.42	1.48	
1205			8.19	0.14	0.04	12.13	0.850	7.42	-144.0	0.23	2.00	
1210		225	8.18	0.13	0.01	12.07	0.851	7.43	-146.5	0.21	2.03	
1215		225	8.15	0.10	0.03	12.04	0.851	7.43	-138.1	0.26	2.06	
1220			8.15	0.10	0.00	12.05	0.850	7.43	-167.7	0.40	0.75	
1225			8.15	0.10	0.00	12.05	0.850	7.43	-165.5	0.21	0.52	
1230		225	8.15	0.10	0.00	12.02	0.850	7.43	-166.0	0.25	0.27	
1235												Sampled @ 1235

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-1-10 Page 1 of 1 **Well ID :** ASI 23 S
Field Personnel Ken Marks Purging Start Time : 0845
Well Depth as installed (ft.): 18 bgs Measured Well Depth (ft.): 20.63 TOC
Screen Length in ft. 10 Screen Depth in ft. 8-18 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 8.10 From: TOC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 13 From: 9S Total Volume Purged, Including Drawdown (gallons): 0.5
Sample Designation ASI-023S-1110A Time at Purge Completion: 0955
Sample Time 0945 Signature: Ken Marks
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo-Pump Low
Multimeter model and serial number YSI 650 MDS #01B0853 Turbidity meter model and serial number LaMotte 2020e #12350 AA
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	Geo-Pump											
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0850	~~Low~~ Low	100	12.6	4.5	–	9.99	0.413	6.58	12.3	4.72	32.7	Purge water slighty cloudy
0855	↓	100	14.8	2.2	6.7	10.09	0.400	6.47	-52.8	1.85	29.0	with black specks flotting
0900	↓	100	17.1	2.3	9.0	10.12	0.406	6.36	-49.2	2.25	23.6	↓
0905	↓	100	19.3	2.2	11.2	10.11	0.541	6.33	-37.0	3.00	21.1	clearer with some black
												specks flotting.
												↓
												I let well recharge
												to 8.22 DTW and
												sampled at a slow purge
												rate, 1045 end of
												sampling.

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/2010 Page 1 of 1 **Well ID:** AS1-23D2
Field Personnel Heidi Borchers Purging Start Time : 0855
Well Depth as installed (ft.): 30 bgs Measured Well Depth (ft.): 31.28 TOC
Screen Length in ft. 5 Screen Depth in ft. 25-30 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 6.67 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 27.5 From: gs Total Volume Purged, Including Drawdown (gallons): 3.5
Sample Designation AS1-023D2-1110A Time at Purge Completion: 1045
Sample Time 1005 Signature:
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo Pump
Multimeter model and serial number YSI 600 XL SN# 1009 (pH/DO) Turbidity meter model and serial number LaMotte 2020e SN# MC-11975
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0900	NA	200	6.80	0.13	0.00	9.67	1.343	9.65	32.6	1.22	1.57	
0905			6.80	0.13	0.00	9.63	1.340	6.52	-0.5	1.51	3.19	
(HB) 0915 ~~0910~~			6.80	0.13	~~0.00~~							Needed to change tubing - diameter was too large - spraying res. 0920
0920			6.80	0.13	0.00	9.71	1.328	6.50	-30.3	0.90	1.00	
0925			6.80	0.13	0.00	9.77	1.326	6.50	-28.9	1.05	0.81	
0930			6.80	0.13	0.00	9.77	1.325	6.49	-28.4	0.93	0.58	
0935		200	6.80	0.13	0.00	9.80	1.323	6.50	-29.4	0.75	0.49	
0940			6.80	0.13	0.00	9.82	1.317	6.49	-31.7	0.69	0.46	
0945			6.80	0.13	0.00	9.77	1.315	6.48	-33.4	0.47	0.55	
0950			6.80	0.13	0.00	9.76	1.315	6.48	-33.7	0.36	0.48	
0955			6.80	0.13	0.00	9.81	1.312	6.48	-35.7	0.43	0.03	re-calibrated turbidity
1000			6.80	0.13	0.00	9.83	1.313	6.49	-34.1	0.26	0.03	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

1005 sampled @ 1005

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 1 of 2 **Well ID :** BF-4
Field Personnel S. Ward Purging Start Time : 12:00
Well Depth as installed (ft.): 11.5' Measured Well Depth (ft.): 12.45
Screen Length in ft. 10' Screen Depth in ft. 1.5 → 11.5 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 8.15 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): ~10.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 4.0
Sample Designation BF-4-1110A Time at Purge Completion: 13:50
Sample Time 13:25 Signature:
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic
Multimeter model and serial number 600XL 02A0874AE Turbidity meter model and serial number ME-10539
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
12:05	5 / 10	150	8.23	—	—	12.06	420	6.41	-79.1	3.67	6.71	15 PSI
12:10	5 / 10	200	8.23	—	—	12.03	403	6.37	-77.6	1.06	45.8	
12:15	5 / 10	200	8.23	—	—	12.04	398	6.40	-77.5	0.46	47.6	
12:20	5 / 10	200	8.23	—	—	12.04	397	6.41	-77.6	0.45	45.0	
12:25	5 / 10	200	8.23	—	—	12.06	398	6.41	-77.8	0.44	43.9	
12:30	5 / 10	200	8.23	—	—	12.06	396	6.42	-77.5	0.43	34.1	
12:35	5 / 10	200	8.23	—	—	12.07	396	6.42	-77.2	0.43	34.1	
12:40	5 / 10	200	8.23	—	—	12.07	395	6.42	-76.5	0.46	21.0	
12:45	5 / 10	200	8.23	—	—	12.08	395	6.42	-76.0	0.41	15.0	
12:50	5 / 10	200	8.23	—	—	12.08	395	6.42	-75.6	0.41	12.4	
12:55	5 / 10	200	8.23	—	—	12.08	394	6.42	-75.3	0.41	10.03	
13:00	5 / 10	200	8.23	—	—	12.07	394	6.42	-74.5	0.40	9.22	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 2 of 2 **Well ID :** BF-4

Field Personnel Ward, Jason G. Purging Start Time : 12:00

Well Depth as installed (ft.): Measured Well Depth (ft.): 12.45

Screen Length in ft. 10 Screen Depth in ft. Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 8.15 From: Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft): ~~11.5~~ 10.5 From: Total Volume Purged, Including Drawdown (gallons): 4.0

Sample Designation BF-4 Time at Purge Completion: 13:50

Sample Time 13:25 Signature:

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments)

Multimeter model and serial number Turbidity meter model and serial number

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
13:05	5 / 10	200	8.23	—	—	12.09	393	6.42	-74.0	0.41	8.04	15 PSI
13:10	5 / 10	200	8.23	—	—	12.09	394	6.42	-73.8	0.40	7.87	
13:15	5 / 10	200	8.23	—	—	12.09	394	6.42	-74.0	0.41	7.84	Sampled @ 13:25

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Attachment B, Page 1 of 1
Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 1 of 2 **Well ID :** BM-35
Field Personnel K. Armitage Purging Start Time : 1325
Well Depth as installed (ft.): Measured Well Depth (ft.): 15.19 top of pvc
Screen Length in ft. ~~5~~ 10 Screen Depth in ft. 15 – 5 Parameter Stabilization: (Circle) Yes / No NA
Depth to GW (ft.): 7.41 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 12.00 From: PVC Total Volume Purged, Including Drawdown (gallons): ~6
Sample Designation MS/MSD BM-035-1110A Time at Purge Completion: 1600
Sample Time 1510 Signature: K. Armitage
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder : p≈15psi ; R/D=11.5/3.5
Multimeter model and serial number YSI 650MDS : PINE1782 Turbidity meter model and serial number LaMotte 2020e : ME14123
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)
PINE # used for YSI ID because serial # was unreadable.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1334			7.84									Adjust flowrates.
1340	11.5 / 3.5	300	7.84	Ø	Ø	11.28	1,016	6.62	121.9	3.40	8.34	p~18psi
1345	11.5 / 3.5	300	7.84	Ø	Ø	11.34	1,005	6.63	125.1	3.25	7.95	
1350	11.5 / 3.5	300	7.84	Ø	Ø	11.40	1,010	6.64	126.8	3.12	6.20	
1355	11.5 / 3.5	300	7.84	Ø	Ø	11.50	995	6.64	126.2	2.98	5.87	
1400	11.5 / 3.5	300	7.84	Ø	Ø	11.50	958	6.65	128.8	2.76	5.41	
1405	11.5 / 3.5	300	7.84	Ø	Ø	11.52	929	6.65	126.9	2.62	4.89	
1410	11.5 / 3.5	300	7.84	Ø	Ø	11.51	901	6.65	123.2	2.51	3.19	
1415	11.5 / 3.5	300	7.84	Ø	Ø	11.42	867	6.65	118.0	2.42	2.00	
1420	11.5 / 3.5	300	7.84	Ø	Ø	11.36	837	6.65	111.8	2.37	1.84	
1425	11.5 / 3.5	300	7.84	Ø	Ø	11.37	819	6.65	110.1	2.34	1.68	
1430	11.5 / 3.5	300	7.84	Ø	Ø	11.36	781	6.65	103.7	2.25	0.79	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 2 of 2 **Well ID :** BM-35

Field Personnel K Armitage Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation MS/MSD Time at Purge Completion: _____

Sample Time 1510 Signature: K Armitage

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1435	11.5 / 3.5	300	7.84	Ø	Ø	11.40	764	6.65	100.4	2.23	0.68	
1445	11.5 / 3.5	300	7.84	Ø	Ø	11.37	741	6.64	96.4	2.21	0.14	
1450	11.5 / 3.5	300	7.84	Ø	Ø	11.36	728	6.64	95.0	2.23	0.17	
1455	11.5 / 3.5	300	7.84	Ø	Ø	11.39	717	6.64	93.9	2.20	0.10	
1500	11.5 / 3.5	300	7.84	Ø	Ø	11.38	708	6.64	92.5	2.19	0.00	
1505	11.5 / 3.5	300	7.84	Ø	Ø	11.37	699	6.64	90.9	2.19	0.00	
							✓					←

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 1 of 2 **Well ID :** BM-3D

Field Personnel Jay Wood JF Purging Start Time : 13.25

Well Depth as installed (ft.): ~~30.38~~ 29 bgs Measured Well Depth (ft.): 30.38

Screen Length in ft. 5 Screen Depth in ft. 24-29 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.46 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 26.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 6.5

Sample Designation BM-3D-1110A Time at Purge Completion: 1530

Sample Time 1525 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder

Multimeter model and serial number YSI 600XL 02A0874AB Turbidity meter model and serial number ME1055 / Lamotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
13:35	5 / 10	200	6.72	—	—	10.94	937	6.83	-68.5	3.91	125	
13:40	5 / 10	200	6.72	—	—	10.89	958	6.71	-85.6	3.96	96.9	
13:45	5 / 10	200	6.72	—	—	10.88	966	6.81	-88.0	4.01	78.7	
13:50	5 / 10	200	6.75	.03	.03	10.88	970	6.68	-92.0	3.89	66.3	
13:55	5 / 10	200	6.75	—	.03	10.91	972	6.67	-92.5	3.98	60.6	
14:00	5 / 10	200	6.75	—	.03	10.97	973	6.68	-93.5	3.77	55.3	
14:05	5 / 10	200	6.75	—	.03	10.97	974	6.66	-93.8	3.70	46.6	
14:10	5 / 10	200	6.75	—	.03	10.97	975	6.66	-93.4	3.71	44.8	
14:15	5 / 10	200	6.75	-	.03	10.93	975	6.65	-93.2	3.27	39.5	
14:20	5 / 10	200	6.75	-	.03	10.87	976	6.65	-93.2	2.91	32.3	
14:25	5 / 10	200	6.77	.02	.05	10.88	975	6.65	-93.3	2.64	27.7	
14:30	5 / 10	200	6.77	—	.05	10.83	976	6.65	-92.0	2.51	24.1	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : _____ Page 2 of 2 **Well ID :** BM-3D

Field Personnel _____ Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: _____

Sample Time _____ Signature: _____

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
14:35	5 / 10	200	6.77	—	.05	10.80	976	6.64	-91.4	2.13	24.6	
14:40	5 / 10	200	6.77	—	.05	10.78	975	6.64	-91.5	1.97	20.8	
14:45	5 / 10	200	6.77	—	.05	10.86	974	6.64	-92.2	1.81	24.3	
14:50	5 / 10	200	6.77	—	.05	10.86	976	6.66	-92.8	1.48	23.8	
14:55	5 / 10	200	6.77	—	.05	10.85	976	6.64	-92.5	1.26	18.3	
15:00	5 / 10	200	6.77	—	.05	10.84	976	6.63	-92.2	1.07	~~22.2~~ 18.4	
15:05	5 / 10	200	6.77	—	.05	10.86	977	6.63	-92.7	0.93	17.2	
15:10	5 / 10	200	6.77	—	.05	10.86	977	6.64	-92.8	.87	16.9	
15:15	5 / 10	200	6.77	—	.05	10.86	976	6.63	-92.7	.85	16.5	Sample Time 15:25

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/2/2010 Page 1 of 1 **Well ID :** BR-1

Field Personnel Heidi Borchers Purging Start Time : 0842

Well Depth as installed (ft.): 123 ft (BGS) Measured Well Depth (ft.): 7100

Screen Length in ft. 10 Screen Depth in ft. 113-123 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 17.85 From: ~~7~~ 700 Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 118 From: Total Volume Purged, Including Drawdown (gallons): 0.5

Sample Designation BR-001-1110A Time at Purge Completion: 1030

Sample Time 0945 Signature:

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) 1600 Pump

Multimeter model and serial number YSI 600 XL SN (Pine ID# 1009) Turbidity meter model and serial number La Motte 2020e SN# 11995 NG

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	mS/cm		mV	mg/L	NTU	
0850	NA	75	~~17.85~~ 19.50	1.65	0.00	9.71	5.177	12.20	95.2	3.09	9.52	well drains down very fast - no rech
0855			21.30	3.45	1.80	9.61	5.381	12.20	111.5	2.68	9.10	
0900			22.20	4.35	0.90	9.72	5.445	12.19	101.7	2.52	7.77	
0905			22.80	4.95	0.60	9.78	5.486	12.20	109.1	2.41	8.86	
0910			23.50	5.65	0.70	9.68	5.512	12.23	98.9	2.34	4.36	
0915		75	24.15	6.30	0.65	9.70	5.545	12.21	91.9	2.19	3.83	
0920			24.80	6.95	0.65	9.54	5.561	12.23	83.2	2.16	4.49	
0925			25.45	7.60	0.65	9.58	5.565	12.26	74.8	2.14	4.59	
0930			26.30	8.45	0.85	9.55	5.561	12.25	66.7	2.05	4.30	
0935		75	26.40	8.55	0.10	9.54	5.551	12.25	61.4	2.03	3.70	
0940			26.50	8.65	0.10	9.47	5.555	12.27	57.2	2.02	3.33	
0945												Sampled @ 0945

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

Attempted resample @ 1515 - DTW 24.75 | Could not collect 2 amber 100 mL bottles - well went dry ~1030 - will need to come back & collect later after recharge

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/3/2010 Page 1 of 1 **Well ID :** BR-1 - attempted recollection successful - 2 Ambers - now complete

Field Personnel Heidi Barbers Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 18.57 From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: 0820

Sample Time 0810 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geopump

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.) 2 SVOCs Amber 1 L bottles.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
		9	18.57	initial water level.								collected.

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/2/10 Page 1 of 1 **Well ID :** BW-13S
Field Personnel Sag Lehn Purging Start Time : 12:05
Well Depth as installed (ft.): 6 bgs Measured Well Depth (ft.): 7.25
Screen Length in ft. 1' Screen Depth in ft. 5-6' Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 4.62 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 5.5' From: PVC Total Volume Purged, Including Drawdown (gallons): 1.7
Sample Designation ~~BW-13S~~ DF BW-013S-1110A Time at Purge Completion: 1310
Sample Time 13:00 Signature: [illegible]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) PERI Pump 2959
Multimeter model and serial number YSI 556 MPS 02A0874AB Turbidity meter model and serial number Lamotte 2020e ME 10539
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
12:10		100	4.96	—	—	7.69	672	7.19	35.0	6.53	13.1	
12:15		100	4.99	.03	.03	7.86	651	6.82	39.4	6.79	5.89	
12:20		100	5.00	—	.03	7.88	642	6.69	40.7	4.26	2.71	
12:25		100	5.00	—	.03	8.06	625	6.60	41.3	3.61	1.58	
12:30		100	5.00	—	.03	8.06	619	6.55	42.2	3.44	0.92	
12:35		100	5.02	.02	.05	8.04	611	6.50	43.4	2.85	0.76	
12:40		100	5.03	.01	.06	8.04	604	6.47	44.0	3.07	0.41	
12:45		100	5.05	.02	.08	8.39	594	6.44	44.2	2.95	0.36	
12:50		100	5.05	—	.08	8.43	593	6.44	44.2	2.92	0.29	
12:55		100	5.06	.01	.09	8.42	593	6.43	44.5	2.95	0.25	
												Sample Time 13:00

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 1 of 1 **Well ID :** MI-1

Field Personnel E. JOHNSON Purging Start Time : 1020

Well Depth as installed (ft.): 15.0 Measured Well Depth (ft.): 15.12

Screen Length in ft. 5' Screen Depth in ft. 10'-15' Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.91 From: TOP OF PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 12.5' From: 95 Total Volume Purged, Including Drawdown (gallons): 2.75

Sample Designation MI-01-1110A Time at Purge Completion: 1115

Sample Time 1120 Signature: Eric Johnson

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) BLADDER PUMP

Multimeter model and serial number YSI 600 XLM 12777 Turbidity meter model and serial number LAMOTTE 2020E ME 14820

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

No odor detected on purge water, MW opening @ sfc.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1030	5 / 10	150	6.92	0.01	0.01	10.10	1,599	7.07	197.8	5.19	14.2	Pressure @ ~15 psi
1035	6.5 / 8.5	190	6.92	0.0	0.01	10.47	1,535	7.19	187.4	4.96	13.6	
1040	6.5 / 8.5	190	6.92	0.0	0.01	10.72	1,430	7.39	167.9	4.78	7.06	
1045	6.5 / 8.5	190	6.93	0.01	0.02	10.75	1,355	7.57	146.5	4.71	6.69	
1050	6.5 / 8.5	190	6.93	0.0	0.02	10.80	1,306	7.64	138.9	4.68	3.96	
1055	6.5 / 8.5	190	6.93	↓	↓	10.83	1,264	7.70	130.0	4.73	3.33	
1100	6.5 / 8.5	190	6.93	↓	↓	10.80	1,249	7.73	124.4	4.73	2.59	
1105	6.5 / 8.5	190	6.93	↓	↓	10.82	1,238	7.74	119.3	4.65	2.65	
1110	6.5 / 8.5	190	6.93	↓	↓	10.80	1,230	7.75	116.2	4.60	2.40	
1115	6.5 / 8.5	190	6.93	↓	↓	10.84	1,217	7.75	112.1	4.52	2.22	
												→ PARAMETERS STABILIZED, GW
												SAMPLED @ 11:20

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 1 of 2 **Well ID :** ~~KLM-2~~ MI-2

Field Personnel K Armitage Purging Start Time : 10:25

Well Depth as installed (ft.): 15' bgs Measured Well Depth (ft.): NM

Screen Length in ft. 10 Screen Depth in ft. ~~top of pvc~~ 5-15 bgs JF Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.62 From: ~~top of pvc~~ Two Hour Time Limit Reached ? (Circle) Yes (No)

Pump/Tubing Intake set (ft.): 12.5 From: ~~top of pvc~~ JF gs Total Volume Purged, Including Drawdown (gallons): 4

Sample Designation MI-02-1110A Time at Purge Completion: 1200

Sample Time 1155 Signature: K Armitage

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder: p≈15psi R/D = 10/5

Multimeter model and serial number YSI 650MDS PINE1782 Turbidity meter model and serial number LaMotte 2020e: ME14123

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1035		240	6.71								~~22~~	flow adjustments.
1040	10 / 5	240	6.71	0.0	0.09	11.68	220	6.18	197.3	7.18	22.2	p~15psi
1045	10 / 5	220	6.71	Ø	0.09	11.78	227	6.15	196.8	6.61	16.4	
1050	10 / 5	220	6.71	Ø	0.09	11.81	233	6.19	196.8	6.14	12.8	
1055	10 / 5	220	6.71	Ø	0.09	11.78	239	6.13	198.2	5.84	7.51	
1100	10 / 5	220	6.71	Ø	0.09	12.12	259	6.13	191.7	5.24	5.50	
1110	10 / 5	220	6.71	Ø	0.09	12.12	272	6.13	190.4	4.99	1.51	
1115	10 / 5	220	6.71	Ø	0.09	12.16	284	6.12	190.3	4.76	1.66	
1120	10 / 5	220	6.71	Ø	0.09	12.13	295	6.12	189.3	4.56	1.44	
1125	10 / 5	220	6.71	Ø	0.09	12.18	304	6.12	189.0	4.38	1.07	
1130	10 / 5	220	6.71	Ø	0.09	12.12	311	6.11	188.2	4.22	0.70	
1135	10 / 5	220	6.71	Ø	0.09	12.19	317	6.11	188.0	4.12		

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

See Page #1

Date : 11/29/10 Page 2 of 2 **Well ID :** MI-2

Field Personnel K Armitage. Purging Start Time : 1025

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: _____

Sample Time _____ Signature: K Armitage

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1140	10 / 5	220	6.71	Ø	0.09	12.08	320	6.11	188.2	4.04	0.63	p ~ 15psi
1145	10 / 5	220	6.71	Ø	0.09	12.10	326	6.11	187.9	3.96	0.60	
1150	10 / 5	220	6.71	Ø	0.09	12.10	328	6.11	187.7	3.94	0.56	
1155												Samples collected.

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/2/2010 Page 1 of 1 **Well ID :** MI-8
Field Personnel Heidi Bachers Purging Start Time : 1333
Well Depth as installed (ft.): 14.5 bgs Measured Well Depth (ft.): 13.53
Screen Length in ft. 5 Screen Depth in ft. 9.5-14.5 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 5.61 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 12 From: gs Total Volume Purged, Including Drawdown (gallons): 4
Sample Designation MI-008-1110A Time at Purge Completion: 1433
Sample Time 1415 Signature: [signature]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geo Pump
Multimeter model and serial number YSI 600 XL SN (pine ID # 1009) Turbidity meter model and serial number La Motte 2020e SN# 11995
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	mS/cm		mV	mg/L	NTU	
1340	NA	3.25	5.76	0.15	0.00	10.11	0.293	7.26	55.0	1.57	2.30	
1345			5.76	0.15	0.00	9.98	0.274	6.30	126.9	1.60	0.53	
1350			5.76	0.15	0.00	9.98	0.260	6.09	142.7	1.46	0.75	
1355			5.76	0.15	0.00	9.95	0.248	5.98	146.9	1.46	0.68	
1400			5.76	0.15	0.00	9.92	0.250	5.93	147.7	1.40	0.46	
1405		3.25	5.76	0.15	0.00	9.84	0.254	5.91	149.7	1.30	0.46	
1410			5.76	0.15	0.00	9.84	0.249	5.91	148.6	1.30	0.31	
1415												Sampled @ 1415

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 1 of 2 **Well ID :** MW-1D
Field Personnel K. Armitage Purging Start Time : 0902
Well Depth as installed (ft.): 40 bgs Measured Well Depth (ft.): 39.49 TOC
Screen Length in ft. 5 Screen Depth in ft. 38-33 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 2.62 From: PVC Two Hour Time Limit Reached ? (Circle) Yes No
Pump/Tubing Intake set (ft.): ~36 From: PVC Total Volume Purged, Including Drawdown (gallons): 5
Sample Designation MW-01D-1110A Time at Purge Completion: 1050
Sample Time 1040 Signature: K. Armitage
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder : P = ±30 psi, R/D = 10/5
Multimeter model and serial number YSI 650 MDS : Pine 1782 Turbidity meter model and serial number LaMotte 2020e : ME 14123
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0910	10 / 5	240	2.80	/	/	11.02	819	7.02	-211.9	2.84	165	
0915	10 / 5	220	2.80	Ø	Ø	11.07	805	7.00	-227.8	2.38	165	
0920	10 / 5	220	2.82	-0.02	0.02	11.10	787	7.04	-235.1	1.90	108.5	
0925	10 / 5	220	2.82	-0	0.02	11.11	781	7.09	-232.7	1.56	101.6	
0930	10 / 5	220	2.82	Ø	0.02	11.12	776	7.10	-234.2	1.37	99.4	
0935	10 / 5	220	2.82	Ø	0.02	11.14	772	7.13	-232.1	1.34	94.4	
0940	10 / 5	220	2.81	+0.01	0.01	11.14	770	7.15	-230.5	1.33	91.0	
0945	10 / 5	220	2.81	Ø	0.01	11.16	767	7.17	-232.2	1.32	94.5	
0950	10 / 5	220	2.81	Ø	0.01	11.17	765	7.17	-233.6	1.37	86.9	
0955	10 / 5	220	2.81	Ø	0.01	11.17	764	7.20	-232.4	1.34	77.1	
1000	10 / 5	220	2.81	Ø	0.01	11.16	763	7.22	-233.1	1.34	84.1	
1005	10 / 5	220	2.81	Ø	0.01	11.16	761	7.22	-232.2	1.33	78.2	
1010		220	2.81	Ø	0.01	11.18	759	7.22	-233.8	1.32	75.6	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 2 of 2 **Well ID :** MW-1D

See page 1

Field Personnel K Armitage
Purging Start Time :
Well Depth as installed (ft.):
Measured Well Depth (ft.):
Screen Length in ft. Screen Depth in ft.
Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): From:
Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): From:
Total Volume Purged, Including Drawdown (gallons):
Sample Designation
Time at Purge Completion:
Sample Time 1040
Signature: K Armitage
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments)
Multimeter model and serial number Turbidity meter model and serial number
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1015	10 / 5	220	2.81	Ø	0.01	11.20	757	7.23	-234.5	1.33	70.8	
1020	10 / 5	220	2.81	Ø	0.01	11.25	756	7.24	-235.1	1.32	80.9	
1025	10 / 5	220	2.81	Ø	0.01	11.26	755	7.25	-239.6	1.34	70.0	
1030	10 / 5	220	2.81	Ø	0.01	11.28	753	7.25	-240.8	1.32	74.8	
1035	10 / 5	220	2.81	Ø	0.01	11.29	754	7.26	-238.7	1.35	75.4	
					✓	✓	✓	✓	✓	✓	✓	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 1 of 2 **Well ID :** MW-2M

Field Personnel E. JOHNSON Purging Start Time : 1357

Well Depth as installed (ft.): 29.3 bgs Measured Well Depth (ft.): 29.31

Screen Length in ft. 5 Screen Depth in ft. 24.3-29.3 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 3.22 From: TOP OF PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 27 From: TOP OF PVC Total Volume Purged, Including Drawdown (gallons): 6

Sample Designation MW-02M-1110A Time at Purge Completion: 1530

Sample Time 1525 Signature: J Fapiano for E. Johnson

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) BLADDER PUMP 18518

Multimeter model and serial number YSI 600 XLM 12777 Turbidity meter model and serial number LAMOTTE 2020E 14820

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Misread measuring cup, purging @ ~250 ml/min w/ no drawdown. EJ

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
		250 EJ										
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1410	6.0 / 9.0	~~225~~	3.31			10.17	813	9.01	-27.0	1.11	92.2	Pressure @ ~20 psi, fairly
1415	6.0 / 9.0	~~228~~	3.31			10.15	813	8.93	-29.4	0.81	116	silty upon start up, no
1420	6.0 / 9.0	~~225~~	3.31			10.15	810	8.85	-29.5	0.62	65.1	odor detected on purge
1425	6.0 / 9.0	~~225~~	3.31			10.17	809	8.78	-28.8	0.54	74.0	water.
1430	6.0 / 9.0	250	3.31			10.10	810	8.73	-28.1	0.45	60.1	-Silt slowly clearing.
1435	6.0 / 9.0	250	3.31			10.12	809	8.68	-27.2	0.43	63.0	
1440	6.0 / 9.0	250	3.31			10.10	811	8.64	-26.4	0.40	51.8	
1445	6.0 / 9.0	250	3.31			10.08	811	8.61	-25.8	0.36	49.5	
1450	6.0 / 9.0	250	3.31			10.11	809	8.57	-24.6	0.31	43.6	
1455	6.0 / 9.0	250	3.31			10.11	809	8.54	-23.7	0.31	39.9	
EJ ~~1455~~ 1500	6.0 / 9.0	250	3.31			10.08	809	8.53	-23.2	0.30	34.0	
1505	6.0 / 9.0	250	3.31			10.11	809	8.50	-22.2	0.23	36.5	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 2 of 2 **Well ID :** MW-2M
Field Personnel E. JOHNSON Purging Start Time : 1357
Well Depth as installed (ft.): Measured Well Depth (ft.): 29.31
Screen Length in ft. Screen Depth in ft. Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 3.22 From: TOP OF PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 27 From: TOP OF PVC Total Volume Purged, Including Drawdown (gallons): 5
Sample Designation Time at Purge Completion: 1520
Sample Time 1525 Signature: Eric Johnson
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) BLADDER PUMP 18518
Multimeter model and serial number YSI 600 XLM 12777 Turbidity meter model and serial number LAMOTTE 2020E 14820
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1510	6.0 / 9.0	250	3.31			10.10	808	8.48	-21.4	0.20	29.9	
1515	6.0 / 9.0	250	3.31			10.06	808	8.46	-21.0	0.20	29.0	
1520	6.0 / 9.0	250	3.31			10.09	809	8.45	-20.7	0.21	27.9	
												PARAMETERS STABILIZED,
								@	1523	=	28.5	GW SAMPLED @ 1525,
												PURGE STILL SOMEWHAT
												SILTY, TURBIDITY REMAINING
												CONSTANT.

Eric Johnson

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/29/10 Page 1 of 1 **Well ID :** MW-3D
Field Personnel Jay Ward Purging Start Time : 10:25
Well Depth as installed (ft.): 40.2 bgs Measured Well Depth (ft.): 42'
Screen Length in ft. 5' Screen Depth in ft. 35.2-40.2 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 7.33 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 2' From Bottom From: Total Volume Purged, Including Drawdown (gallons): 3.5
Sample Designation MW-03D-1110A Time at Purge Completion: 12:20
Sample Time 11:49 Signature: [signature]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder
Multimeter model and serial number 600XL 02A0874A13 Turbidity meter model and serial number SN ME 10551 Lamotte 2020
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)
VOA 3 Pres 4 Bumpers

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10:30	5 / 10	200	7.45	—		11.38	764	6.93	-172.9	4.46	201	22 psi
10:35	5 / 10	—	—	—	—	—	—	—	—	—	—	Faulty Flow-through Cell
10:50	5 / 10	200	7.49	.04	.04	11.16	693	7.26	-233.9	3.81	196	
10:55	5 / 10	200	7.49	—	.04	11.32	682	7.31	-252.6	5.30	193	
11:00	5 / 10	200	7.49	—	.04	11.43	672	7.33	-255.2	4.84	191	
11:05	5 / 10	200	7.49	—	.04	11.13	661	7.38	-269.9	3.73	178	
11:10	5 / 10	200	7.49	—	.04	11.24	651	7.41	-274.5	3.66	166	
11:15	5 / 10	200	7.49	—	.04	11.28	642	7.41	-277.8	3.13	172	
11:20	5 / 10	200	7.49	—	.04	11.38	634	7.43	-285.6	3.18	161	
11:25	5 / 10	200	7.49	—	.04	11.39	630	7.46	-294.2	4.04	174	
11:30	5 / 10	200	7.49	—	.04	11.34	629	7.50	-299.8	4.00	178	
11:35	5 / 10	200	7.49	—	.04	11.42	622	7.45	-303.2	4.02	179	Sampled @ 11:45

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : ~~12/3/10~~ 12/12/10 (ES) Page 1 of 2 **Well ID :** MW-4D

Field Personnel E. JOHNSON J. Stewart Purging Start Time : 918

Well Depth as installed (ft.): 38.5 bgs Measured Well Depth (ft.): 38.53

Screen Length in ft. 5 Screen Depth in ft. 33.5-38.5 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 3.26 From: TOP OF PVC Two Hour Time Limit Reached ? (Circle) Yes (No)

Pump/Tubing Intake set (ft.): ~~36~~ 36.5' (EJ) From: TOP OF PVC Total Volume Purged, Including Drawdown (gallons): 3

Sample Designation MW-04D-1110A Time at Purge Completion: 1105

Sample Time 1115 Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) BLADDER PUMP 13521

Multimeter model and serial number YSI 600 XL 4309 Turbidity meter model and serial number LAMOTTE 2020E ME 14820

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

ADDED DEDICATED TUBING

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
930	2.5 / 12.5	150	3.39	0.13	0.13	10.51	1,113	6.98	-236.5	1.86	NR	Pressure @ ~25psi, fairly
935	2.5 / 12.5	150	3.40	0.01	0.14	10.69	1,142	7.11	-272.3	0.94	41.3	silty purge H_2O.
940	2.5 / 12.5	150	3.40	0.00	0.14	10.59	1,149	7.23	-279.7	0.75	34.2	
945	2.5 / 12.5	150	3.41	0.01	0.15	10.66	1,152	7.33	-282.3	0.66	32.5	
950	2.5 / 12.5	150	3.41	0.00	0.15	10.67	1,155	7.41	-282.2	0.61	24.7	
955	2.5 / 12.5	150	3.41	0.00	0.15	NA	NA	NA	NA	NA	NA	
1000	~~Pulsed~~	PUMP	(ES)	water	in air	line	air in	water	line	No	bladder	Installed in stainless bladder
1010	2.5 / 12.5	~~150~~ 50	3.29	-0.12	0.03	10.82	1124	7.41	-214.4	2.14	126	
1015	10 / 20	75	3.32	0.03	0.06	10.72	1078	7.36	-204.1	2.07	180	Switch to 2CPM
1020	14 / 16	150	3.31	-0.01	0.05	10.62	1102	7.37	-212.3	1.44	146	
1025	14 / 16	150	3.35	0.04	0.09	10.85	1112	7.40	-221.3	1.13	141	
1030	14 / 16	150	3.30	-0.05	0.04	10.86	1133	7.44	-232.6	0.84	123	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/2/10 Page 2 of 2 **Well ID :** MW-4D

Field Personnel E. JOHNSON / J. STEWART Purging Start Time : 918

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) (Yes) No

Depth to GW (ft.): 3.26 From: TOP OF PVC Two Hour Time Limit Reached ? (Circle) Yes (No)

Pump/Tubing Intake set (ft.): 36 From: TOP OF PVC Total Volume Purged, Including Drawdown (gallons): 3

Sample Designation MW-04D-1110A Time at Purge Completion: 1105

Sample Time 1115 Signature: Eric Johnson

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) BLADDER PUMP 13521

Multimeter model and serial number YSI 600 XL 4309 Turbidity meter model and serial number LAMOTTE 2020E ME14820

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1035	14 / 16	150	3.30	0.00	0.04	10.75	1132	7.47	-240.2	0.71	100	25 PSI
1040	14 / 16	150	3.33	0.03	0.07	10.86	1124	7.48	-245.3	0.64	102.1	
1045	14 / 16	150	3.33	0.00	0.07	10.90	1122	7.49	-246.2	0.58	82.4	
1050	14 / 16	150	3.33	0.00		10.86	1116	7.49	-247.7	0.54	92.9	
1055	14 / 16	150	3.33	0.00		10.91	1111	7.47	-246.9	0.54	71.2	
1100	14 / 16	150	3.33	0.00		11.03	1115	7.47	-245.8	0.52	69.1	
1105	14 / 16	150	3.33	0.00		11.08	1111	7.47	-246.0	0.50	71.6	
												Parameters stabilized, GW Sampled @ 1115.

Eric Johnson

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/2010 Page 1 of 1 **Well ID :** MW-5D ~~2~~ JF

Field Personnel Heidi Borchers Purging Start Time : 0900

Well Depth as installed (ft.): 33.5 bgs Measured Well Depth (ft.): 33.6

Screen Length in ft. 5 Screen Depth in ft. 28.5-33.5 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 6.5 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): ~~[illegible]~~ 31 From: PVC Total Volume Purged, Including Drawdown (gallons): 6

Sample Designation ~~[illegible]~~ MW-05D-1110A Time at Purge Completion: 1030

Sample Time 1015 Signature: [illegible]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder pump dis. ~~15~~ rech- 10 (HB)

Multimeter model and serial number YSI 600 XL S.N# 10096 (Pine ID) Turbidity meter model and serial number LaMotte 2020e S.N# MG 11985

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0915	5 10	500	6.80	0.30	0.00	11.50	0.436	7.78	-161.5	5.11	212	
0920		400	7.30	0.80	0.50	11.54	0.435	7.78	-160.3	5.07	202	
0925	5 10	400	6.80	0.30	0.50	11.48	0.425	7.77	-152.6	5.42	231	
0930			6.80	0.30	0.00	11.47	0.421	7.77	-149.3	5.45	186	
0935			6.80	0.30	0.00	11.45	0.418	7.76	-144.4	5.46	208	
0940		400	6.80	0.30	0.00	11.43	0.421	7.77	-135.5	5.56	198 (HB)	
0945			6.80	0.30	0.00	11.42	0.418	7.78	-133.5	5.59	~~162~~ 179	
0950			6.81	0.31	0.01	11.41	0.416	7.78	-124.5	5.67	178	
0955			6.80	0.30	0.00	11.37	0.413	7.77	-120.2	5.68	157	
1000		400	6.80	0.30	0.00	11.36	0.413	7.76	-122.2	5.76	154	
1005			6.80	0.30	0.00	11.35	0.422	7.75	-117.4	5.76	144	
1010												Sampled @ 1010

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11-30-10 Page 1 of 2 **Well ID :** MW - 5D2 MW-5D2

Field Personnel Ken Marks

Purging Start Time : 0850

Well Depth as installed (ft.): 44.4 bgs

Measured Well Depth (ft.): 44.41

Screen Length in ft. 5 Screen Depth in ft. 39.4-44.4 bgs

Parameter Stabilization: (Circle) Yes / (No)

Depth to GW (ft.): 8.20 From: PVC

Two Hour Time Limit Reached ? (Circle) (Yes)/ No

Pump/Tubing Intake set (ft.): 41.9 From: PVC

Total Volume Purged, Including Drawdown (gallons): 5

Sample Designation MW-05 D2-111004 Normal

Time at Purge Completion: 1055

Sample Time 1100

Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) ~~Lowatte 2020~~ QED 20 PSI

Multimeter model and serial number YSI 650MDS Turbidity meter model and serial number Lowatte 2020e

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Page #1 of 2

Clock Time	Discharge / Refill / Pump Setting 20 PSI	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0900	5 / 10	150	8.48	0.28	—	11.19	1.031	6.76	-98.6	0.13	1452	Purge water silty gray. No odors
0905		120	8.40	0.20	0.2	11.40	1.034	6.92	-163.8	0.10	1411	
0910		120	8.40	0.0	0.2	11.49	1.088	7.00	-196.2	0.11	1007	
0915		120	8.40	0.0	0.2	11.60	1.086	7.06	-213.3	0.11	589	
0920		120	8.40	0.0	0.2	11.49	1.084	7.10	-228.6	0.11	530	
0925		120	8.40	0.0	0.2	11.52	1.086	7.13	-236.2	0.11	501	
0930		120	8.40	0.0	0.2	11.54	1.087	7.15	-241.1	0.11	426	
0935		120	8.40	0.0	0.2	11.56	1.089	7.16	-243.2	0.11	221	
0940		120	8.40	0.0	0.2	11.60	1.093	7.16	-247.3	0.11	200	
0945		120	8.40	0.0	0.2	11.63	1.095	7.17	-251.1	0.10	237	
0950		120	8.40	0.0	0.2	11.63	1.097	7.18	-255.7	0.10	259	
0955		120	8.40	0.0	0.2	11.60	1.099	7.18	-258.4	0.09	281	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11-30-10 Page 2 of 2 **Well ID :** MW-5D2

Field Personnel Ken Marks Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / (No)

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) (Yes) / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: _____

Sample Time _____ Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

INFO on Page#1

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	20 PSI											
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1000	5 10	120	8.40	0.0	0.2	11.58	1.090	7.19	-260.3	0.09	270	Page#2 of 2 S.Cond=1.090
1005		120	8.40	0.0	0.2	11.62	1.093	7.18	-265.1	0.09	251	INFO on Page#1
1010		120	8.40	0.0	0.2	11.61	1.095	7.18	-266.2	0.09	228	Purge water cloudy gray
1015		120	8.40	0.0	0.2	11.58	1.096	7.17	-271.1	0.09	213	
1020		120	8.40	0.0	0.2	11.62	1.092	7.17	-278.8	0.09	201	
1025		120	8.40	0.0	0.2	11.63	1.092	7.16	-288.1	0.09	190	
1030		120	8.40	0.0	0.2	11.65	1.091	7.16	-299.1	0.10	181	
1035		120	8.40	0.0	0.2	11.64	1.090	7.14	-308.1	0.10	211	
1040		120	8.40	0.0	0.2	11.64	1.090	7.13	-317.9	0.10	227	
1045		120	8.40	0.0	0.2	11.63	1.086	7.13	-323.4	0.10	199	
1050		120	8.40	0.0	0.2	11.65	1.078	7.12	-331.7	0.10	212	
1055		120	8.40	0.0	0.2	11.66	1.081	7.17	-338.9	0.10	202	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** MW-6M
Field Personnel KArmitage Purging Start Time : 0915
Well Depth as installed (ft.): 28.9 bgs Measured Well Depth (ft.): 28.85
Screen Length in ft. 5 Screen Depth in ft. 28.85-23.85 Parameter Stabilization: (Circle) (Yes) / No
Depth to GW (ft.): 5.55 From: PVC Two Hour Time Limit Reached ? (Circle) ~~Yes~~ / (No)
Pump/Tubing Intake set (ft.): 26.85 From: PVC Total Volume Purged, Including Drawdown (gallons): 3.5
Sample Designation MW-06M-1110A Time at Purge Completion: 1035
Sample Time 1015 Signature: KArmitage
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder : p=20 psi ; D/R=5/10
Multimeter model and serial number YSI 650 MDS : PINE1782 Turbidity meter model and serial number LaMotte 2020e : ME14123
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0920	10 / 5	200	5.84	Ø	Ø	11.63	1161	6.84	-132.9	8.18	280	
0925	10 / 5	200	5.85	0.01	0.01	11.65	1162	6.82	-135.3	7.11	201	
0930	10 / 5	200	5.85	Ø	0.01	11.77	1171	6.83	-142.5	3.59	147	
0935	10 / 5	200	5.85	Ø	0.01	11.75	1170	6.85	-147.9	2.20	126	
0940	10 / 5	200	5.85	Ø	0.01	11.77	1168	6.88	-153.6	2.02	111	
0945	10 / 5	220	5.86	0.01	0.02	11.74	1166	6.93	-153.7	1.30	94.5	
0950	10 / 5	220	5.86	Ø	0.02	11.74	1167	6.96	-156.9	1.05	77.4	
0955	10 / 5	220	5.86	Ø	0.02	11.75	1167	6.97	-157.3	0.95	82.7	
1000	10 / 5	220	5.86	Ø	0.02	11.76	1168	6.99	-158.2	0.93	85.7	
1005	10 / 5	220	5.86	Ø	0.02	11.75	1167	7.01	-158.6	0.90	84.9	
1010	10 / 5	220	5.86	Ø	0.02	11.74	1167	7.02	-158.9	0.94	87.8	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

Nobis Engineering, Inc. nobisengineering.com

Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** MW-6D
Field Personnel Jay Ward Purging Start Time : 9:15
Well Depth as installed (ft.): 37.9 bgs Measured Well Depth (ft.): 37.90
Screen Length in ft. 5' Screen Depth in ft. 32.9-37.9 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 5.35 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 2' From Bottom From: PVC Total Volume Purged, Including Drawdown (gallons): 2.0
Sample Designation MW-6D-1110A Time at Purge Completion: 10:32
Sample Time 10:20 Signature:
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder
Multimeter model and serial number YSI 650XL/02A0874AB Turbidity meter model and serial number LaMotte 2020 ME/0539
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)
Flush Mount Neo Well

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
9:25	5 / 10	125	5.75	—	—	10.66	673	7.24	-176.3	1.55	198	21 PSI
9:30	5 / 10	125	5.75	—	—	11.12	642	7.39	-248.2	0.80	212	
9:35	5 / 10	125	5.75	—	—	11.13	646	7.47	-255.2	0.65	226	
9:40	5 / 10	125	5.75	—	—	11.19	648	7.54	-260.3	0.55	236	
9:45	5 / 10	150 ~~125~~	5.80	.05	.05	11.32	653	7.60	-263.7	0.59	191	
9:50	5 / 10	150	5.80	~~.05~~	.05	11.31	655	7.62	-261.3	0.55	154	
9:55	5 / 10	150	5.80	—	.05	11.24	657	7.64	-257.3	0.55	150	
10:00	5 / 10	150	5.80	—	.05	11.28	657	7.65	-253.0	0.60	111	
10:05	5 / 10	150	5.80	—	.05	11.28	661	7.66	-251.2	0.54	126	
10:10	5 / 10	150	5.80	—	.05	11.25	661	7.66	-249.4	0.52	119	
10:15	5 / 10	150	5.80	—	.05	11.27	661	7.66	-247.4	0.49	117	
												Sample Time 10:20

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/2/10 Page 1 of 1 **Well ID :** MW-7M
Field Personnel KArmitage Purging Start Time : 0857
Well Depth as installed (ft.): 34 bgs Measured Well Depth (ft.): 34.23
Screen Length in ft. ~~5.41~~ 5 Screen Depth in ft. 34.23-29.23 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 5.41 From: pvc mark Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 31.40 From: pvc mark Total Volume Purged, Including Drawdown (gallons): 3
Sample Designation MW-07M-1110A Time at Purge Completion: 1025
Sample Time 1010 Signature: KArmitage
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder : p~22psi : R/D = 10/5
Multimeter model and serial number YSI 650 MDS : PINE1782 Turbidity meter model and serial number LaMotte 2020e : ME14123
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Do value low @ end of day cal check. ES

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
0910	10 / 5	250	5.73	—	—	10.81	1,071	7.14	-126.4	1.97	195	p~22psi ✓
0915	10 / 5	250	5.73	Ø	Ø	10.81	1073	7.18	-130.3	1.85	228	
0920	10 / 5	250	5.73	Ø	Ø	10.77	1087	7.21	~~-126~~	1.99	241	ORP = -129.7
0925	10 / 5	250	5.73	Ø	Ø	10.78	1100	7.23	-127.5	2.11	238	
0930	10 / 5	250	5.73	Ø	Ø	10.75	1119	7.26	-123.4	2.32	237	
0935	10 / 5	250	5.73	Ø	Ø	10.82	1121	7.30	-122.9	2.61	140	
0940	10 / 5	250	5.73	Ø	Ø	10.81	1127	7.33	-122.8	2.79	168	
0945	10 / 5	250	5.73	Ø	Ø	10.83	1130	7.35	-124.4	3.02	175	
0950	10 / 5	250	5.73	Ø	Ø	10.80	1138	7.36	-123.7	3.09	165	
0955	10 / 5	250	5.73	Ø	Ø	10.83	1142	7.38	-126.4	3.13	160	
1000	10 / 5	250	5.73	Ø	Ø	10.83	1147	7.39	-125.0	3.18	177	
1005	10 / 5	250	5.73	Ø	Ø	10.82	1148	7.40	-125.2	3.20	178	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** MW-8M
Field Personnel Jay Gilbert Purging Start Time : 12:16
Well Depth as installed (ft.): 24 Measured Well Depth (ft.): 23.97
Screen Length in ft. 5 Screen Depth in ft. 19-24 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 15.3 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 2' From Bottom From: PVC Total Volume Purged, Including Drawdown (gallons): 2.0
Sample Designation MW-08M-1110A Time at Purge Completion: 13:25
Sample Time 13:15 Signature:
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder
Multimeter model and serial number YSI 650XL 02A0874AB Turbidity meter model and serial number LaMotte 2020 ME/0539
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
12:20	5 / 10	200	1.91	—	—	10.15	556	6.75	-5.4	3.36	62.5	18/19 PSI
12:25	5 / 10	200	1.91	—	—	10.66	559	6.51	-41.0	1.24	67.8	
12:30	5 / 10	200	1.91	—	—	10.75	564	6.53	-61.9	0.80	75.8	
12:35	5 / 10	200	1.93	.02	.02	10.74	563	6.59	-75.6	0.57	76.9	
12:40	5 / 10	200	1.93	—	.02	10.72	566	6.63	-78.5	0.48	54.1	
12:45	5 / 10	200	1.93	—	.02	10.73	568	6.67	-81.2	0.47	56.4	
12:50	5 / 10	200	1.93	—	.02	10.73	567	6.69	-82.0	0.41	46.1	
12:55	5 / 10	200	1.93	—	.02	10.73	565	6.72	-82.8	0.37	35.7	
13:00	5 / 10	200	1.93	—	.02	10.75	564	6.73	-82.6	0.37	35.2	
13:05	5 / 10	200	1.93	—	.02	10.77	561	6.74	-82.7	0.35	34.0	Sample Time 13:15

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/10 Page 1 of 1 **Well ID :** MW-8S

Field Personnel: KArmitage Purging Start Time : 1210

Well Depth as installed (ft.): 19 bgs Measured Well Depth (ft.): 18.76

Screen Length in ft. 5 Screen Depth in ft. 18.76-13.76 Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 1.85 From: PVC-mark Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 16.76 From: PVC-mark Total Volume Purged, Including Drawdown (gallons): 4

Sample Designation MW-08S-1110A Time at Purge Completion: 1325

Sample Time 1315 Signature: KArmitage

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder : p=20psi

Multimeter model and serial number YSI 650MDS : PINE 1782 Turbidity meter model and serial number LaMotte 2020e ME14123

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1215	10 / 5	300	1.93	—	—	11.23	918	6.20	39.2	6.01	78.4	p=20psi
1220	10 / 5	300	1.93	Ø	Ø	11.38	918	5.94	36.9	3.63	61.6	
1225	10 / 5	300	1.93	Ø	Ø	11.44	908	5.77	42.4	2.40	32.7	
1230	10 / 5	300	1.93	Ø	Ø	11.42	903	5.73	41.4	2.38	21.4	
1235	10 / 5	300	1.93	Ø	Ø	11.47	893	5.67	35.7	2.23	16.7	
1240	10 / 5	300	1.93	Ø	Ø	11.48	889	5.63	32.5	2.36	15.2	
1245	10 / 5	300	1.93	Ø	Ø	11.48	891	5.59	33.0	2.29	10.33	
1250	10 / 5	300	1.93	Ø	Ø	11.48	880	5.57	24.9	2.23	9.60	
1255	10 / 5	300	1.93	Ø	Ø	11.46	875	5.56	18.0	2.09	10.15	
1300	10 / 5	300	1.93	Ø	Ø	11.45	878	5.55	9.0	2.01	7.96	
1305	10 / 5	300	1.93	Ø	Ø	11.45	881	5.55	7.4	1.98	7.41	
1310	10 / 5	300	1.93	Ø	Ø	11.48	881	5.54	10.3	1.97	7.88	✓

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010
Attachment B, Page 1 of 1
Rev.: 2
Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-1-10 Page 1 of 2 **Well ID :** MW-9M
Field Personnel Ken Marks Purging Start Time : 1435
Well Depth as installed (ft.): 30 bgs Measured Well Depth (ft.): 31.78 TOC
Screen Length in ft. 5 Screen Depth in ft. 25-30 bgs Parameter Stabilization: (Circle) Yes / No JF
Depth to GW (ft.): 9.08 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No JF
Pump/Tubing Intake set (ft.): 29 From: PVC Total Volume Purged, Including Drawdown (gallons): 6
Sample Designation MW-09M-1110A Time at Purge Completion: 1605
Sample Time 1555 Signature: Ken Marks
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder PSI = 22
Multimeter model and serial number YSI 650MDS # Turbidity meter model and serial number LaMotte 2020e # 12350
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Page #1 of 2

Clock Time	Discharge / Refill / Pump Setting PSI = 22	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3% mS/cm	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	~~µS/cm~~		mV	mg/L	NTU	
1440	5 / 10	250	9.01	–	–	12.17	1.790	6.79	-0.9	1.97	621	Purge water cloudy light brown
1445		250	9.07	–	–	11.96	1.833	6.79	-29.9	1.21	228	
1450		250	9.07	–	–	11.94	1.855	6.81	-62.2	3.37	202	
1455		250	9.07	–	–	11.93	1.875	6.84	-90.1	5.21	143	
1500		250	9.07	–	–	11.92	1.879	6.85	-112.9	4.66	102	
1505		250	9.07	–	–	11.89	1.876	6.84	-124.4	1.33	71.2	
1510		250	9.07	–	–	11.82	1.887	6.84	-126.5	1.71	56.0	
1515		250	9.07	–	–	11.84	1.893	6.84	-128.0	1.63	47.8	
1520		250	9.07	–	–	11.85	1.893	6.84	-128.6	1.39	44.3	
1525		250	9.07	–	–	11.82	1.903	6.84	-130.1	1.25	22.5	
1530		250	9.07	–	–	11.80	1.905	6.84	-131.0	1.16	18.2	
1535		250	9.07	–	–	11.71	1.908	6.85	-131.7	1.28	16.2	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-1-10 Page 2 of 2 **Well ID :** MW-9M

Field Personnel Ken Marks

Purging Start Time : _____

Well Depth as installed (ft.): _____

Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____

Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____

Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____

Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____

Time at Purge Completion: _____

Sample Time 1555

Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

INFO on Page #1

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1540		250	9.07	–	–	11.63	1.911	6.85	-133.2	1.23	14.1	INFO on Page #1
1545		250	9.07	–	–	11.64	1.912	6.85	-133.1	1.31	14.4	↓
1550		250	9.07	–	–	11.65	1.912	6.85	-133.3	1.30	13.8	↓

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-2-10 Page 1 of 2 **Well ID :** MW-9D

Field Personnel Ken Marks Purging Start Time : 0910

Well Depth as installed (ft.): 40 bgs Measured Well Depth (ft.): 42.33 TOC

Screen Length in ft. 5 Screen Depth in ft. 35-40 bgs Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): 8.78 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): 39.5 From: PVC Total Volume Purged, Including Drawdown (gallons): 7

Sample Designation MW-09D-1110A Time at Purge Completion: 1050

Sample Time 1055 Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder Pump PSI = 25

Multimeter model and serial number YSI 650 MDS #0160853 Turbidity meter model and serial number LaMotte 2020e # 12350

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting PSI = 25	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3% mS/cm	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	~~µS/cm~~		mV	mg/L	NTU	
0920	5 10	250	9.01	0.23	-	10.17	0.377	7.50	-200.2	1.13	777	Purge water silty light brown
0925		250	8.97	0.19	0.19	10.11	0.357	7.74	-260.1	0.63	568	
0930		250	8.93	0.15	0.15	10.15	0.346	8.01	-292.7	0.50	505	
0935		250	8.81	0.03	0.03	10.15	0.340	8.18	-303.9	0.41	441	
0940		250	8.80	0.02	0.02	10.12	0.337	8.22	-312.6	0.33	411	
0945		250	8.80	0.0	0.02	10.21	0.332	8.30	-320.1	0.25	389	
0950		250	8.80	0.0	0.02	10.17	0.333	8.37	-328.1	0.24	340	
0955		250	8.80	0.0	0.02	10.22	0.328	8.39	-331.0	0.24	321	
1000		250	8.80	0.0	0.02	10.32	0.327	8.41	-333.7	0.26	301	
1005		250	8.80	0.0	0.02	10.37	0.326	8.42	-334.8	0.29	287	
1010		250	8.80	0.0	0.02	10.42	0.326	8.43	-330.4	0.77	262	
1015		250	8.80	0.0	0.02	10.51	0.324	8.44	-334.7	0.51	229	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12-2-10 Page 2 of 2 **Well ID :** MW-9D

Field Personnel Ken Marks Purging Start Time : _____

Well Depth as installed (ft.): _____ Measured Well Depth (ft.): _____

Screen Length in ft. _____ Screen Depth in ft. _____ Parameter Stabilization: (Circle) Yes / No

Depth to GW (ft.): _____ From: _____ Two Hour Time Limit Reached ? (Circle) Yes / No

Pump/Tubing Intake set (ft.): _____ From: _____ Total Volume Purged, Including Drawdown (gallons): _____

Sample Designation _____ Time at Purge Completion: _____

Sample Time _____ Signature: Ken Marks

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) _____

Multimeter model and serial number _____ Turbidity meter model and serial number _____

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

INFO on page# 1

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1020		250	8.80	0.0	0.02	10.49	0.323	8.46	-334.6	0.30	262	Page#2 INFO on Page#1
1025		250	8.80	0.0	0.02	10.42	0.321	8.46	-334.9	0.28	301	
1030		250	8.80	0.0	0.02	10.50	0.321	8.45	-335.1	0.27	332	
1035		250	8.80	0.0	0.02	10.63	0.320	8.47	-338.0	0.27	288	
1040		250	8.80	0.0	0.02	10.68	0.321	8.46	-337.0	0.27	221	
1045		250	8.80	0.0	0.02	10.59	0.321	8.46	-337.6	0.27	219	Turbidity stable @ about
1050		250	8.80	0.0	0.02	10.61	0.321	8.45	-337.1	0.27	218	200 NTU

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/2/10 Page 1 of 1 **Well ID :** MW-10D
Field Personnel KArmitage Purging Start Time : 1217
Well Depth as installed (ft.): 35 bgs Measured Well Depth (ft.): 35.07
Screen Length in ft. 5 Screen Depth in ft. 30-35 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 2.59 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / (No)
Pump/Tubing Intake set (ft.): 32.95 From: PVC Total Volume Purged, Including Drawdown (gallons): 1.75
Sample Designation MW-10D-1110A Time at Purge Completion: 1514
Sample Time 1325 Signature: KArmitage
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) bladder: P~20psi, R/D = 10.5/4.5
Multimeter model and serial number YSI 650MDS : PINE1782 Turbidity meter model and serial number LaMotte 2020e : ME14123
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)
very silty! DO check low @ end of day cal check (EJ)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1225	10.5 / 4.5	110	2.74	—	—	11.00	446	7.83	-207.6	1.17	332	P~20 psi
1230	10.5 / 4.5	100	2.70	-0.04	-0.04	11.12	449	7.83	-223.0	0.74	312	
1235	10.5 / 4.5	100	2.72	+0.02	-0.02	10.99	448	7.83	-234.3	0.53	327	
1240	10.5 / 4.5	100	2.72	Ø	-0.02	11.33	452	7.84	-239.6	0.46	305	
1245	10.5 / 4.5	100	2.72	Ø	-0.02	11.47	454	7.85	-247.2	0.38	524	
1250	10.5 / 4.5	100	2.70	-0.02	-0.04	11.35	453	7.85	-249.2	0.35	509	
1255	10.5 / 4.5	100	2.70	Ø	-0.04	10.98	449	7.85	-249.6	0.33	487	
1300	10.5 / 4.5	100	2.70	Ø	-0.04	10.99	450	7.86	-252.9	0.31	480	
1305	10.5 / 4.5	100	2.70	Ø	-0.04	11.20	454	7.86	-255.9	0.27	487	
1310	10.5 / 4.5	100	2.70	Ø	-0.04	11.24	456	7.86	-257.9	0.24	~~232~~ EJ	resampled turbidity = 499
1315	10.5 / 4.5	100	2.70	Ø	-0.04	11.03	454	7.87	-256.7	0.23	471	
1320	10.5 / 4.5	100	2.70	Ø	-0.04	11.03	454	7.87	-258.2	0.23	482	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 12/1/10 Page 1 of 1 **Well ID :** MW-11S
Field Personnel E. JOHNSON Purging Start Time : 924
Well Depth as installed (ft.): 19 Measured Well Depth (ft.): 19.28 (12/1)
Screen Length in ft. 5 Screen Depth in ft. 14-19 Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 6.95 From: TOP OF PVC (FLUSH MT) Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 17' From: BSG Total Volume Purged, Including Drawdown (gallons): 5
Sample Designation MS/MSD Time at Purge Completion: 1015
Sample Time 1020 Signature: Eric Johnson
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) BLADDER PUMP 13521
Multimeter model and serial number YSI 600 XL 4309 Turbidity meter model and serial number LAMOTTE 2020E ME14820
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Added dedicated tubing.

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
935	8.5 / 6.5	340	6.97	.02	.02	12.87	1,151	6.46	118.7	5.79	NM	Silty upon start-up, ~~psi~~ pressure @ 15 psi (EJ)
940	8.5 / 6.5	340	6.97			12.97	1,151	6.44	101.9	5.69	51.3	
945	8.5 / 6.5	340	6.97			13.02	1,153	6.44	96.0	5.70	25.9	
950	8.5 / 6.5	340	6.97			13.05	1,151	6.44	93.2	5.67	20.1	
955	8.5 / 6.5	340	6.97			13.06	1,146	6.44	91.6	5.63	12.5	
1000	8.5 / 6.5	340	6.97			13.07	1,139	6.44	90.4	5.53	10.59	
1005	8.5 / 6.5	340	6.97			13.09	1,142	6.43	89.8	5.55	9.00	
1010	8.5 / 6.5	340	6.97			13.09	1,137	6.43	89.3	5.50	8.41	
1015	8.5 / 6.5	340	6.97			13.13	1,132	6.43	89.4	5.44	8.75	
												Readings stabilize, GW sampled @ 1020.

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

11-30-10 OE-2A

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010
Attachment B, Page 1 of 1
Rev.: 2
Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11-30-10 Page 1 of 1 **Well ID :** OE-~~2B~~ 2A
Field Personnel Ken Marks Purging Start Time : 1240
Well Depth as installed (ft.): 35 bgs Measured Well Depth (ft.): 36.90
Screen Length in ft. 10 Screen Depth in ft. 25-35 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 7.09 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 27.5 From: ~~PVC~~ SF gs Total Volume Purged, Including Drawdown (gallons): 2
Sample Designation OE-02A-1110A Time at Purge Completion: 1350
Sample Time 1355 Signature: Ken Marks
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder PSI = 20
Multimeter model and serial number YSI 650MDS #01608534A Turbidity meter model and serial number LaMotte 2020e #1235
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting PSI-20	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1255	10 / 5	100	7.20	0.11	–	9.01	2.118	7.34	-42.2	0.57	167	Purge water cloudy gray
1300		100	7.23	0.02	0.13	8.96	2.043	7.38	-82.9	0.38	119	
1305		100	7.24	0.01	0.14	8.94	1.977	7.42	-93.6	0.38	130	
1310		100	7.24	0.0	0.14	8.93	1.938	7.47	-112.0	0.38	111	
1315		100	7.24	0.0	0.14	8.94	1.920	7.49	-121.6	0.33	90.1	
1320		100	7.24	0.0	0.14	8.94	1.910	7.51	-137.2	0.21	73.8	
1325		100	7.24	0.0	0.14	8.93	1.902	7.54	-148.6	0.18	62.7	
1330		100	7.24	0.0	0.14	8.94	1.888	7.54	-152.7	0.17	51.3	
1335		100	7.24	0.0	0.14	8.92	1.898	7.55	-154.8	0.17	50.1	
1340		100	7.24	0.0	0.14	8.98	1.899	7.56	-156.9	0.17	46.3	
1345		100	7.24	0.0	0.14	8.97	1.894	7.57	-158.2	0.17	46.1	
1350		100	7.24	0.0	0.14	8.97	1.895	7.57	-158.8	0.17	45.7	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 11/30/2010 Page 1 of 1 **Well ID :** OE 2B (HR) Dup.
Field Personnel Heidi Borchers Purging Start Time : 1250
Well Depth as installed (ft.): 13 bgs Measured Well Depth (ft.): 15.4
Screen Length in ft. 10 Screen Depth in ft. 3-13 bgs Parameter Stabilization: (Circle) Yes / No
Depth to GW (ft.): 7.09 From: PVC Two Hour Time Limit Reached ? (Circle) Yes / No
Pump/Tubing Intake set (ft.): 8 From: Bgs Total Volume Purged, Including Drawdown (gallons): 4.5
Sample Designation OE-02B-1110A Time at Purge Completion: 1500
Sample Time 1405 Signature: [signature]
Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Bladder Pump - dis. 5 - recharg - 10
Multimeter model and serial number YSI 600XL SN# 1009 (Rise FD) Turbidity meter model and serial number La Motte 2020 SN# ME-11495
Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
1305	5 10	250	7.20	~~7.20~~ 0.11	0.00	9.58	0.062	5.36	127.7	3.05	86.5	
1310		250	7.20	0.11	0.00	9.58	0.066	5.33	147.3	4.07	63.4	
1315			7.20	0.11	0.00	9.58	0.070	5.33	151.5	3.97	34.5	
1320			7.20	0.11	0.00	9.60	0.072	5.32	149.5	3.69	25.7	
1325			7.20	0.11	0.00	9.58	0.073	5.31	139.0	3.78	19.5	
1330		250	7.20	0.11	0.00	9.59	0.075	5.31	135.3	3.45	12.3	
1335			7.20	0.11	0.00	9.57	0.081	5.30	134.3	3.39	10.16	
1340			7.20	0.11	0.00	9.56	0.084	5.30	132.7	3.39	7.08	
1345			7.20	0.11	0.00	9.55	0.085	5.31	129.8	3.24	5.65	
1350		250	7.20	0.11	0.00	9.52	0.088	5.32	127.4	3.15	4.42	
1355			7.20	0.11	0.00	9.52	0.089	5.32	125.0	3.16	2.79	
1400			7.20	0.11	0.00	9.49	0.090	5.32	123.8	3.23	3.13	

Notes: All depths in feet below top of PVC unless specified.
1405 NR = No Reading
Use the back of the log to record additional observations and descriptions.

Sampled @ 1405

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Vert. Profiling

Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 8/23/10 Page 1 of 1 **Well ID :** VP-01

Field Personnel J. Fapiano Purging Start Time : 1130

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): 12

Sample Designation — Time at Purge Completion: 1325

Sample Time — Signature: J Fapiano

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geopump Peristaltic

Multimeter model and serial number YSI 600XL / 05734 Turbidity meter model and serial number LaMotte 2020e / 11760

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth (ft)	Sample/ Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1320	— —	—	—	—	—	15.29	1314	6.39	-173.3	0.55	111	
20	1300	— —	—	—	—	—	13.47	1133	6.45	-156.1	6.70	115	
25	1245	— —	—	—	—	—	13.64	1583	6.13	-172.5	4.60	146	
30	1230	— —	—	—	—	—	13.19	1420	6.14	-119.5	5.10	602	
35	1210	— —	—	—	—	—	13.12	723	6.98	-189.3	5.30	1029	
40	1155	— —	—	—	—	—	13.76	413	7.67	-220.7	4.30	1331	
43	1140	— —	—	—	—	—	13.67	483	7.46	-200.1	0.38	813	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/13/10 Page 1 of 1 **Well ID :** VP-02

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth (Ft)	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	No Metals
10	0805	—	—	—	—	—	—	—	—	—	—	—	No water
15	0820	—	—	—	—	—	15.20	1070	6.64	49.1	6.46	18.4	grey
20	900	—	—	—	—	—	13.59	1273	6.10	62.3	1.54	168	↓
25	1015	—	—	—	—	—	12.85	1248	6.27	60.0	1.36	184	↓
30	1055	—	—	—	—	—	13.36	1138	6.27	27.9	2.58	1000+	grey / Brown
35	1125	—	—	—	—	—	—	—	—	—	—	—	One vial collected
40	NA	—	—	—	—	—	NA						Stopped at 35 ft

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/15/10 Page 1 of 1 **Well ID :** VP-03

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	825	X	–	–	–	–	Not	enough	water	for	readings	EPA	Sample only
15	835	X	–	–	–	–	16.12	777	6.76	11.7	4.40	6.69	Metal Clear
20	0850	X	–	–	–	–	14.57	580	6.22	38.4	0.54	198	grey/brown
25	0905	X	–	–	–	–	14.41	707	5.89	68.6	0.64	147	Metal lt brown
30	0925	X	–	–	–	–	14.75	432	6.13	4.2	0.70	268	grey/brown
35	0940	X	–	–	–	–	14.73	541	6.45	-74.0	0.57	1288	grey cloudy
38	1000	X	–	–	–	–	14.95	740	6.73	-114.9	1.16	206	Metal

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/13/10 Page 1 of 1 **Well ID :** VP-04

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
12	1415		–	–	–	–	No Readings			Ran out	of water		grey / brown
15	1430		–	–	–	–	15.00	440	6.42	45.9	1.52	2.92	↓
20	1440		–	–	–	–	13.49	634	6.12	76.2	1.01	244	↓
25	1455		–	–	–	–	13.03	588	5.64	87.7	0.74	787	↓
30	1510		–	–	–	–	13.07	720	5.86	50.2	0.72	801	grey
35	1525		–	–	–	–	12.66	1026	6.55	-103.9	0.77	172	↓
40	1545		–	–	–	–	13.53	0737	7.16	-159.6	0.40	1000+	↓

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/14/10 Page 1 of 1 **Well ID :** VP-05

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number La Motte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	1050		–	–	–	–	Not Enough water for readings						EPA Sample only
15	1105		–	–	–	–	13.33	559	6.55	38.7	2.31	23.1	Dark Brown
20	1115		–	–	–	–	13.11	631	6.44	13.6	1.33	~~1532~~ 678	Brown
25	1135		–	–	–	–	12.53	709	6.47	-49.9	1.15	990	grey
30	1150		–	–	–	–	13.34	866	6.34	-18.7	1.60	1379	grey
35	1210		–	–	–	–	13.13	811	7.00	-145.9	1.58	1410	grey
~~40~~ 38	1315		–	–	–	–	14.49	502	7.65	-172.9	1.52	971	grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

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Well ID : VP-06

Field Personnel Josh Stewart

Purging Start Time : –

Well Depth as installed (ft.): –

Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. –

Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: –

Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: –

Total Volume Purged, Including Drawdown (gallons): –

Sample Designation –

Time at Purge Completion: –

Sample Time –

Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth FT	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
12	1630			–	–	–	–	No Readings			No	Water	
15	1640		–	–	–	–	15.67	748	6.35	60.8	2.34	16.2	Grey/Brown
20	1650		–	–	–	–	13.91	742	6.33	36.7	0.64	143	Brown
25	1705		–	–	–	–	13.04	740	6.24	51.0	0.83	697	Grey
7/14/10 30	0820		–	–	–	–	13.42	523	6.18	-16.9	0.88	1729	Grey
35	0935		–	–	–	–	13.65	587	6.41	-44.1	2.26	150	Grey
40	1005		–	–	–	–	13.74	622	6.60	-84.4	1.02	831	Grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/14/10 Page 1 of 1 **Well ID :** VP-07

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	1440	X	–	–	–	–	17.90	1755	6.74	-36.0	5.67	7.37	Clear Odor
15	1500	X	–	–	–	–	15.53	931	6.71	-14.3	2.55	24.4	Clear
20	1515	X	–	–	–	–	14.63	864	6.37	22.2	1.29	1210	Cloudy / grey
25	1530	X	–	–	–	–	13.76	657	6.41	-43.8	0.61	2000+	Dark grey
30	1555	X	–	–	–	–	13.16	642	6.71	-108.9	0.71	2000+	Dark grey
35	1615	X	–	–	–	–	13.09	814	6.78	-131.9	1.35	1215	Cloudy / grey
40	1640	X	–	–	–	–	14.36	503	7.34	-179.9	1.55	633	Cloudy / grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/12/10 Page 1 of 1 **Well ID :** VP-08

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
5 Ft	1210		–	–	–	–	NA	NA	NA	NA	NA	NA	No water
10 Ft	1240 (SS)		–	–	–	–	Sample	Collected					No water for Metals readings (CS)
15 Ft	1320		–	–	–	–	Sample	Collected					Metals Collected No readings
20 Ft	1400 (SS)		–	–	–	–	15.81	768	6.81	38.7	3.66	34.9	
25 Ft	1425		–	–	–	–	15.30	1455	6.28	65.3	3.88	56.2	Metals
30	1440		–	–	–	–	15.20	3409	6.18	3.9	3.37	817	
35	1500		–	–	–	–	14.89	6028	6.53	-93.2	2.23	183	
40	1520		–	–	–	–	15.20	986	6.45	52.1	2.77	103.2	Metals

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Prepared by: S. Bonis
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Date : 7/15/10 Page 1 of 1 **Well ID :** VP-09

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	1040		—	—	—	—	17.31	1843	6.62	51.8	6.88	11.1	Clear
15	1055		—	—	—	—	15.02	1739	6.54	26.9	1.70	164	Cloudy
20	1110		—	—	—	—	13.55	703	6.47	31.9	0.54	150	Cloudy
25	1125		—	—	—	—	14.11	1049	6.34	43.1	0.49	1183	~~MS/MSD~~ Grey
30	1200		—	—	—	—	13.57	714	6.09	69.5	0.36	844	Grey
35	1215		—	—	—	—	13.20	671	6.39	-58.6	0.42	236	Cloudy
40	1320		—	—	—	—	14.63	695	7.09	-138.0	0.76	112	Cloudy FDUP 01

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
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Date : 7/15/10 Page 1 of 1 **Well ID :** VP-10

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	1440		—	—	—	—	Not enough water for readings						Sample Collected
15	1455		—	—	—	—	Not enough water for reading						Metals Brown Slow recharge
20	1515		—	—	—	—	13.72	3295	6.35	53.6	2.68	162	Brown
25	1535		—	—	—	—	13.42	2840	6.40	45.5	2.40	1158	Metals DUP 01
30	1600		—	—	—	—	12.97	1439	6.43	-30.7	0.54	850	grey
35	1625		—	—	—	—	12.99	981	6.46	-89.6	0.59	752	grey
40	1645		—	—	—	—	13.36	800	6.67	-136.4	0.47	683	Metals grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Prepared by: S. Bonis
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Preserved with 1:1 Hydrochloric Acid

Date : 7/19/10 Page 1 of 1 **Well ID :** VP-11

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time HHMM	Discharge / Refill / Pump Setting sec. / sec. or setting	Purge Rate ml/min	Depth to Water ft.	Draw down ft.	Cum. Draw down ft.	Temp. +/- 3% °C	Spec. Cond. +/- 3% µS/cm	pH +/- 0.1	ORP +/-10 mV	DO +/- 10% if >0.5 mg/L mg/L	Turbidity +/- 10% if > 5 NTU NTU	Comments / Gas Pressure / Observations
15	1345	X	–	–	–	–	14.31	353	7.12	95.8	3.80	4.66	Clear
20	1400	X	–	–	–	–	13.25	590	6.67	28.8	1.91	127	Cloudy
25	1420	X	–	–	–	–	12.71	796	6.46	35.5	1.90	209	Cloudy
30	1435	X	–	–	–	–	12.41	892	6.56	-48.9	2.16	824	lt grey Cloudy
35	1515	X	–	–	–	–	14.22	848	6.89	-128.9	1.85	188	Cloudy
40	1540	X	–	–	–	–	14.69	677	7.10	-139.9	1.83	866	Cloudy lt grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/20/10 Page 1 of 1 **Well ID :** VP-12

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Used the SP-15 Sampler FROM 25 Ft down Silt was flowing into the Other Sampler

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	0810	X	–	–	–	–	17.29	349	6.56	-11.7	5.72	114	Clear
20	0825	X	–	–	–	–	15.61	900	6.15	1.3	0.92	191	Cloudy
25	0905	X	–	–	–	–	16.20	1084	6.63	-108.5	1.00	234	Cloudy
30	0930	X	–	–	–	–	15.73	722	6.81	-99.9	1.53	102.5	Clear
35	0955	X	–	–	–	–	16.00	736	6.81	-119.9	1.23	139	Cloudy
40	1020	X	–	–	–	–	16.80	564	7.15	-136.9	1.31	224	Cloudy

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/16/10 Page 1 of 1 **Well ID :** VP-13

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: Josh

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	805		—	—	—	—	Not enough water for readings						It Brown
15	0820		—	—	—	—	16.10	1222	6.32	20.4	3.61	13.2	Clear
20	0835		—	—	—	—	14.20	2162	6.17	24.6	1.06	138	Cloudy It Brown
25	0855		—	—	—	—	13.98	1890	6.29	-38.9	0.95	208	Cloudy It Brown
30	0920		—	—	—	—	13.68	1215	6.67	-110.9	0.81	1374	grey
35	0940		—	—	—	—	13.71	1050	6.70	-117.5	0.91	216	cloudy
40	1005		—	—	—	—	13.99	545	7.26	-163.9	0.64	2000+	Dark grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/19/10 Page 1 of 1 **Well ID :** VP-14

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1625	X	–	–	–	–	17.31	1723	6.55	-0.4	1.97	43.1	VOC MS/MSD Metals
20	1645	X	–	–	–	–	15.45	820	6.46	31.3	1.48	214	Cloudy
25	1700	X	–	–	–	–	14.67	1982	6.28	27.7	1.88	235	Metals DUP OZ
30	1720	X	–	–	–	–	14.22	1756	6.78	-96.7	1.20	925	lt grey Cloudy
35	1745	X	–	–	–	–	14.20	2175	6.96	-131.9	1.41	1029	lt grey Cloudy
40	1805	X	–	–	–	–	14.02	760	7.28	-151.9	1.10	112	Metals Cloudy

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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SOP No: SA-003
Date: Mar. 2010

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Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/16/10 Page 1 of 1 **Well ID :** VP-15

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: JOSH

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	1040	X	–	–	–	–	17.58	831	6.93	20.0	7.24	37.8	lt Brown
15	1055	X	–	–	–	–	15.20	2229	6.62	25.9	4.00	192	lt Brown
20	1120	X	–	–	–	–	14.26	2929	6.53	31.0	1.53	1836	lt grey / brown
25	1140	X	–	–	–	–	13.82	1897	6.46	-6.3	0.64	923	grey / brown
30	1205	X	–	–	–	–	14.51	1322	6.80	-91.8	1.35	2106	grey / brown
35	1310	X	–	–	–	–	14.32	880	7.22	-130.8	0.88	1373	Dark grey
40	1345	X	–	–	–	–	15.46	849	7.43	-162.1	1.12	202	Cloudy grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Date: Mar. 2010

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Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/16/10 Page 1 of 1 **Well ID :** VP-16

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	1520	X	—	—	—	—	18.58	2889	6.94	63.1	6.25	11.9	Clear
15	1535	X	—	—	—	—	16.50	1764	6.62	44.4	2.30	1147	Brown
20	1550	X	—	—	—	—	14.61	1661	6.46	52.9	1.76	265	Cloudy
25	1605	X	—	—	—	—	14.79	1246	6.33	55.0	1.10	685	lt Grey
30	1625	X	—	—	—	—	14.14	943	6.74	82.8	0.99	1951	grey
35	1720	X	—	—	—	—	16.09	785	7.24	156.7	0.77	1084	grey
40	1805	X	—	—	—	—	15.24	1309	7.52	163.0	0.88	1173	grey Cloudy

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/17/10 Page 1 of 1 **Well ID :** VP-17

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
10	0835		Not enough			water	for	readings			Sample	Collected	/ Brown
15	0845		—	—	—	—	16.75	709	6.81	40.3	3.59	67.9	Clear
20	0910		—	—	—	—	14.66	258	6.59	12.9	1.20	2000+	Dark grey / Brown
25	0935		—	—	—	—	14.18	423	6.68	-50.8	1.21	168	↓
30	1015		—	—	—	—	15.32	924	6.75	-102.9	2.34	125	Cloudy
35	1040		—	—	—	—	15.18	653	7.15	-124.9	2.02	182	Cloudy
40	1110		—	—	—	—	15.08	477	7.62	-182.8	0.87	807	Cloudy grey
45	1155		in Clay	Unable	to draw	water	VP 45	- 41	FT				Pulled up to 41 No water

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 8/24/10 Page 1 of 1 **Well ID :** VP-18

Field Personnel J. Fopiano Purging Start Time : 0900

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: 1145

Sample Time — Signature: J Fopiano

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL/05734 Turbidity meter model and serial number LaMotte 2020e/11760

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth (ft)	Sample/ Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	0905	— —	—	—	—	—	15.79	1826	6.53	-124.2	1.16	72	
20	0920	— —	—	—	—	—	15.30	1967	5.76	-136.6	1.73	185	
25	—	— —	—										Too silty; no sample/parameters
30	1015	— —	—	—	—	—	15.37	997	6.82	-166.4	1.07	328	SP-16 used
35	1055	— —					17.85	789	7.27	-181.7	0.73	ABR	Dupe collected
40	1140	— —											Too silty; no parameters; Mobile lab sample only

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/20/10 Page 1 of 1 **Well ID :** VP-19

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1105	\	–	–	–	–	18.03	2417	6.22	113.2	1.87	40.1	Clear
20	1120	\	–	–	–	–	16.25	1977	6.26	-1.6	1.85	126	Cloudy
25	1150	\	–	–	–	–	14.56	1474	6.25	-72.3	1.29	1101	Cloudy grey
30	1215	\	–	–	–	–	14.74	1616	6.55	-116.9	1.12	814	Cloudy grey
35	1250	\	–	–	–	–	15.72	913	6.95	-130.9	1.90	148	Cloudy
40	1320	\	–	–	–	–	15.65	498	7.80	-158.0	1.57	1098	Dark grey
45	1420	\	–	–	–	–	14.37	409	7.90	-173.9	1.57	2129	Dark grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/12/10 Page 1 of 1 **Well ID :** VP-20

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth ft	Clock Time HHMM	Discharge / Refill / Pump Setting sec. / sec. or setting	Purge Rate ml/min	Depth to Water ft.	Draw down ft.	Cum. Draw down ft.	Temp. +/- 3% °C	Spec. Cond. +/- 3% µS/cm	pH +/- 0.1	ORP +/-10 mV	DO +/- 10% if >0.5 mg/L mg/L	Turbidity +/- 10% if > 5 NTU NTU	Comments / Gas Pressure / Observations
15	1610	X	—	—	—	—	16.08	797	6.95	-63.5	2.01	64.4	Metals / Brown
20	1630	X	—	—	—	—	13.66	2458	6.87	-105.9	1.89	216	Brown Cloudy
25	1705	X	—	—	—	—	13.71	1290	7.28	-109.9	1.70	1067	Metals Brown
30	1740	X	—	—	—	—	15.60	990	7.46	-132.9	1.38	222	Cloudy grey
35	1805	X	—	—	—	—	15.05	822	7.32	-142.8	1.00	2000+	Dark grey
40	1855	X	—	—	—	—	No	reading		water	too	silty	Metals and EPA Sample only

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vertical Profiling

Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 8/24/10 + 8/25/10 Page 1 of 1 **Well ID :** VP-21

Field Personnel J. Fapiano Purging Start Time : 1630 (8/24/10)

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): ____

Sample Designation — Time at Purge Completion: 0825 (8/25/10)

Sample Time — Signature: J. Fapiano

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geopump Peristaltic

Multimeter model and serial number YSI 600XL/05734 Turbidity meter model and serial number Lamotte 2020e/11760

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth (ft)	Sample/ Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
8/25/10 15	0755	— —	—	—	—	—	13.86	261	6.09	-159.2	1.86	7.36	MS/MSD
↓ 20	0820	— —	—	—	—	—	12.92	187	5.55	-163.2	2.31	29.1	
8/24/10 25	1825	— —	—	—	—	—	12.88	650	5.89	-198.6	2.60	1181	Very silty; only EPA sample collected; SP-16
30	1750	— —	—	—	—	—	12.90	708	7.20	-200.0	0.29	1327	Very silty; only EPA sample collected; SP-16
35	1720	— —	—	—	—	—	—	—	—	—	—	—	Too silty; unable to obtain params; EPA sample only SP-16
↓ 40	1645	— —	—	—	—	—	15.18	162	7.34	-188.2	0.32	1281	SP-16

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/21/10 Page 1 of 1 **Well ID :** VP-22

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

SP-15 used at 35 and 40

Depth ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	0840	X	–	–	–	–	13.42	2614	6.94	-146.1	1.84	61.8	Metals MS/MSD
20	0910	X	–	–	–	–	14.98	2423	7.04	-134.1	1.43	155	lt brown
25	0955	X	–	–	–	–	12.85	1797	7.22	-116.5	2.27	1317	Metals Dark grey
30	1045	X	–	–	–	–	13.41	11.50	7.27	-129.7	1.84	2000+	lots of silt reacted with HCl
35	1105	X	–	–	–	–	15.55	882	7.35	-141.9	2.12	60.3	Clear - SP-15 used
40	1150	X	EPA	Sample	only		could	not	get	enough	water		~~Metals~~ - SP-15 used

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling Low-Flow Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/21/10 Page 1 of 1 **Well ID :** VP-23

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1325		—	—	—	—	16.19	1608	6.47	129.9	2.91	5.75	Clear
20	1355		—	—	—	—	13.57	1939	5.94	182.2	2.02	97.2	lt brown
25	1430		—	—	—	—	13.46	2431	5.67	307.9	2.77	1341	lt brown
30	1455		—	—	—	—	14.16	2418	6.95	-92.9	1.58	200	Cloudy lt grey
35	1630		—	—	—	—	No reading to silty				—	2000+	Metals VP-22 replacement Dark grey
(SS) 38 ~~40~~	1715		No readings to silty				EPA Sample only					2000+	Dark grey
41 ~~40~~	1805		No water			EPA Sample only				600° silt			Dark grey
50													

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vertical Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 8/24/10 Page 1 of 1 **Well ID :** VP-24

Field Personnel J. Fapiano Purging Start Time : 1330

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: 1530

Sample Time — Signature: J Fapiano

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Geopump Peristaltic

Multimeter model and serial number YSI 600XL / 05734 Turbidity meter model and serial number LaMotte 2020e / 11760

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth (ft)	Sample/ Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1455	— —	—	—	—	—	14.82	373	6.52	-56.7	0.36	11.8	Poor yield
20	1520	— —	—	—	—	—	14.58	389	6.06	-72.0	0.38	15.3	
25	1435	— —	—	—	—	—	13.17	488	7.45	-191.3	0.28	26.1	
30	1420	— —	—	—	—	—	14.14	339	7.90	-216.0	0.39	34.6	
35	1355	— —	—	—	—	—	13.58	212	7.85	-204.7	0.33	28.7	
40	1340	— —	—	—	—	—	13.59	198	7.61	-202.0	0.63	34.6	

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/23/10 Page 1 of 1 **Well ID :** VP-25

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

SP-15 Uses 35 ft down

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1030	X	—	—	—	—	16.55	428	7.18	-79.9	5.58	13.3	Metals Clear
20	1045	X	—	—	—	—	14.76	390	6.37	30.0	3.96	31.5	Clear
25	1120	X	—	—	—	—	13.39	1018	6.04	-84.0	4.47	67.9	Metals DUP-03 Clear
30	1200	X	—	—	—	—	15.10	1171	6.50	-150.9	0.72	189	Cloudy grey
35	1235	X	—	—	—	—	16.00	740	6.90	-170.9	0.99	192	Cloudy grey SP-15
40	1300	X	—	—	—	—	15.63	528	7.02	-149.6	1.02	190	Cloudy dark grey
45	1325	X	—	—	—	—	15.89	526	7.30	-194.8	1.03	151	Cloudy

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/23/10 Page 1 of 1 **Well ID :** VP-26

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion:

Sample Time — Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

SP-15 Used at 30 ft and down

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1510		—	—	—	—	16.00	600	6.44	-63.7	3.35	22.0	Clear
20	1525		—	—	—	—	14.40	537	6.13	-129.7	0.84	221	Cloudy
25	1545		—	—	—	—	14.17	755	6.25	-198.9	0.92	1229	grey
30	1620		—	—	—	—	14.80	854	7.21	-231.9	0.74	228	Cloudy grey
35	1645		—	—	—	—	14.44	829	7.23	-215.8	0.72	238	Cloudy grey
40	1720		—	—	—	—	15.08	460	7.54	-251.7	0.54	1062	grey
45	1745		—	—	—	—	15.54	276	7.73	-235.9	0.66	1192	grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

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Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/24/10 Page 1 of 1 **Well ID :** VP-27

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number La Motte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

VP-15 uses at 30 ft on.

Depth ft	Clock Time HHMM	Discharge / Refill / Pump Setting sec. / sec. or setting	Purge Rate ml/min	Depth to Water ft.	Draw down ft.	Cum. Draw down ft.	Temp. +/- 3% °C	Spec. Cond. +/- 3% µS/cm	pH +/- 0.1	ORP +/-10 mV	DO +/- 10% if >0.5 mg/L mg/L	Turbidity +/- 10% if > 5 NTU NTU	Comments / Gas Pressure / Observations lots of bubbles reaction with HCl Possible
15	1055	\	–	–	–	–	15.97	1233	6.58	-20.7	8.87	33.9	Metals Clear lots of air
20	1115	\	–	–	–	–	14.47	749	5.62	45.2	0.99	54.5	Clear
25	1145	\	–	–	–	–	13.57	1162	5.38	15.2	0.81	670	Cloudy grey Metals
30	1215	\	–	–	–	–	15.10	1067	6.16	-139.9	0.65	200	Cloudy lt grey
35	1235	\	–	–	–	–	14.95	1145	6.44	-168.3	1.13	1124	Cloudy grey
40	1305	\	–	–	–	–	14.79	487	6.77	-195.8	4.05	1714	Metals grey
45	1335	\	–	–	–	–	16.07	233	7.11	-198.9	0.57	2009	grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

Nobis Engineering, Inc. nobisengineering.com

Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/24/10 Page 1 of 1 **Well ID :** VP-28

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number La Motte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

SP-15 Used at 35 and 40 FT

Depth FT	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	815	✓	–	–	–	–	12.21	301	5.21	76.0	0.61	6.33	Clear
20	830	✓	–	–	–	–	11.91	1140	5.11	25.0	0.64	18.0	Clear
25	850	✓	–	–	–	–	10.90	909	5.76	-73.9	0.44	213	Cloudy
30	0910	✓	–	–	–	–	10.64	1105	6.43	-116.5	0.54	141	Cloudy
35	0950	✓	–	–	–	–	11.80	294	7.25	-168.9	0.57	1515	Cloudy grey
40	1015	✓	–	–	–	–	12.61	217	7.36	-175.1	0.63	1274	Cloudy grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

Nobis Engineering, Inc. nobisengineering.com

Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/22/10 Page 1 of 1 **Well ID :** VP-29

Field Personnel Josh Stewart Purging Start Time : –

Well Depth as installed (ft.): – Measured Well Depth (ft.): –

Screen Length in ft. – Screen Depth in ft. – Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): – From: – Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): – From: – Total Volume Purged, Including Drawdown (gallons): –

Sample Designation – Time at Purge Completion: –

Sample Time – Signature: Josh S

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number ~~YA~~ YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1340	X	–	–	–	–	17.04	326	6.00	9.3	7.36	173	Dark Brown
20	1405	X	–	–	–	–	13.72	219	5.67	32.6	6.63	127	lt Brown
25	1435	X	–	–	–	–	13.78	337	5.73	329.0	5.90	69.4	lt grey
30	1510	X	–	–	–	–	15.80	647	6.62	41.0	0.82	183	lt grey
35	1545	X	–	–	–	–	15.28	363	5.54	-155.9	0.46	138	Dark grey
40	1625	X	–	–	–	–	15.63	187	6.44	-16.9	0.55	84.4	Dark grey

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

Nobis Engineering, Inc. nobisengineering.com

Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/22/10 Page 1 of 1 **Well ID :** VP-30

Field Personnel Josh Stewart Purging Start Time : —

Well Depth as installed (ft.): — Measured Well Depth (ft.): —

Screen Length in ft. — Screen Depth in ft. — Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): — From: — Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): — From: — Total Volume Purged, Including Drawdown (gallons): —

Sample Designation — Time at Purge Completion: —

Sample Time — Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Switch to SP-15 at 30 ft

Depth Ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	0850		—	—	—	—	15.66	393	6.29	50.2	8.17	5.89	Air Bubbles → high DO Clear
20	0910		—	—	—	—	13.46	377	6.05	-128.9	4.03	222	MS/MSD VOC Cloudy lt brown
25	0925		—	—	—	—	12.48	732	6.60	-67.2	2.82	666	Cloudy lt grey
30	1010		—	—	—	—	12.70	305	7.75	-182.9	1.12	231	Cloudy lt grey
35	1040		—	—	—	—	12.58	204	7.65	-198.1	0.36	640	Cloudy grey
40	1130		—	—	No readings to silty sample collected							2000+	Silt reacted with the HCl Dark grey
43			No water in clay layer										

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

Nobis Engineering, Inc. nobisengineering.com

Vert. Profiling ~~Low-Flow~~ Field Log

SOP No: SA-003
Date: Mar. 2010

Rev.: 2

Prepared by: S. Bonis
Approved by: M. Summerlin

Date : 7/22/10 - 7/23/10 Page 1 of 1 **Well ID :** VP-31

Field Personnel BL Stewart Purging Start Time : -

Well Depth as installed (ft.): - Measured Well Depth (ft.): -

Screen Length in ft. - Screen Depth in ft. - Parameter Stabilization: (Circle) Yes / No NA

Depth to GW (ft.): - From: - Two Hour Time Limit Reached ? (Circle) Yes / No NA

Pump/Tubing Intake set (ft.): - From: - Total Volume Purged, Including Drawdown (gallons): -

Sample Designation - Time at Purge Completion: -

Sample Time - Signature: [signature]

Pump Type (include pressure, discharge, and recharge for bladder pump under pump setting and comments) Peristaltic

Multimeter model and serial number YSI 600XL Turbidity meter model and serial number LaMotte 2020

Notes: (initial wellhead PID/FID reading, deviations from SOP, etc.)

Depth ft	Clock Time	Discharge / Refill / Pump Setting	Purge Rate	Depth to Water	Draw down	Cum. Draw down	Temp. +/- 3%	Spec. Cond. +/- 3%	pH +/- 0.1	ORP +/-10	DO +/- 10% if >0.5 mg/L	Turbidity +/- 10% if > 5 NTU	Comments / Gas Pressure / Observations
	HHMM	sec. / sec. or setting	ml/min	ft.	ft.	ft.	°C	µS/cm		mV	mg/L	NTU	
15	1745	X	-	-	-	-	15.80	548	4.86	-74.7	1.87	32.6	Clear
20	1800	X	-	-	-	-	14.12	776	4.47	-492.5	1.23	643	Cloudy
25	1820	X	-	-	-	-	13.42	801	4.61	-459.0	0.99	835	Cloudy
30	800	X	-	-	-	-	13.51	757	5.73	-378.2	0.72	213	Cloudy
35	0825	X	-	-	-	-	13.34	1059	6.17	-199.7	0.95	90.3	Cloudy
40	0900	X	-	-	-	-	13.52	803	6.93	-241.9	0.43	2000+	DUP - 02

Notes: All depths in feet below top of PVC unless specified.
NR = No Reading
Use the back of the log to record additional observations and descriptions.

APPENDIX B

APPENDIX A. THE GEOPHYSICAL TECHNIQUES

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A.1 Ground Penetrating Radar

A.1.1 Description of the Method

The principle of ground penetrating radar (GPR) is the same as that of weather or police radar, except that GPR transmits electromagnetic energy into the ground, which is reflected back to the surface from interfaces between materials with contrasting electrical (dielectric and conductivity) properties. The greater the contrast between two materials in the subsurface, the stronger the reflection observed on the GPR record. The depth of GPR signal penetration depends on the properties of the subsurface materials and the frequency of the antenna used to collect radar data. The lower the antenna frequency used, the deeper the signal penetration, but the lower the signal resolution.

We collect GPR data using a Geophysical Survey Systems SIR System 2 or 2000 digital ground penetrating radar unit, which consists of a computer connected to a transmit/receive antenna. Radar data are collected in point, continuous, or survey wheel mode while moving the antenna across the ground. Data are displayed in color on the computer monitor and simultaneously recorded on the unit's hard drive for later processing and interpretation using proprietary RADAN for Windows® software. Hard copies of the data may be printed in the field on a thermal printer.

A.1.2 Data Analysis and Interpretation

The horizontal scale of the GPR record shows distance along the survey traverse. In the continuous data collection mode, the horizontal scale on each GPR record is determined by the antenna speed. When a survey wheel is used; as at this site, the GPR record is automatically marked at specified intervals along the survey line. The vertical scale of the radar records is determined by the recording interval. The recording interval represents the maximum two-way travel time in which data are recorded. The conversion of two-way travel time to depth depends on the propagation velocity of the GPR signal, which is site specific. In the absence of site-specific subsurface information about stratigraphy, we estimate propagation velocities from handbook values and experience at similar sites.

The size, shape, and amplitude of GPR reflections are used to interpret GPR data. Metal objects such as USTs and utilities produce reflections with high amplitude and distinctive hyperbolic shapes in GPR records when traverses are made perpendicular to their long axes. Clay or concrete pipes and boulders may produce radar signatures of similar shape but lower amplitude. The boundaries between saturated and unsaturated materials, sand and clay, and bedrock and overburden, generally also produce strong reflections.

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A.1.3 Limitations of the Method

GPR signal penetration is site specific, determined by the dielectric properties of local soil and fill materials. GPR signals propagate well in resistive materials such as sand and gravel; however, soils containing clay, ash- or cinder-laden fill, or fill saturated with brackish or otherwise conductive groundwater cause GPR signal attenuation and loss of target resolution (i.e., limited detection of small objects). Concrete containing rebar or mesh also inhibits signal penetration.

Interpreted depths of objects detected using GPR are based on on-site calibration, handbook values, and/or estimated GPR signal propagation velocities from similar sites. GPR velocities and depth estimates may vary if the medium of investigation or soil water content is not uniform throughout the site. (Electromagnetic waves do not travel as fast through water as air, so the distance to a reflector below the water table may appear farther than in actuality.)

Utilities are interpreted on the basis of reflectors of similar size and depth that show a linear trend, but GPR cannot unambiguously determine that all such reflectors are related. Fiberglass USTs or utilities composed of plastic or clay may be difficult to detect, as well as objects underneath reinforced concrete pads.

Changes in the speed at which the GPR antenna is moved between stations causes slight variations in distance interpolations, and hence in interpreted object positions.

The GPR antenna produces a cone-shaped signal pattern that emanates approximately 45 degrees from horizontal fore and aft of the antenna. Therefore, buried objects may be detected before the antenna is located directly over them, and GPR anomalies may appear larger than actual target dimensions.

GPR is an interpretive method, based on the subjective identification of reflection patterns that may not uniquely identify a subsurface target. Borings, test pits, or site utility plans must verify the results.

A.2 Seismic Refraction

A.2.1 Description of the Method

We collect seismic refraction data using our Geometrics Geode® exploration seismograph system with 24- or 48-channel geophone arrays. Geophone spacing depends on the depth of investigation, but is between 5 to 20 feet. Shot points are located at a minimum off the ends of each spread, at the end geophones, and in the middle of the spread

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A.2.2 Data Analysis and Interpretation

The seismic data are analyzed using the SIPWin® iterative ray tracing technique and/or Interpex Limited IXRefraX® using the general reciprocal method. Data are input into the computer and a first-approximation model is created. The computer then compares the modeled arrival times along each ray trace from shot to geophone with the "picked" field arrival times and subsequently adjusts the model. After a number of iterations of this process, a reasonable fit between modeled and actual data is produced (i.e. the travel times along ray paths of modeled and calculated data are similar) which leads to the determination of layer depth beneath each geophone and shot point. The accuracy of the SIPWin® iterative method is contingent on a reasonable first-guess horizontally layered model.

A.2.3 Limitations of the Method

Analysis of seismic refraction data requires an assumption of a model composed of a number of layers, such as bedrock overlain by overburden, or bedrock overlain by till and overburden. Other limiting assumptions are i) seismic refraction layers are continuous and extend from one end of the refraction line to the other; and ii) layer velocities increase with depth.

Seismic refraction requires a sufficiently strong source so that seismic energy is transmitted to refracting interfaces and returned to the surface to be recorded by each geophone in a seismic spread. When bedrock is deep and/or overburden velocities are low, explosives or seisgun sources may be required to produce sufficient seismic energy to reach most or all of the geophones in a spread. It is becoming increasingly difficult to use intrusive seismic sources, particularly explosives, at many sites.

Seismic refraction can only distinguish between materials if their seismic velocities are sufficiently different. Thus it may not be possible to distinguish between weathered bedrock and till, particularly if the bedrock is shale.

Electric lines with 60-cycle current (and/or greater harmonics) may create interference with seismic data collection along lines adjacent to or beneath them.

A.3 Seismic Reflection

A.3.1 Description of the Method

We collect seismic reflection data using our Geometrics Geode© exploration seismograph system with 24- or 48-channel geophone arrays. Geophone spacing generally depends on the depth of investigation, but is usually between 2.5 to 10 feet. Shot points are located in-line with the geophones to depict stratigraphy. The source of seismic energy is anthropogenic and is coupled to the ground through either hammering on a steel plate or with a Betsy seisgun that

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fires industrial blanks. For the latter source, the nozzle of the seisgun is buried 1.5 to 2 feet below the surface to enhance the amplitude of the signal entering the ground. The quality of the seismic signal for each shot point is verified in the field.

A typical field recording configuration is the common source gather, which involves 24 active geophones and a single source location at a fixed offset from the recording channels. With HGI's 48-channel recording capability, this configuration can be maintained throughout a seismic line by "rolling" the geometrical configuration along the ground surface at 5 feet intervals. In doing so, a number of reflections from different source-receiver geometries are recorded which correspond to the same subsurface reflection point. These can be subsequently stacked to improve the quality of recorded signals.

A.3.2 Data Analysis and Interpretation

A substantial amount of processing is needed before it is possible to make any geologic interpretation of recorded seismic data. A typical processing sequence includes, but is not restricted to, the following: i) initial frequency filtering; ii) pre-stack F/K filtering; iii) trace edit; iv) first arrival mute; v) common offset to CDP sort; vi) application of datum statistics; vii) normal move out correction; viii) surface consistent residual statistics; ix) CDP stack; x) deconvolution; xi) post-stack F/K filtering; xii) migration; xiii) frequency filtering; and xiv) trace scaling/normalization. HGI utilizes the Kansas Geological Survey WinSeis®-15 Turbo software package to analyze seismic reflection data.

Geologic interpretation is carried out on the CDP stacked data and generally involves identifying continuous reflectors. After reflector horizons have been delineated and stratigraphically assessed, a "time-to-depth" conversion can be applied using velocity information obtained from neighboring borehole data or from typical velocity estimates from compiled tables.

A.3.3 Limitations of the Method

Analysis and interpretation of shallow seismic reflection data is inherently limited by:

The ability to resolve thin layers is dependent on the dominant frequency of the interrogating energy source. A general "rule of thumb" is that a layer must be thicker than ¼ of the dominant wavelength to produce a noticeable reflection.

The ability to isolate an individual reflector is dependent on the ability to separate it from the wavelets of earlier arrivals.

The magnitude of the reflection from any discontinuous interface is directly related to the impedance contrast across it (where impedance is defined as the product of density and velocity).

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Thus, situations frequently occur where additional strata exist but have an associated impedance contrast too small to be discerned.

Seismic energy sources must be strong enough for adequate penetration of seismic energy to the target of interest.

The robustness of any “time-to-depth” conversion is directly correlated with the validity of the velocity profile used. For near-surface seismic reflection investigations, this problem is greatly exacerbated by the possibility of strong lateral variations in the velocity profile.

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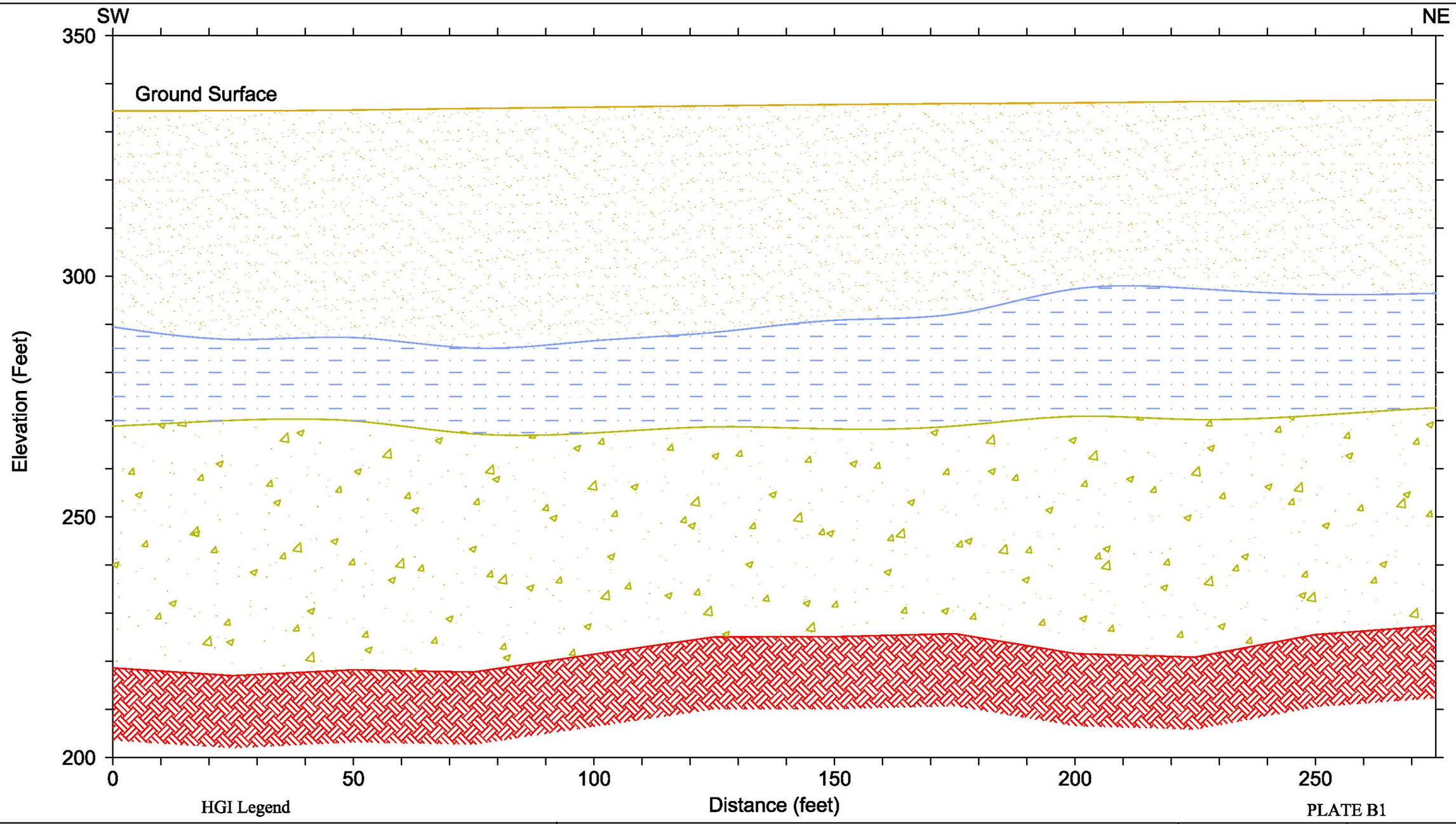
APPENDIX B. GPR CROSS SECTIONS



HGI Legend

PLATE B1

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

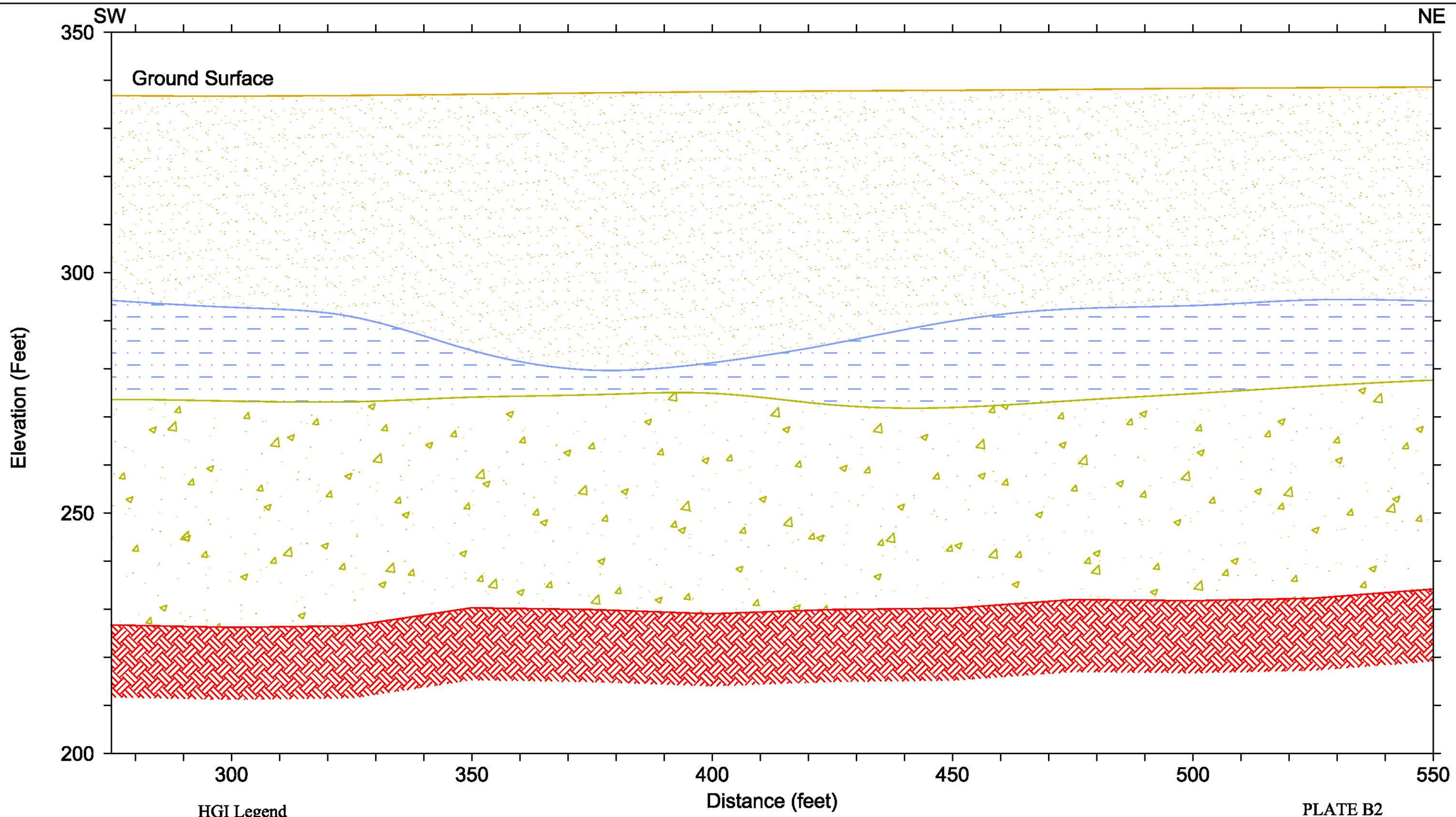
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 1
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B2

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

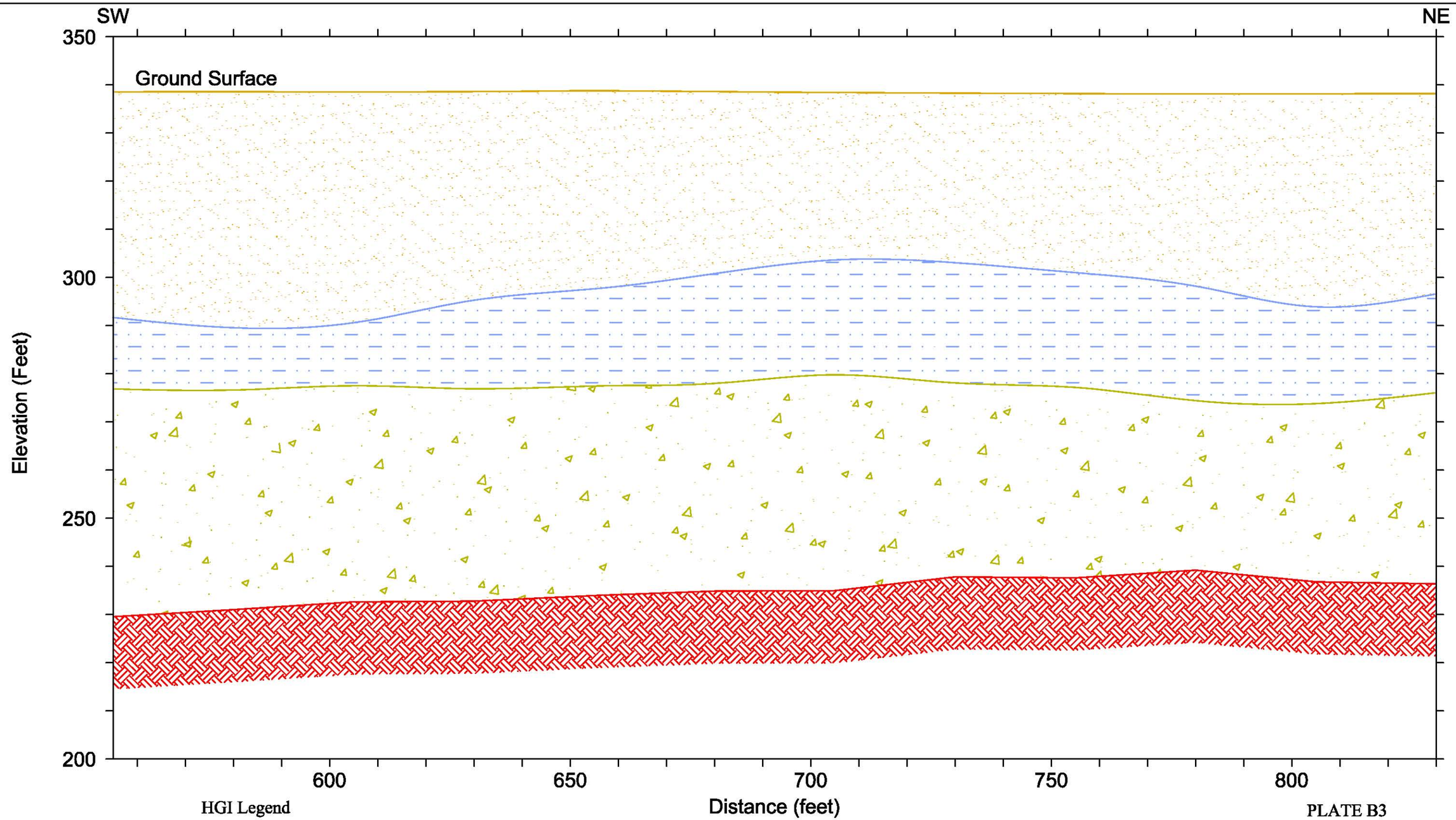
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 2
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B3

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

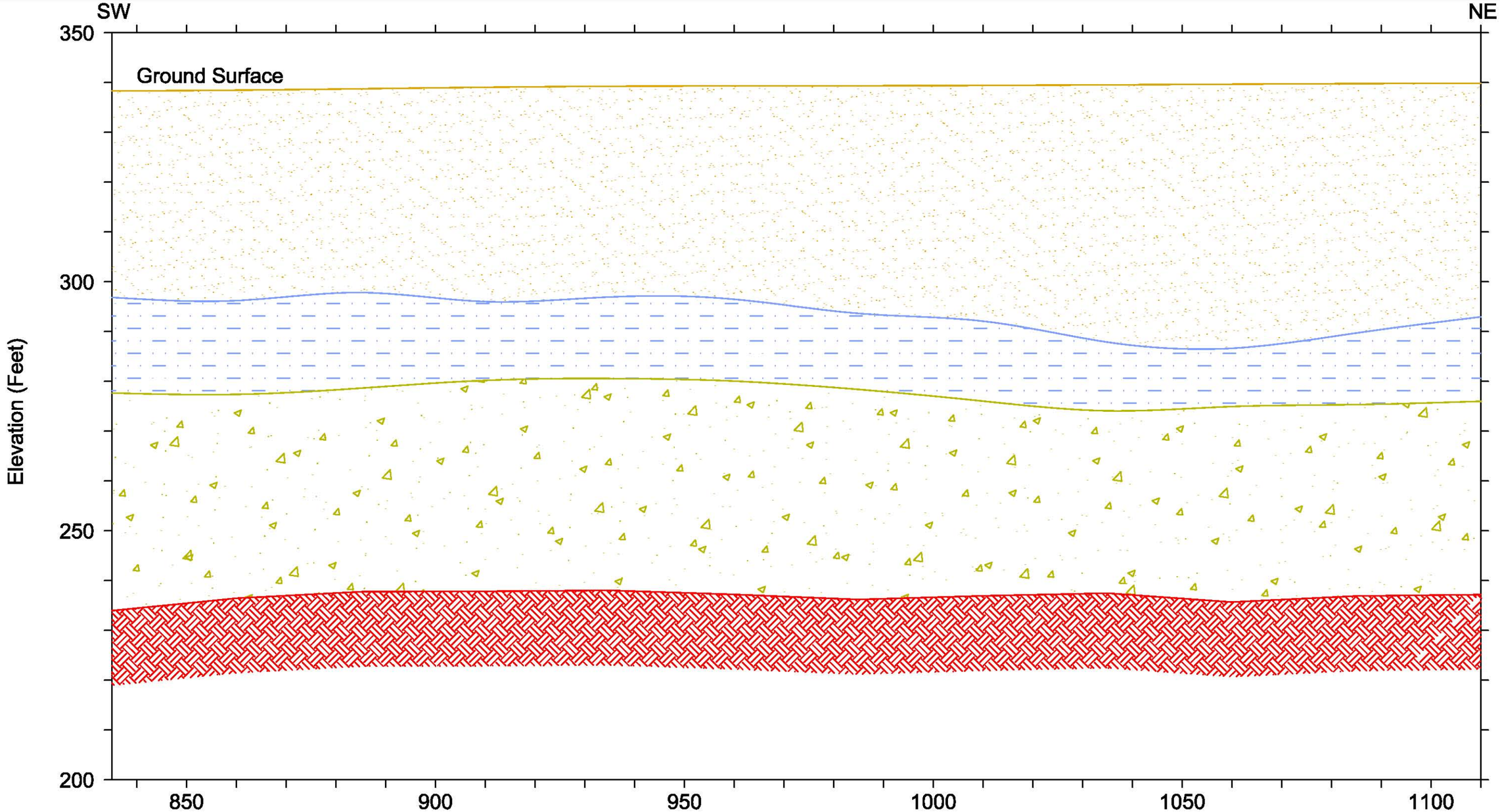
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 3
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B4

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

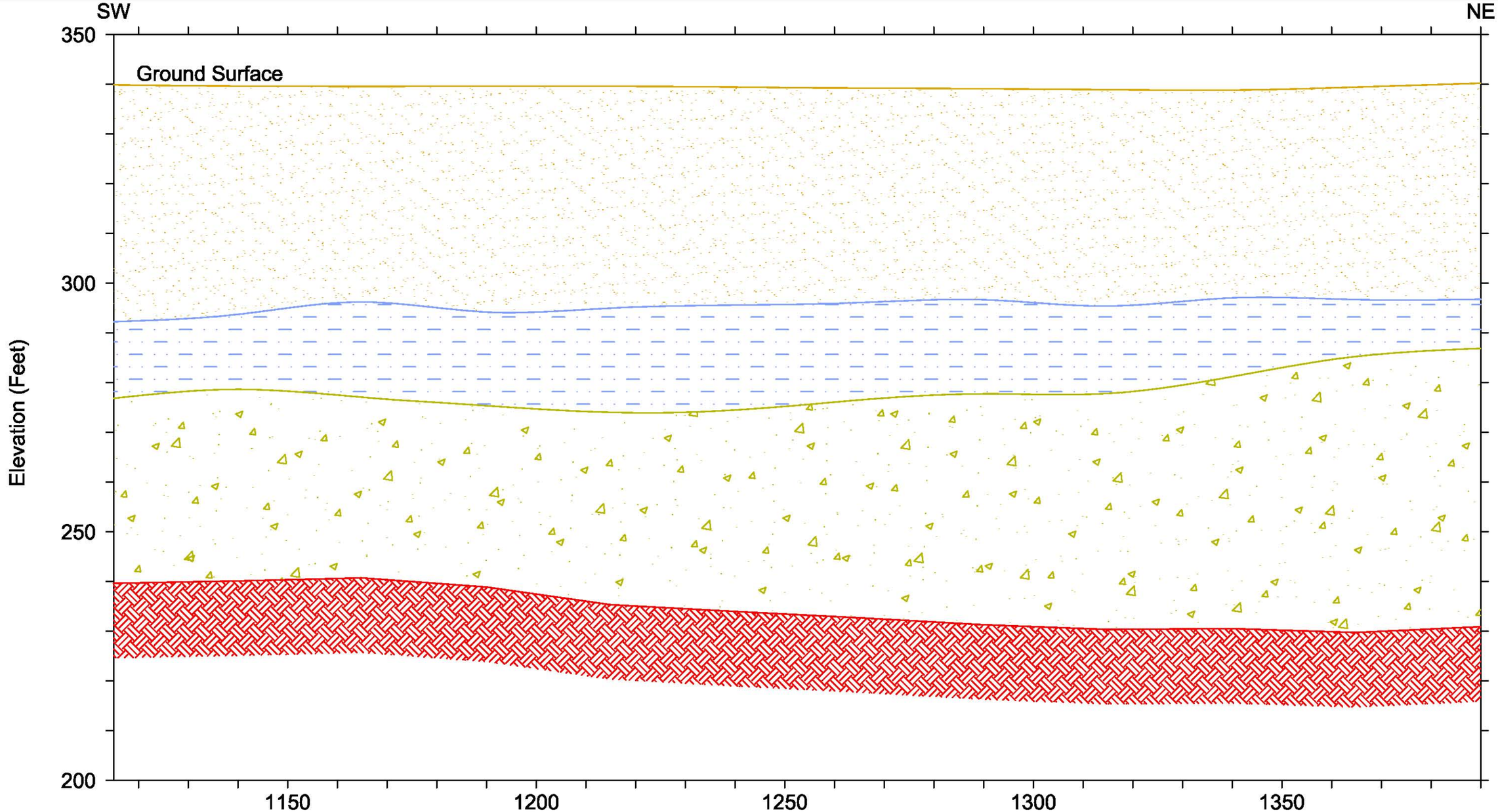
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 4
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B5

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

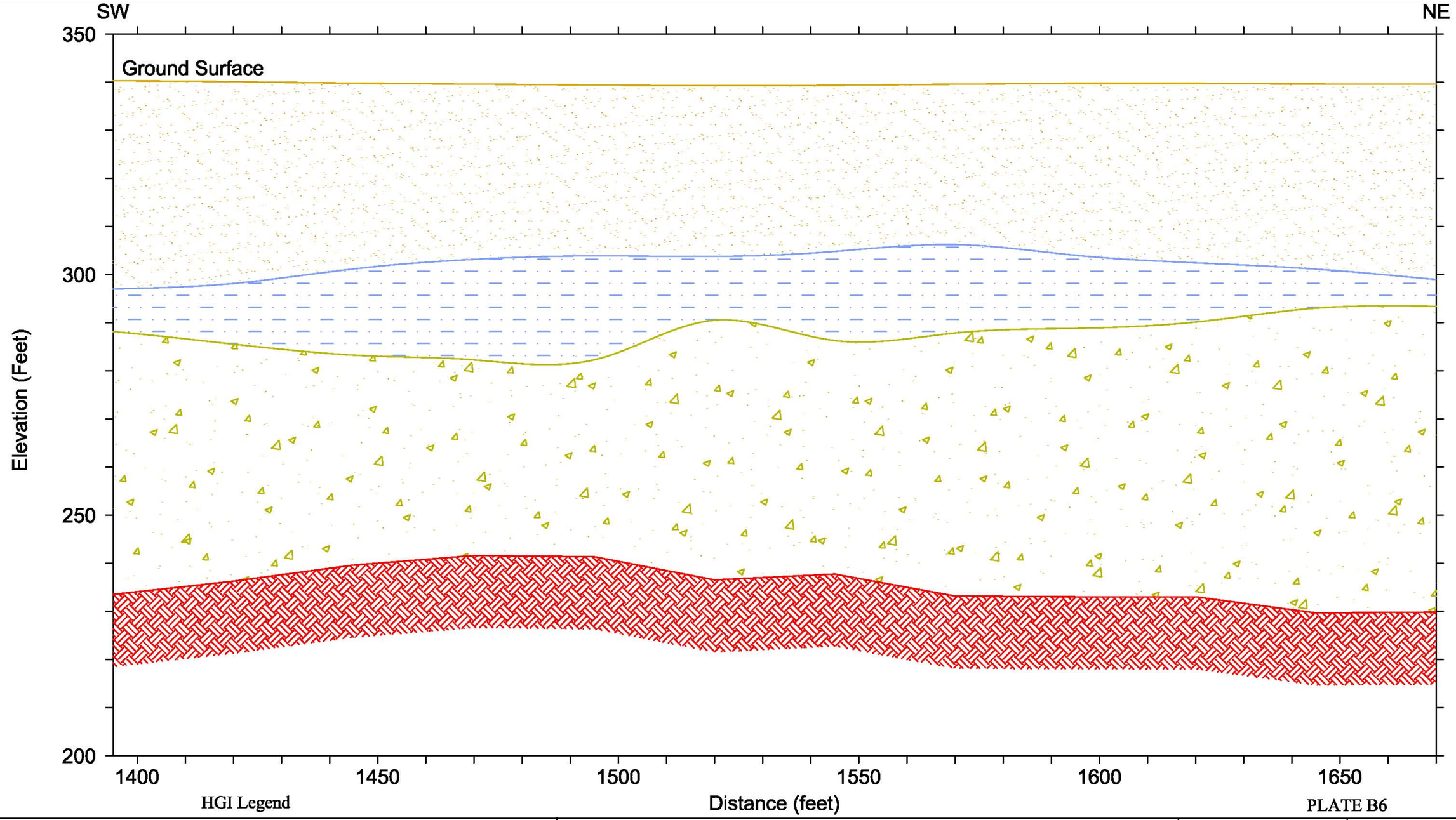
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 5
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B6

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

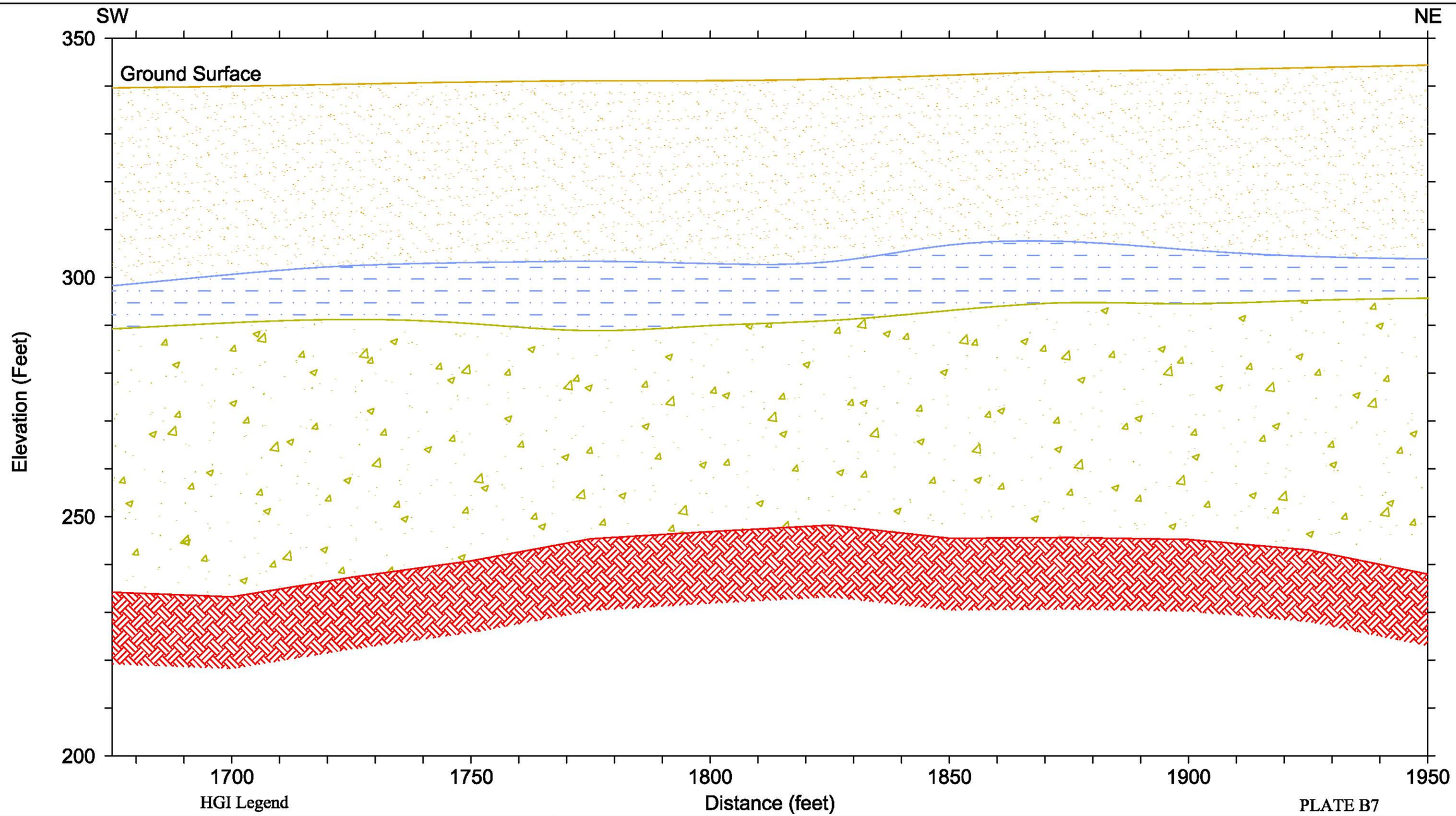
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 6
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B7

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

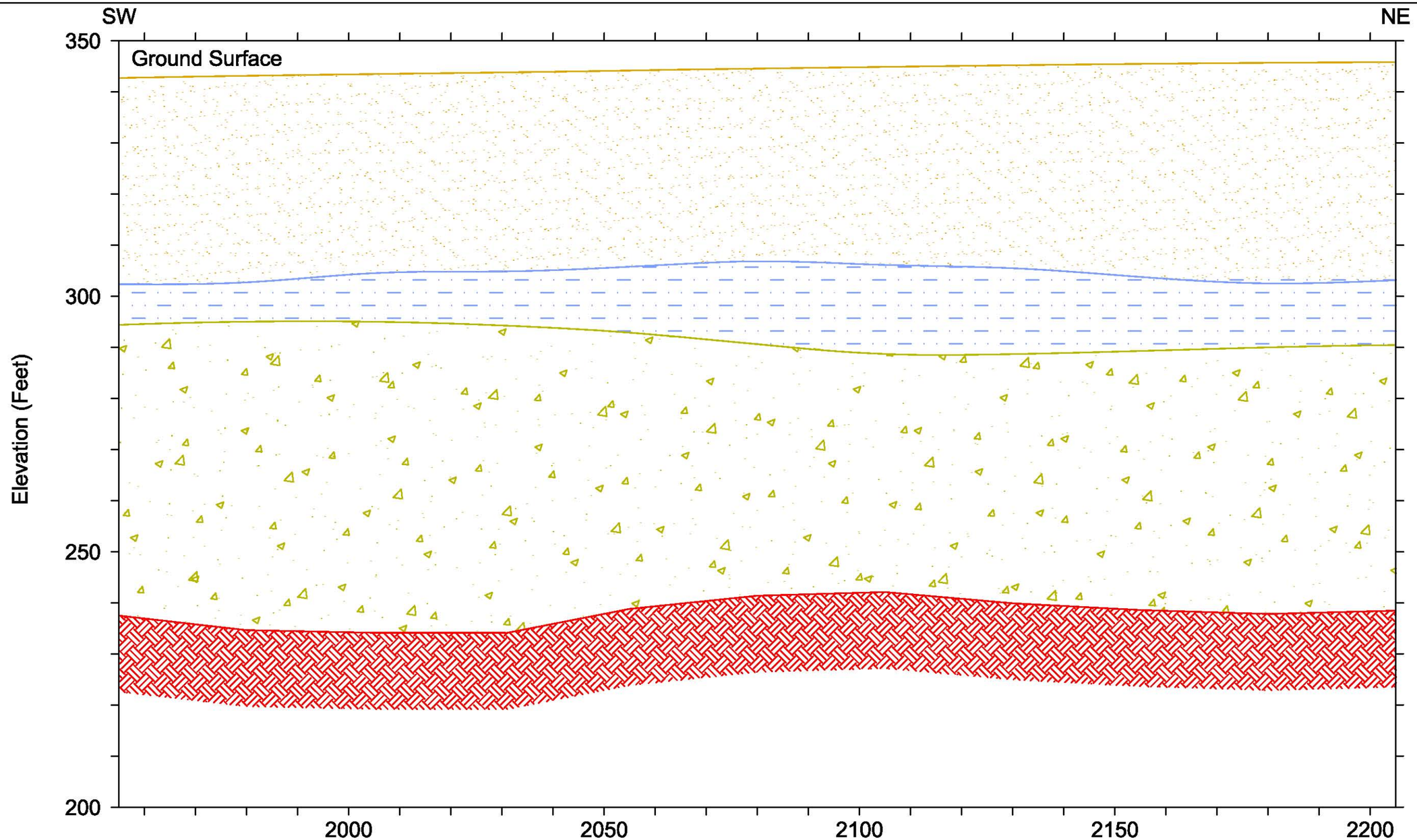
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 7
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B8

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

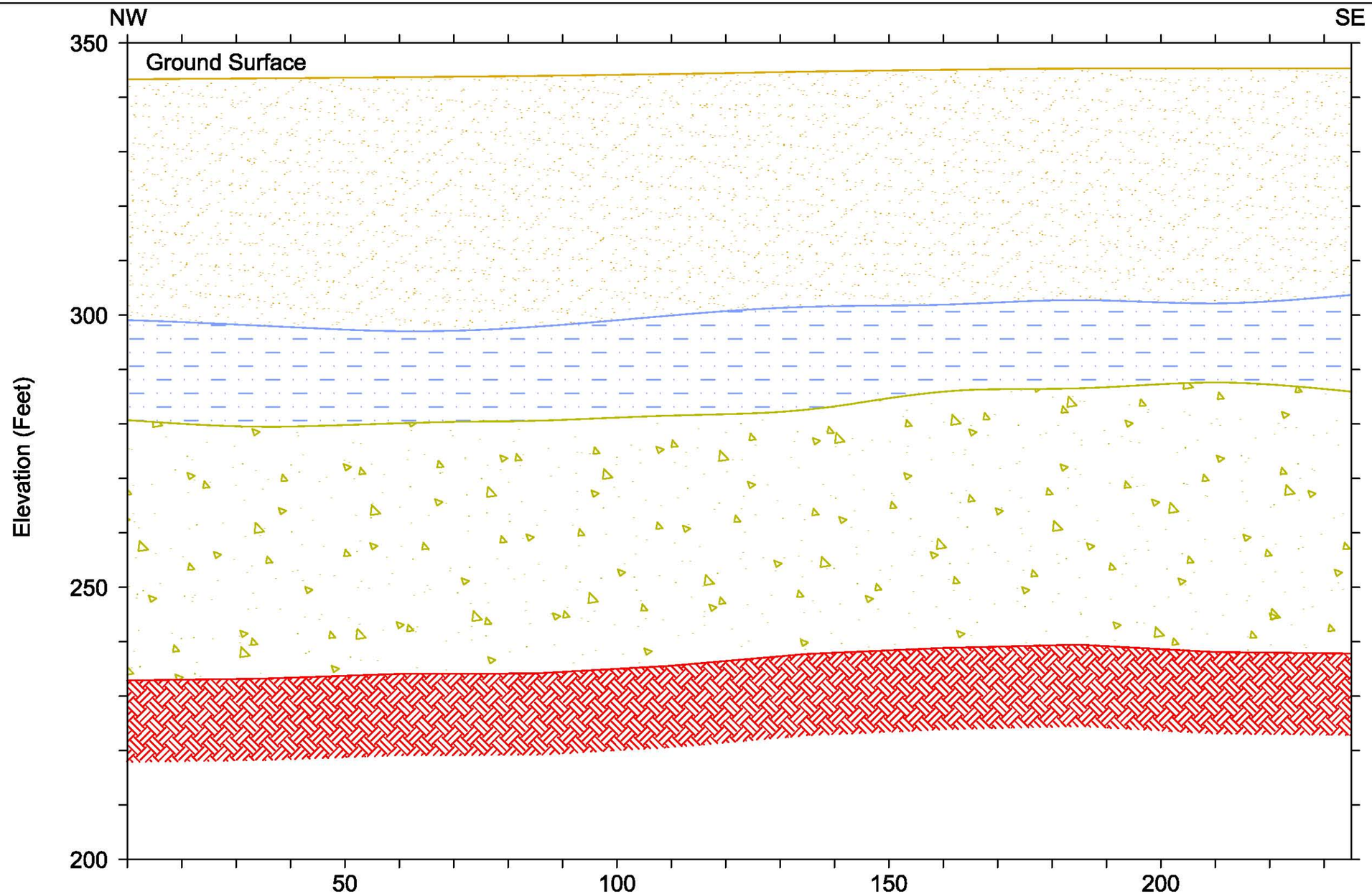
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 8
Commerce Street
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B9

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

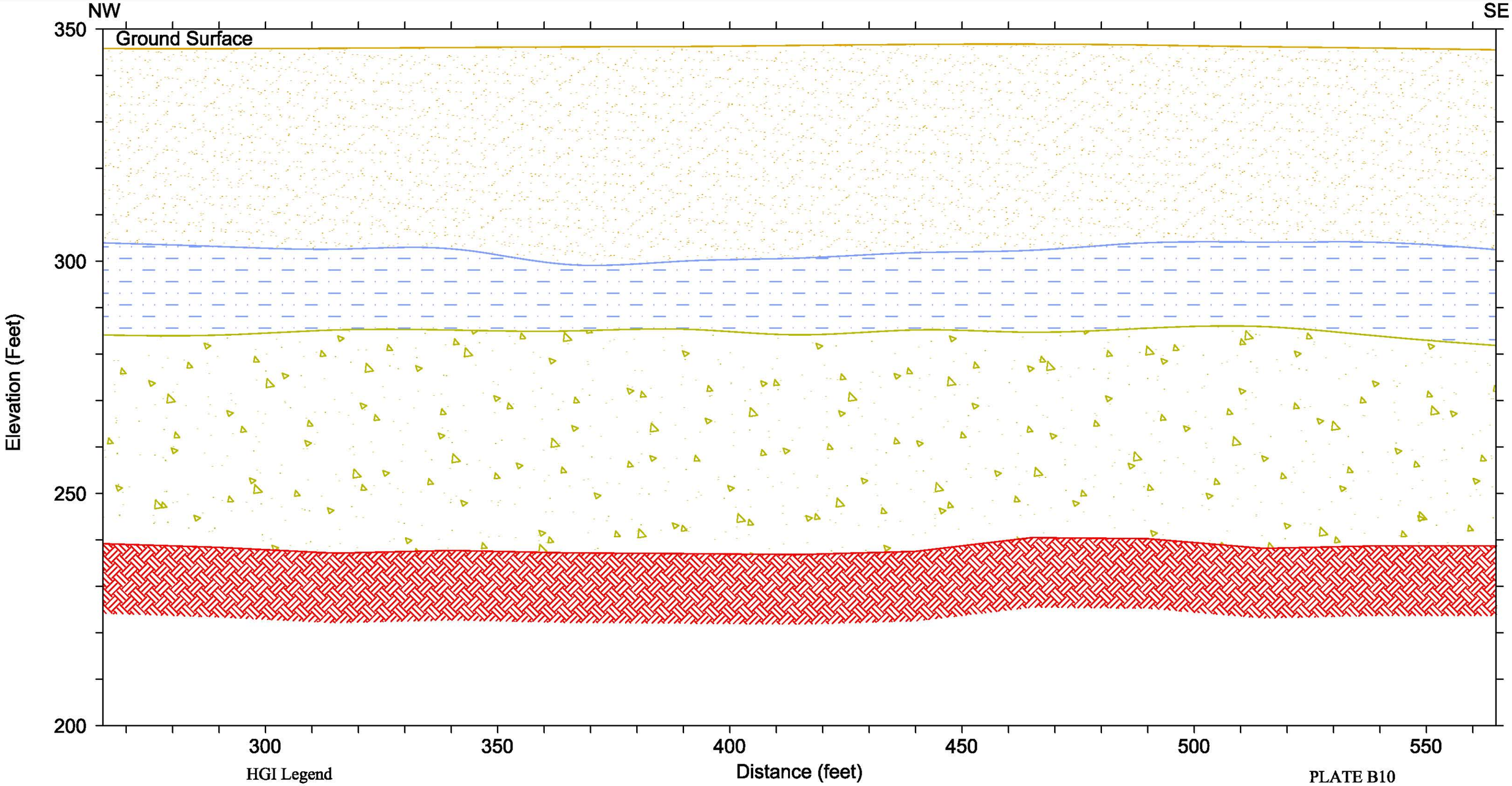
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 10
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B10

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

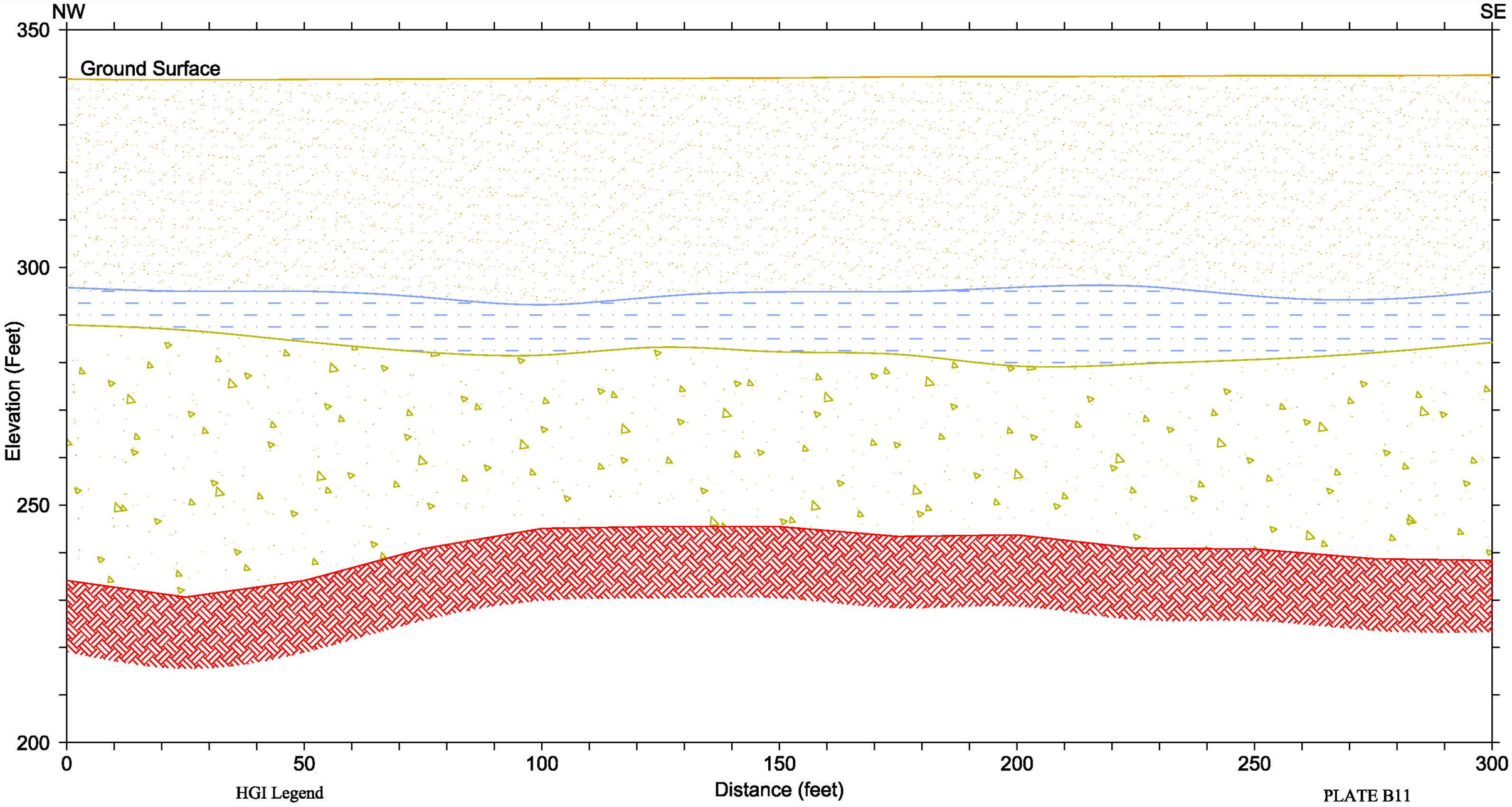
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 9
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B11

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

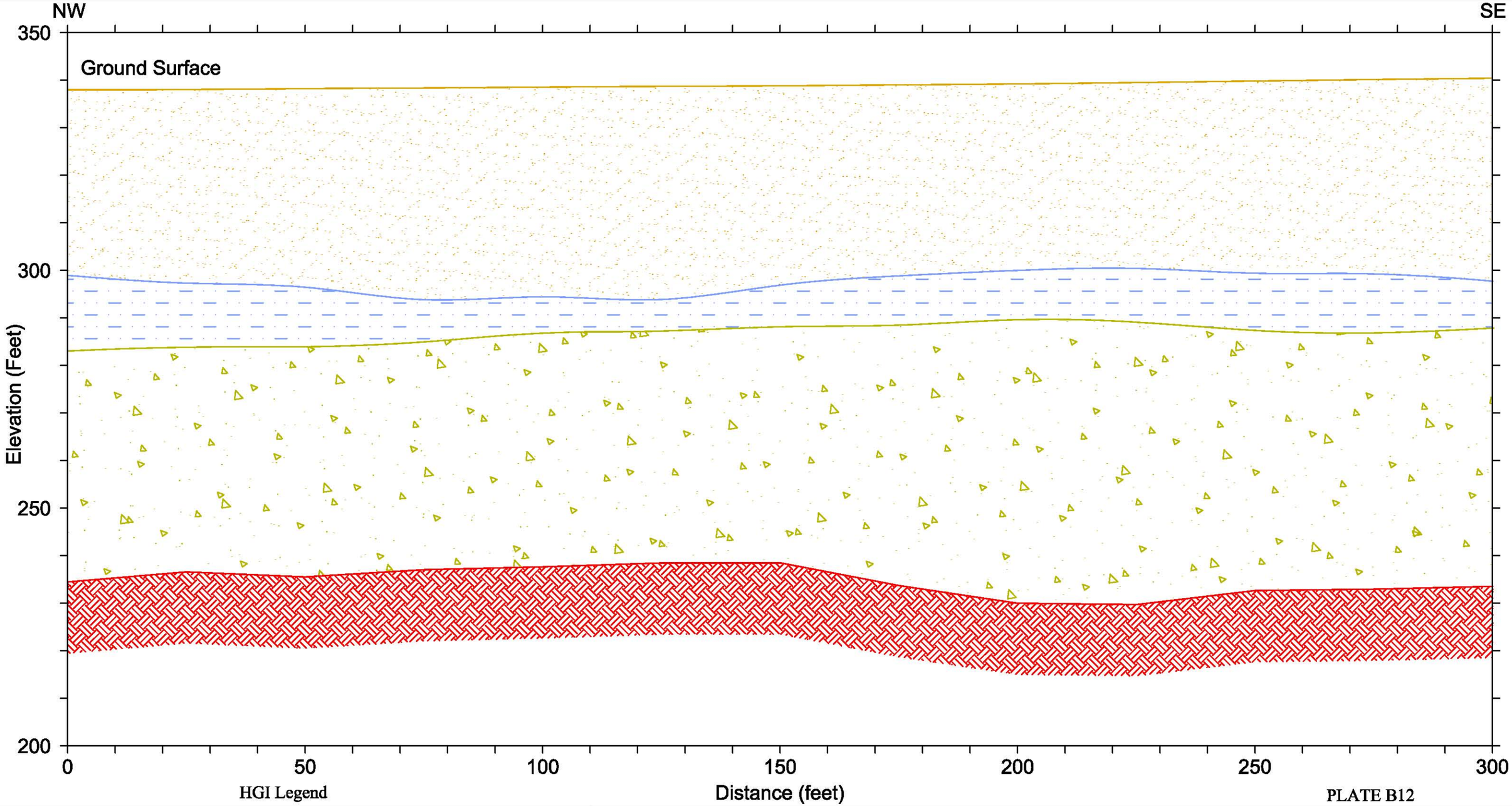
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 11
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B12

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

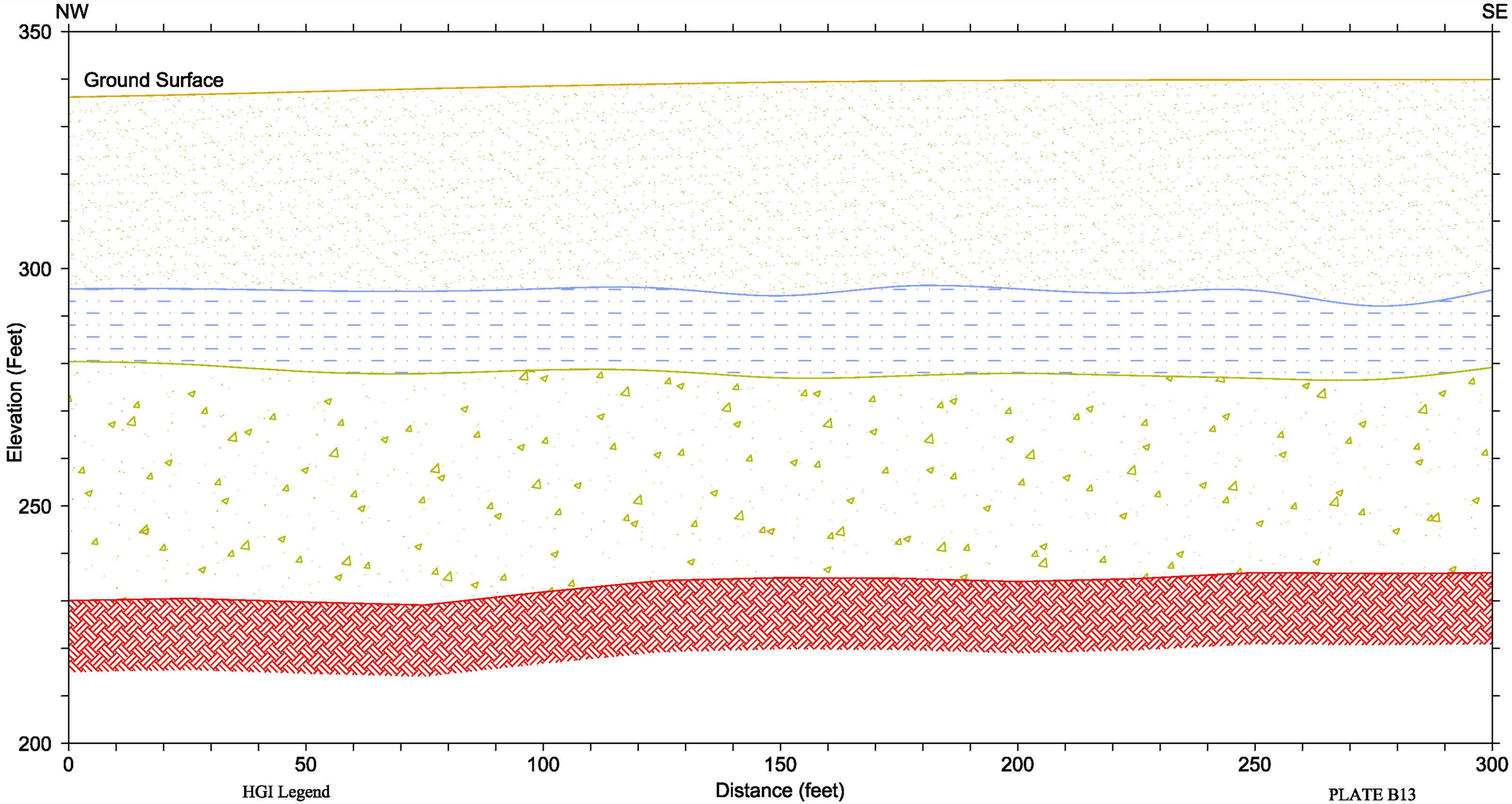
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 12
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B13

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

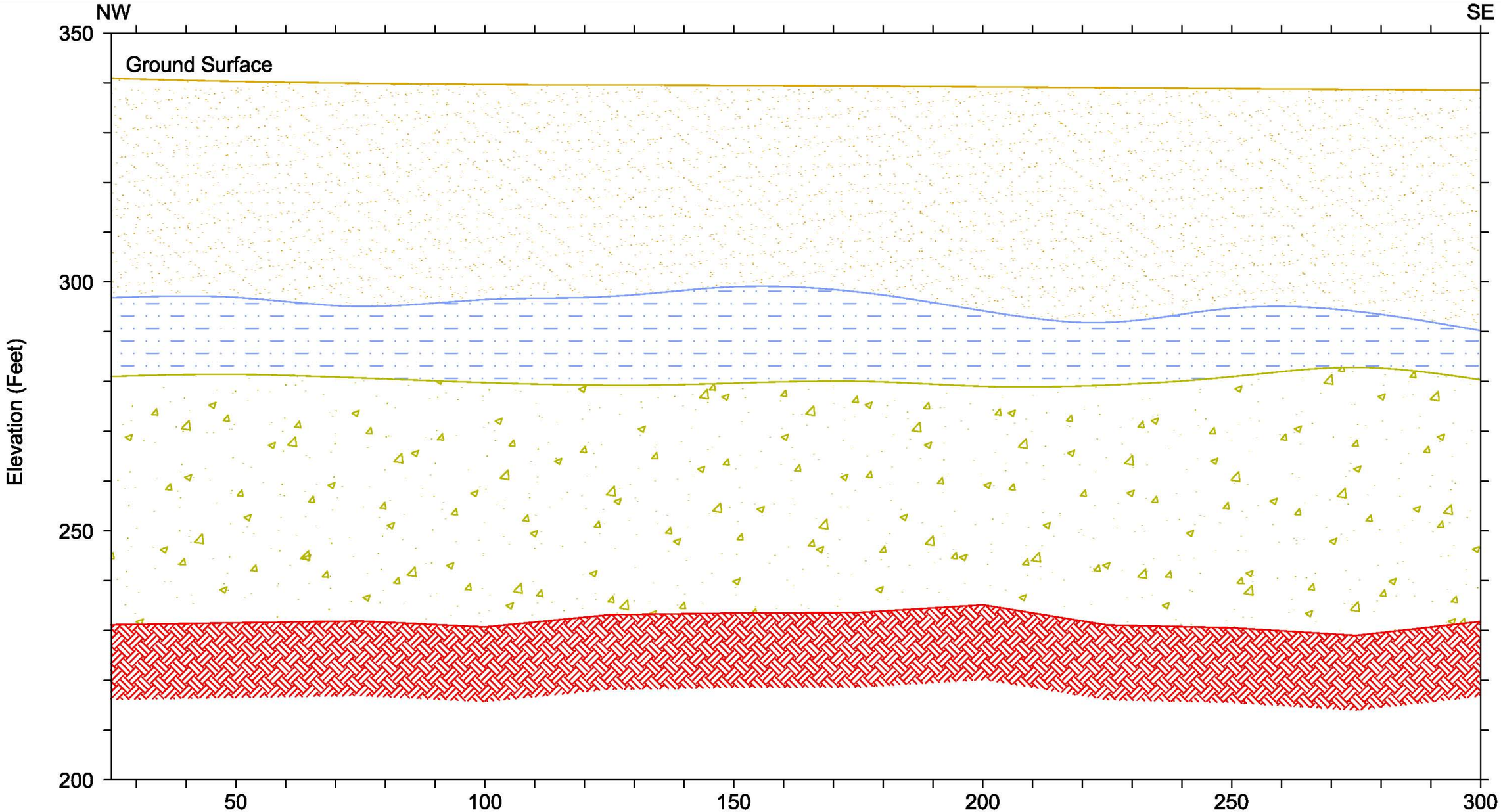
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 13
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B14

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

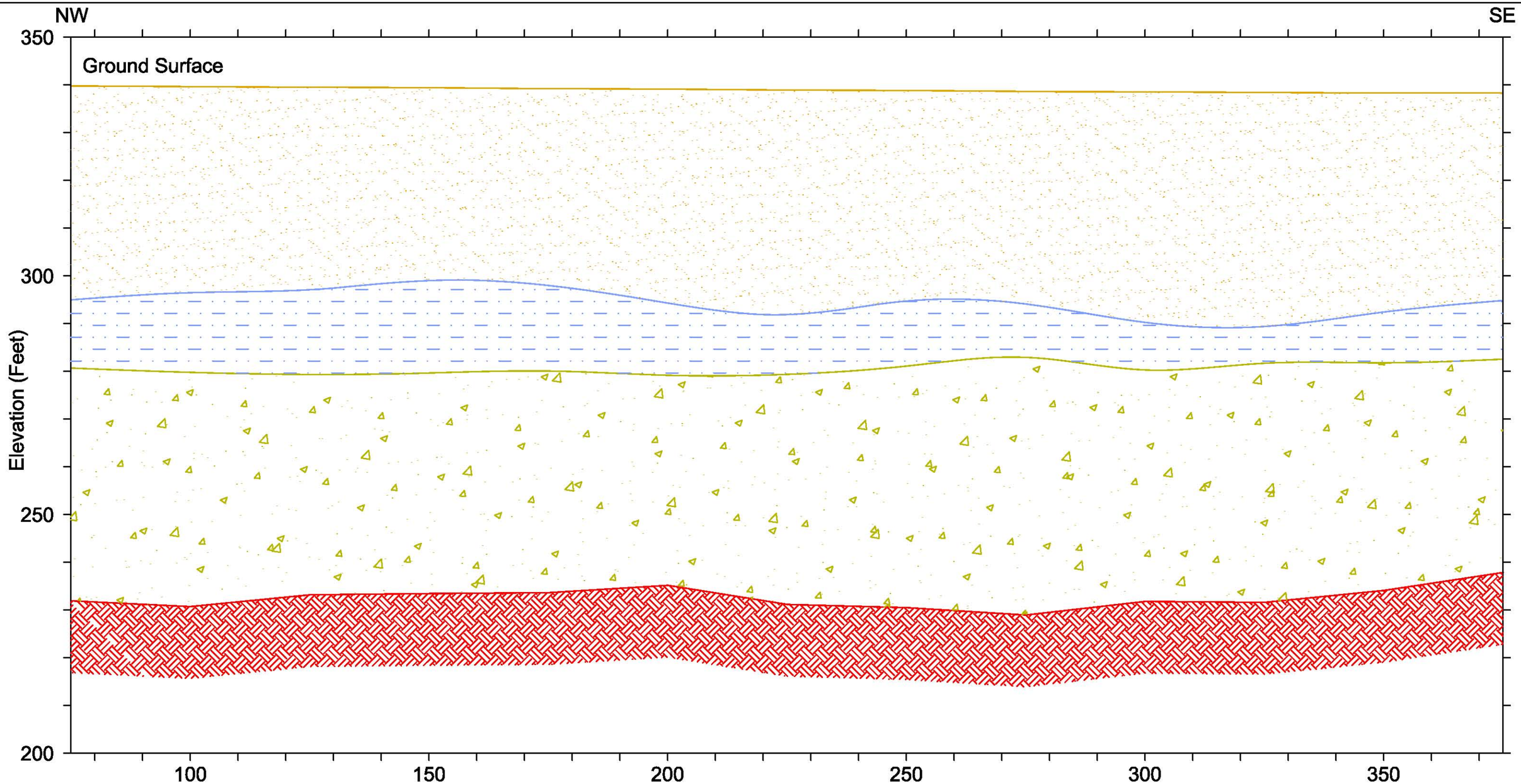
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 14-1
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B15

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

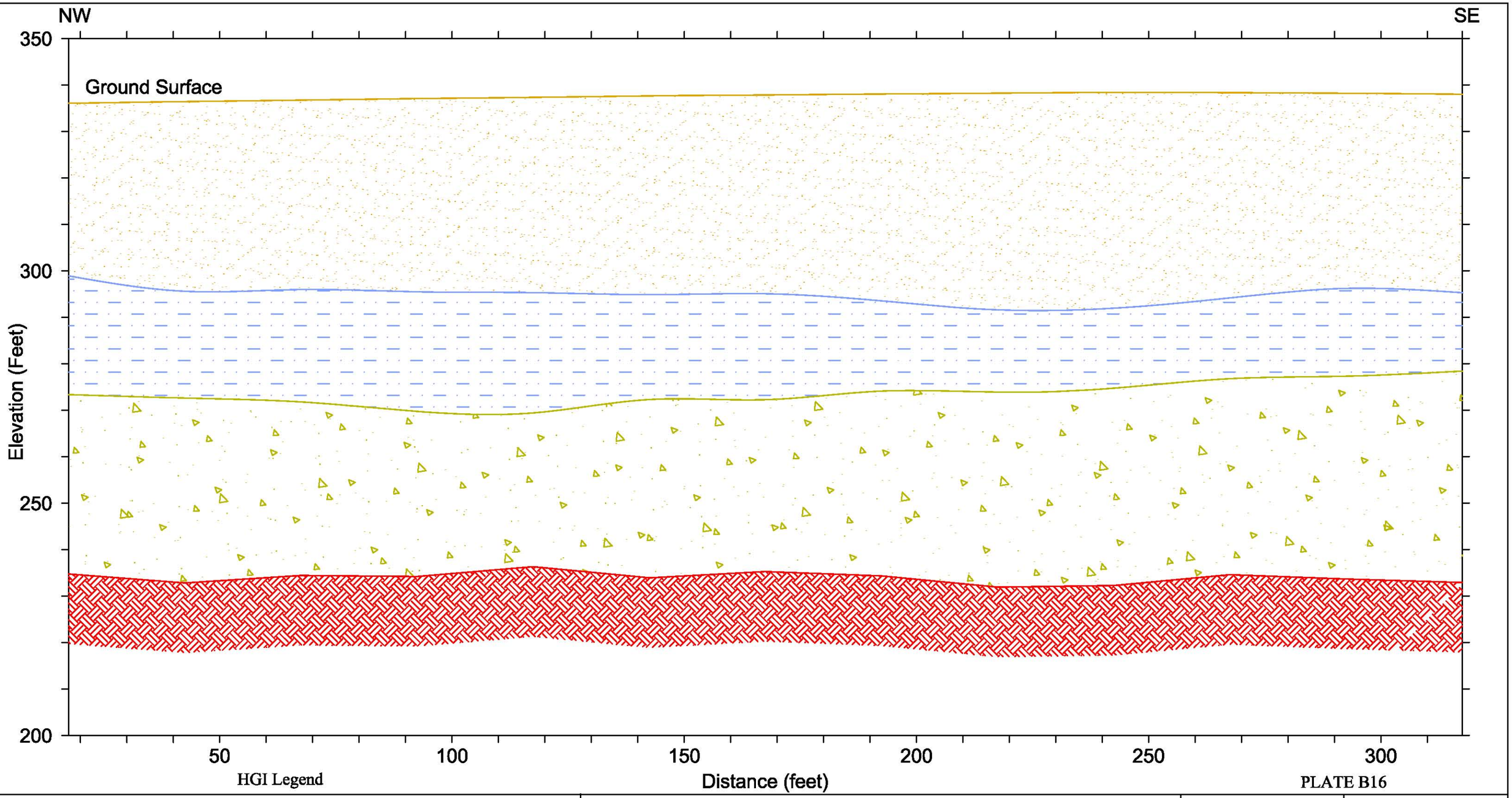
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 14-2
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B16

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

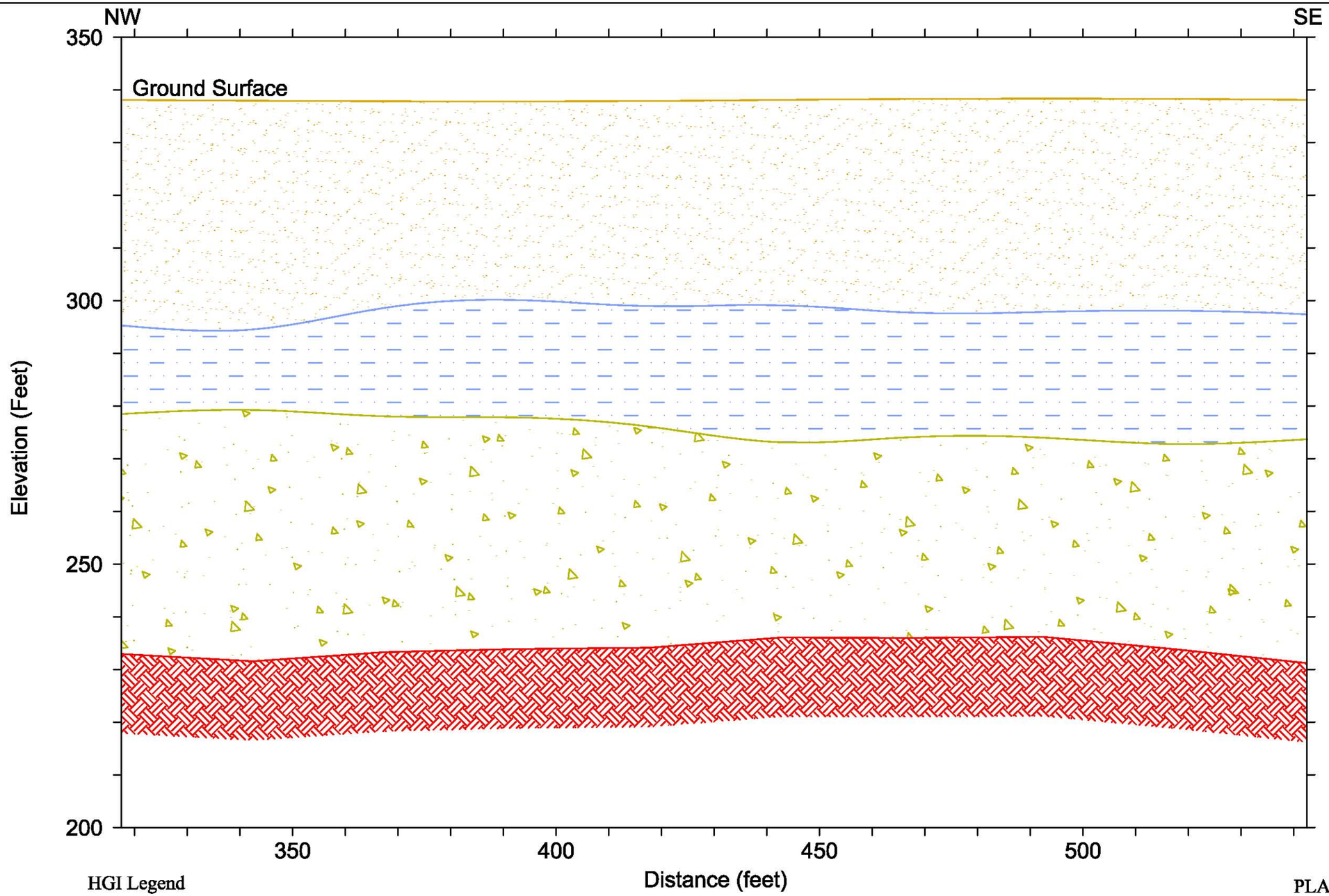
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 15-2
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B17

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

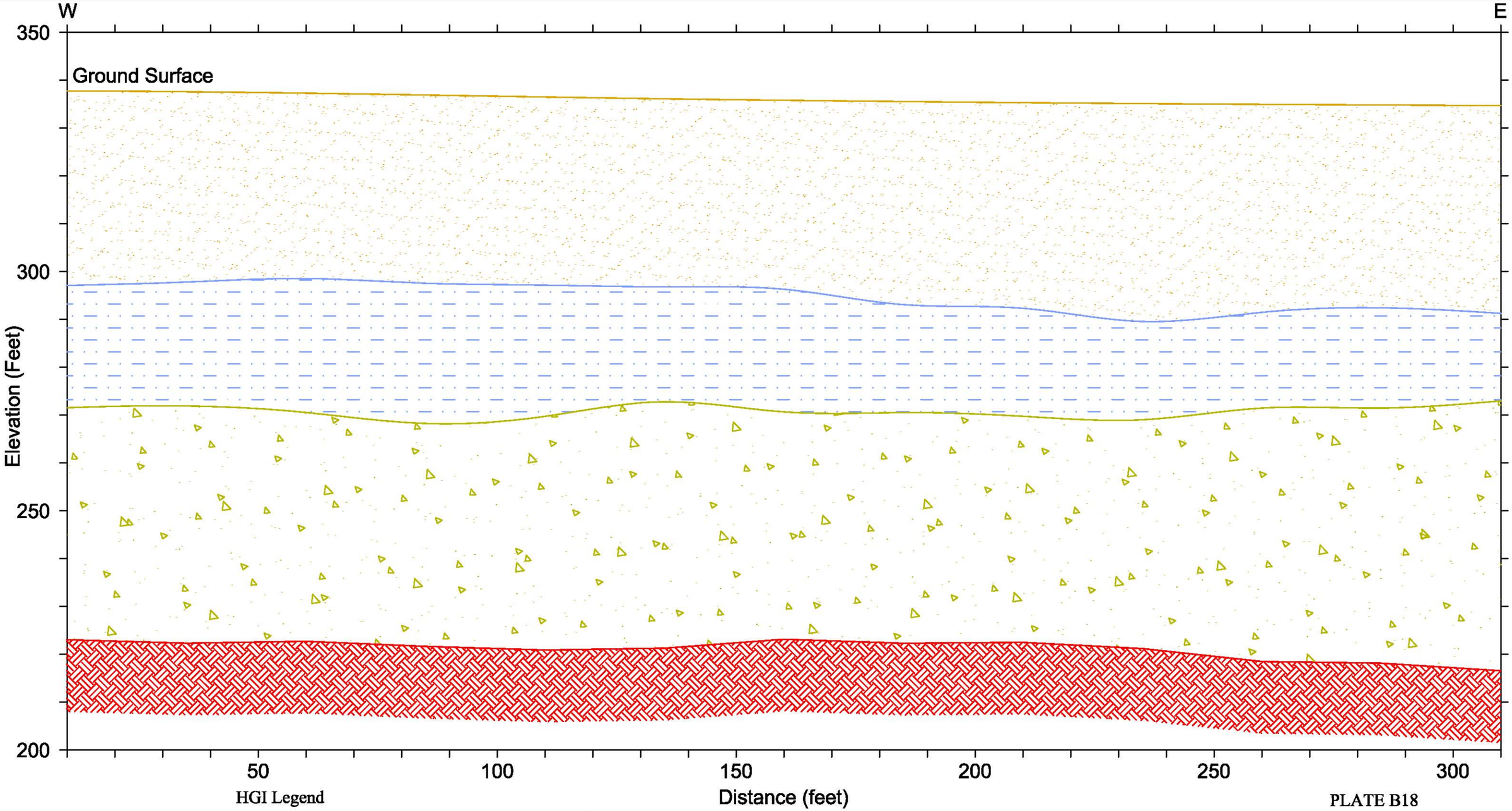
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 15-1
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B18

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

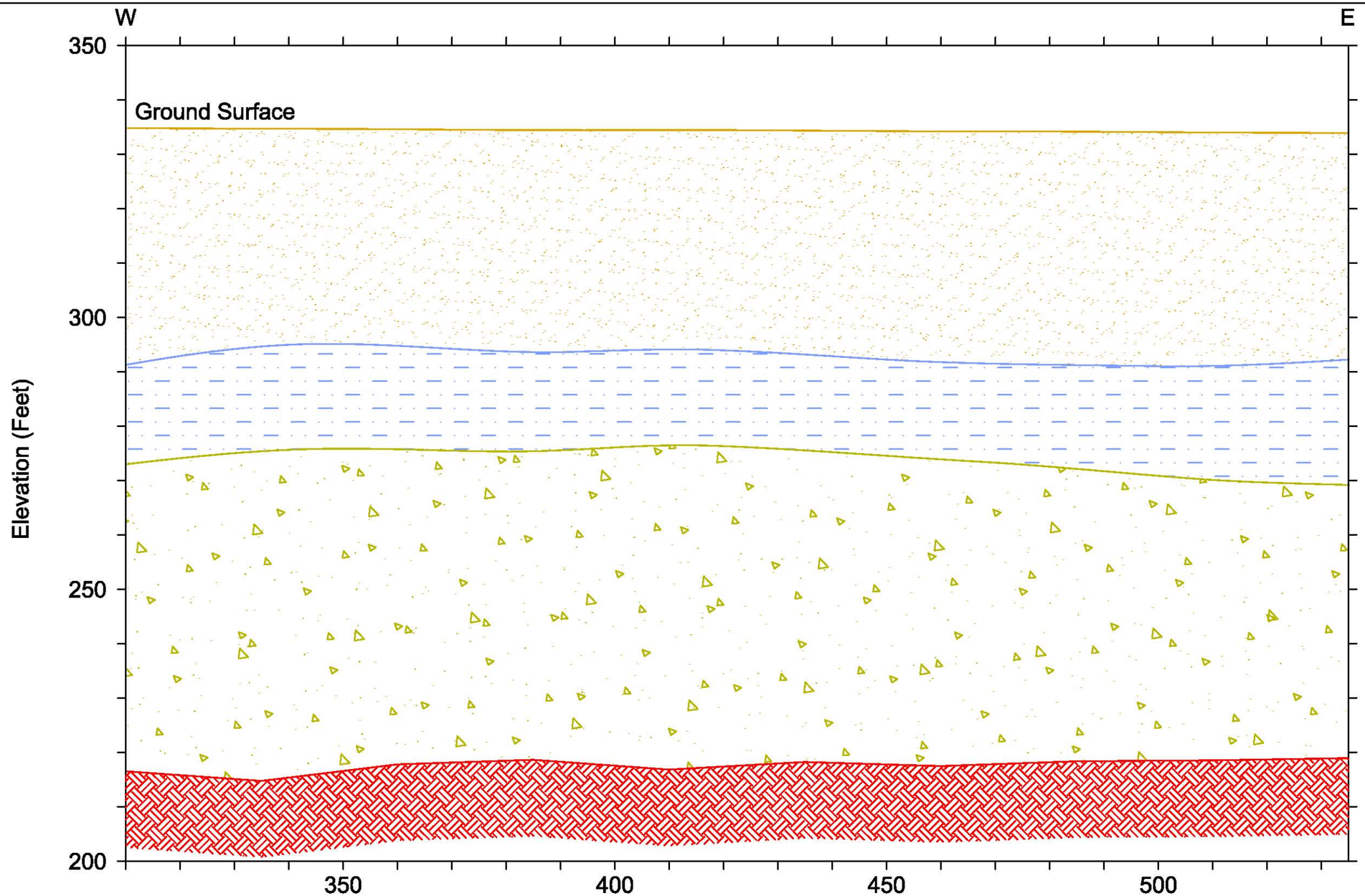
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 16-2
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B19

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

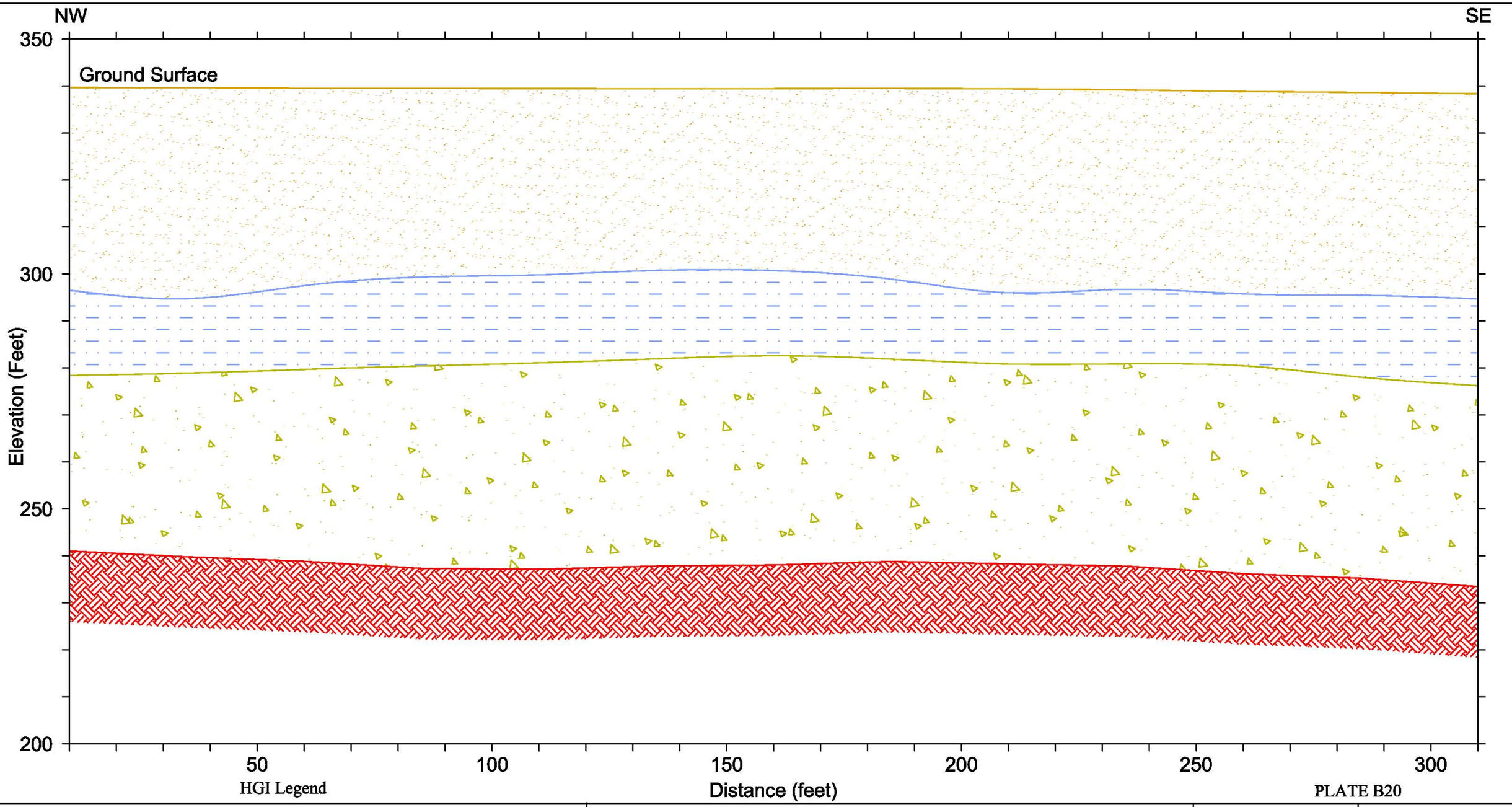
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 16-1
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B20

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

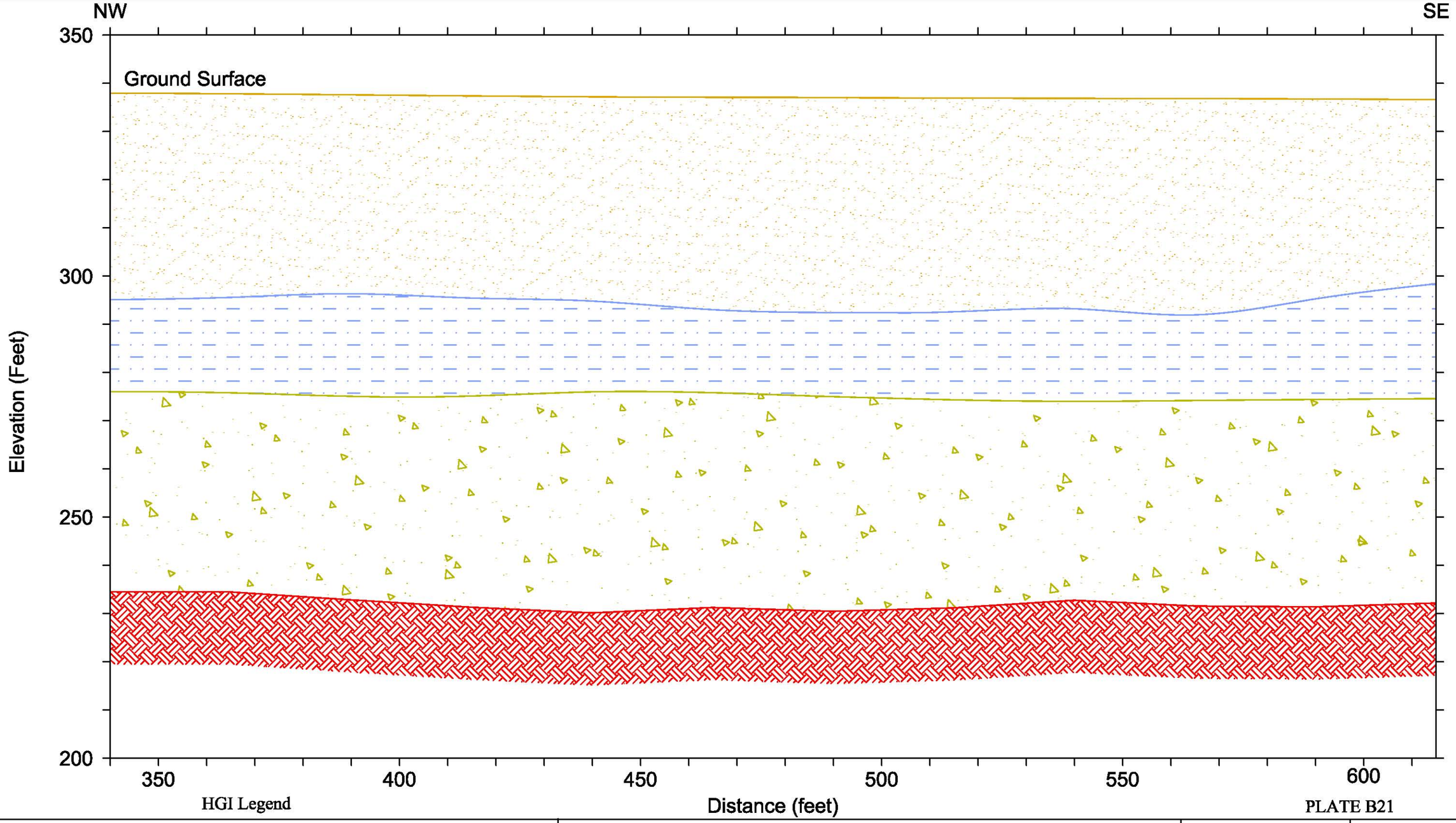
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 18
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B21

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

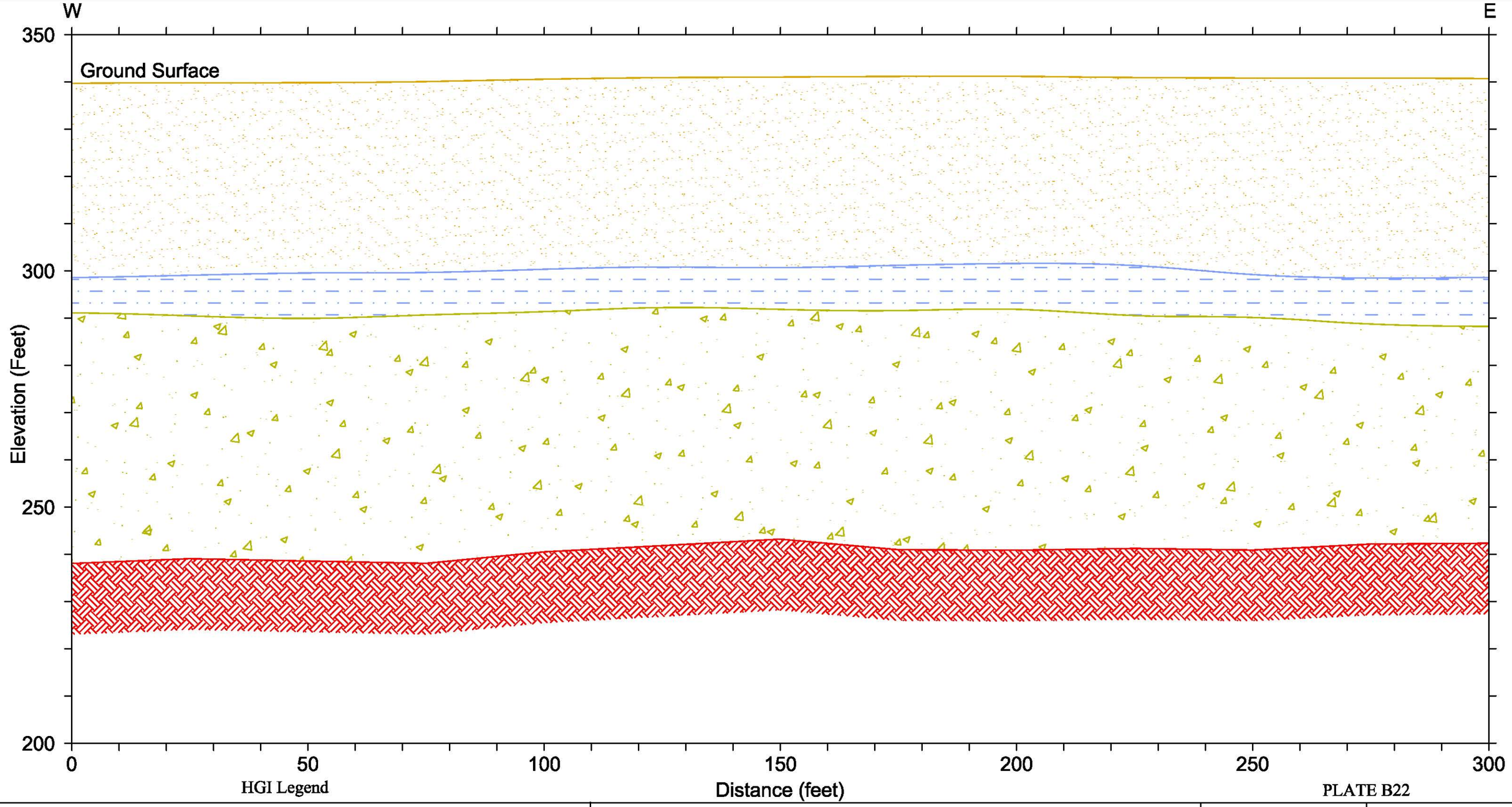
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 17
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B22

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

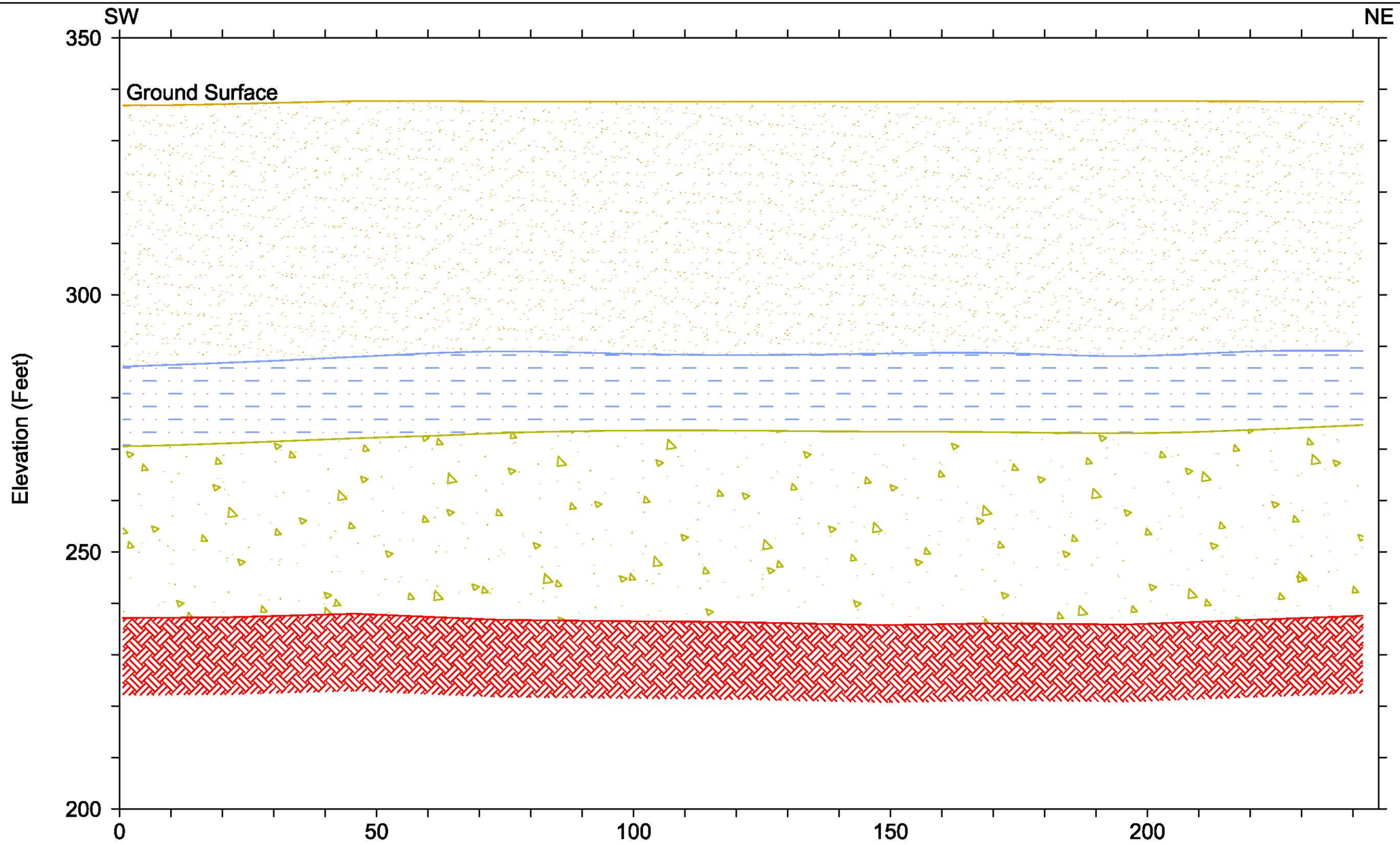
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 19
Commerce Street Cross Line
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B23

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

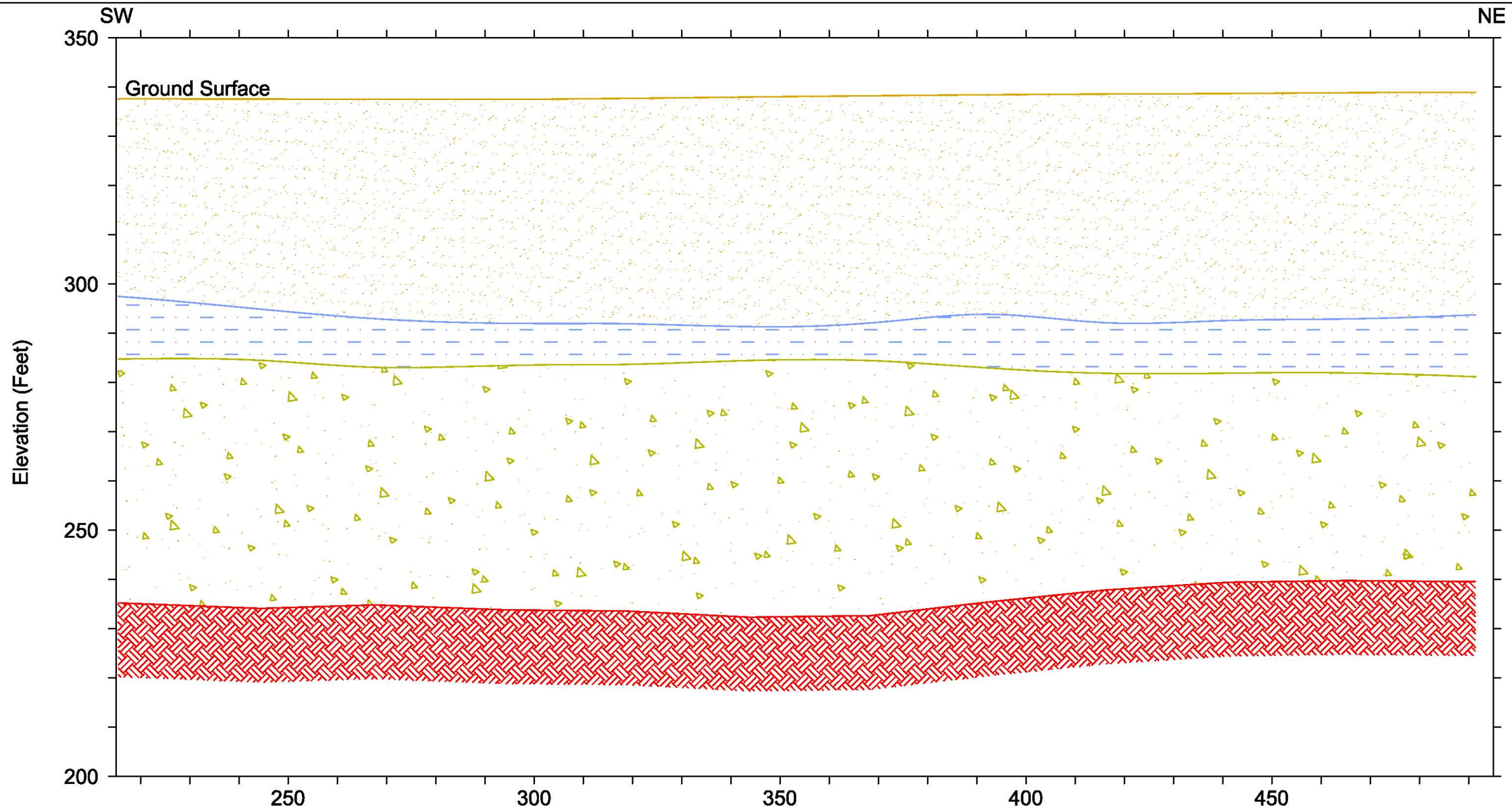
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 22
Southwest of Harvest Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B24

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

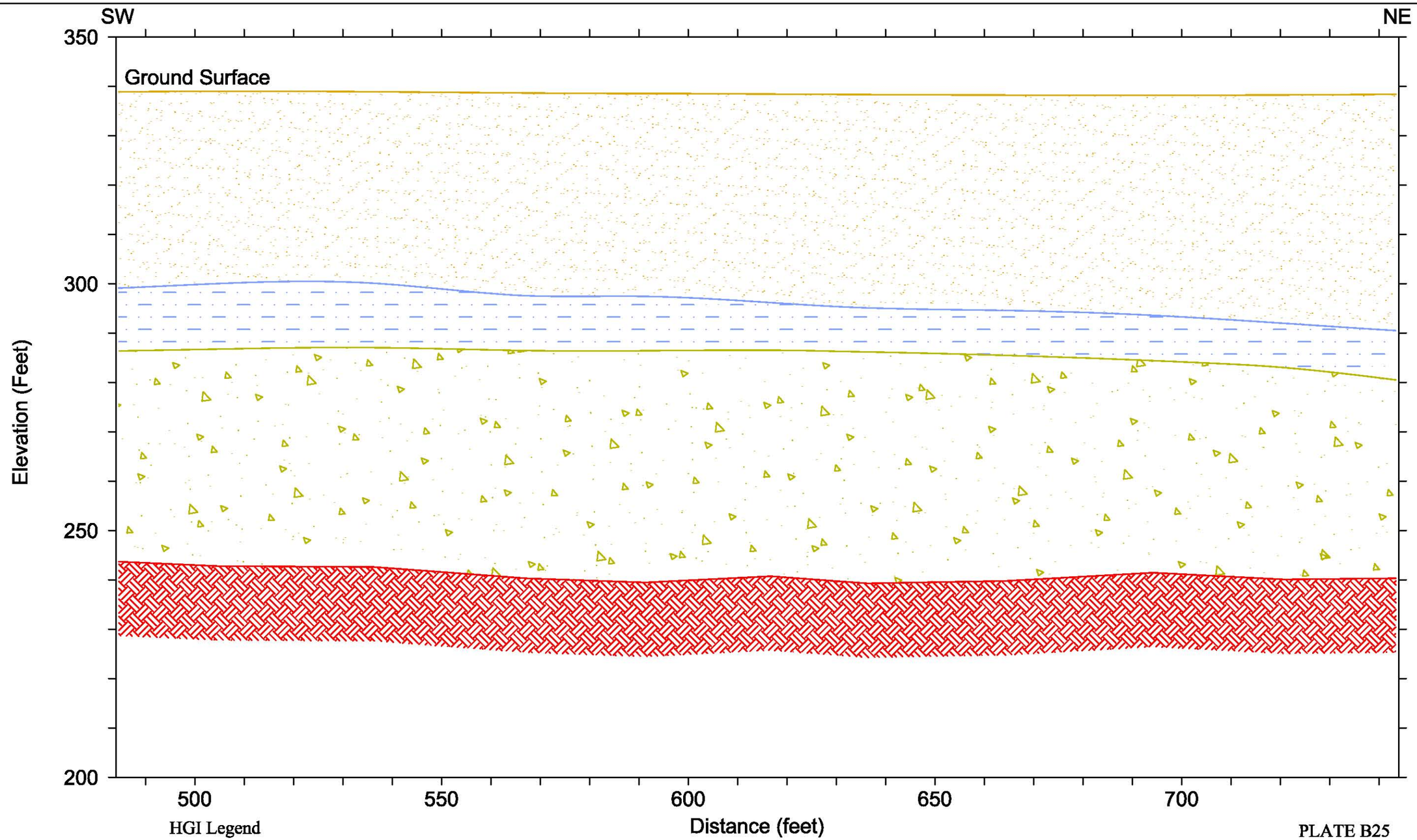
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 21
Southwest of Harvest Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B25

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

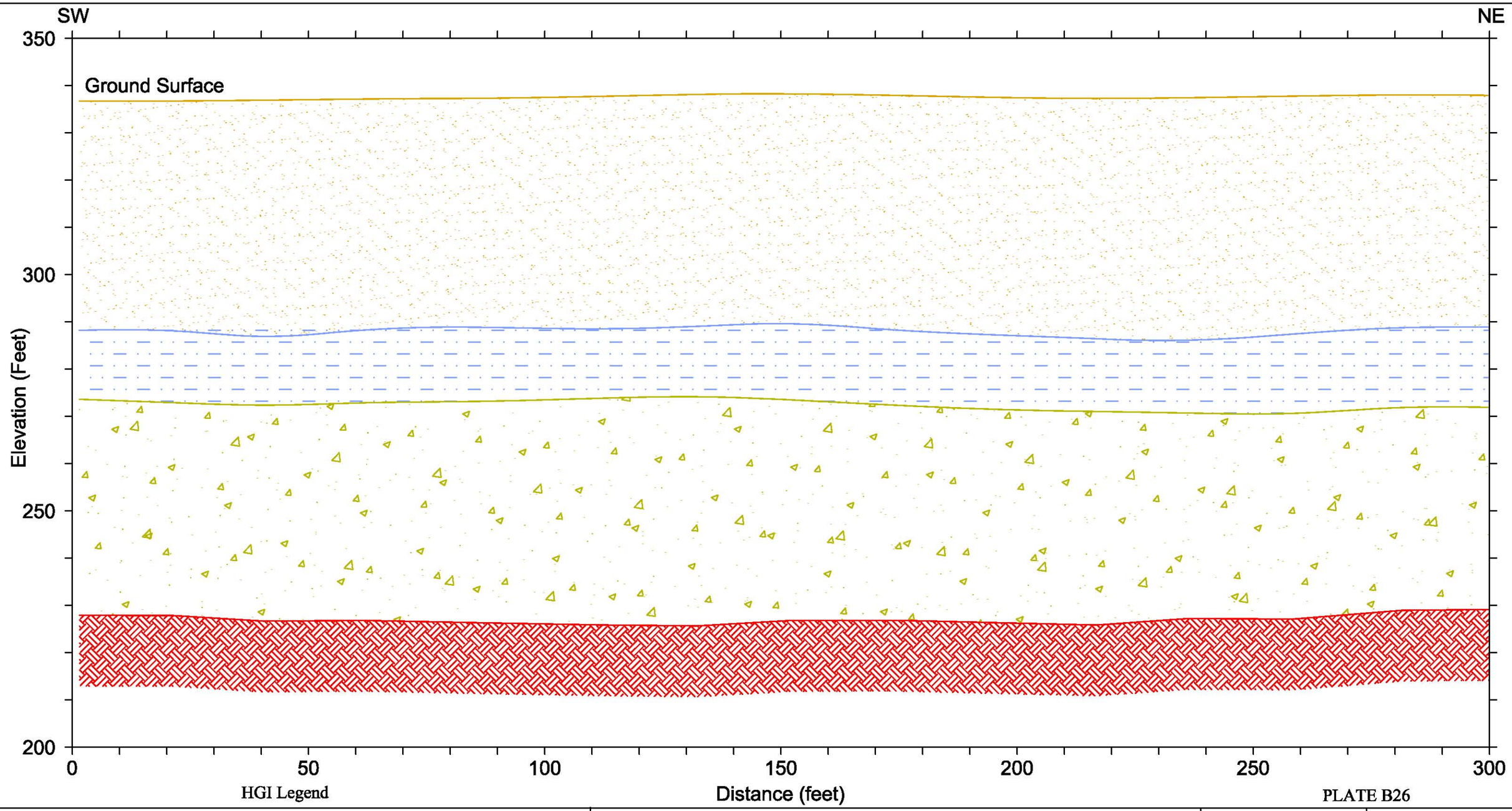
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 20
Southwest of Harvest Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B26

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

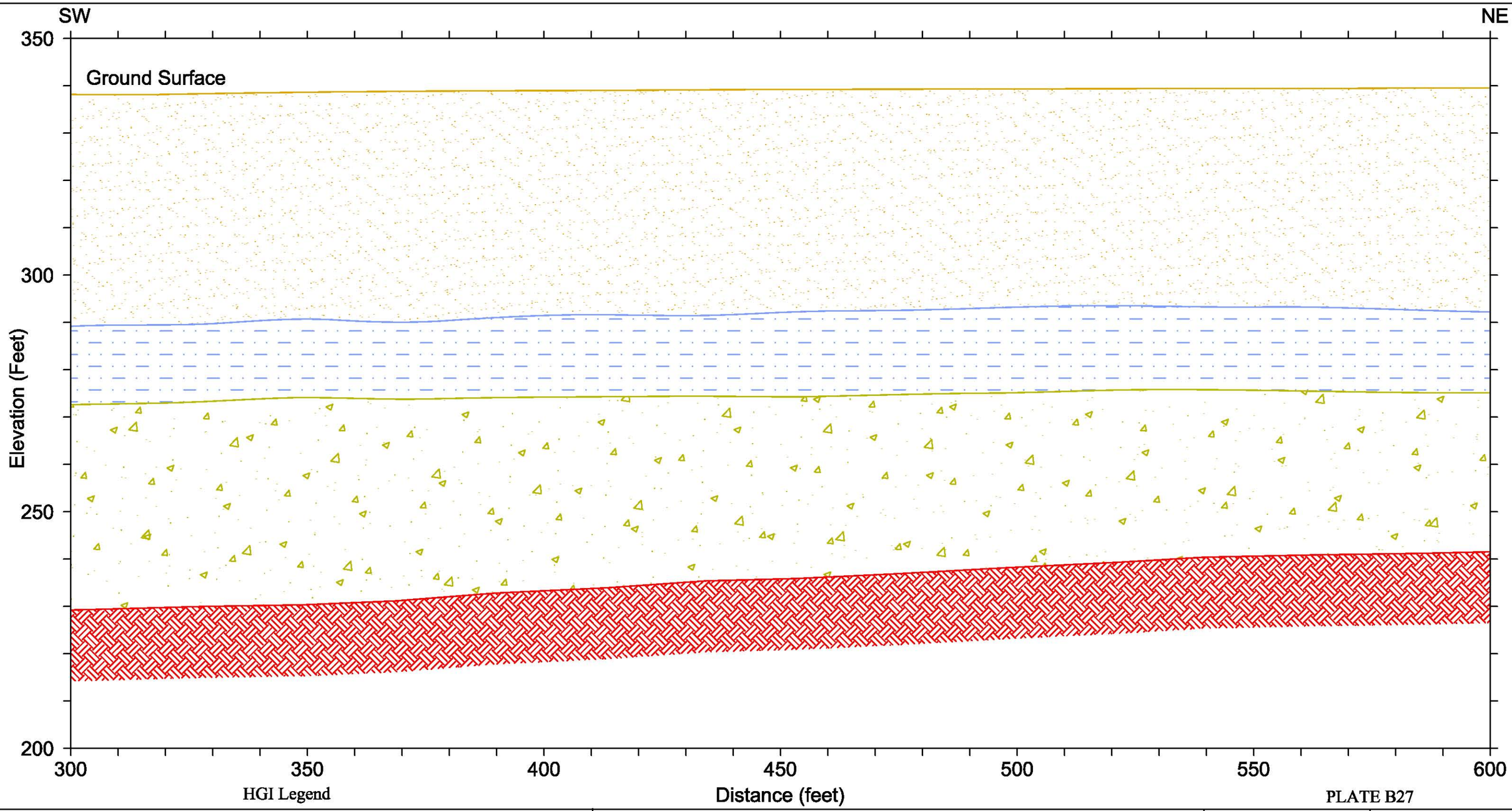
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 23-1
Kirby Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B27

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

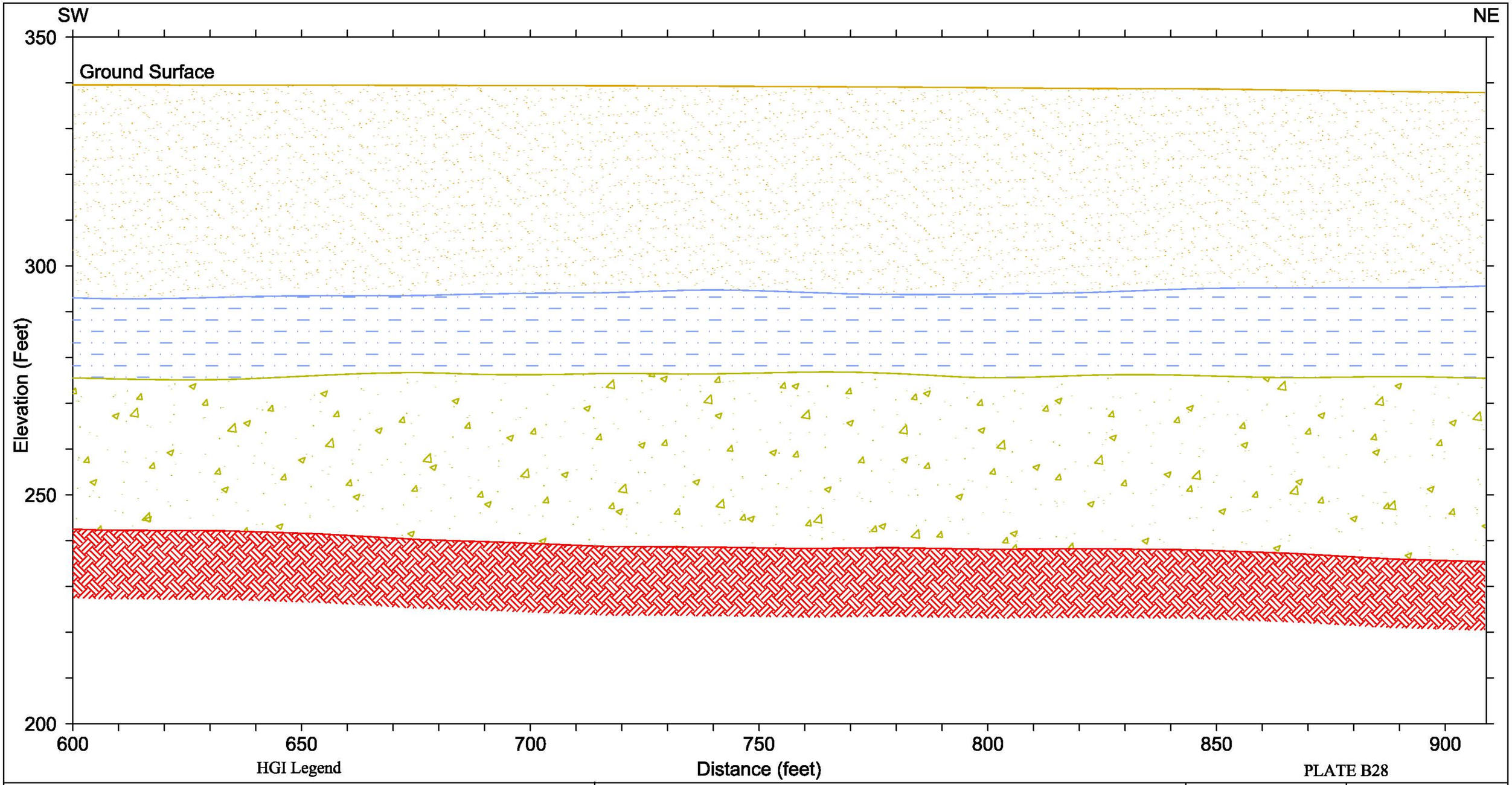
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 23-2
Kirby Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B28

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

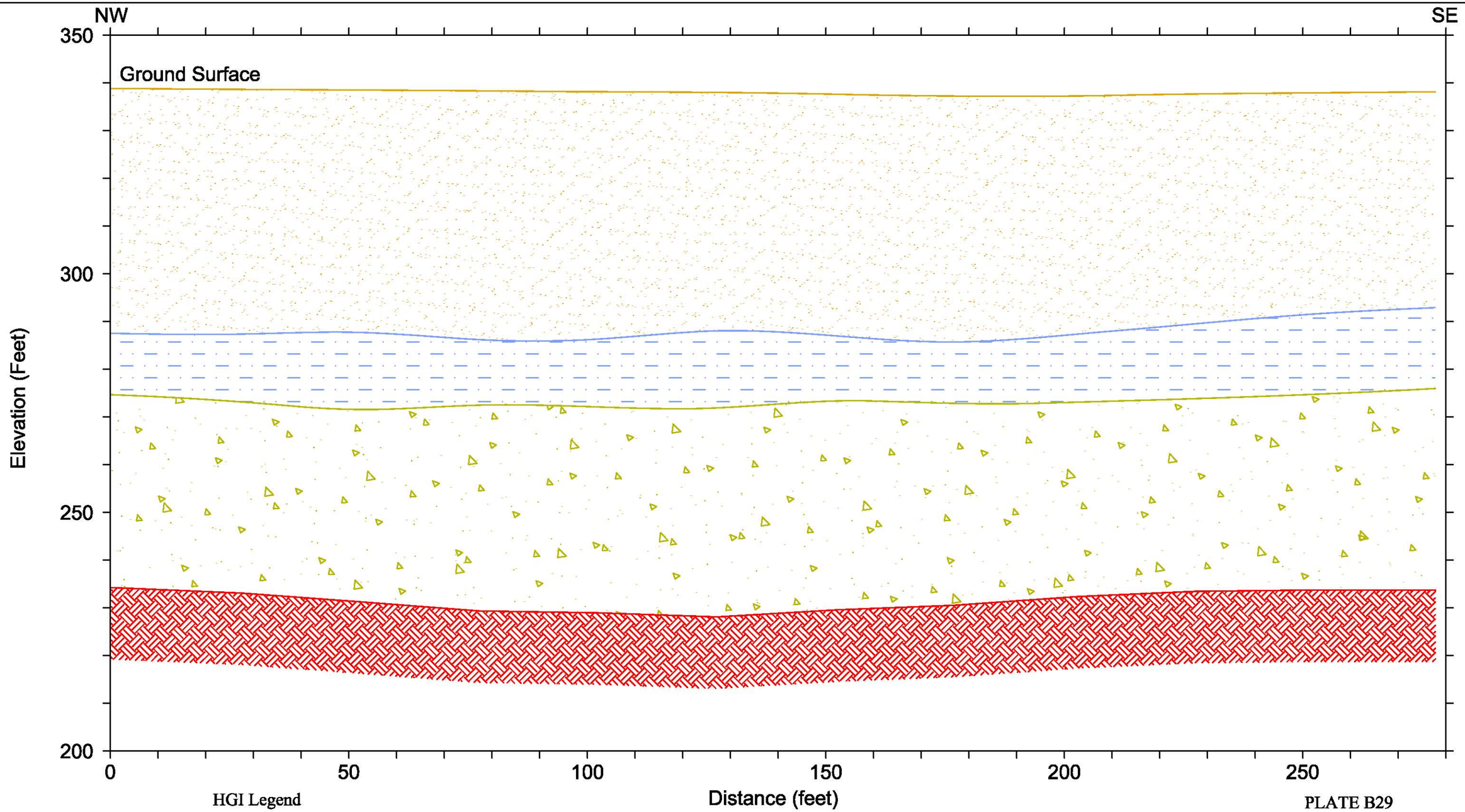
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 23-3
Kirby Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B29

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

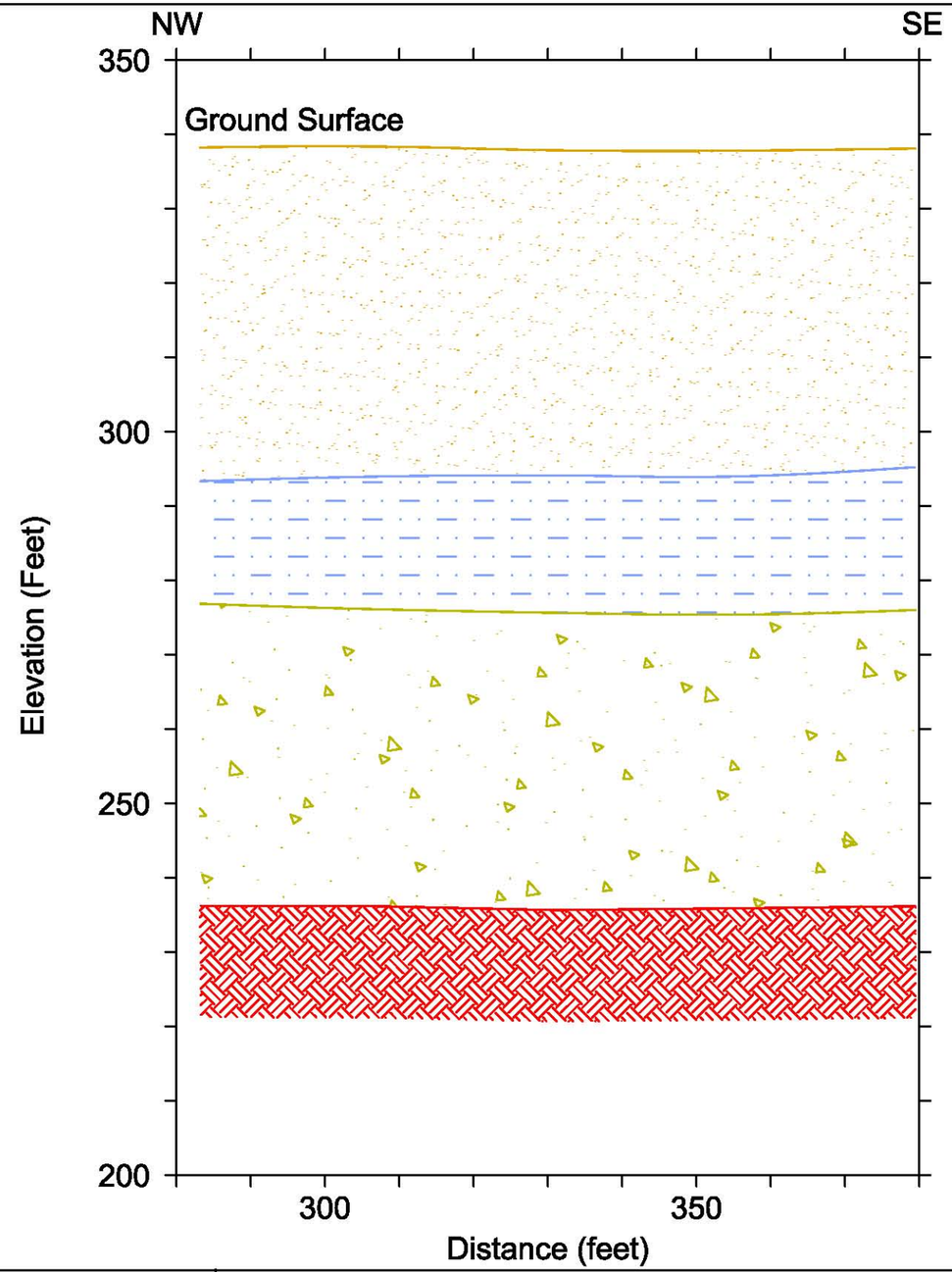
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 25
Kirby Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B30

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

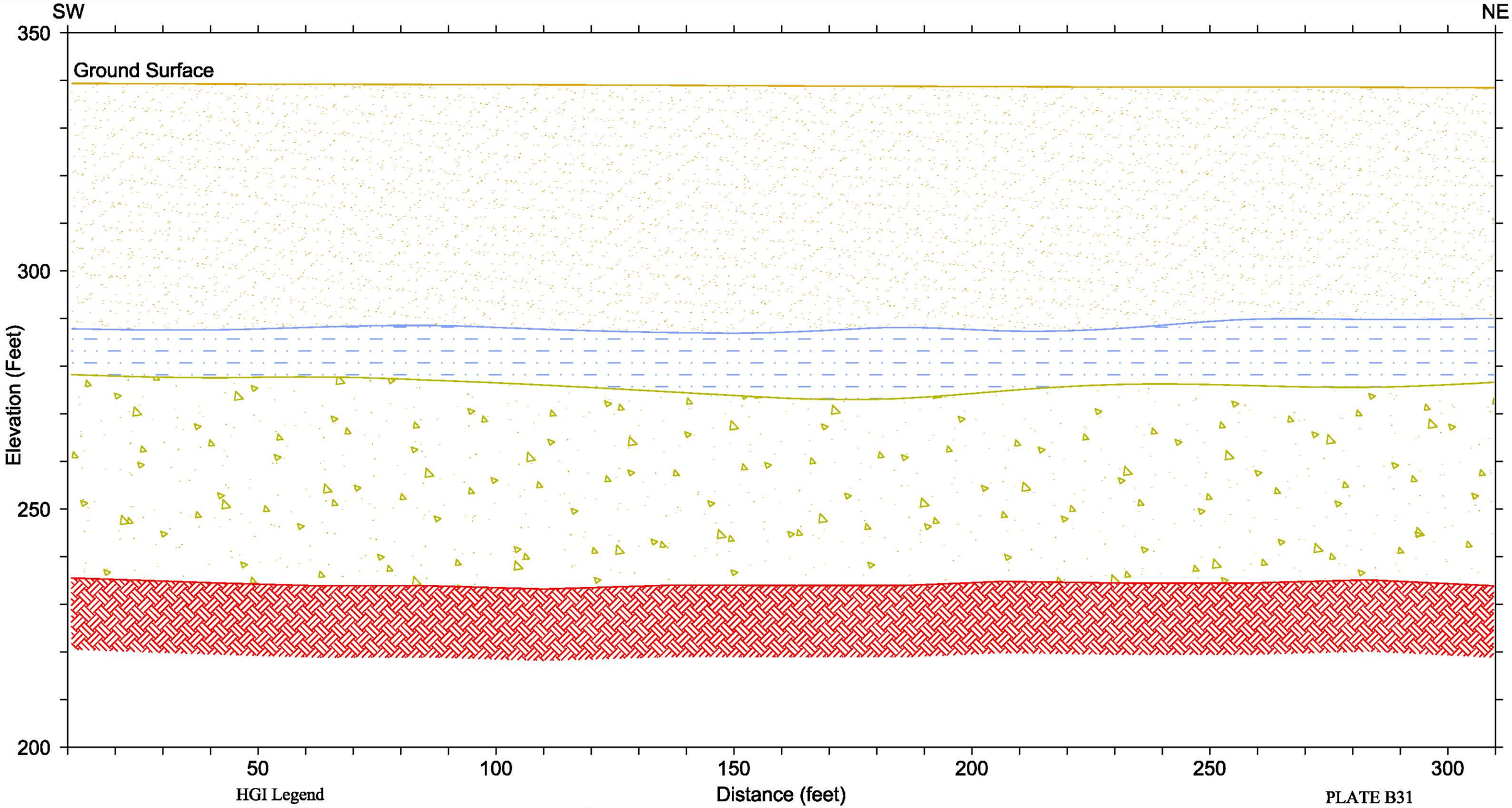
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 24
Kirby Lane
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B31

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

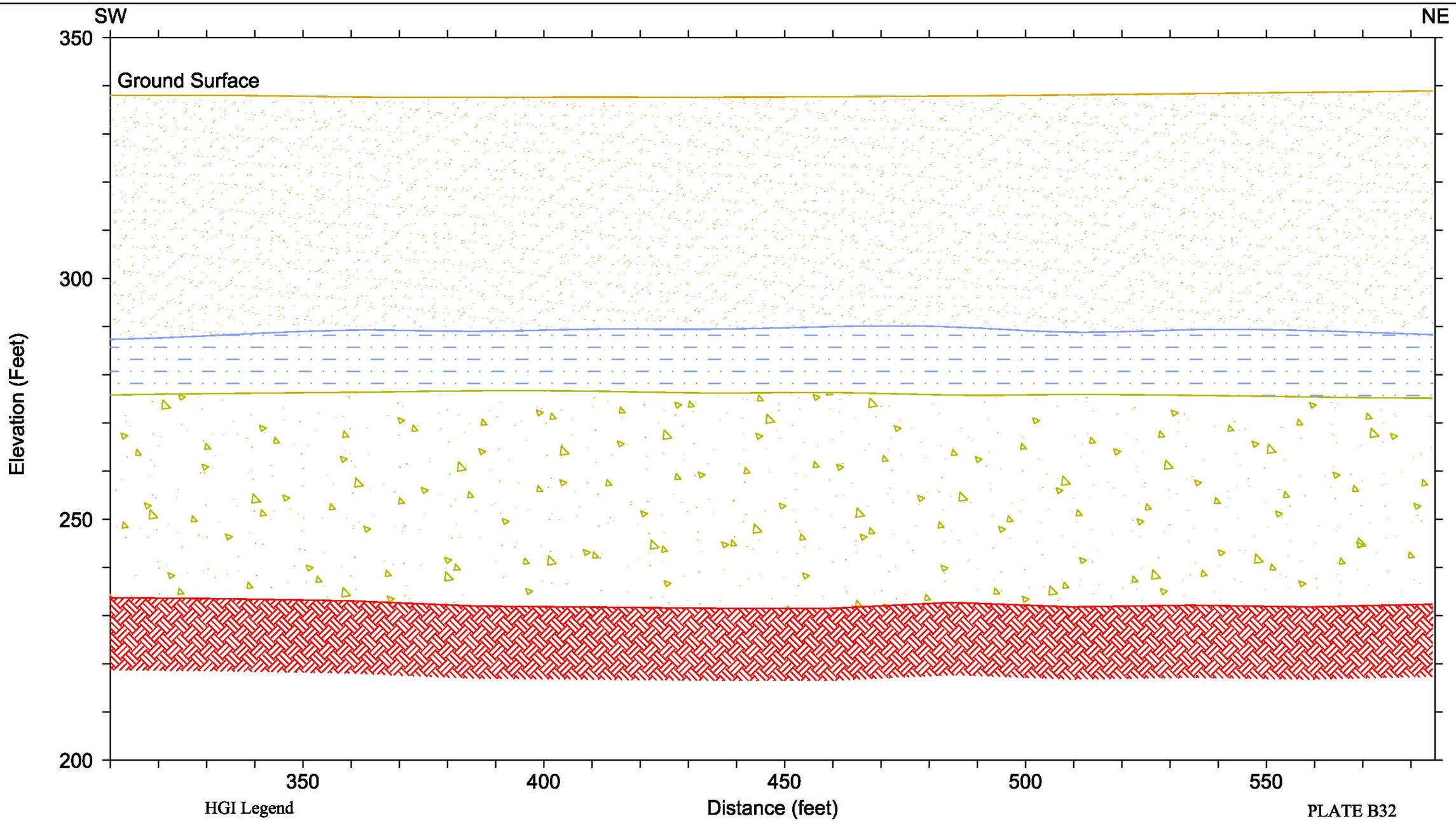
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 26-2
South Brownell Road
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B32

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

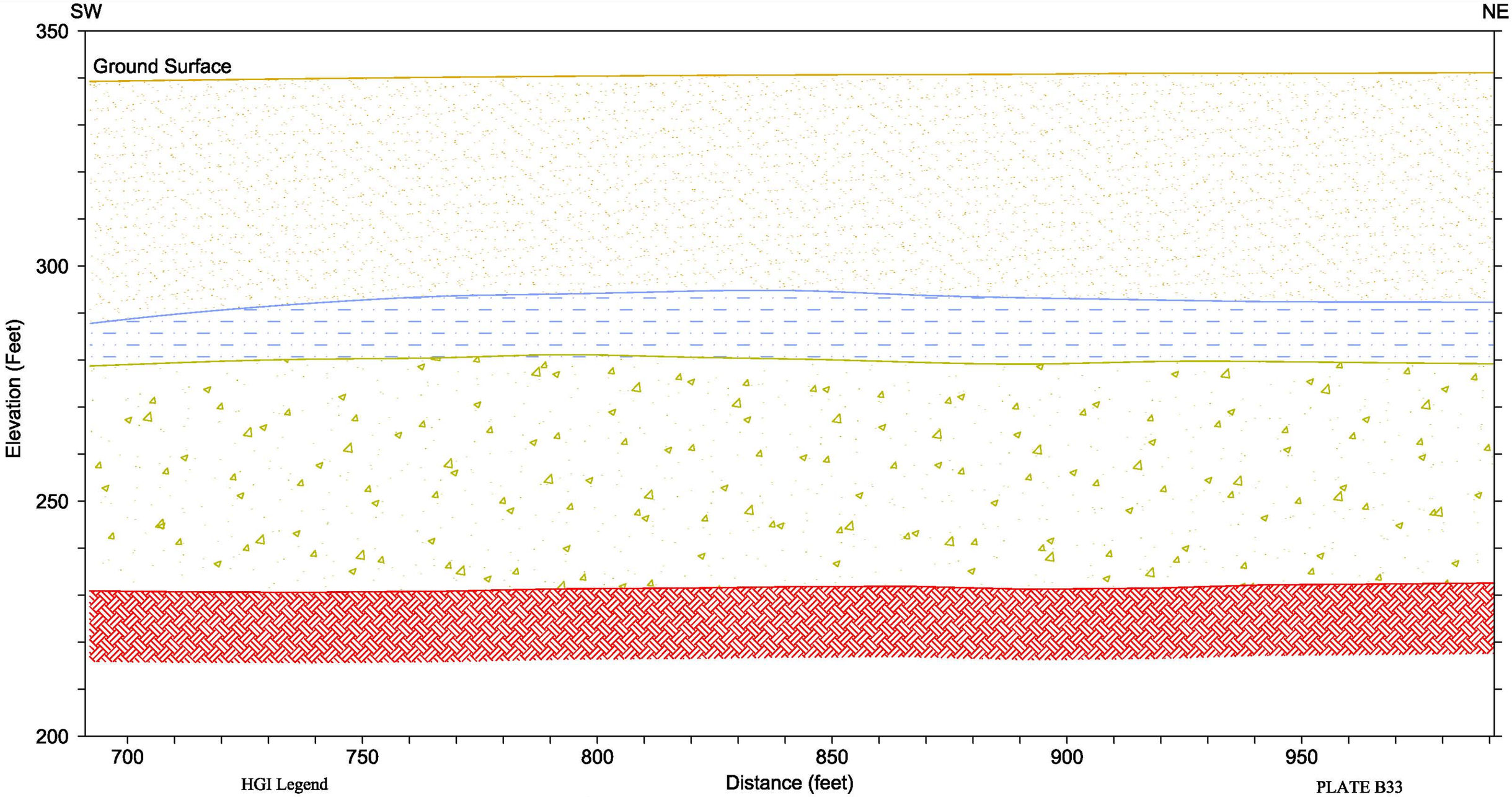
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 26-1
South Brownell Road
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B33

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

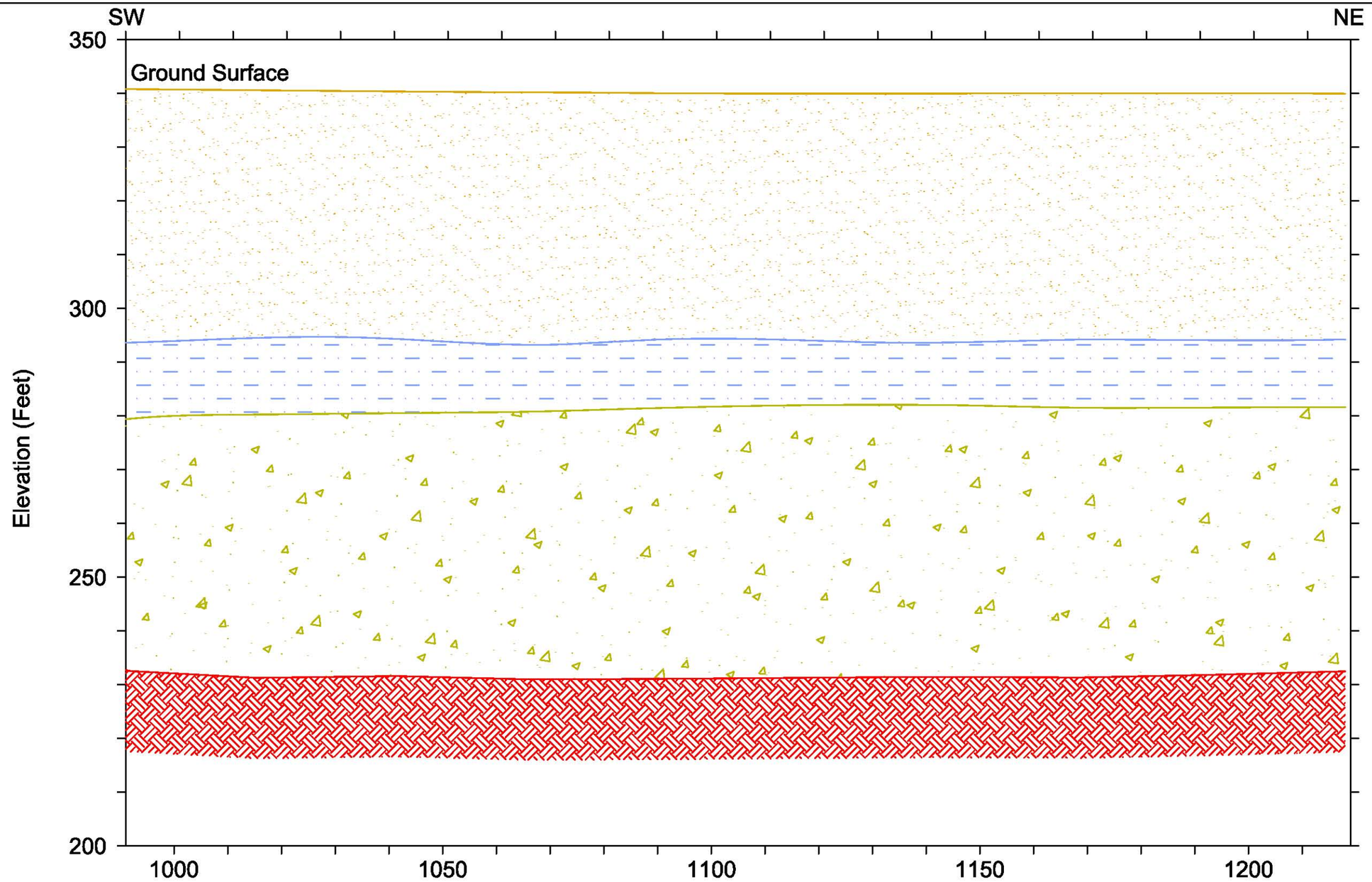
Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 28-1
South Brownell Road
Commerce Street Superfund Site
Williston, VT

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com



HGI Legend

PLATE B34

Undifferentiated Sediments

Till

Clay

Bedrock

0 5 10 20 40

Scale in Feet

V.E. = 1

AUGUST 2010	FILE NO. 2010036

GPR Cross Section
Line 28-2
South Brownell Road
Commerce Street Superfund Site
Williston, VT

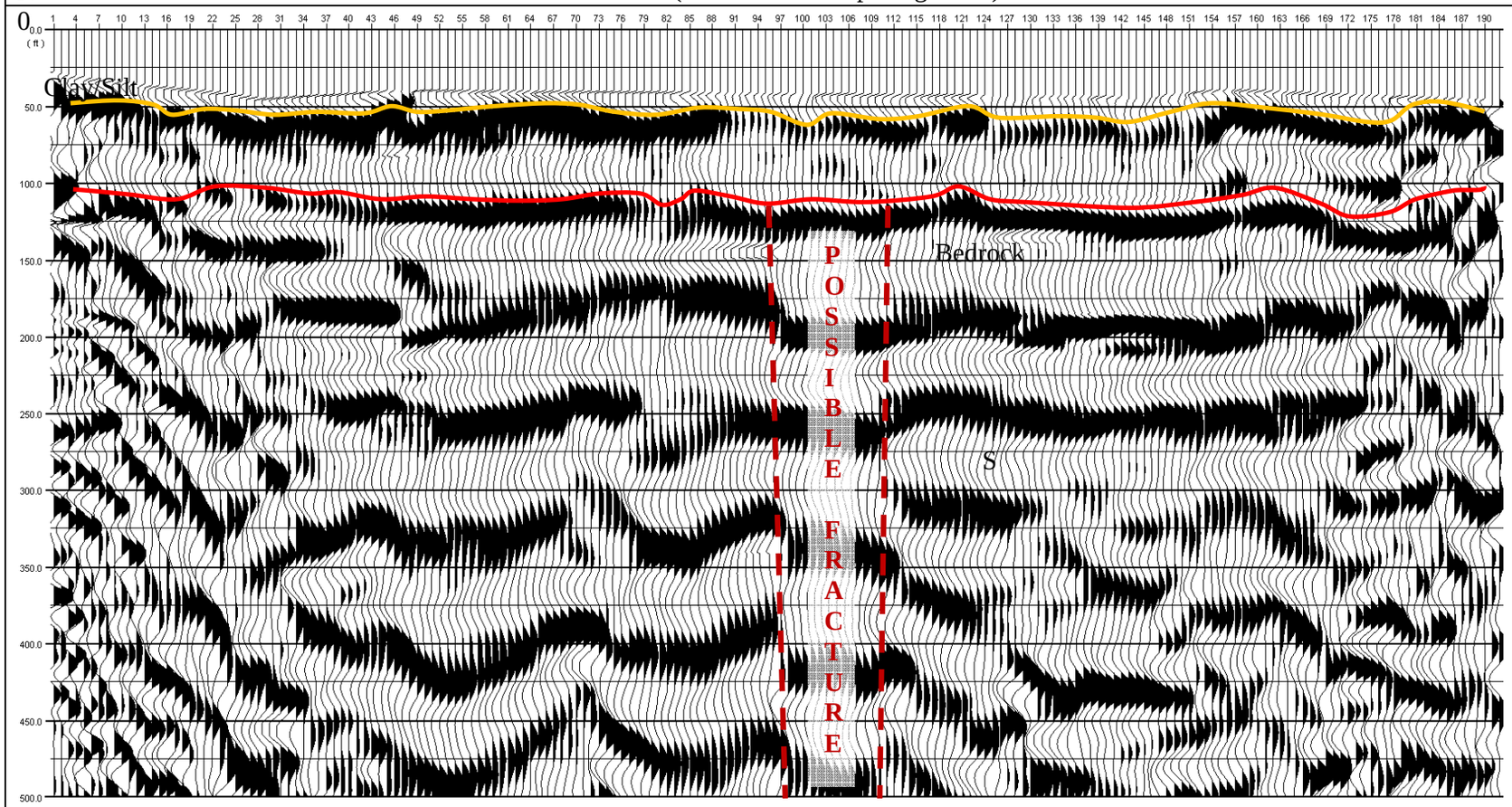
Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

APPENDIX C. REFLECTION PROFILES

"Till"

Figure C-1
LINE 100 CDP Stack
Distance (feet-CDP trace spacing = 5 ft)

N



Hager GeoScience, Incorporated
596 Main St.- Woburn, MA - 01801

Line: 100
Date: 6-11-10
Location: Williston, Vt
Client: Nobis

FIELD PARAMETERS

INSTRUMENTS: Geode	**RECORD LENGTH:** 1000ms
POLARITY: Positive	**SAMPLE:** 0.125
SOURCE: BSG-PEG	**S.P. OFFSET:** 5 ft In-Line
S.P. INTERVAL: 5 ft	**GEOPHONES:** 48
CABLE: 48 Channel	**SPREAD LENGTH:** 470 feet
G.P. INTERVAL: **10 feet**	**# OF SPREADS:** One roll
AQUISITION FILTER: OUT	**NOTCH: OUT**

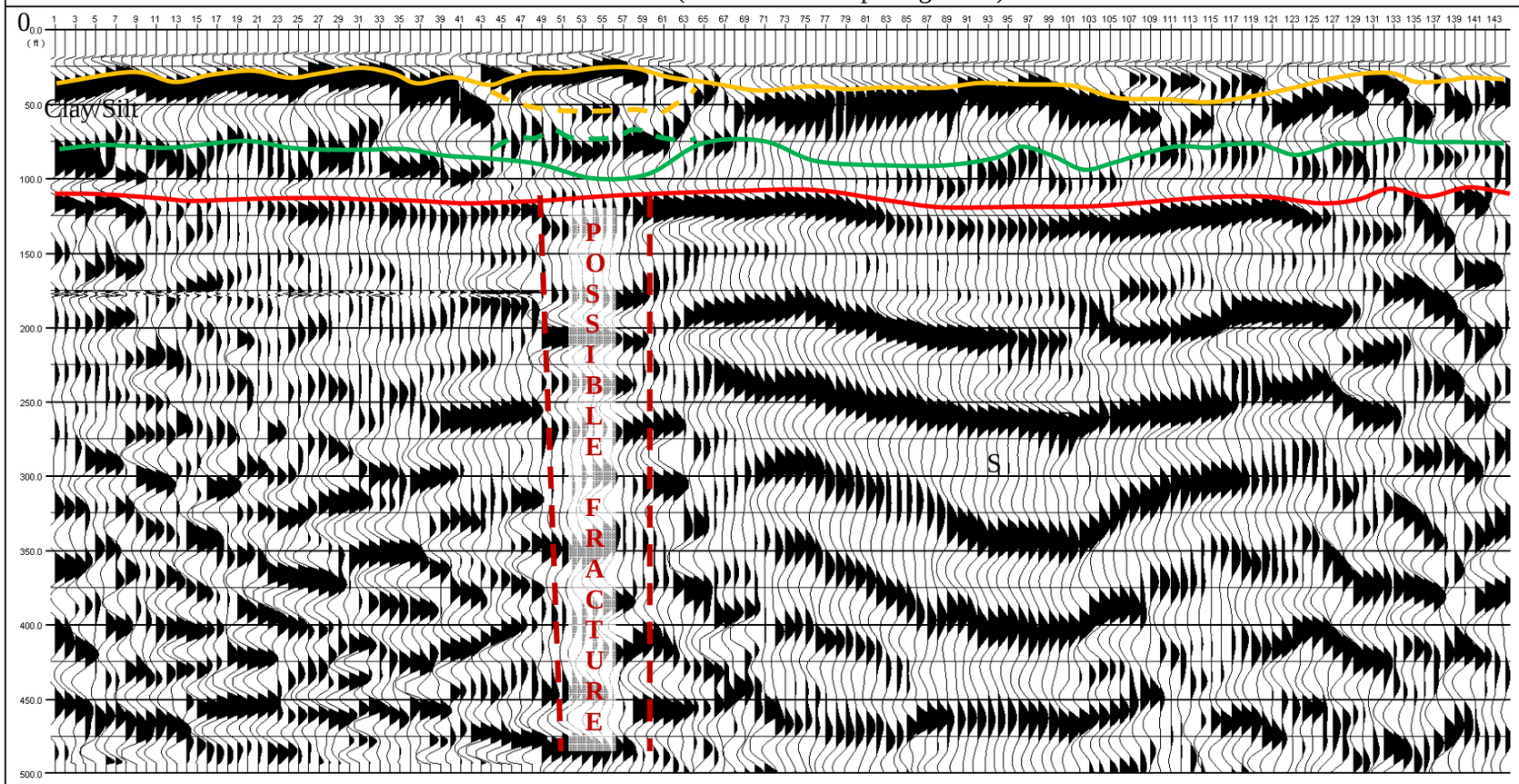
PROCESSING SEQUENCE

1. FREQUENCY FILTER: BP 50-140 Hz
2. PRE-STACK F/K FILTER: Yes
3. TRACE EDIT:
4. FIRST ARRIVAL MUTE: Top Mute
5. DECONVOLUTION: None
6. CDP SORT: Yes
7. APPLICATION OF DATUM STATISCICS:
DATUM= 0 VEL= Semblance File
8. NMO CORRECTION
9. SURFACE CONSISTENT AUTO RESIDUAL STASTICS
10. FINAL NMO CORRECTION
11. TRIM STATISTICS
12. CDP STACK; FOLD= 24 Max.
13. POST STACK F/K FILTER:
14. MIGRATION
15. FREQUENCY FILTER BP 50-120 Hz
16. TRACE SCALING: RMS and AGC

"Till"

Bedrock

Figure C-2
LINE 200 CDP Stack
Distance (feet-CDP trace spacing = 5 ft)



Hager GeoScience, Incorporated
596 Main St.- Woburn, MA - 01801

Line: 200
Date: 6-14-10
Location: Williston, Vt
Client: Nobis

FIELD PARAMETERS

INSTRUMENTS: Geode	**RECORD LENGTH:** 1000ms
POLARITY: Positive	**SAMPLE:** 0.125
SOURCE: BSG-PEG	**S.P. OFFSET:** 5 ft In-Line
S.P. INTERVAL: 5 ft	**GEOPHONES:** 48
CABLE: 48 Channel	**SPREAD LENGTH:** 470 feet
G.P. INTERVAL: **10 feet**	**# OF SPREADS:** One roll
AQUISITION FILTER: OUT	**NOTCH: OUT**

PROCESSING SEQUENCE

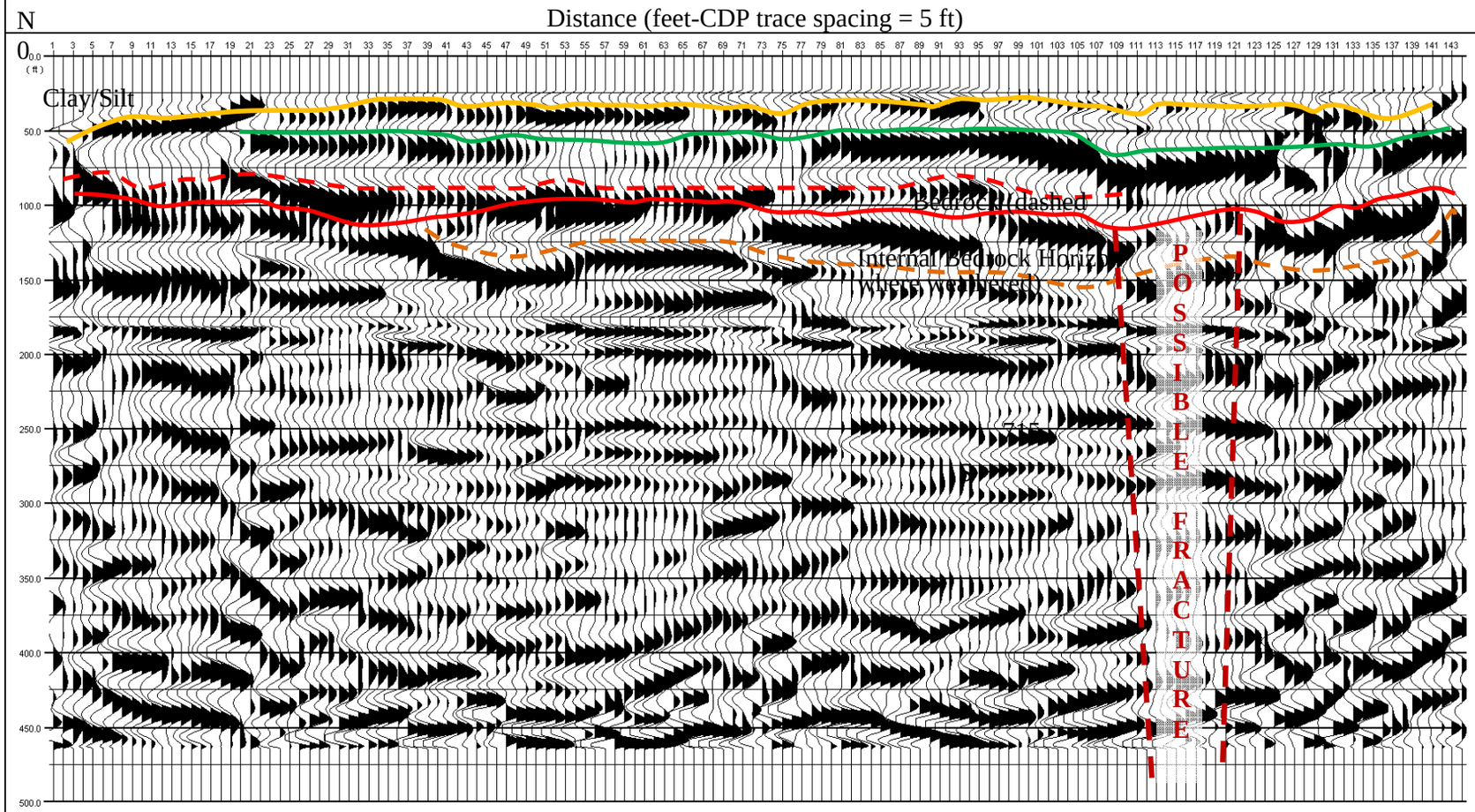
1. FREQUENCY FILTER: BP 50-140 Hz
2. PRE-STACK F/K FILTER: Yes
3. TRACE EDIT:
4. FIRST ARRIVAL MUTE: Top Mute
5. DECONVOLUTION: De-spiking
6. CDP SORT: Yes
7. APPLICATION OF DATUM STATISCICS:
DATUM= 0 VEL= Semblance File
8. NMO CORRECTION
9. SURFACE CONSISTENT AUTO RESIDUAL STASTICS
10. FINAL NMO CORRECTION
11. TRIM STATISTICS
12. CDP STACK; FOLD= 24 Max.
13. POST STACK F/K FILTER:
14. MIGRATION
15. FREQUENCY FILTER BP 50-120 Hz
16. TRACE SCALING: RMS and AGC

Hager GeoScience, Incorporated
596 Main St.- Woburn, MA - 01801

Line: 300
Date: 6-15-10
Location: Williston, Vt
Client: Nobis

"Till"

Figure C-3
LINE 300 CDP Stack
Distance (feet-CDP trace spacing = 5 ft)



FIELD PARAMETERS

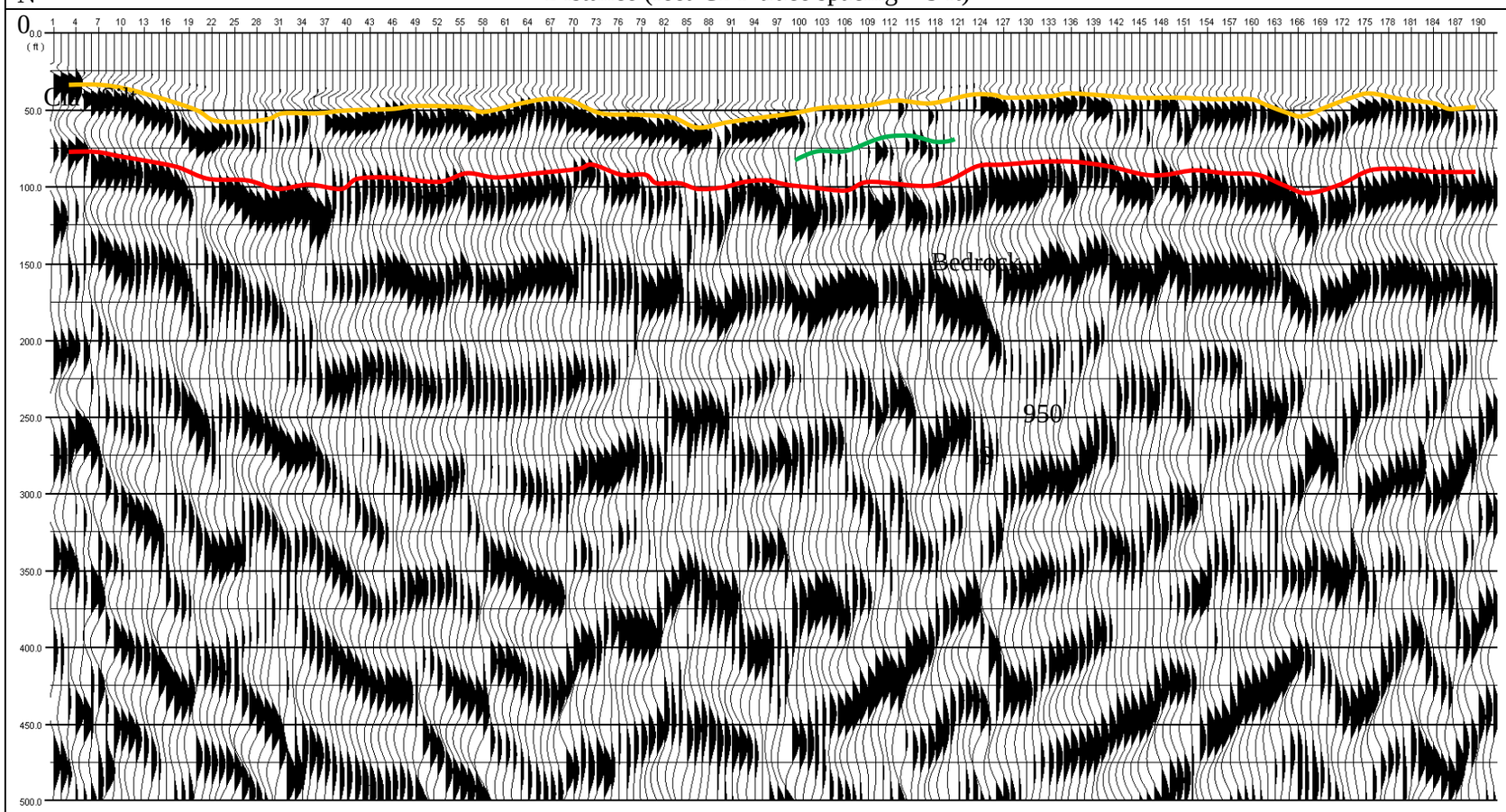
INSTRUMENTS: Geode	**RECORD LENGTH:** 1000ms
POLARITY: Positive	**SAMPLE:** 0.125
SOURCE: BSG-PEG	**S.P. OFFSET:** 5 ft In-Line
S.P. INTERVAL: 5 ft	**GEOPHONES:** 48
CABLE: 48 Channel	**SPREAD LENGTH:** 470 feet
G.P. INTERVAL: 10 feet	**# OF SPREADS:** One roll
AQUISITION FILTER: OUT	**NOTCH: OUT**

PROCESSING SEQUENCE

1. FREQUENCY FILTER: BP 50-140 Hz
2. PRE-STACK F/K FILTER: Yes
3. TRACE EDIT:
4. FIRST ARRIVAL MUTE: Top Mute
5. DECONVOLUTION: De-spiking
6. CDP SORT: Yes
7. APPLICATION OF DATUM STATISCICS:
DATUM= 0 VEL= Semblance File
8. NMO CORRECTION
9. SURFACE CONSISTENT AUTO RESIDUAL STASTICS
10. FINAL NMO CORRECTION
11. TRIM STATISTICS
12. CDP STACK; FOLD= 24 Max.
13. POST STACK F/K FILTER:
14. MIGRATION
15. FREQUENCY FILTER BP 50-120 Hz
16. TRACE SCALING: RMS and AGC

"Till"

Figure C-4
LINE 400 CDP Stack
Distance (feet-CDP trace spacing = 5 ft)



Hager GeoScience, Incorporated
596 Main St.- Woburn, MA - 01801

Line: 400
Date: 6-16-10
Location: Williston, Vt
Client: Nobis

FIELD PARAMETERS

INSTRUMENTS: Geode	**RECORD LENGTH:** 1000ms
POLARITY: Positive	**SAMPLE:** 0.125
SOURCE: BSG-PEG	**S.P. OFFSET:** 5 ft In-Line
S.P. INTERVAL: 5 ft	**GEOPHONES:** 48
CABLE: 48 Channel	**SPREAD LENGTH:** 470 feet
G.P. INTERVAL: **10 feet**	**# OF SPREADS:** One roll
AQUISITION FILTER: OUT	**NOTCH: OUT**

PROCESSING SEQUENCE

1. FREQUENCY FILTER: BP 50-140 Hz
2. PRE-STACK F/K FILTER: Yes
3. TRACE EDIT:
4. FIRST ARRIVAL MUTE: Top Mute
5. DECONVOLUTION: None
6. CDP SORT: Yes
7. APPLICATION OF DATUM STATISCICS:
DATUM= 0 VEL= Semblance File
8. NMO CORRECTION
9. SURFACE CONSISTENT AUTO RESIDUAL STASTICS
10. FINAL NMO CORRECTION
11. TRIM STATISTICS
12. CDP STACK; FOLD= 24 Max.
13. POST STACK F/K FILTER:
14. MIGRATION
15. FREQUENCY FILTER BP 50-120 Hz
16. TRACE SCALING: RMS and AGC

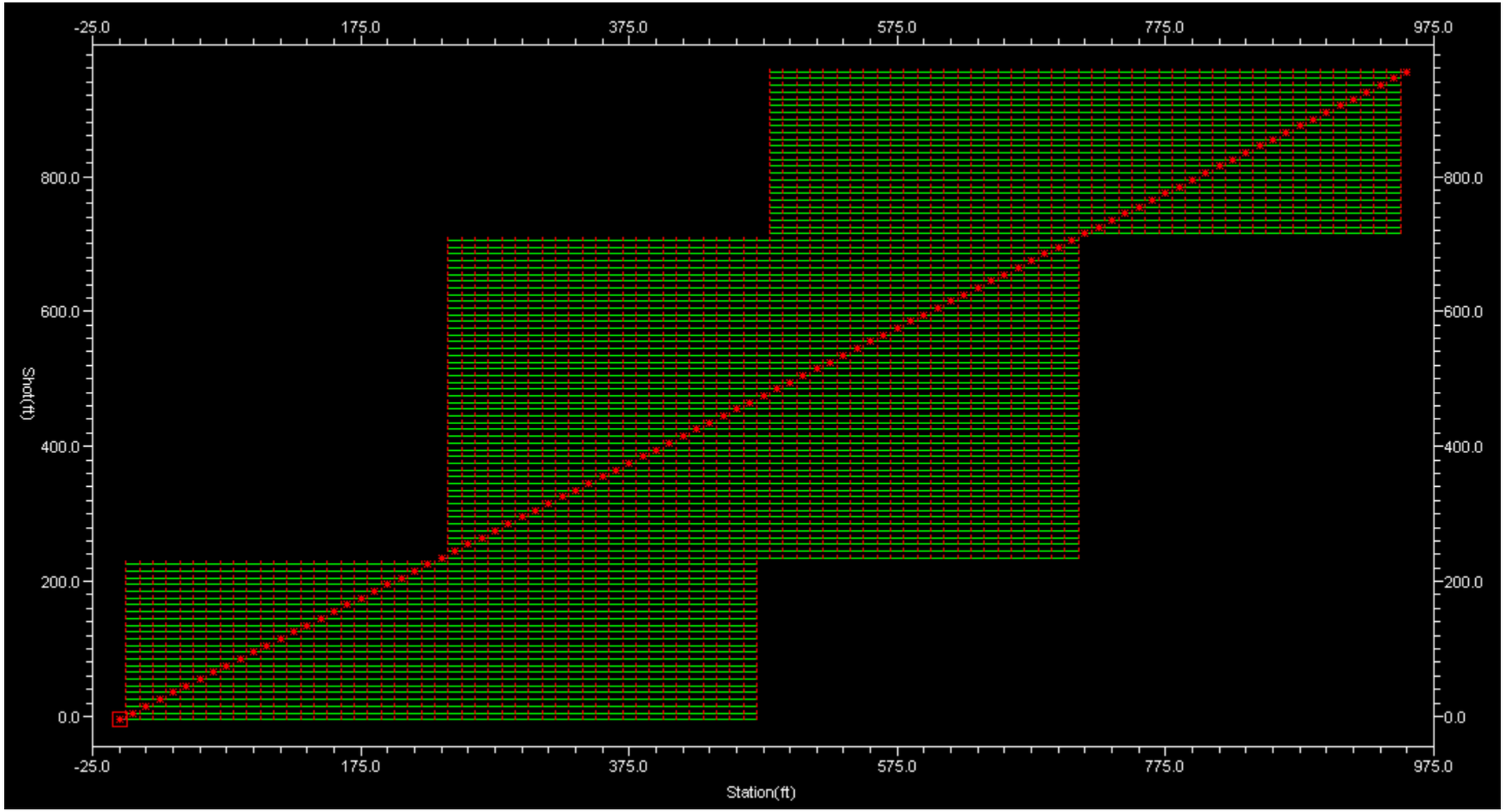


Figure C-5 Survey geometry for seismic reflection Line 100

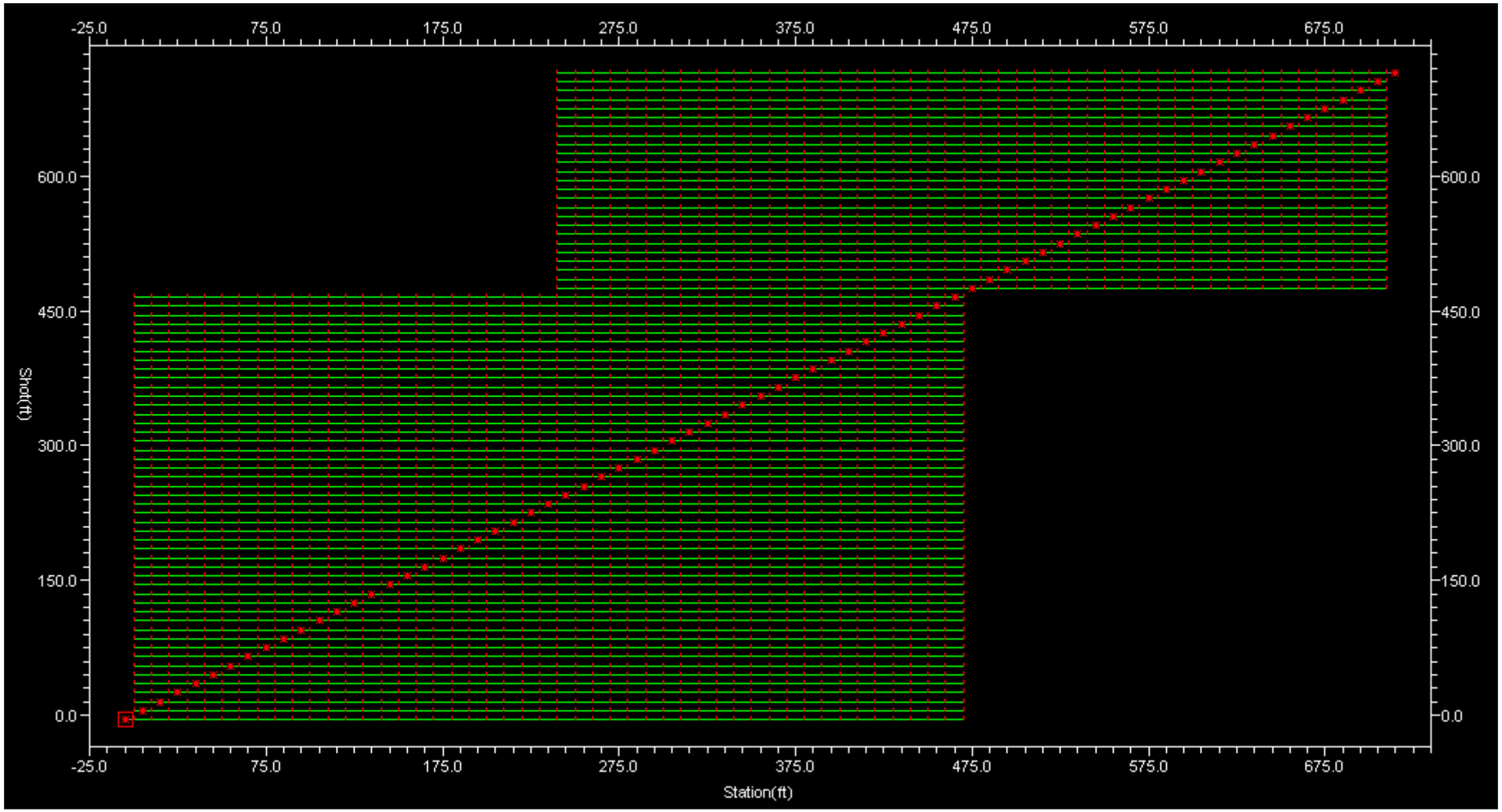


Figure C-6 Survey geometry for seismic reflection Line 200

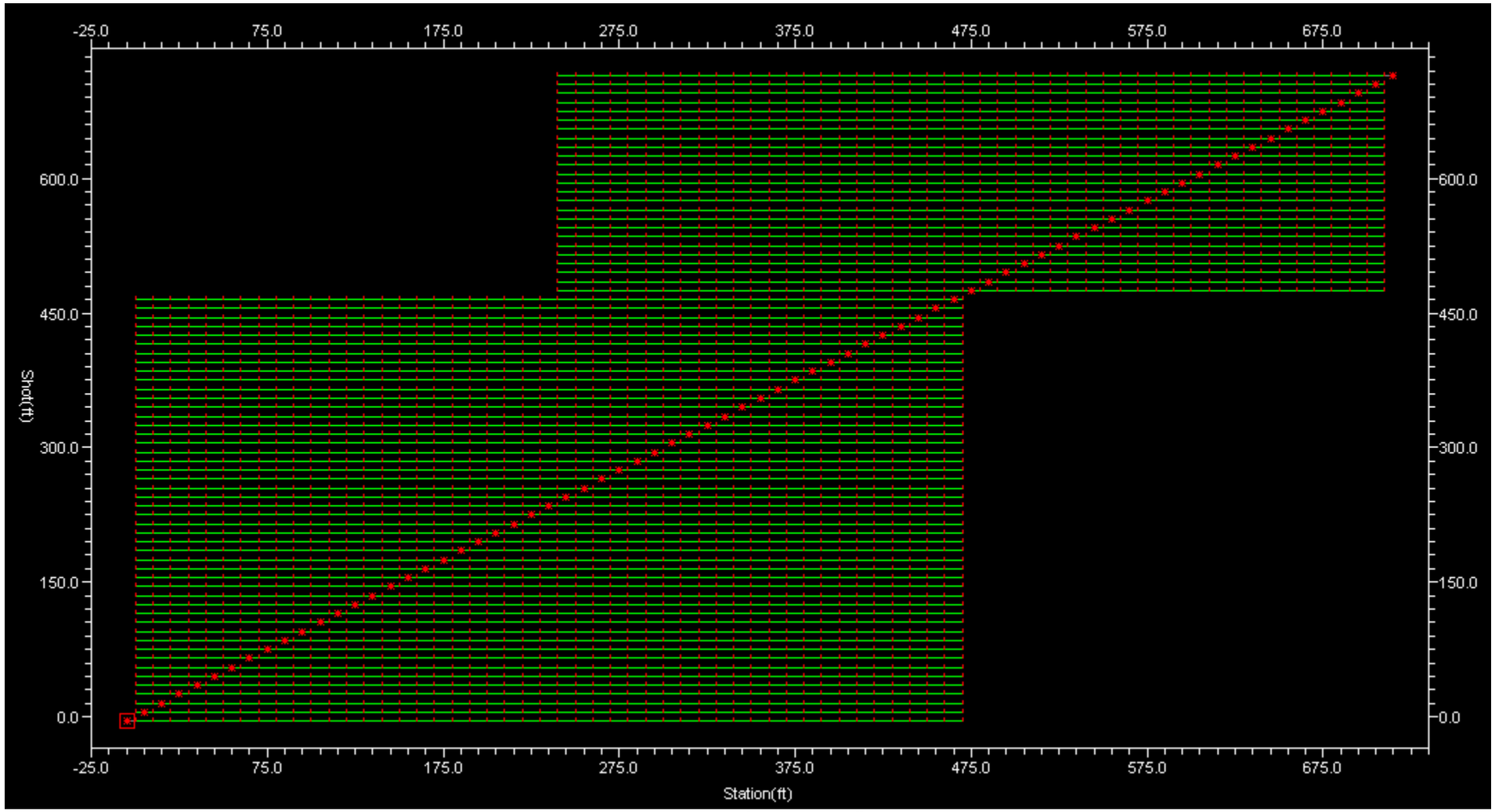


Figure C-7 Survey geometry for seismic reflection Line 300

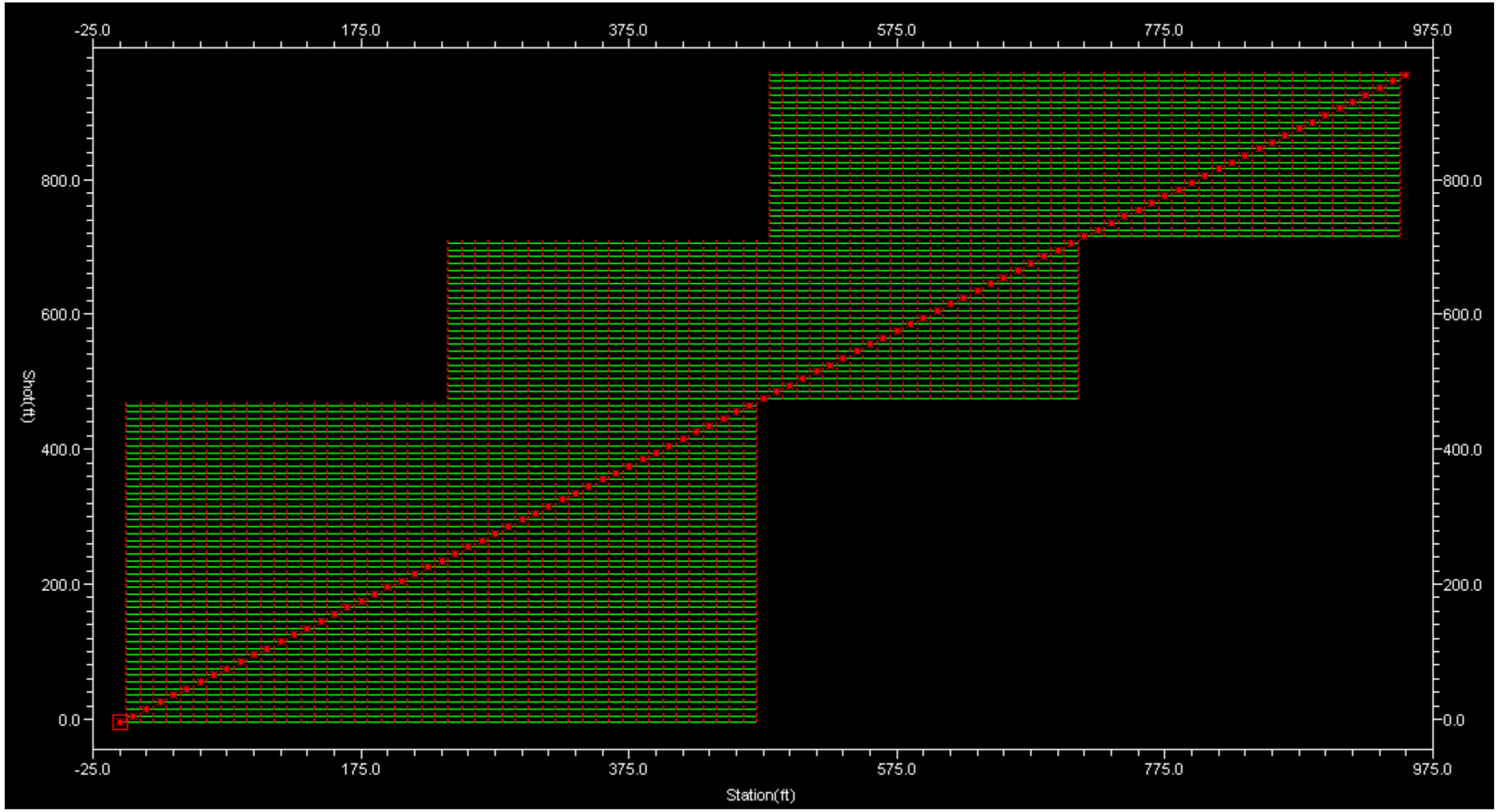
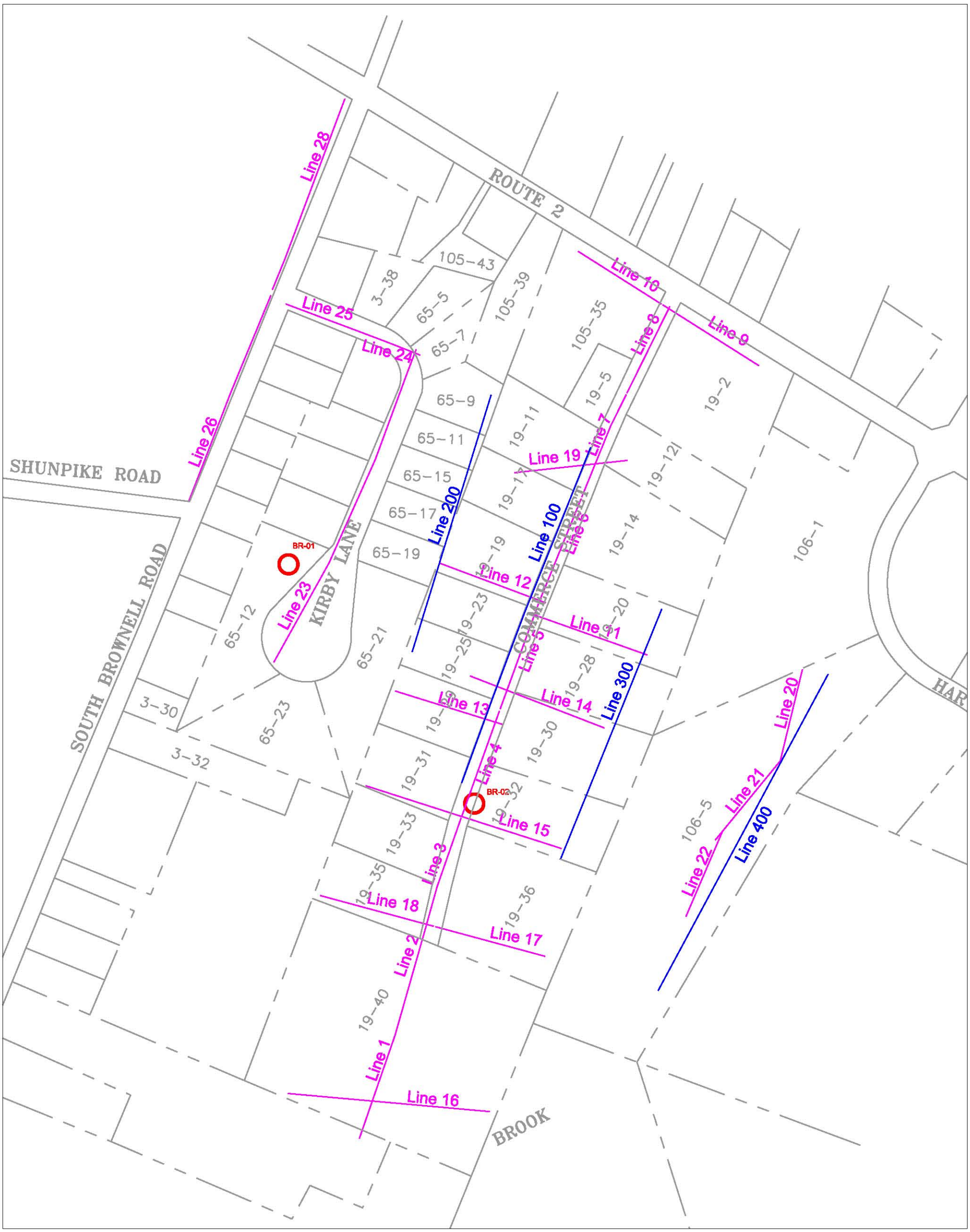


Figure C-8 Survey geometry for seismic reflection Line 400



Seismic Line

GPR Line

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.

0 50 100 200 400

Scale in Feet

PLATE 1

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
GPR & Seismic Traverses
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

NOT ALL SUBSURFACE FEATURES MAY BE DEPICTED ON THIS MAP

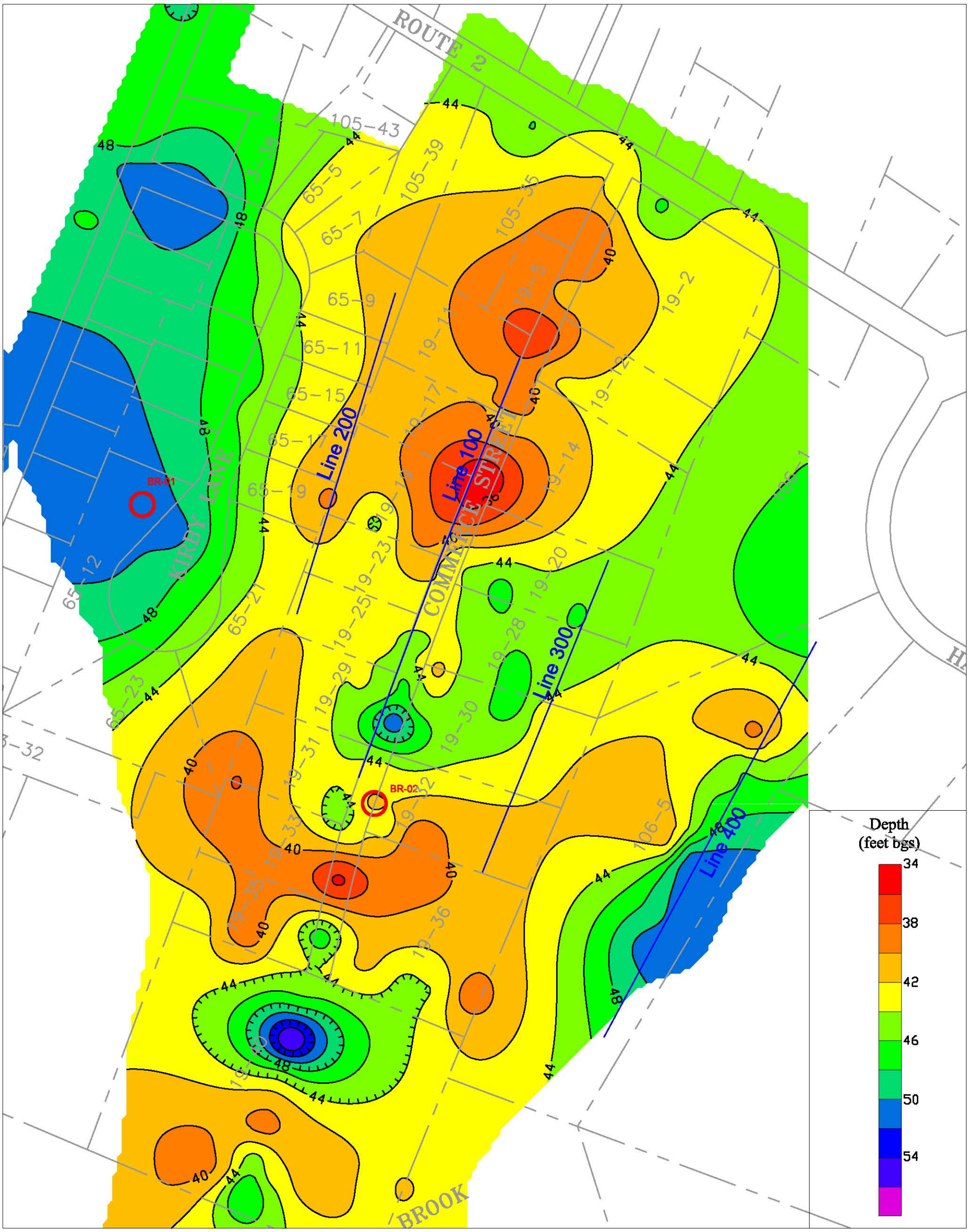


PLATE 2

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Clay depth contours represent the general trend of the clay surface and are not intended to be used as precise site-specific depth measurements.
4.) Clay layer depths were determined by converting GPR travel times to distance.

0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Clay Layer Depth Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

NOT ALL SUBSURFACE FEATURES MAY BE DEPICTED ON THIS MAP

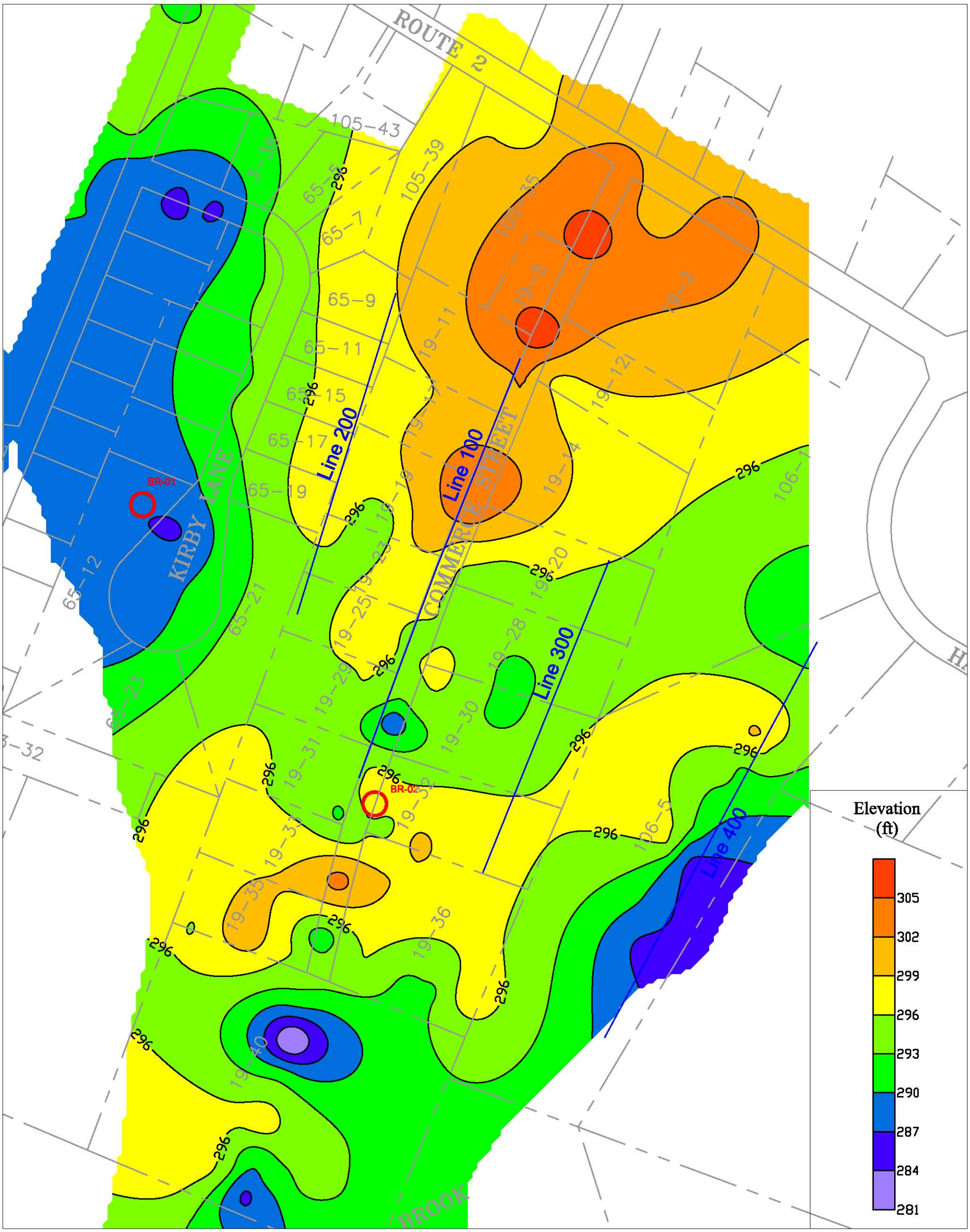


PLATE 3

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Clay elevation contours represent the general trend of the clay surface and are not intended to be used as precise site-specific elevation measurements.
4.) Clay layer elevations were determined by converting GPR travel times to distance.

0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Clay Layer Elevation Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
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NOT ALL SUBSURFACE FEATURES MAY BE DEPICTED ON THIS MAP

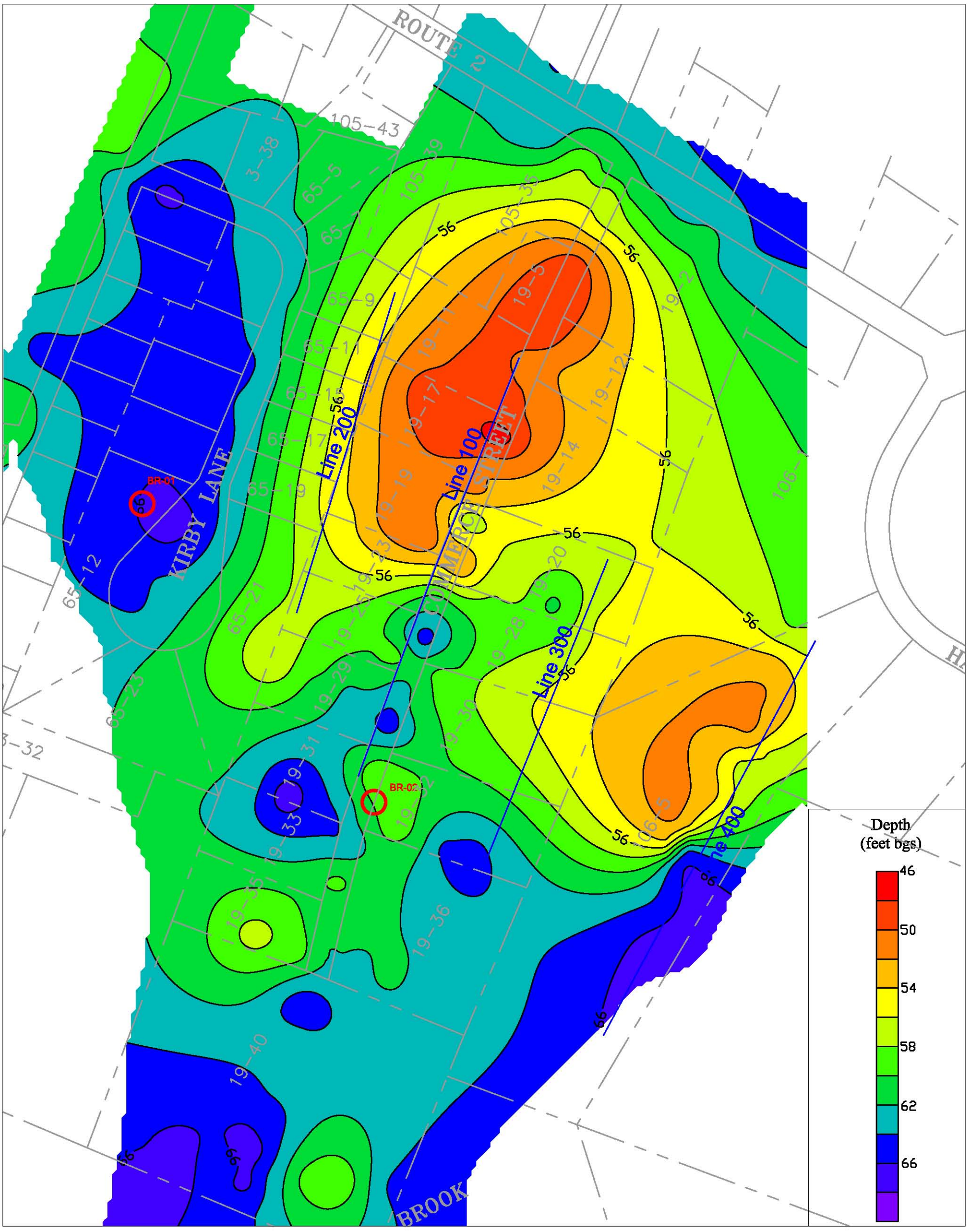

PLATE 4

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Till depth contours represent the general trend of the till layer surface and are not intended to be used as precise site-specific depth measurements.
4.) Till layer depths were determined by converting GPR travel times to distance.

0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Till Layer Depth Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
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NOT ALL SUBSURFACE FEATURES MAY BE DEPICTED ON THIS MAP

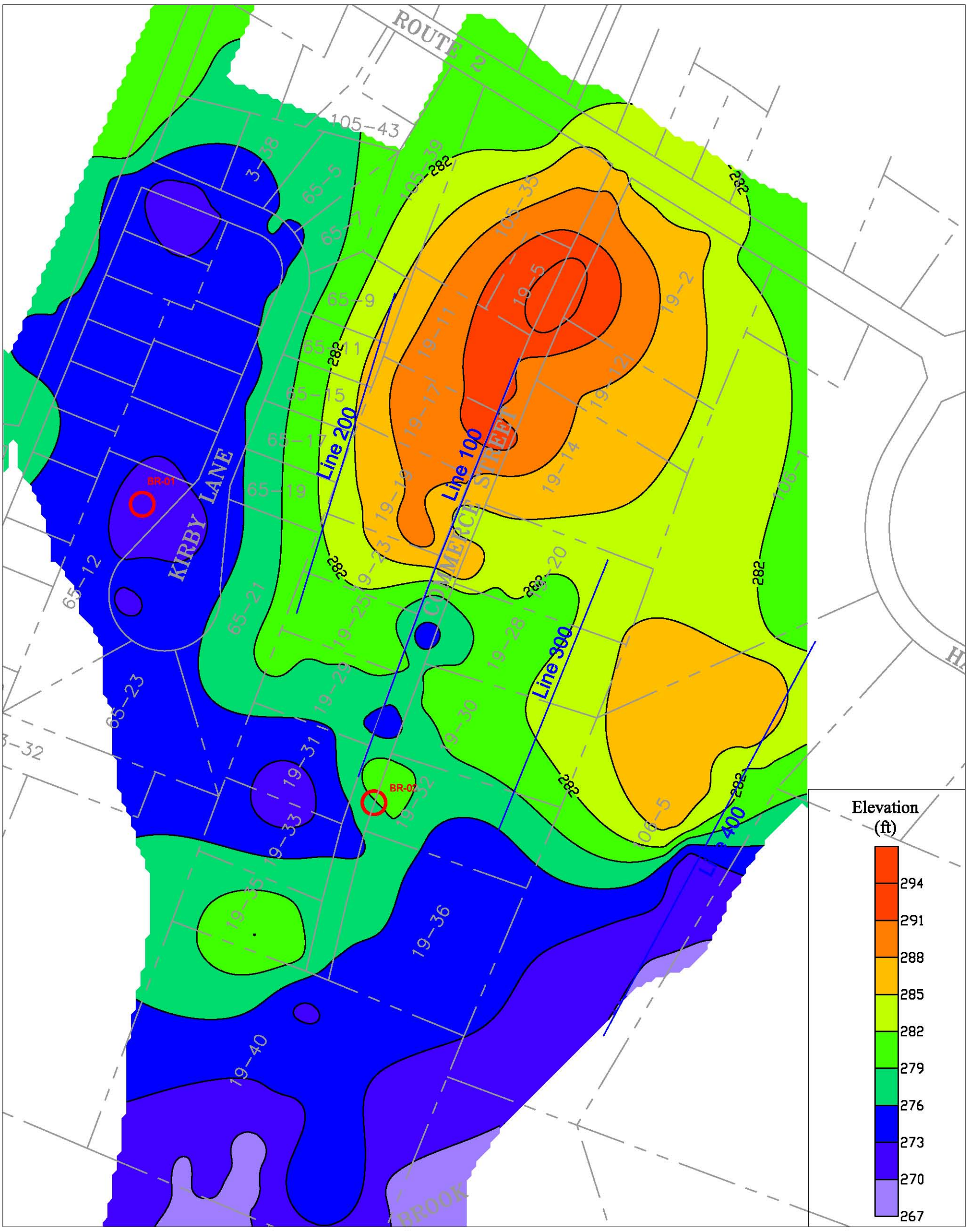

PLATE 5

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Till elevation contours represent the general trend of the till layer surface and are not intended to be used as precise site-specific elevation measurements.
4.) Till layer elevationswere determined by converting GPR travel times to distance.

0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Till Layer Elevation Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

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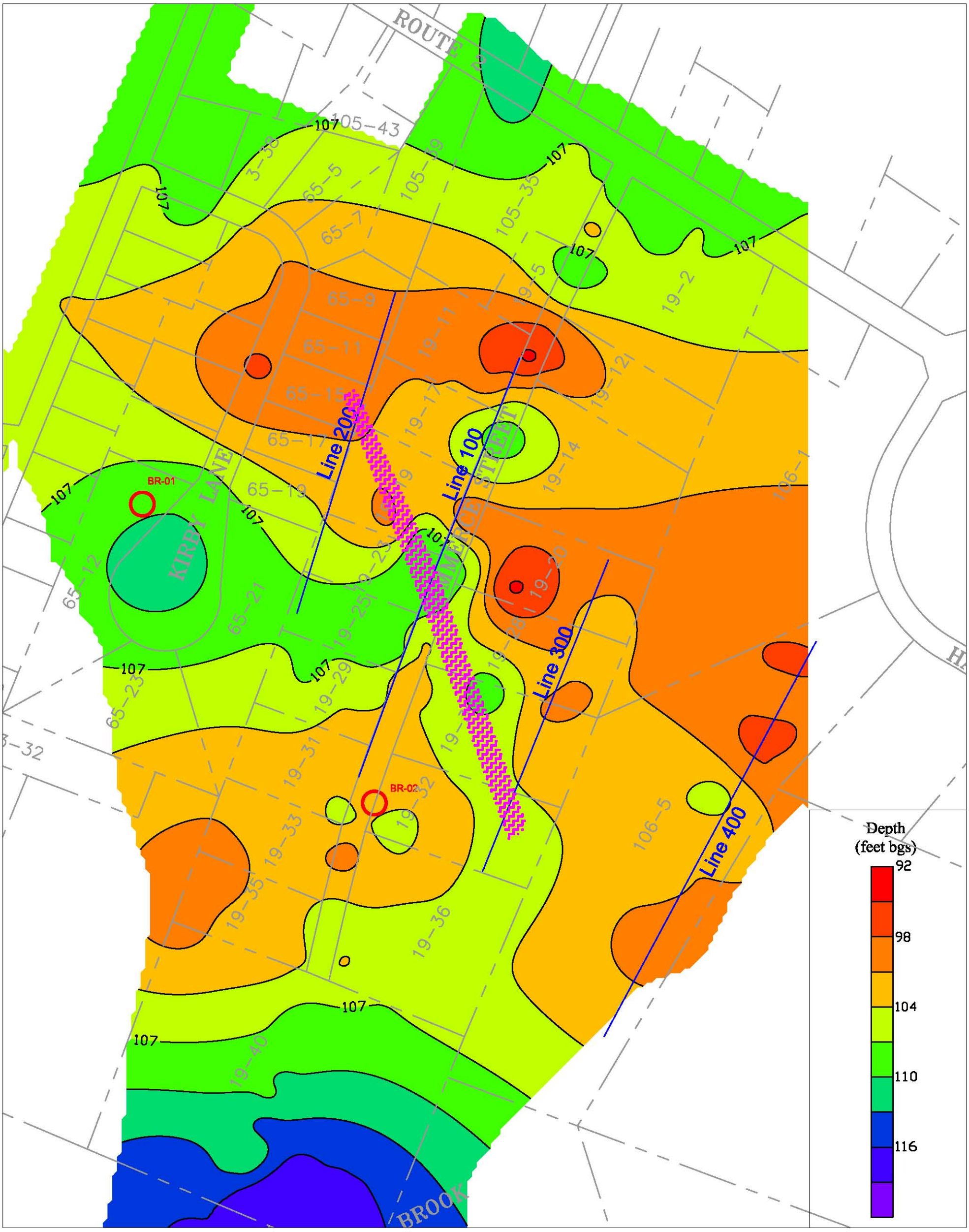


Possible Fracture Zone

PLATE 6

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Bedrock depth contours represent the general trend of the bedrock surface and are not intended to be used as precise site-specific depth measurements.
4.) Bedrock depths were determined by converting GPR travel times to distance.

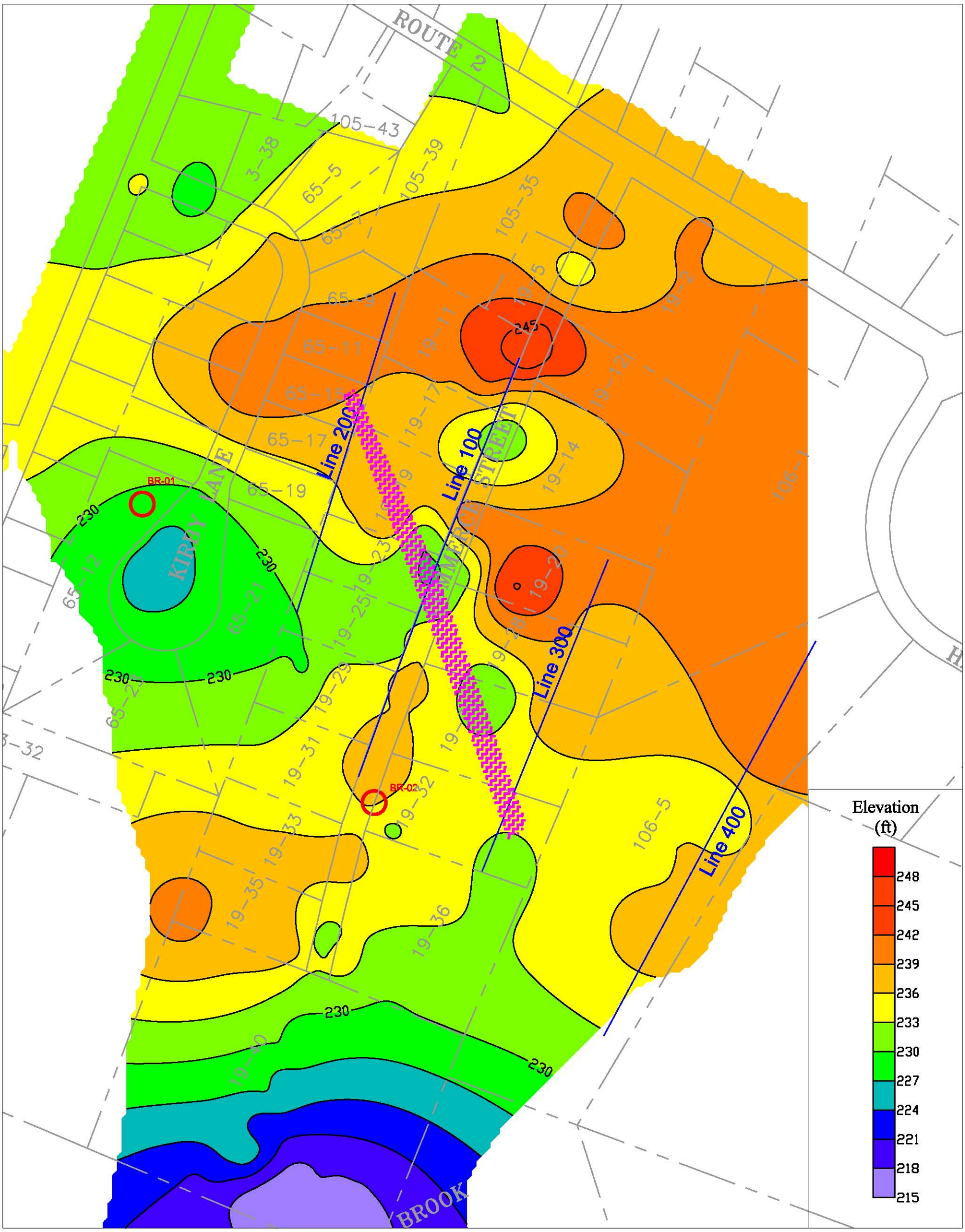
0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Bedrock Depth Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

NOT ALL SUBSURFACE FEATURES MAY BE DEPICTED ON THIS MAP



Possible Fracture Zone

PLATE 7

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Bedrock elevation contours represent the general trend of the bedrock surface and are not intended to be used as precise site-specific elevation measurements.
4.) Bedrock elevations were determined by converting GPR travel times to distance.

0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Bedrock Elevation Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

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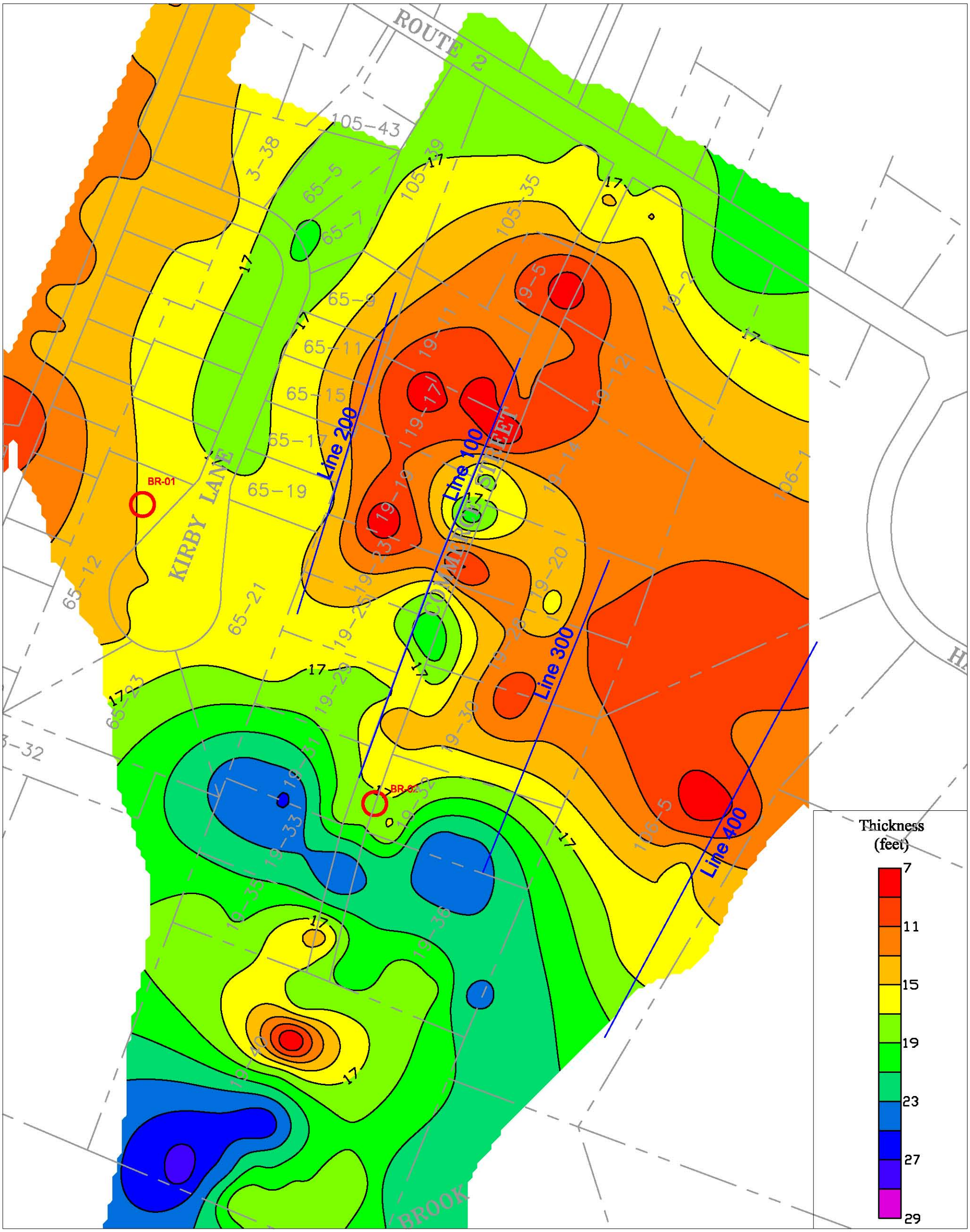

PLATE 8

Notes:
1.) Base map created by HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Clay thickness contours represent the general trend of the clay thickness and are not intended to be used as precise site-specific thickness measurements.
4.) The thickness of the clay layer was determined by taking the difference between the top of till and top of clay elevations.

0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Clay Layer Isopach Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

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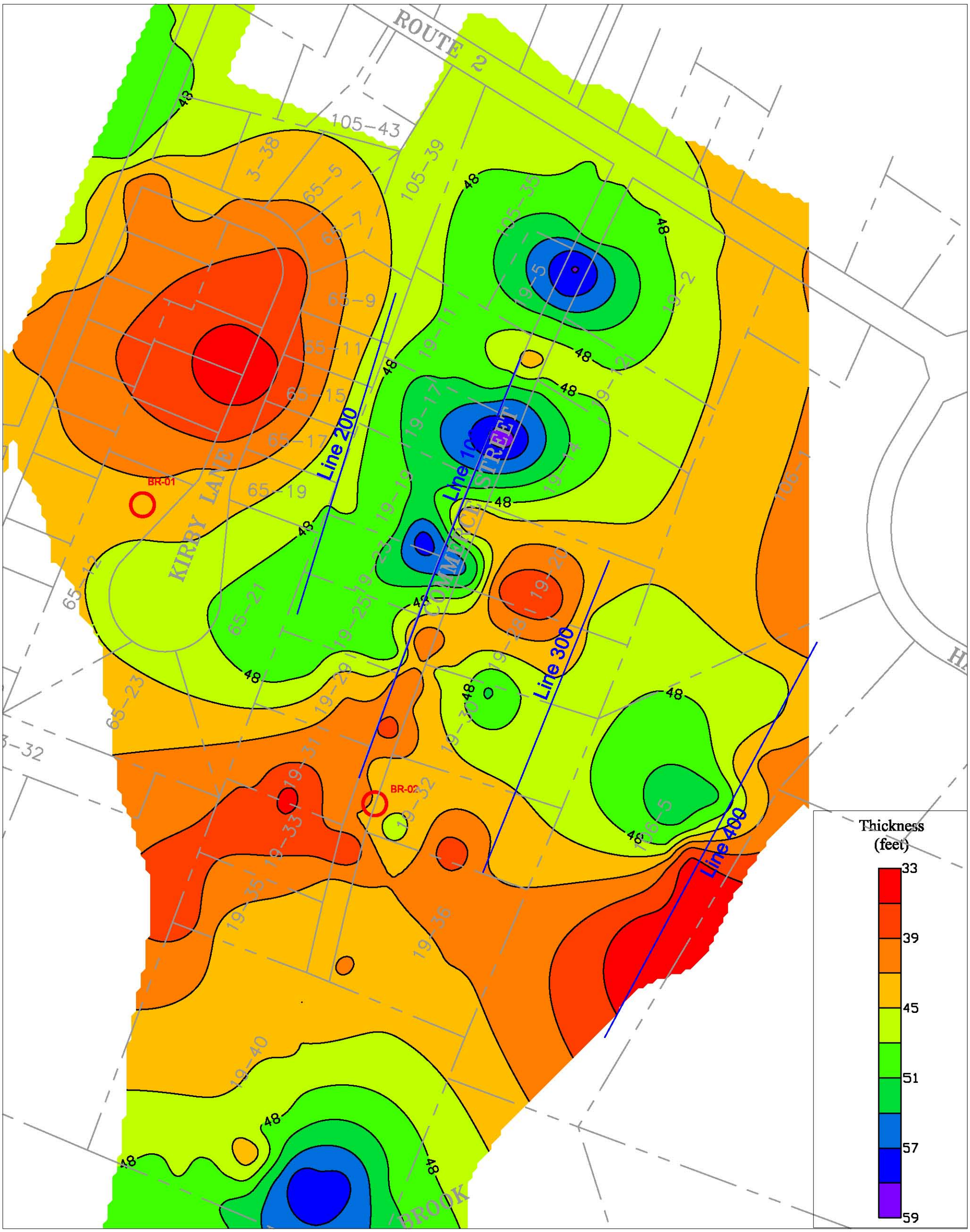

PLATE 9

Notes:
1.) Base map created from HGI GPS data.
2.) HGI's geophysical traverses were located using a subfoot GPS system. The data were overlaid on our GPS map.
3.) Till thickness contours represent the general trend of the till thickness and are not intended to be used as precise site-specific thickness measurements.
4.) The thickness of the till layer was determined by taking the difference between the top of bedrock and top of till elevations.

0 50 100 200 400
Scale in Feet

AUGUST 2010	FILE NO. 2010036

Stratigraphic Investigation
Till Layer Isopach Contour Plot
Commerce Street Superfund Site
Williston, Vermont

Hager GeoScience, Inc.
596 Main Street, Woburn, MA 01801
(781)-935-8111 hgi@hagergeoscience.com

NOT ALL SUBSURFACE FEATURES MAY BE DEPICTED ON THIS MAP

STRATIGRAPHIC INVESTIGATION REPORT
COMMERCE STREET SUPERFUND SITE
WILLISTON, VERMONT

Prepared for:

Nobis Engineering, Inc.
18 Chenell Drive
Concord, NH 03301

Prepared by:

Hager GeoScience, Inc.
596 Main Street
Woburn, MA 01801

File 2010036
August 2010

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FIGURES

Figure 1 GPR 100-MHz bi-static antenna setup for survey along Commerce Road.
Figure 2 GPR MLF bi-static antenna traversing along Kirby Lane toward South Brownell Road.
Figure 3 Seismic reflection and refraction setup along Commerce Street.

PLATES

Plate 1 Location Map with GPR and Seismic Lines
Plate 2 Depth Map of Clay Layer Surface
Plate 3 Elevation Map of Clay Layer Surface
Plate 4 Depth Map of Till Layer Surface
Plate 5 Elevation Map of Till Layer Surface
Plate 6 Depth Map of Bedrock Surface
Plate 7 Elevation Map of Bedrock Surface
Plate 8 Isopach Map of Clay Layer
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APPENDICES

APPENDIX A. The Geophysical Techniques

APPENDIX B. GPR Cross Sections (Plates B1-B34)

APPENDIX C. Seismic Reflection Profiles (Plates C1-C8)

EXECUTIVE SUMMARY

In June of 2010, Hager GeoScience, Inc. (HGI) performed a geophysical survey for Nobis Engineering, Inc. (Nobis) at the Commerce Street Superfund Site in Williston, Vermont. HGI's objective was to provide an elevation and depth contour map to confirm the areal extent of a subsurface clay unit and depth to bedrock to help select locations for groundwater vertical profiling and soil boring/monitoring well installation.

HGI performed the field investigations primarily with low frequency ground penetrating radar (GPR), using high-powered 100- and 40-MHz bi-static antennas. Data were collected along four seismic reflection and refraction lines to provide bedrock depth constraints for the GPR interpretation. A GPS system was used to provide survey and elevation control.

HGI performed the data collection over 8 days between June 8th and 17th, 2010. Twenty-seven GPR transects totaling 9093 feet and four seismic profiles totaling 3335 feet were made in the project area.

Three stratigraphic horizons were mapped within the project area. In descending order, they include clay, till, and bedrock horizons. Depth and elevation maps were prepared for each horizon, as well as isopach maps of the clay and till layers.

The clay layer model is recognized as undulating, with localized lows along Commerce Street and larger depressions in the east and west portions of the survey area. The range of relief of the clay horizon is approximately 28 feet, and its thickness varies from 7 to 29 feet.

The till model is characterized by a circular high at the north end of Commerce Street, and elevation lows at the western and southern portions of the project area. The range of elevation relief of the till horizon is approximately 30 feet, and its thickness ranges from 33 to 59 feet.

The bedrock topographic relief is approximately 36 feet across the project area, occurring as an undulating surface with the highest elevation at the northern end and the lowest elevation at the southern end of the project area.

1.0 INTRODUCTION

In June of 2010, Hager GeoScience, Inc. (HGI) performed a geophysical survey for Nobis Engineering, Inc. (Nobis) at the Commerce Street Superfund Site in Williston, Vermont. HGI's objective was to provide an elevation and depth contour map to confirm the areal extent of a subsurface clay unit and depth to bedrock to help select locations for groundwater vertical profiling and soil boring/monitoring well installation.

Site preparation and overview were performed on June 7th, 2010. Initial limits for the geophysical survey were loosely established from information provided by Nobis and physical constraints of the site. The area of investigation - defined by Route 2 to the north, wetlands at the south end of Commerce Street, South Brownell Street to the west, and an unnamed brook to the east - was expanded to provide reasonable spatial limits for developing a stratigraphic model. The spatial distribution of 394 data points provided by the GPR method made the expansion possible.

Nobis provided HGI with the logs from two bedrock borings located within the area of the geophysical investigations. HGI used these logs to calibrate the clay/bedrock model.

2.0 DATA ACQUISITION

The geophysical study at the Commerce Street Superfund Site was designed to acquire a distribution of data suitable for mapping overburden and bedrock stratigraphy. The current data set provides much more spatial resolution than that from a previous survey completed at the site by Geophysics GPR International, Inc. in 1999.

HGI performed the data collection during the period from June 8th through 17th, 2010, using low frequency GPR and seismic reflection/refraction. The low-frequency GPR surveys were performed using two very high-powered bi-static antenna systems: a 100-MHz antenna with 3.3 feet of separation and a 40-MHz antenna with 15 feet of separation. Data were collected along four seismic lines to help constrain the GPR interpretation, particularly where well data were not available (Plate 1). The seismic surveys included reflection and limited refraction surveys using a 48-channel seismograph system. HGI provided a field crew of 3 to 4 people during the course of the field program. Figures 1 through 3 illustrate the GPR and seismic field setups.

The survey area was approximately 1500 x 2800 feet in size. GPR lines were added outside the site to expand the data on both the east and west sides of the area of concern. Twenty-seven GPR transects totaling 9093 feet and four seismic profiles totaling 3335 feet were made in the project area.

HGI used a Sokkia 2700 ISX GPS system to locate GPR lines, wells, test pits, seismic lines, and surface features. The GPS system was also used to obtain sufficient elevation points to reconstruct the surface topography and calculate the elevation of GPR-measured depth points.

Appendix A describes the geophysical techniques and their limitations.

2.1 Low Frequency GPR Survey

The primary use of the radar data was to enhance the spatial coverage of depth points for modeling stratigraphy and bedrock. The GPR method is amenable to the interrogation and mapping of discontinuous subsurface interfaces, such as changes in stratigraphy. GPR data were collected as two-way travel time, in which the measurements are made of the time for the input radar wave pulse to travel to a subsurface discontinuity and reflect back to the antenna at the ground surface. Depths to discontinuous interfaces were recovered from the recorded travel-time data using radar propagation velocities estimated through calibration with borehole logs and from material-specific velocity tables.

Twenty-seven (27) low frequency GPR traverses were completed throughout the site and perimeter where accessible (Plate 1). The low frequency GPR survey was conducted using GSSI SIR-2 and -2000 digital acquisition systems with very high powered 100-MHz and multiple low frequency (MLF) antenna systems. The MLF antenna system is capable of frequency configurations ranging from 15- to 80-MHz. A 40-MHz bi-static configuration was used to provide the depth penetration and vertical resolution needed for the survey.

The 40-MHz data were collected in discrete point mode and the 100-MHz data in continuous survey wheel mode. In point mode, the GPR pulses were manually triggered at 5-foot intervals along the line. Each scan was stacked 128 times at the measurement point to increase the signal-to-noise (S-N) ratio. A tape measure recorded distance along the line.

2.2 Seismic Survey

To acquire reflection data, HGI used 40-Hz RT Clark Products® geophones deployed along linear 48-channel geophone arrays, with 10-foot station spacing. The geophone array was attached to our Geometrics Geode® 48-channel exploration seismograph via a seismic cable that relays the motion-induced electrical signals from individual sensors. The electrical signals were recorded as SEG-2 Rev 1, 32-bit integer data. Our acquisition software provided a number of Windows-based modules that permitted the on-site display and evaluation of data quality. Seismic energy was provided by a Betsy Seisgun (on soil) using 400-grain 8-gauge industrial blanks and a propelled energy generator (PEG) (on pavement).

Reflection data was collected along four parallel north-south lines (Plate A1). Limited refraction data were collected along three of the four reflection lines (Lines 100-300). The reflection survey used a roll-along technique, with 48 geophones spaced at 10-foot intervals and shots every 10 feet between geophones. Shot records were 1 second long, with a sampling interval of 0.125 milliseconds. A total of 341 48-channel shot gathers

were collected: 98 for L100; 73 for L200; 73 for L300; and 97 for L400. The predominant fold coverage was 24 with a maximum of 48-fold coverage. Figures C-5 through C-8 illustrates survey geometries for lines 100 through 400, respectively.

Refraction data were collected using 48 stationary geophones, with three shots off each end of the line. The quality of the seismic signals was verified in the field at each shot location. For records exhibiting low S-N levels, additional shots were made to additively stack the coherent parts of the signal and help mitigate the detrimental effects of random environmental noise. Shot locations were also mirrored to enable examination of the reciprocity of refractor travel-times.

3.0 DATA REDUCTION AND ANALYSIS

Following the field data collection, the geophysical data were downloaded to a PC at the HGI office, where they were archived, processed, and analyzed using the following proprietary software:

- GPR: GSSI's RADAN for Windows XP™ with Structural and Stratigraphic Interactive Interpretation Module®
- Refraction: Rimrock Geophysics SipWin® and Interpex Limited's IXRefraX®
- Data Modeling: Surfer®
- Reflection: Geogiga Technology Corporation's Geogiga Reflector 6.0
- Graphic Presentations: AutoCAD® and Surfer®

Nearly 140 GPS measurements were made onsite to establish location and elevation survey control. Base station readings were registered to the Vermont State Plane Coordinate System (VSPCS), which is used as the basis for the report maps.

3.1 Low Frequency GPR Survey

Site stratigraphy along GPR traverses was determined using GPR reflections that arose due to the back-scattering of the input GPR wave from discontinuous stratigraphic interfaces. However, before the data could be analyzed, significant processing was required to reduce the detrimental effects of noise associated with radio frequency signals and reflections from surface structures and buried debris. As anticipated, the MLF system reached greater depths than the 100-MHz antenna.

The GPR data were processed using GSSI's RADAN for Windows XP™. High-pass and spatial filters, horizontal smoothing, gain adjustments, migration were performed as essential processing steps.

The processed radargrams were analyzed for the location and depth of bedrock. The GPR reflector boundaries and their depth were interpreted as clay, till, or bedrock surfaces on the basis of observed structural features and/or calibration depths provided by borehole data, if available. Appendix B contains cross sections of the GPR lines.

A total of 395 clay, till, and bedrock depth points were "picked" along boundaries observed in 27 GPR radargrams. The picks were saved as ASCII files and incorporated into an Excel database. Each bedrock depth point was associated with a calculated easting, northing, surface elevation, and two-way travel time. Travel times were converted to depth using a site-specific signal velocity value calculated from borehole data or velocity analysis of GPR data.

The Excel data base of clay, till, and bedrock depth points were used to create a 2-D grid matrix for each stratigraphic layer using a Kriging algorithm. The gridded data were smoothed and contoured using Surfer and constructed as AutoCAD drawings.

The geometries of the stratigraphic horizons are presented as separate depth and elevation maps (Plates 2 through 7). The elevation maps of the clay, till, and bedrock were used to isopach (thickness) contour maps of the clay and till, shown as Plates 8 and 9, respectively,

The confidence level for the delineated clay surface is higher than that for the till and bedrock surfaces. The confidence level for our interpretations is based on the ability to resolve large changes in the electromagnetic properties at the overburden/clay boundary compared to a much smaller change at the till/bedrock boundary. The precision for this data set is approximately ± 10%.

3.2 Seismic Reflection Survey

Using the Geogiga Technology Corporation's Geogiga Reflector 6.0 software, individual shot gathers for each seismic reflection line were combined into one file and organized by their survey geometry using a receiver and shot coordinate system. Using a common offset grouping, the shot gathers were processed to reduce the effects of cultural interference and non-reflected seismic energy. The processing regimen varied by location, but included frequency filters, F-K filters, trace editing, gain adjustments, and deconvolution.

Velocity analyses were performed at various locations along each line to determine stacking velocities and for the time-to-depth conversion. Using the velocity data, CDP time stacks of all the shot gathers for each line were created. Depth stacks where then created from the time stacks using the velocity data. Spiking deconvolution was used when necessary to enhance reflection boundaries that were, otherwise, poorly delineated.

Appendix C contains plots of the reflection depth profiles form Lines 100-400. The depth profiles have been annotated to show the clay and bedrock boundaries, as well as the till boundaries, where resolvable. Possible fracture zones where identified in Lines 100-300. They are based on anomalies in the reflector geometries.

It is important to note that the interpreted stratigraphic boundaries are acoustic boundaries and may not exactly match electromagnetic stratigraphic boundaries resolved by the GPR method.

3.3 Seismic Refraction Survey

Rimrock Geophysics SipWin® 2.78 and Interpex Limited's IXRefraX® 1.11 software were used to analyze the refraction data. Refraction data reduction and analysis initiated with the determination of arrival times of the direct (where applicable) and refracted waves for each shot-receiver pair. The arrivals were identified and "picked" on a trace-by-trace basis by examining individual seismograms for the break in phase leading the first coherent seismic wavelet arrival. Coherent arrivals were enhanced through the use of frequency filters that remove both coherent (e.g. electrical) and non-coherent (e.g. wind) noise from individual records.

Direct and refracted wave travel-times expressed as a function of source and receiver locations and elevations were used to generate the earth model with velocities to complement the seismic reflection data. Several iterations of modeled results were evaluated with available known constraints, including data from nearby boreholes.

The seismic refraction data were primarily used as a constraint for the seismic reflection and GPR interpretation. The signal frequencies normally used for this method contain wavelengths too long to resolve thin or shallow stratigraphy.

4.0 DATA SYNTHESIS

4.1 Stratigraphy

The geologic model presented in this report is built upon the clay, till, and bedrock stratigraphic mapping. The primary function of the geologic model is to provide the structural and thickness trends of the mapped units. Although deemed to be reasonably accurate, the depth and elevation data used for the model should be considered as good approximations. Additional calibration data for the model is needed to depict more accurate layer depths and elevations. In particular, additional surface topography and borehole derived bedrock depths in the central and northern portions of the investigation area are needed.

The clay topography (Plates 2 and 3) within the studied area consists of a low in the south-central region, a high ridge reaching elevation 305 through the northern center of the survey area, and valleys on the west and southeastern sides reaching an elevation of approximately 285 feet. The clay layer slopes gradually from a high of approximately 20 feet to a low in the south center, southeastern and western sides of the surveyed area.

The till layer (Plates 4 and 5) follows the same general trend as the clay layer. It reaches a topographic high in the north-central portion of the survey area of approximately 294

feet and slopes downward toward the east, west and south to a low of approximately elevation 267 feet.

The bedrock layer (Plates 6 and 7) shows a topographic high in the northeastern portion of the survey area, gradually sloping toward the south and east. The bedrock elevation reaches a high of approximately 248 feet and a low in the southernmost portion of the survey area of approximately 215 feet.

A possible bedrock fracture zone was identified in seismic reflection data from Lines 100 to 300. The possible fracture zone trends NNW and appears to align with the trend of the bedrock ridge.

The clay and till isopach maps define a post clay-deposition erosional environment responsible for shaping the configuration of the surfaces expressed in the clay and till elevation maps (Plates 3 and 5). This observation is consistent with the Vermont Geological Survey's interpretation of the surficial geology of the Williston Quadrangle. The investigation area is situated at the front of post-glacial deltaic deposits overlying the marine clay.

4.2 Comparison with Previous Survey

The results of this investigation correlate with some aspects of the previous geophysical results. Similar to the previous results, the top of the clay layer (referred to in the previous survey as silt) presented in this report occurs as an elevation high trending southwest through the northern edge of the survey area. Our results also indicate a low clay elevation at the southern, eastern, and western limits of the survey area where the previous results show low elevations surrounding this ridge. Our till contour map shows a pattern similar to that from the previous survey; i.e. a till ridge running through the north-central portion of the study area surrounded by low till elevations.

The greatest discrepancy between the two surveys is associated with the bedrock surface. The previous study's profiles show northeast-southwest-trending bedrock ridge while this study shows the bedrock ridges trending more east-west. The discrepancies between our depths/elevations and those of the previous survey are most likely due to the previous study's lower seismic vertical data resolution compared to GPR and their lower spatial data resolution affecting the structural trends of the stratigraphic surfaces.

Figure 1 GPR 100-MHz bi-static antenna setup for survey along Commerce Road.

Figure 2 GPR MLF bi-static antenna traversing along Kirby Lane toward South Brownell Road.

Figure 3 Seismic reflection and refraction line setup along Commerce Street.

APPENDIX C

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 1
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION
NORTH CHELMSFORD, MASSACHUSETTS 01863-2431

MEMORANDUM

DATE: 9/01/2010

SUBJECT: **Commerce Street Plume, Williston, VT - Volatile Organics Analysis of Soil Samples**

FROM: Scott Clifford, Chemist SC 9/2/10

TO: Karen Lumino, RPM

THRU: Dan Boudreau, Chemistry Team Leader DB 9/8/10

PROJECT NUMBER: 10080064

DATE OF ANALYSIS: 08/25/10 - 08/27/10

ANALYTICAL PROCEDURE:

Soil samples were analyzed using Region I's Standard Operating Procedure for Head Space Screening for Volatile Organic Compounds in Aqueous and Soil samples. (EIA-FLDVOA2.SOP). Soil samples were collected in 40 ml vials with 10 mls of methanol. Sample were analyzed using a Shimadzu GC14B gas chromatograph (GC) equipped with a a 30 meter, 0.53mm DBPS-624 column, electron capture and photoionization detectors. Concentrations of volatile organics were calculated using the external standard technique.

File: K:\CHEMISTRY\REPORTS\FIELD\10080064sfdvoa.xls

Target Compounds and Approximate Reporting Limits

Commerce Street Plume, Williston, VT - Soil Volatile Organic Target Compounds & Approximate Reporting Limits	
Compound	Reporting Limit ppb (ug/kg) wet wt.
Trichloroethylene (TCE)	4
Tetrachloroethylene (C_2Cl_4)	2
cis 1,2-Dichloroethylene (cis 12 DCEE)	80

Results: The results in tables are Tentatively Identified Compounds and Approximate Concentrations.

ND ( ) = Nothing detected above reporting limit. Reporting limit in parenthesis.

Note: Results are in ppb (ug/kg), based on sample wet weight.

Commerce Street Plume, Williston, VT - Soil VOA Results ppb (ug/kg)			
	08/25/10 - 08/27/10		
			cis
Sample #	TCE	C_2Cl_4	12DCEE
MB-01	ND(4)	ND(2)	ND(80)
SB1_0-1	ND(4)	ND(2)	ND(80)
SB1_3-3.5	ND(4)	ND(2)	ND(80)
SB1_8-8.5	ND(4)	ND(2)	ND(80)
SB1_12-12.5	ND(4)	ND(2)	ND(80)
SB1_22-22.5	6	ND(2)	ND(80)
SB1_17-17.5	ND(4)	ND(2)	ND(80)
SB1_44.5-45	66	ND(2)	ND(80)
SB06_1-2	ND(4)	ND(2)	ND(80)
SB06-3-3.5	ND(4)	ND(2)	ND(80)
SB06_7-7.5	ND(4)	ND(2)	ND(80)
SB06_13-13.5	ND(4)	ND(2)	ND(80)
SB06_18-18.5	ND(4)	ND(2)	ND(80)
SB06_23-23.5	22	ND(2)	ND(80)
SB06_27.5-28	18	ND(2)	ND(80)
SB06_32.5-33	7	ND(2)	ND(80)
SB06_37.5-38	15	ND(2)	ND(80)
SB06_42.5-43	ND(4)	ND(2)	ND(80)
SB02_0.5-1	ND(4)	ND(2)	ND(80)
SB02_2-2.5	ND(4)	ND(2)	ND(80)
SB02_7-7.5	ND(4)	ND(2)	ND(80)
SB02_12.5-13	ND(4)	ND(2)	ND(80)
SB02_22.5-23	2	ND(2)	ND(80)
SB02_17-17.5	ND(4)	ND(2)	ND(80)
SB02_29.5-30	740	ND(2)	ND(80)
SB02_30-30.5	2460	ND(2)	ND(80)
SB02_37.5-38	12500	ND(2)	ND(80)
SB03_0.5-1	ND(4)	ND(2)	ND(80)
SB03_3-3.5	ND(4)	ND(2)	ND(80)
SB03_7-7.5	ND(4)	ND(2)	ND(80)
SB03_12-12.5	ND(4)	ND(2)	ND(80)
SB03_17-17.5	1	ND(2)	ND(80)
SB03_22-22.5	40	ND(2)	ND(80)
SB03_25-25.5	785	ND(2)	ND(80)
SB03_34.5-35	7900	ND(2)	ND(80)
SB03_36.5-37	5700	ND(2)	ND(80)
SB04_0.5-1	ND(4)	ND(2)	ND(80)
SB04_3.5-4	ND(4)	ND(2)	ND(80)
SB04_7-7.5	ND(4)	ND(2)	ND(80)
SB04_12-12.5	ND(4)	ND(2)	ND(80)
SB04_17-17.5	ND(4)	ND(2)	ND(80)
SB04_24.5-25	1180	ND(2)	ND(80)
SB04_40.5-41	1710	ND(2)	ND(80)
SB05_0.5-1	ND(4)	ND(2)	ND(80)
SB05_3-3.5	ND(4)	ND(2)	ND(80)
SB05_7-7.5	ND(4)	ND(2)	ND(80)
SB05_13-13.5	ND(4)	ND(2)	ND(80)
SB05_17-17.5	ND(4)	ND(2)	ND(80)
SB05_25-35	690	ND(2)	ND(80)

PN 10030064

Balance check
50 gm = 49.99 gm
1.43 gm = 1.43 gm

Commerce St Plume
Williston, VT
Soil VOAs
Results ppb (ug/Kg) wet wt

FVAS 8/25/10
lc

	Sample ID	Final wt	Initial wt	Soil wet wt into 10mls MeOH	TCE	C2Cl4	cis 12DCEE
(1)	MB-01 (Blank)	–	–	–	ND(4)	ND(2)	ND(80)
(2)	SB1 0-1	42.37	36.62	5.75			
(3)	SB1 3-3.5	41.43	36.45	4.98			
(4)	SB1 8-8.5	44.56	36.68	7.88			
(5)	SB1 12-12.5	45.80	36.40	9.40			
(6)	SB1 22-22.5	47.65	36.37	11.28	6		
(7)	SB1 17-17.5	47.86	36.02	11.84	ND(4)		
(8)	SB1 44.5-45	46.92	36.35	10.57	66		
(9)	SB 06 1-2	46.00	36.65	9.45	ND(4)	ND(2)	ND(80)
(10)	SB 06 3-3.5	47.38	36.58	10.8			
(11)	SB 06 7-7.5	47.04	36.34	10.7			
(12)	SB 06 13-13.5	47.17	36.62	10.55			
(13)	SB 06 18-18.5	45.68	36.39	9.29			
(14)	SB 06 23-23.5	46.92	36.66	10.26	22		
(15)	SB 06 27.5-28	47.85	36.30	11.55	18		
(16)	SB 06 32.5-33	46.46	36.43	10.03	7		
(17)	SB 06 37.5-38	47.51	36.75	10.76	15		
(18)	SB 06 42.5-43	47.36	36.64	10.72	ND(4)		
(19)	SB 02 0.5-1	46.78	36.38	10.40	ND(4)		
(20)	2-2.5	47.45	36.68	10.77			
(21)	7-7.5	47.43	36.58	10.85			
(22)	12.5-13	48.14	36.6	11.54			
(23)	22.5-23	47.97	36.54	11.43	2		
(24)	17-17.5	47.84	36.4	11.44	ND(4)		
(25)	29.5-30	48.47	36.5	11.97	740		

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7/12/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

				Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
Count	Sample ID	Date Sampled	Date Analyzed	Concentration in Water (ug/L)						
1	VP-08 10	7/12/10	7/12/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
2	15								1.5	
3	20								1.3	
4	25								2.4	
5	30								10	
6	35								35	
7	40								23	
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:	7/12/10	Date Reviewed:	
Entered by:	Scott Clifford SC	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7/13/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

				Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
Count	Sample ID	Date Sampled	Date Analyzed	Concentration in Water (ug/L)						
1	VP-02 15	7/13/10	7/13/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
2	20									
3	25									
4	30									
5	35									
6	VP-04 12								0.7	
7	15								0.9	
8	20							0.13	5.7	
9	25							0.3	37	
10	30								5.4	
11	35								7.9	
12	40								200	
13										
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:	7/13/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7/14/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	VP-06 15	7/13/10	7/14/10	ND(2)	ND(0.5)	ND (0.5)	ND (0.5)	ND(0.2)	0.4	ND(0.2)
2	20	7/13/10							1.3	
3	25	7/13/10						0.1	6.3	
4	30	7/14/10						0.6	74	
5	35			ND(20)	ND(3)	ND (3)	ND (3)	1.0	121	ND(2)
6	40			ND (2)	ND (0.5)	ND (0.5)	ND (0.5)	0.3	66	ND(0.2)
7	VP-05 10							ND(0.2)	0.18	
8	15								2.7	
9	20							0.03	4.9	
10	25							ND(0.2)	4.5	
11	30								0.4	
12	35								0.04	
13	38								ND(0.5)	
14	VP-07 10*				Int	Int	Int		0.9	
15	15*				Int	Int	Int		2.1	
16	20				ND(0.5)	Int	ND(0.5)	0.06	5.9	
17	25					ND(0.5)		0.02	25	
18										
19										
20										

Notes:

Date Entered:	7-14-10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

* Notes:

Int = Interferences

UP-07 10 had many unidentified peaks, 21 ppb ethyl benzene and 7ppb m/p xylene

UP-07 15 had many unidentified peaks, 7ppb ethyl benzene and 7ppb m/p xylene

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7/15/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID		Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
					Approximate Quantitation Limits in Water (ug/L)						
					2	0.5	0.5	0.5	0.2	0.5	0.2
					Concentration in Water (ug/L)						
1	VP-07	30	7/14/10	7/15/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	29	ND(0.2)
2		35								0.3	
3		40								ND(0.5)	
4	VP-03	10	7/15/10							0.1	
5		15								2.0	
6		20 *								0.2	
7		25								1.2	
8		30								2.3	
9		35								1.9	
10		38								0.8	
11	VP-09	10								ND(0.5)	
12		15								1.5	
13		20								4.8	
14		25								4.3	
15		30								18	
16		35					ND(2)			206	
17		40			ND(30)	ND(5)	ND(5)	ND(5)	ND(2)	185	ND(2)
18	VP-10	10			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
19		15								ND(0.5)	
20		20 *								0.2	
		25								3.2	

Date Entered:	7-15-10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

* Large unidentified peaks (2) in samples VP-03 20' and VP-10 20'.

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7-16-10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID		Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
					Approximate Quantitation Limits in Water (ug/L)						
					2	0.5	0.5	0.5	0.2	0.5	0.2
					Concentration in Water (ug/L)						
1	VP-10	30	7-15-10	7-16-10	ND (15)	ND(5)	ND(5)	ND(5)	ND(3)	30	ND(3)
2		35			ND (20)	ND(6)	ND(6)	ND(6)	ND(4)	71	ND(4)
3		40			ND (20)	ND(6)	ND(6)	ND(6)	ND(4)	254	ND(4)
4	VP-13	10	7-16-10		ND (2)	ND(0.5)	ND(0.5)	ND (0.5)	ND(0.2)	ND(0.5)	ND(0.2)
5		15								0.6	
6		20								5.7	
7		25			ND (15)	ND(5)	ND(5)	ND(5)	ND(3)	40	ND(3)
8		30			ND(20)	ND(6)	ND (6)	ND(6)	ND(4)	270	ND(4)
9		35								743	
10		40			ND (8)	ND(8)	ND (8)	ND (8)	ND(5)	1525	ND(5)
11	VP-15	10			ND (2)	ND(0.5)	ND(0.5)	ND (0.5)	ND(0.2)	ND(0.5)	ND(0.2)
12		15								ND(0.5)	
13		20								0.8	
14											
15											
16											
17											
18											
19											
20											

Notes:

Date Entered:	7-17-10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7-19-10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	UP-15 25	7/16/10	7-19-10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	6.7	ND(0.2)
2	30			ND(50)	ND(15)	ND(15)	ND(15)	ND(6)	69	ND(6)
3	35			ND(80)	ND(50)	ND(50)	ND(50)	ND(20)	6015	ND(20)
4	40				ND(50)				20000	
5	UP-16 10			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
6	15								ND(0.5)	
7	20								4.7	
8	25								10	
9	30			ND(50)	ND(15)	ND(15)	ND(15)	ND(6)	850	ND(6)
10	35			ND(80)	ND(50)	ND(50)	ND(50)	ND(20)	19000	ND(20)
11	40				ND(50)	ND(50)	ND(50)	ND(20)	61000	ND(20)
12	UP-17 10			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
13	15									
14	20								0.5	
15	25								2.3	
16	30			ND(50)	ND(15)	ND(15)	ND(15)	ND(6)	914	ND(6)
17	35			ND(80)	ND(50)	ND(50)	ND(50)	ND(20)	4400	ND(20)
18	40			ND(80)					900	
19										
20										

Notes:

Date Entered:	7/19/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7-20-10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID		Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
					Approximate Quantitation Limits in Water (ug/L)						
					2	0.5	0.5	0.5	0.2	0.5	0.2
					Concentration in Water (ug/L)						
1	VP-11	15	7-19-10	7/20/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	0.2	ND(0.2)
2		20								4.7	
3		25							0.14	15	
4		30			ND(50)	ND(15)	ND(15)	ND(15)	ND(6)	269	ND(6)
5		35			ND(80)	ND(50)	ND(50)	ND(50)	ND(20)	1590	ND(20)
6		40								114	
7	VP-14	15			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
8		20								0.8	
9		25								6.1	
10		30			ND(50)	ND(15)	ND(15)	ND(15)	ND(6)	116	ND(6)
11		35			ND(80)	ND(50)	ND(50)	ND(50)	ND(20)	314	ND(20)
12		40								5980	
13	VP-12	15	7-20-10		ND(2)	ND(0.5)	ND(0.5)	ND(5)	ND(0.2)	0.4	ND(0.2)
14		20						ND(3)		10	
15		25			ND(20)	ND(5)	ND(5)	ND(5)	ND(2)	148	ND(2)
16		30			ND(50)	ND(15)	ND(15)	ND(15)	ND(6)	544	ND(6)
17		35			ND(80)	ND(50)	ND(5)	ND(5)	ND(20)	146	ND(20)
18		40			ND(2)	ND(0.5)	7.0	ND(0.5)	ND(0.2)	9.6	ND(0.2)
19	VP-19	15			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	0.2	ND(0.2)
20		20			ND(2)	ND(0.5)	~~ND(0.5)~~ 1.0	ND(0.5)	0.08	~~[illegible]~~ 17	ND(0.2)

Notes:

Date Entered:	7-20-10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7-20-10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	UP-19 25	7-20-10	7-20-10	ND(20)	ND(5)	ND(5)	ND(5)	ND(3)	82	ND(3)
2	30			ND(200)	ND(60)	ND(60)	ND(60)	ND(20)	1510	ND(20)
3	35			ND(6000)	ND(1000)	ND(1000)	ND(1000)	ND(500)	29,000	ND(500)
4	40			ND(6000)	ND(1000)	ND(1000)	ND(1000)	ND(500)	13,500	ND(500)
5	45			ND(5000)	ND(100)	ND(100)	ND(100)	ND(30)	7900	ND 30
6	UP-20 15			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
7	20			ND(2)					5.8	
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:	7-20-10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7-21-10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	VP-20 25	7/20/10	7/21/10	ND(120)	ND(30)	ND(30)	ND(30)	ND(10)	2230	ND(10)
2	30			ND(1500)	ND(500)	ND(500)	ND(500)	ND(300)	41,900	ND(200)
3	35			ND(6000)	ND(1000)	ND(1000)	ND(1000)	ND(600)	44,000	ND(500)
4	40			ND(1000)	ND(200)	ND(200)	ND(200)	ND(100)	4310	ND(100)
5	VP-22 15	7/21/10		ND 2	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	507	ND(0.2)
6	20								23	
7	25			ND(200)	ND(60)	ND(60)	ND(60)	ND(24)	261	ND(24)
8	30			ND(200)		4620		ND(0.5)	16	ND(20)
9	35			ND(2)		18200		ND(0.2)	201	ND(0.2)
10	40			ND(200)		212		ND(24)	118	ND(24)
11	VP-23 15			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
12	20			ND(2)					0.7	
13	25			ND(2)					7.8	
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:		Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

18,200

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7-22-10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID		Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
					Approximate Quantitation Limits in Water (ug/L)						
					2	0.5	0.5	0.5	0.2	0.5	0.2
					Concentration in Water (ug/L)						
1	VP-23	30	7-21-10	7-22-10	ND (80)	ND(20)	ND (20)	ND(20)	ND(6)	46.3	ND(6)
2		35			ND (2)	ND(0.5)	ND(0.5)	ND (0.5)	ND(0.2)	4.5	ND 0.2
3		38			ND (2)					0.4	
4		41			ND(2)					0.2	
5	VP-30	15	7-22-10							ND(0.5)	
6		20									
7		25									
8		30									
9		35									
10		40									
11	VP-29	15									
12		20									
13		25									
14		30								2.4	
15		35								ND(0.5)	
16		40									
17											
18											
19											
20											

Notes:

Date Entered:	7/22/10 ll	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	7/23/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

				Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
Count	Sample ID	Date Sampled	Date Analyzed	Concentration in Water (ug/L)						
1	VP 31 15	7/22/10	7/23/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	1.0	ND(0.2)
2	20								1.5	
3	25							0.12	3.4	
4	30	7/23/10						ND(0.2)	0.7	
5	35								2.2	
6	40								10	
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:	7/23/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Pore waters

Date:	
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	PW-1	7/22/10	7/22/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND0.5	ND(0.5)
2	2									
3	3									
4	4					2.4	ND(10)		5.5	
5	4D					3.0	ND(10)		4.9	
6	5					ND(0.5)	ND(0.5)		ND(0.5)	
7	6				ND(5)	1010	ND(10)		5.0	
8	7				ND(0.5)	17	ND(0.5)		ND(0.5)	
9	8				ND(5)	255	ND(3)		30	
10	9				ND(0.5)	209	ND(3)		1.6	
11	10				ND(0.5)	23	ND(0.5)		ND(0.5)	
12	11				ND(10)	1840	ND(10)		1020	
13	12				ND(0.5)	0.8	ND(0.5)		ND(0.5)	
14	13					0.8			ND(0.5)	
15	14					ND(0.5)				
16	15					4.0				
17	16					250	ND(3)			
18	9D					105	ND(3)			
19										
20										

Notes:

Date Entered:	7/23/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

pore waters

Date:	7/23/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	PW-17	7/22/10	7/23/10	ND (2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.5)
2	18	↓	↓	↓	↓	↓	↓	↓	↓	↓
3	19	↓	↓	↓	↓	1.7	↓	↓	0.2	↓
4	20	↓	↓	↓	↓	ND(0.5)	↓	↓	ND(0.5)	↓
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:	7/23/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	8/23/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	UP-01 15	8/23/10	8/23/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	6.1	ND(0.2)
2	20								5.5	
3	25								23	
4	30					ND(5)			57	
5	35							0.3	191	
6	40							0.15	229	
7	43							ND(0.2)	109	
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:	8/23/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	8/24/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID		Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
					Approximate Quantitation Limits in Water (ug/L)						
					2	0.5	0.5	0.5	0.2	0.5	0.2
					Concentration in Water (ug/L)						
1	VP 16A	15	8/23/10	8/24/10	ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.2)
2		20								0.5	
3		25								2.5	
4		30								18	
5	VP 18	15	8/24/10							ND(0.5)	
6		20								9.1	
7		30					22		0.5	2740	
8		35					26		0.11	5400	
9		40					ND(1)		ND(0.2)	26	
10	VP 24	25			ND(2)	ND(0.5)	8.6	ND(0.5)	5.1	3920	ND(0.2)
11		30			ND(300)	ND(75)	ND(75)	ND(75)	ND(25)	400	ND(25)
12		35			ND(4)	ND(2)	ND(2)	ND(2)	ND(0.2)	41	ND(0.2)
13		40			ND(2)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	1.4	ND(0.2)
14		15			ND(2)	ND(0.5)	5.3	ND(0.5)	14	1200	ND(0.2)
15		20			ND(4000)	ND(1000)	ND(1000)	ND(1000)	ND(400)	3920	ND(400)
16											
17											
18											
19											
20											

Notes:

Date Entered:	8/24/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

Commerce St. Plume Superfund Site, Williston, VT
Field Laboratory Data Sheet, GC VOC Analysis

Date:	8/25/10
Analyst:	Scott Clifford
Laboratory:	US EPA Mobile Lab

Notes:

Count	Sample ID	Date Sampled	Date Analyzed	Chlorobenzene	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	1,1,1-TCA
				Approximate Quantitation Limits in Water (ug/L)						
				2	0.5	0.5	0.5	0.2	0.5	0.2
				Concentration in Water (ug/L)						
1	UP-21 35	8/24/10	8/25/10	ND(2)	ND(0.5)	ND 0.5	ND 0.5	ND 0.2	0.2	ND(0.2)
2	40								0.4	
3	25								32	
4	30			ND (240)	ND(60)	ND (60)	ND (60)	ND(25)	1210	ND(25)
5	15	8/25/10		ND (2)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.2)	ND(0.5)	ND(0.2)
6	20								ND(0.5)	
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Notes:

Date Entered:	8/25/10	Date Reviewed:	
Entered by:	Scott Clifford	Reviewed by:	
Company:	US EPA	Company:	Nobis Engineering

DATA SUMMARY TABLE
OEME VOC Analysis
Aqueous - ug/L

SITE: Commerce Street Plume - Williston, VT
CASE NO.: E004S SDG NO.: 10070038

Sample Name	EP0086		EP0087		EP0088		EP0089		EP0090	
Sample Location	VP-25		VP-25		VP-25		VP-25		VP-25	
Lab Sample ID	AB07959		AB07960		AB07961		AB07962		AB07963	
Station ID	VP-2515-072310AX		VP-2520-072310AX		VP-2525-072310AX		VP-2530-072310AX		VP-2535-072310AX	
Dilution Factor	1		1		1		1		1	
Sample Date	23 Jul 10		23 Jul 10		23 Jul 10		23 Jul 10		23 Jul 10	
Date Analyzed	28 Jul 10		28 Jul 10		29 Jul 10		29 Jul 10		29 Jul 10	
Chemical										
1,1,1-Trichloroethane	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloroethylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Benzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Chlorobenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
cis-1,2-Dichloroethylene	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
m/p-Xylene	1.5	U	1.5	U	1.5	U	1.5	U	1.5	U
o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Tetrachloroethylene	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Toluene	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Trans-1,2-Dichloroethylene	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Trichloroethylene	0.20	U	0.48		2.8		16		20	

DATA SUMMARY TABLE
OEME VOC Analysis
Aqueous - ug/L

SITE: Commerce Street Plume - Williston, VT
CASE NO.: E004S SDG NO.: 10070038

Sample Name	EP0091		EP0092		EP0093		EP0094		EP0095	
Sample Location	VP-25		VP-25		VP-26		VP-26		VP-26	
Lab Sample ID	AB07964		AB07965		AB07966		AB07967		AB07968	
Station ID	VP-2540-072310AX		VP-2545-072310AX		VP-2615-072310AX		VP-2620-072310AX		VP-2625-072310AX	
Dilution Factor	1		1		1		1		5	
Sample Date	23 Jul 10		23 Jul 10		23 Jul 10		23 Jul 10		23 Jul 10	
Date Analyzed	29 Jul 10		29 Jul 10		28 Jul 10		28 Jul 10		29 Jul 10	
Chemical										
1,1,1-Trichloroethane	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U
1,1-Dichloroethylene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U
Benzene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U
Chlorobenzene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U
cis-1,2-Dichloroethylene	0.50	U	0.50	U	0.50	U	0.50	U	2.5	U
Ethylbenzene	1.0	U	1.0	U	1.0	U	1.0	U	5	U
m/p-Xylene	1.5	U	1.5	U	1.5	U	1.5	U	7.5	U
o-Xylene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U
Tetrachloroethylene	0.20	U	0.20	U	0.2	U	0.43		9.3	
Toluene	0.50	U	0.50	U	0.50	U	0.50	U	2.5	U
Trans-1,2-Dichloroethylene	1.0	U	1.0	U	1.0	U	1.0	U	5.0	U
Trichloroethylene	0.20	U	0.20	U	0.26		0.75		150	

DATA SUMMARY TABLE
OEME VOC Analysis
Aqueous - ug/L

SITE: Commerce Street Plume - Williston, VT
CASE NO.: E004S SDG NO.: 10070038

Sample Name	EP0096		EP0097		EP0098		EP0099		EP0100	
Sample Location	VP-26		VP-26		VP-26		VP-26		VP-28	
Lab Sample ID	AB07969		AB07970		AB07971		AB07972		AB07973	
Station ID	VP-2630-072310AX		VP-2635-072310AX		VP-2640-072310AX		VP-2645-072310AX		VP-2815-072410AX	
Dilution Factor	50		100		100		1		1	
Sample Date	23 Jul 10		23 Jul 10		23 Jul 10		23 Jul 10		24 Jul 10	
Date Analyzed	28 Jul 10		28 Jul 10		28 Jul 10		29 Jul 10		28 Jul 10	
Chemical										
1,1,1-Trichloroethane	50	U	100	U	100	U	1.0	U	1.0	U
1,1-Dichloroethylene	50	U	100	U	100	U	1.0	U	1.0	U
Benzene	50	U	100	U	100	U	1.0	U	1.0	U
Chlorobenzene	50	U	100	U	100	U	1.0	U	1.0	U
cis-1,2-Dichloroethylene	25	U	50	U	50	U	0.50	U	0.50	U
Ethylbenzene	50	U	100	U	100	U	1.0	U	1.0	U
m/p-Xylene	75	U	150	U	150	U	1.5	U	1.5	U
o-Xylene	50	U	100	U	100	U	1.0	U	1.0	U
Tetrachloroethylene	10	U	20	U	20	U	0.2	U	0.20	U
Toluene	25	U	50	U	50	U	0.50	U	0.50	U
Trans-1,2-Dichloroethylene	50	U	100	U	100	U	1.0	U	1.0	U
Trichloroethylene	900	U	5700		1900		1.3		0.20	U

DATA SUMMARY TABLE
OEME VOC Analysis
Aqueous - ug/L

SITE: Commerce Street Plume - Williston, VT
CASE NO.: E004S SDG NO.: 10070038

Sample Name	EP0101		EP0102		EP0103		EP0104		EP0105	
Sample Location	VP-28		VP-28		VP-28		VP-28		VP-28	
Lab Sample ID	AB07974		AB07975		AB07976		AB07977		AB07978	
Station ID	VP-2820-072410AX		VP-2825-072410AX		VP-2830-072410AX		VP-2835-072410AX		VP-2840-072410AX	
Dilution Factor	1		5		50		100		1	
Sample Date	24 Jul 10		24 Jul 10		24 Jul 10		24 Jul 10		24 Jul 10	
Date Analyzed	28 Jul 10		28 Jul 10		28 Jul 10		29 Jul 10		03 Aug 10	
Chemical										
1,1,1-Trichloroethane	1.0	U	5.0	U	50	U	100	U	1.0	U
1,1-Dichloroethylene	1.0	U	5.0	U	50	U	100	U	1.0	U
Benzene	1.0	U	5.0	U	50	U	100	U	1.0	U
Chlorobenzene	1.0	U	5.0	U	50	U	100	U	1.0	U
cis-1,2-Dichloroethylene	0.50	U	2.5	U	25	U	50	U	0.50	U
Ethylbenzene	1.0	U	5.0	U	50	U	100	U	1.0	U
m/p-Xylene	1.5	U	7.5	U	75	U	150	U	1.5	U
o-Xylene	1.0	U	5.0	U	50	U	100	U	1.0	U
Tetrachloroethylene	0.20	U	1.0	U	10	U	20	U	0.20	U
Toluene	0.50	U	2.5	U	25	U	50	U	0.50	U
Trans-1,2-Dichloroethylene	1.0	U	5.0	U	50	U	100	U	1.0	U
Trichloroethylene	9.0		130		1100		4900		23	

DATA SUMMARY TABLE
OEME VOC Analysis
Aqueous - ug/L

SITE: Commerce Street Plume - Williston, VT
CASE NO.: E004S SDG NO.: 10070038

Sample Name	EP0106		EP0107		EP0108		EP0109		EP0110	
Sample Location	VP-27		VP-27		VP-27		VP-27		VP-27	
Lab Sample ID	AB07979		AB07980		AB07981		AB07982		AB07983	
Station ID	VP-2715-072410AX		VP-2720-072410AX		VP-2725-072410AX		VP-2730-072410AX		VP-2735-072410AX	
Dilution Factor	1		1		1		50		1	
Sample Date	24 Jul 10		24 Jul 10		24 Jul 10		24 Jul 10		24 Jul 10	
Date Analyzed	29 Jul 10		29 Jul 10		29 Jul 10		29 Jul 10		29 Jul 10	
Chemical										
1,1,1-Trichloroethane	1.0	U	1.0	U	1.0	U	50	U	1.0	U
1,1-Dichloroethylene	1.0	U	1.0	U	1.0	U	50	U	1.0	U
Benzene	1.0	U	1.0	U	1.0	U	50	U	1.0	U
Chlorobenzene	1.0	U	1.0	U	1.0	U	50	U	1.0	U
cis-1,2-Dichloroethylene	0.50	U	0.50	U	0.50	U	25	U	0.50	U
Ethylbenzene	1.0	U	1.0	U	1.0	U	50	U	1.0	U
m/p-Xylene	1.5	U	1.5	U	1.5	U	75	U	1.5	U
o-Xylene	1.0	U	1.0	U	1.0	U	50	U	1.0	U
Tetrachloroethylene	0.20	U	0.44		3.0		26		0.20	U
Toluene	0.50	U	0.50	U	0.50	U	25	U	0.50	U
Trans-1,2-Dichloroethylene	1.0	U	1.0	U	1.0	U	50	U	1.0	U
Trichloroethylene	0.20	U	1.2		9.6		720		210	

DATA SUMMARY TABLE
OEME VOC Analysis
Aqueous - ug/L

SITE: Commerce Street Plume - Williston, VT
CASE NO.: E004S SDG NO.: 10070038

Sample Name	EP0111		EP0112		EP0113	
Sample Location	VP-27		VP-27			
Lab Sample ID	AB07984		AB07985		AB07986	
Station ID	VP-2740-072410AX		VP-2745-072410AX		TP-04-072610AX	
Dilution Factor	100		100		1	
Sample Date	24 Jul 10		24 Jul 10		26 Jul 10	
Date Analyzed	29 Jul 10		29 Jul 10		29 Jul 10	
Chemical						
1,1,1-Trichloroethane	100	U	100	U	1.0	U
1,1-Dichloroethylene	100	U	100	U	1.0	U
Benzene	100	U	100	U	1.0	U
Chlorobenzene	100	U	100	U	1.0	U
cis-1,2-Dichloroethylene	50	U	50	U	0.50	U
Ethylbenzene	100	U	100	U	1.0	U
m/p-Xylene	150	U	150	U	1.5	U
o-Xylene	100	U	100	U	1.0	U
Tetrachloroethylene	20	U	20	U	0.20	U
Toluene	50	U	50	U	0.50	U
Trans-1,2-Dichloroethylene	100	U	100	U	1.0	U
Trichloroethylene	1400		240		0.20	U

APPENDIX D

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-01
FILE NO. 80036
Sheet No. 1 of 3
Checked by: JF
Date Start 8/25/10
Date End 8/25/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
1		S-1	53	0.0-5.0			<1	S-1: 2" Dark brown, medium-fine sand, some fine gravel, some organics. 29" Brown, fine sand, fades to 10" Red/brown fine sand. 6" Very fine-fine sand. 6" Reddish-brown, medium-fine sand, little coarse sand. Sample collected at 0.5 - 1'. Sample collected at 3 - 3.5'.				
2												
3												
4												
5												
6		S-2	52	5.0-10.0			<1	S-2: 20" Coarse-medium sand, brown, moist. 2" Very fine sand, some fines, gray/brown, moist. 8" Fine sand, brown with dark brown lens at 4-inches (2-inch lens), wet. 5" Coarse-medium sand, brown, wet. 8" Fine sand, brown, wet. 9" Coarse-fine sand, brown, wet. Sample collected at 8 - 8.5'.		▽		
7												
8												
9												
10												
11		S-3	60	10.0-15.0			<1	S-3: 24" Fine sand, little medium-coarse sand, light brown. 18" Medium-fine sand, little coarse sand. 18" Gray, fine-medium sand. Sample collected at 12 - 12.5'.				
12												
13												
14												
15												
16		S-4	53	15.0-20.0			<1	S-4: 6" 6" Gray, Coarse-fine sand. 4" Medium-fine sand, gray. 36" Fine sand, gray. 1" Very fine sand with fines, gray. Sample collected at 17 - 17.5'.				
17												
18												
19												
20												
21		S-5	52	20.0-25.0			<1	S-5: 52" Gray, fine-very fine sand. Sample collected at 22 - 22.5'.				
22												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/25/10		7 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-01
FILE NO. 80036
Sheet No. 2 of 3
Checked by: JF
Date Start 8/25/10
Date End 8/25/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
24								No samples collected between 25 to 40 feet below ground surface (bgs) due to running sands.				
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41		S-6	60	40.0-45.0			<1	S-6: 60" Very fine sand, gray, saturated. Sample collected at 44.5 - 45'.				
42												
43												
44												
45												
		S-7	50	45.0-50.0				S-7: 11" Silty clay, gray, loose.				

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/25/10		7 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-01
FILE NO. 80036
Sheet No. 3 of 3
Checked by: JF
Date Start 8/25/10
Date End 8/25/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
								39" Clay, gray, hard from 11" to 28".				
47												
48												
49												
50												
51								End of Boring at 50 ft. bgs. Following completion of SB-01, Nobis attempted collection of samples between 25-40 feet bgs on 8/27/10. No recovery.				
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/25/10		7 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-02
FILE NO. 80036
Sheet No. 1 of 2
Checked by: JF
Date Start 8/26/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
1		S-1	48	0.0-5.0			1.1	S-1: 3" Topsoil, dark brown, dry-slightly moist. 9" Dark brown, fine sand, trace fines and medium sand, organics, moist. 10" Dark brown, fine sand, little organics. Defined transition. 7" Rust colored fine sand (fading to tan at bottom of 7"). 19" Tan, fine sand, trace medium sand. Sample collected at 0.5 - 1'. Sample collected at 2 - 2.5'.				1
2												
3												
4												
5												
6		S-2	47	5.0-10.0			<1	S-2: 5" Light brown sand little dark brown/black and rust, fine sand, wet. 10" Fine-medium well graded sand, less densly packed, saturated (water bearing zone). 12" Dense, fine sand, light brown, less dense (loose) 8" Fine-medium well-graded sand (water zone) 4" Dense, fine sand. 8" Fine-medium, water bearing sand, medium dense. Sample collected at 7 - 7.5'.				
7												
8												
9												
10												
11		S-3	35	10.0-15.0			<1	S-3: 7" Fine-medium sand, brown, saturated, less density. 11" Medium sand, brown/orange, less density. 15" Fine sand, more density. Sample collected at 12.5 - 13'.				
12												
13												
14												
15												
16		S-4	30	15.0-20.0			<1	S-4: 30" Brownnish gray, fine sand, medium density, saturated. Sample collected at 17 - 17.5'.				
17												
18												
19												
20												
21		S-5	26	20.0-25.0			<1	S-5: 26" Gray, fine sand, slight increase in density, saturated. Sample collected at 22.5 - 23.3'				
22												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:
1) 1.1 ppmv PID reading measured from 3" topsoil.

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-02
FILE NO. 80036
Sheet No. 2 of 2
Checked by: JF
Date Start 8/26/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
24												
25												
26		S-6	22	25.0-30.0			<1	S-6: 22" Gray, fine sand, slight increase in density, saturated. Sample collected at 29.5 - 30'.				
27												
28												
29												
30												
31		S-7	27	30.0-35.0			10.5	S-7: 27" Gray, fine sand, slight increase in density, saturated. Sample collected at 30 - 30.5'				
32							2.4					
33							1.7					
34							1.2					
35							<1					
36		S-8	17	35.0-40.0			20.8	S-8: 8" Fine sand, gray, wet. 9" Very fine sand, with silt, gray, wet. Performed field test for presence of DNAPL, result negative. Sample collected at 37.5 - 38'.				
37							88.8					
38							135.0					
39							27.8					
40							24.2					
41		S-9	16	40.0-45.0				S-9: 4" Silt with trace of very fine sand, gray. 12" Gray Clay.				
42												
43												
44												
45												

GRANULAR SOILS (N-Value)

0 to 4 - Very Loose
5 to 10 - Loose
10 to 30 - Medium Dense
31 to 50 - Dense
Over 50 - Very Dense

COHESIVE SOILS (N-Value)

0 to 2 - Very Soft
3 to 4 - Soft
5 to 8 - Medium Stiff
9 to 15 - Stiff
15 to 30 - Very Stiff
Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-03
FILE NO. 80036
Sheet No. 1 of 2
Checked by: JF
Date Start 8/26/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
1		S-1	33	0.0-5.0			<1	S-1: 5" Dark brown topsoil, organics, dry. 7" Fine sand, some organics, trace fines, dark brown, dry. 12" Fine sand, trace fines, light brown, dry, medium density. 4" Dark brown, fine sand fines, increasing density, dry. 5" Light brown fine sand, trace fines, dry. Sample collected at 0.5 - 1'. Sample collected at 3 - 3.5'.				
2												
3												
4												
5												
6		S-2	34	5.0-10.0			<1	S-2: 11" Fine sand, medium density, dark brown, trace organics, wet. 7" Brown, fine sand, trace medium sand, trace fine gravel, trace organics. 7" Dark brown, fine sand, little fines, fine-coarse sand, increasing density. 6" Light brown, fine sand with fines, trace coarse sand. 3" Dark brown/black, fine-very fine sand, trace fine gravel. Sample collected at 7 - 7.5'.				
7												
8												
9												
10												
11		S-3	29	10.0-15.0			<1	S-3: 5" Dark brown, fine-medium sand. 4" Medium-coarse sand, trace fine gravel, rust colored, decreasing density, wet. 20" Fine-medium sand, medium density, gray, wet. Sample collected at 12 - 12.5'.				
12												
13												
14												
15												
16		S-4	33	15.0-20.0			<1	S-4: 16" Fine-very fine sand, light brown/brown/rust. 17" Fine-very fine sand, wet, gray, increasing density. Sample collected at 17 - 17.5'.				
17												
18												
19												
20												
21		S-5	27	20.0-25.0			<1	S-5: 27" Fine-very fine sand with little fines, gray. Sample collected at 22 - 22.5'.				
22												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-03
FILE NO. 80036
Sheet No. 2 of 2
Checked by: JF
Date Start 8/26/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
24												
25												
26		S-6		25.0-30.0			2.3	S-6: Fine-very fine sand with some fines, gray. Sample collected at 25 - 25.5'.				
27							2.2					
28							1.7					
29							1.9					
30							2.2					
31		S-7	25	30.0-35.0			7.3	S-7: 25" Fine-very fine sand with fines, gray. Sample collected at 34.5 - 35'.				
32							6.8					
33							9.8					
34							17.8					
35							27					
36		S-8	23				41.1	S-8: 6" Fine grading to very fine sand with fines, gray, wet. 17" Fines, some very fine sand, gray, increasing fines with depth, increasing density. Sample collected at 36.5 - 37'.				
37							71.8					
38							17.9					
39							6.1					
40							5					
41		S-9	60	40.0-45.0			<1	S-9: 60" Gray clay.				
42												
43												
44												
45												
								End of Boring at 45 ft. bgs.				

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-04
FILE NO. 80036
Sheet No. 1 of 2
Checked by: JF
Date Start 8/26/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
1		S-1	42	0.0-5.0			<1	S-1: 10" Black, coarse-fine sand, medium-fine gravel, asphalt pieces. 4" Light brown fine sand, little fines. 3" Dark black with organics, very fine sand with fines. 8" Rust/orange colored fine-very fine sand with trace coarse sand fine gravel. 9" Fine-very fine light brown sand. 7" Fine-very fine brown sand, decreasing density, moist. Sample collected at 0.5 - 1'. Sample collected at 3.5 - 4'.				
2												
3												
4												
5												
6		S-2	33	5.0-10.0			<1	S-2: 4" Tan, very fine sand, decreasing fines, plastic, light brown/rust, wet. 12" Gray band at 0.5", tan very fine sand, decreasing fines, plastic, light brown/rust, 0.5" gray, 14" banded 1/4-1" bands with slight plastic. Sample collected at 7 - 7.5'.				
7												
8												
9												
10												
11		S-3	36	10.0-15.0			<1	S-3: 27" Brown/rust, fine-very fine sand, some fines, wet, (banded) 9" Gray, fine sand, wet. Sample collected at 12 - 12.5'.				
12												
13												
14												
15												
16		S-4	47	15.0-20.0			<1	S-4: 47" Fine sand, brown, gray at 37". Sample collected at 17 - 17.5'.				
17												
18												
19												
20												
21		S-5	120	20.0-30.0			17	S-5: 120" Very fine/fine sand, gray. Sample collected at 24.5 - 25'.				
22												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-04
FILE NO. 80036
Sheet No. 2 of 2
Checked by: JF
Date Start 8/26/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
24												
25												
26												
27												
28												
29												
30												
31				30.0-30.0				No recovery from 30 to 40 feet bgs, due to running sands.				
32												
33												
34												
35												
36												
37												
38												
39												
40												
41		S-6	7	40.0-45.0			5.4	S-6: 5" Very fine sand, slightly plastic. 2" Gray clay. Sample collected at 40.5 - 41'.				
42							2.8					
43							1.3					
44							4.8					
45												
								End of Boring at 45 ft. bgs. Gray clay encountered.				

GRANULAR SOILS (N-Value)

0 to 4 - Very Loose
5 to 10 - Loose
10 to 30 - Medium Dense
31 to 50 - Dense
Over 50 - Very Dense

COHESIVE SOILS (N-Value)

0 to 2 - Very Soft
3 to 4 - Soft
5 to 8 - Medium Stiff
9 to 15 - Stiff
15 to 30 - Very Stiff
Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-05
FILE NO. 80036
Sheet No. 1 of 2
Checked by: JF
Date Start 8/27/10
Date End 8/27/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
1		S-1	22	0.0-5.0			<1	S-1: 7" Topsoil, fine-coarse sand with fines, trace medium-fine gravel, dark brown with organics, dry. 2" Increasing plastic, dark brown clay, trace very fine-fine sand. 10" Loose, fine-coarse sand, little medium-fine gravel, trace fines organics, brown, dry. 3" Increasing plastic fines, some fine-coarse sand, trace fine gravel, dark brown. Sample collected at 0.5 - 1'. Sample collected at 3 - 3.5'.				
2												
3												
4												
5												
6		S-2	44	5.0-10.0			<1	S-2: 4" Plastic fines, little fine-medium sand, brown, dry. 6" Brown with dark brown plastic fines woth fine sand, little medium-coarse sand, moist, large piece of gravel at end of 6" (1" gravel). 5" Fine-very fine sand, brown with black, trace organics. 14" Dark brown, slightly plastic, fine-very fine sand with organics. 15" Gray, fine-very fine sand (1" organics at 1"), brownish gray to very gray. Sample collected at 7 - 7.5'.				
7												
8												
9												
10												
11		S-3	57	10.0-15.0			<1	S-3: 16" Dark brownish gray with black brown, increasing with organics, increasing fine sand with fines, plastic, wet, (wood pieces, sediment, rock fragments) - low density. 19" Grayish brown, fine-very fine sand, decreasing density, wet, loose. 15" Brown, fine-very fine sand. 2" Fine-medium gravel with fine-coarse sand. 5" Fine sand, brown. Sample collected at 13 - 13.5'.				
12												
13												
14												
15												
16		S-4	28	15.0-20.0			<1	S-4: 28" Gray, fine sand, some fine gravel. Sample collected at 17 - 17.5'.				
17												
18												
19												
20												
21		S-5		20.0-20.0				S-5: No recovery.				
22												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/27/10		5.5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-05
FILE NO. 80036
Sheet No. 2 of 2
Checked by: JF
Date Start 8/27/10
Date End 8/27/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
24												
25												
26		S-7	13	25.0-35.0			<1	S-7: 13" Gray, very fine sand. Sample collected at 25 - 35'.				
27												
28												
29												
30												
31												
32												
33												
34												
35												
36		S-8	35	35.0-40.0			<1	S-8: 35" Gray clay.				
37												
38												
39												
40												
41								End of Boring at 40 ft. bgs.				
42												
43												
44												
45												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/27/10		5.5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-06
FILE NO. 80036
Sheet No. 1 of 3
Checked by: JF
Date Start 8/25/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
1		S-1	48	0.0-5.0			1.1	S-1: 3" Organics. 10" Medium-fine sand, brown-light brown, trace gravel. 2" Dark brown, medium-fine sand. 23" Light brown/orange fine sand. 6" Brown, fine-very fine sand, trace medium sand, moist. 4" Very fine sand, moist. Sample collected at 0.5 - 1'. Sample collected at 3 - 3.5'.				
2												
3												
4												
5												
6		S-2	55	5.0-10.0			<1	S-2: 14" Brownish-gray, very fine sand, saturated. 12" Brown/gray, fine sand. 20" Fine sand. 9" Medium-coarse sand, some fine sand. Sample collected at 7 - 7.5'.				
7												
8												
9												
10												
11		S-3	60	10.0-15.0			<1	S-3: 16" Fine sand, brown, saturated. 5" Fine-medium sand, trace coarse. 6" Fine sand - fine medium sand, 1" very fine sand, brown. 32" Medium-fine sand, trace coarse. Sample collected at 13 - 13.5'.				
12												
13												
14												
15												
16		S-4	60	15.0-20.0			<1	S-4: 12" Gray, very fine, dense, sand. 3" Brown/orange, fine sand, trace medium-coarse sand. 18" Fine sand, trace medium sand, gray, medium-fine sand, some medium-coarse sand. 27" Coarse-medium sand, gray. Sample collected at 18 - 18.5'.				
17												
18												
19												
20												
21		S-5		20.0-25.0			<1	S-5: Fine-medium sand, moist, gray, dense. Sample collected at 23 - 23.5'.				1
22												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:
1) Sample stuck in PETG sleeve. Sample collected from 9" in sleeve.

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-06
FILE NO. 80036
Sheet No. 2 of 3
Checked by: JF
Date Start 8/25/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
24												
25												
26		S-6	29	25.0-30.0			<1	S-6: 29" Dark gray fine-very fine sand, wet/moist, dense. Sample collected at 27.5 - 28'.				
27												
28												
29												
30												
31		S-7		30.0-35.0			<1	S-7: Dark gray fine-very fine sand, wet/moist, dense. Sample collected at 32.5 - 33'.				
32												
33												
34												
35												
36		S-8	15	35.0-40.0			<1	S-8: 15" Dark gray fine-very fine sand, wet/moist, less dense in last 6". Sample collected at 37.5 - 38'.				
37												
38												
39												
40												
41		S-9	23	40.0-45.0			<1	S-9: 6" Dark gray fine-very fine sand, some silt, wet/moist. 17" Silty very fine sand. Sample collected at 42.5 - 43'.				
42												
43												
44												
45												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-06
FILE NO. 80036
Sheet No. 3 of 3
Checked by: JF
Date Start 8/25/10
Date End 8/26/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
47												
48												
49												
50												
51								Bottom of boring at 50' bgs.				
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												
65												
66												
67												
68												

GRANULAR SOILS (N-Value)

0 to 4 - Very Loose
5 to 10 - Loose
10 to 30 - Medium Dense
31 to 50 - Dense
Over 50 - Very Dense

COHESIVE SOILS (N-Value)

0 to 2 - Very Soft
3 to 4 - Soft
5 to 8 - Medium Stiff
9 to 15 - Stiff
15 to 30 - Very Stiff
Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/26/10		5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-07
FILE NO. 80036
Sheet No. 1 of 3
Checked by: JF
Date Start 8/27/10
Date End 8/27/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
1		S-1	41	0.0-5.0			<1	S-1: 7" Brown, fine-very fine sand, some organics, trace medium-coarse sand, trace gravel. 34" Brown, fine-very fine sand, trace coarse sand, trace fines, trace medium-coarse sand. Sample collected at 0.5 - 1'. Sample collected at 3 - 3.5'.				
2												
3												
4												
5												
6		S-2	39	5.0-10.0			<1	S-2: 15" Fine-very fine light brown sand, dry. 17" Very fine sand, trace fines, brown, moist at 10", wet at 3'. 3" Medium brown sand. 4" Fine sand, trace fine gravel. Sample collected at 7 - 7.5'.				
7												
8												
9												
10												
11		S-3	27	10.0-15.0			<1	S-3: 16" Medium-coarse brown sand, wet. 3" Very fine brown sand, increasing density. 3" Medium-coarse sand, decreasing density, brown. 1" Very fine sand, brown. 4" Medium-course sand, brown. Sample collected at 12 - 12.5'				
12												
13												
14												
15												
16								Only 20" of recovery from 15-45'. Very soft, zero hydraulic pressure from geoprobe used to push to 42'. Max PID reading was 8 ppmv. Sample collected at 15 - 45'.				
17												
18												
19												
20												
21												
22												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/27/10		8.5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-07
FILE NO. 80036
Sheet No. 2 of 3
Checked by: JF
Date Start 8/27/10
Date End 8/27/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												

GRANULAR SOILS (N-Value)	COHESIVE SOILS (N-Value)
0 to 4 - Very Loose	0 to 2 - Very Soft
5 to 10 - Loose	3 to 4 - Soft
10 to 30 - Medium Dense	5 to 8 - Medium Stiff
31 to 50 - Dense	9 to 15 - Stiff
Over 50 - Very Dense	15 to 30 - Very Stiff
	Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/27/10		8.5 feet		

REMARKS:

Nobis Engineering, Inc.

PROJECT

Commerce Street Plume
Superfund Site
Williston, Vermont
TO 80036

BORING NO. SB-07
FILE NO. 80036
Sheet No. 3 of 3
Checked by: JF
Date Start 8/27/10
Date End 8/27/10

Boring Co. Zebra Environmental Rig Geoprobe 8260 Boring Location See Site Sketch
Driller Brian Ramos, Jeff S. Inspector AB/JF Ground Surface El. Datum Top-of-Riser El.

Depth (ft.)	Casing Blows (ft.)	SAMPLE INFORMATION Type & No.	REC (inches)	DEPTH (feet)	BLOWS/ 6 IN.	SPT N-Value	PID	SAMPLE DESCRIPTION ASTM D2488 - Visual Manual Procedure	WELL DETAIL	Ground Water	STRATUM	REMARKS
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64								Bottom of boring at 63.5' bgs. Gray clay encountered.				
65												
66												
67												
68												

GRANULAR SOILS (N-Value)

0 to 4 - Very Loose
5 to 10 - Loose
10 to 30 - Medium Dense
31 to 50 - Dense
Over 50 - Very Dense

COHESIVE SOILS (N-Value)

0 to 2 - Very Soft
3 to 4 - Soft
5 to 8 - Medium Stiff
9 to 15 - Stiff
15 to 30 - Very Stiff
Over 30 - Hard

Sampler: Soil samples were collected using Geoprobe Macrocore discrete interval samplers. The sampler produces a 60"x2" sample in a disposable PVC sleeve. The sampler is driven to depth using a Geoprobe Model 8260 hydraulic push probe.

Drilling Method:

Groundwater Observations (ft.)

Date	Time	Depth Below Ground	Depth Below Riser	Stabilization Time
8/27/10		8.5 feet		

REMARKS:

KEY TO SYMBOLS

Symbol	Description

Misc. Symbols

▽	Water table during drilling

Notes:

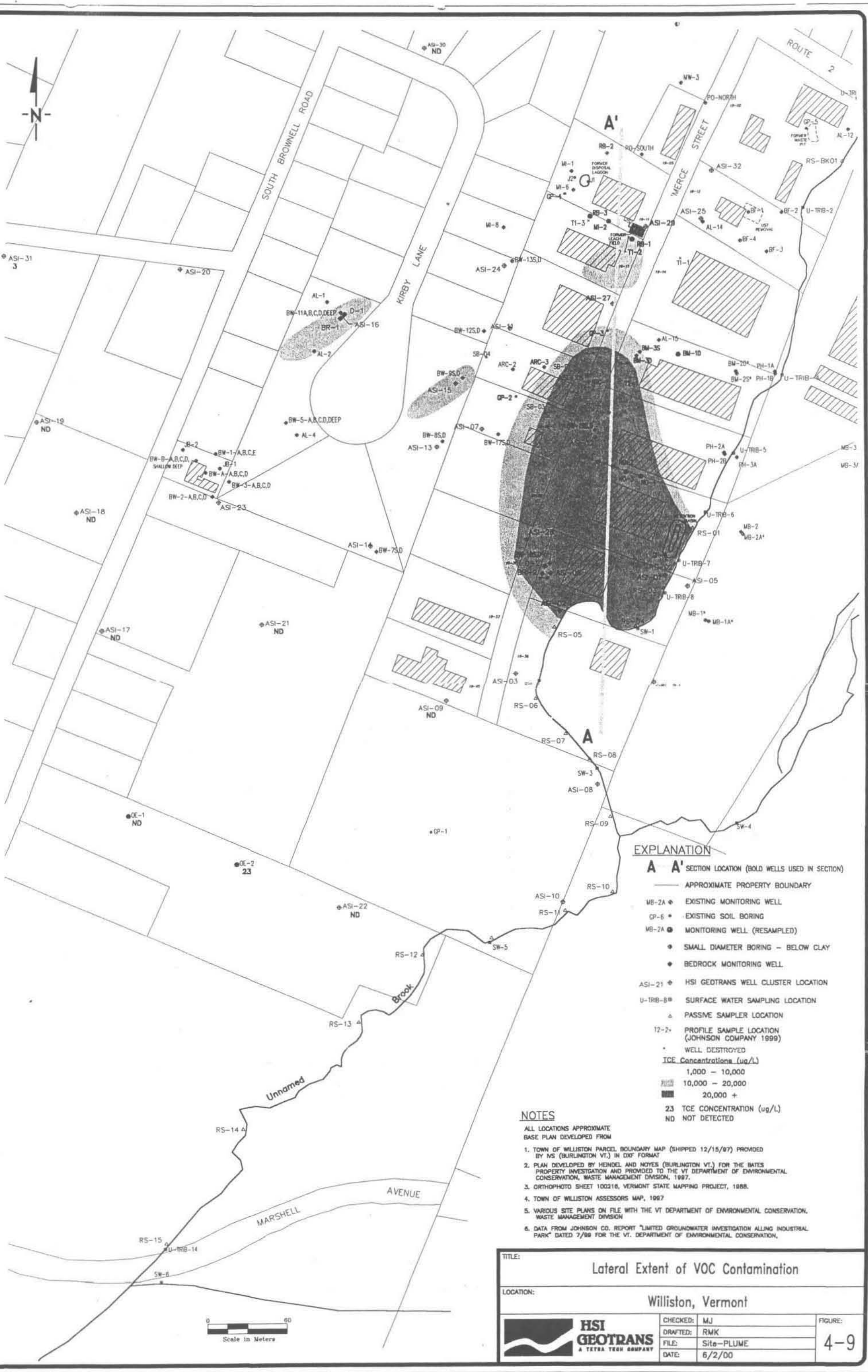
1. Exploratory borings were drilled on the dates indicated using the methods described in the boring logs.

2. Groundwater was encountered as indicated.

3. Boring locations were located relative to existing site features.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

APPENDIX E



TITLE: Lateral Extent of VOC Contamination

LOCATION: Williston, Vermont

HSI GEOTRANS A TETRA TECH COMPANY

CHECKED:	MJ
DRAFTED:	RMK
FILE:	Site-PLUME
DATE:	6/2/00

FIGURE: 4-9

APPENDIX F

Nobis Engineering, Inc.

EPA RAC Contract No. EP-S1-06-03

Commerce Street Field Sampling Technical Systems Audit (TSA) Report

To: Scott Harding and Jason Fopiano
From: Gail DeRuzzo
T.O. No.: 0036-RI-CO-019L
Date: January 13, 2011

INTRODUCTION

A field sampling technical systems audit (TSA) was conducted at the Commerce Street Plume Site located in Williston, Vermont, on December 2, 2010 during a multiday groundwater sampling event. The Nobis staff on site consisted of: Jason Fopiano (JF) as Field Operations Leader (FOL); Josh Stewart (JS) as sample manager; and Ken Marks (KM), Kelly Armitage (KA), Heidi Borchers (HB), Erik Johnson (EJ), and Jay Ward (JW) as field technicians.

The purpose of the audit was to review use and calibration of sample equipment and instrumentation, sample collection procedures, sample handling, tracking, and chain-of-custody procedures, and data handling and management processes for conformance with the QAPP and SOPs. The audit team consisted of Nobis' Lead Chemist Gail DeRuzzo (GD). The field work conducted during this mobilization is referenced in the Quality Assurance Project Plan (QAPP) Subsurface Investigation, Commerce Street Plume Superfund Site, Williston, Vermont dated November 2010. Groundwater sampling was being conducted during this mobilization. The following standard operating procedures (SOP) are cited in the QAPP and pertain to this mobilization:

- SOP No.: SA-003 – Low Flow Groundwater Sampling
- SOP No.: FS-005 – Calibration of YSI® Multiparameter Water Quality Meters
- SOP No.: FS-006 – Calibration of Turbidity Meters
- SOP No.: FS -004 – Field Sampling Equipment Decontamination
- SOP No.: SH-001 – Environmental Samples: Packaging and Shipping

A field audit checklist developed by Nobis was used during the audit process. The following facilities, equipment, documents, and activities were observed while on site:

- Site base camp
- Bottle storage
- Calibration station
- YSI 600XL Multiparameter Water Quality Meters
- Turbidity Meters (LaMotte 2020)
- YSI Instrument Calibration – end of day and walk through initial calibration (EJ)
- Turbidimeter Instrument Calibration – end of day and walk through initial calibration (EJ)
- Calibration Records

- Field Logbook
- Field Logsheets
- Low-flow GW sampling with bladder pump (KA)
- Decon area
- Decon of bladder pump (JW)
- Equipment Blank collection (JS/JW)
- Sample Management staging area
- Chains-of-custody

SUMMARY OF FINDINGS AND OBSERVATIONS

A listing of findings and observations follows. All findings require a response from the Project Manager and/or FOL with a corrective action or recommendation for alternative resolution of the findings within 30 days of the report. Implementation of the corrective actions must be made before the next sampling round.

Observations do not require a response and for the most part are just documentation of good practices by the field team. However, they may warrant discussion to see if incorporation would improve quality or efficiencies in performance.

Field Findings:

1. Finding: A copy of the QAPP was not available at the Site. Per Section 3.1 of the QAPP, a copy of the QAPP will be available at the Site for staff to access. Although the QAPP was available electronically and each sampler had copies of the applicable sampling SOPs, it is advisable to have a hardcopy of the QAPP (including SOPs) printed out and handy to field personnel that do not have access to the computer and/or if power is not available to use the computer.

2. Finding: The FOL had not maintained the field logbook while at the Site. He completed entries after the field operation was completed. Daily entries should be made during the field activities.

3. Finding: The calibration log sheets were missing information. HB's calibration sheet did not have the date of initial calibration. KM and JW's calibration sheets were missing information in the Equipment Information block such as the source of calibration solutions. All information must be completed on the calibration forms. Omissions were identified and completed during the sampling event.

4. Finding: Fifteen new wells were installed three weeks prior to the sampling event. The depths of the wells were not updated on the Table 8-2 with existing wells to have available to the samplers in preparation for sampling. As a result the samplers had to obtain the well information (well depth, screen depth, screen length and screen intake depth) from the FOL, which was then recorded on the field logs and used to properly

position the pump prior to sampling. This information should be updated on the tables prior to mobilization for more efficient and accurate dissemination to the samplers.

5. Finding: Sample ASI-15D2 was initially collected and erroneously documented as sample MI-8. The sampler did not verify the correct well identification before collecting the sample and did not realize it was the wrong sample point until she was sent to sample MI-8 the next day. Correct verification of well ID and subsequent documentation are keys to field sampler's responsibility. Correction to the well ID was made during the sampling event, while the auditor was at the Site and prior to shipping of any samples to the laboratory.

6. Finding: Sample ASI-14S was stated in the QAPP to required special sampling requirements due to the well diameter being less than 2 inches. However, since the recharge was deemed adequate this well was sampled using a modified low flow procedure, with a peristaltic pump instead of the procedure stated in the QAPP. This deviation from the QAPP will require documentation in the final report. In the future, this well will be sampled in accordance with the approved QAPP. This sampling method does not impact the quality of the data.

Field Observations:

1. Observation: Decon vats were labeled with the order for use but not with what they contained. It is recommended that the actual content also be recorded on the vats.

2. Observation: Although there was some knowledge of the MP-10 sample feature that offers one discharge to fill 40-mL VOA vials, there seemed to be a reluctance to use the feature. Since this feature offers the shortest exposure to volatile loss during sampling, it is recommended that it be used.

Conclusions

The groundwater sampling conducted during the December 2010 event was performed in general accordance with the QAPP and SOPs with the above findings noted. Any omissions and modifications should be noted in final reports. Implementation of corrective actions and/or revisions to the QAPP, if necessary, will strengthen the QA/QC program for future events at this Site. Observations may require discussion to see if suggestions are worth implementation to improve quality and performance during future site activities.

The above findings and observations are not considered to have an impact on the quality and usefulness of the collected data.

APPENDIX G

Engineering a Sustainable Future

Memorandum

To: Ms. Karen Lumino, EPA Task Order Project Officer

From: Scott Harding, PE, Nobis Project Manager

Subject: TO 36 - Commerce Street Plume Superfund Site
Evaluation of the Vapor Intrusion Pathway

Date: March 22, 2011

The attached Table presents a comparison of shallow groundwater data to Vermont Groundwater Protection Rule standards, Maximum Contaminant Levels, and Indoor Air Screening Levels. The Vermont Groundwater Protection Rule standards and Maximum Contaminant Levels are intended to be protective of human exposures to groundwater through ingestion of groundwater as drinking water. The Indoor Air Screening Levels represent groundwater concentrations which are protective of potential indoor air exposures resulting from vapor intrusion.

To evaluate the potential for groundwater exposures via the indoor air pathway, shallow groundwater data were screened against the target levels provided in Table 2c (corresponding to target cancer risks of $1x10^{-6}$) of the OSWER's *Draft Guidance for Evaluating the Vapor Intrusion Indoor Air Pathway from Groundwater and Soils* (EPA, 2002a). Several of the screening values in the Draft Vapor Intrusion Guidance were MCLs, rather than inhalation risk-based values. For purposes of this evaluation, these MCL-based values have been replaced by inhalation risk-based values (EPA Region 1, March 11, 2010). In addition, since the Vapor Intrusion Guidance was issued, the toxicity values for several of the detected contaminants have been withdrawn or updated. The corresponding screening levels have been updated to reflect 2010 toxicity values. For chemicals assessed in this evaluation that have non-carcinogenic effects, screening values were adjusted from a target HQ of 1.0 to a more conservative target HQ of 0.1.

Elevated concentrations of trichloroethylene (TCE) (3,400 µg/L) and tetrachloroethylene (PCE) (25 µg/L) were detected in well MW-08S during the November/December 2010 sampling round. These concentrations exceed the Indoor Air Screening Levels of 2.48 µg/L for TCE and 0.57 µg/L for PCE. As noted in the Draft 2010 Data Summary Report prepared by Nobis, the detections observed in MW-08 could be associated with another release and not the Commerce Street Plume Site. Therefore that condition should be considered while evaluating additional activities in the vicinity of MW-08.

Other slight exceedances of the Screening Values are summarized below:

- TCE in well AL-15 (4.8 µg/L) and well ARC-03 (3.2 µg/L)
- PCE in well MI-08 (0.63 µg/L)
- Dichlorodifluoromethane in well AL-12 (2.7 µg/L). Screening Value is 1.43 µg/L

These conditions indicate potential risks from exposure to groundwater contaminants through vapor intrusion if buildings are present or if the property is improved by construction of buildings.

The detection limits for numerous additional contaminants are not low enough to rule out the possibility that these contaminants are also present in shallow groundwater at concentrations that may produce a risk via the vapor intrusion/indoor air pathway at other locations throughout the Site area. During future groundwater sampling rounds, Nobis can request the performance of trace analysis in select shallow monitoring wells to ensure detection limits are low enough for our contaminants of concern.

Nobis recommends that the detection limits are reduced as the next step to a vapor intrusion pathway evaluation. Once that is performed, further recommendations for vapor sampling (soil gas, sub slab or indoor air sampling) can be made based on review of the trace level analytical results.

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2010 Shallow Overburden Groundwater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

				Sample Location:	AL-12		AL-14		AL-15		ARC-03		ASI-14S		ASI-23S		BF-04		BM-03S		BW-13S		MI-01		MI-02	
				Month:	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./Dec.	May	Nov./
				Sample Name:	A2Q29	A42R1	A2PZ7	A3M31	A2PZ8	A3M32	A2PZ9	A3M33	A2Q07	A3M40	A2Q11	A3M43	A2Q06	A3M44	A2Q13	A3M46	A2Q15	A3M29	A2Q16	A3M49	A2Q17	A3
				Station ID:	AL-012-052010A	AL-012-1110A	AL-014-051810A	AL-014-1110A	AL-015-051910A	AL-015-1110A	ARC-003-051910A	ARC-003-1110A	ASI-014S-051810A	ASI-014S-1110A	ASI-023S-051810A	ASI-023S-1110A	BF-004-052010A	BF-004-1110A	BM-003S-051910A	BM-003S-1110A	BW-013S-052010A	BW-013S-1110A	MI-001-051910A	MI-001-1110A	MI-002-051810A	MI-002
Chemical	**CRQL**	**VT GWPR**	**MCL**	**Indoor Air Screening Value[4]**																						
1,1,1-Trichloroethane	0.5	200	200	7.11E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,1,2,2-Tetrachloroethane	0.5			2.80E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5			1.40E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,1,2-Trichloroethane	0.5	5	5	4.51E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,1-Dichloroethane	0.5	70		6.62E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,1-Dichloroethene	0.5	7	7	1.87E+01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,2,3-Trichlorobenzene	0.5			NA	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,2,4-Trichlorobenzene	0.5	70	70	3.45E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,2-Dibromo-3-chloropropane	0.5		0.2	6.75E-02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,2-Dibromoethane	0.5			1.53E-01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,2-Dichlorobenzene	0.5	600	600	2.55E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,2-Dichloroethane	0.5	5	5	1.94E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,2-Dichloropropane	0.5	5	5	2.11E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,3-Dichlorobenzene	0.5	600		NA	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,4-Dichlorobenzene	0.5	75	75	2.25E+00	0.5 U	5 U	0.22 J	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
1,4-Dioxane	100			1.61E+03		100 U		100 U		100 U		100 U		100 U		100 U		100 U		100 U		100 U		100 U		100
2-Butanone	5	4200		2.15E+05	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10
2-Hexanone	5			7.87E+02	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10
4-Methyl-2-pentanone	5			5.32E+04	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10
Acetone	5	700		2.17E+06	5 U	4.3 JB	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	10 U	5 U	6.4 J	5 U	10 U	5 U	5.9 JB	5 U	10 U	5 U	10
Benzene	0.5	5	5	1.37E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Bromochloromethane	0.5	90		NA	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Bromodichloromethane	0.5	80		7.59E-01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Bromoform	0.5			1.01E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Bromomethane	0.5	10		1.67E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Carbon disulfide	0.5			1.19E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.38 J	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Carbon tetrachloride	0.5	5	5	3.59E-01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Chlorobenzene	0.5	100	100	3.93E+01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Chloroethane	0.5			2.20E+03	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Chloroform	0.5	80	80	7.05E-01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.46 J	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Chloromethane	0.5	30		2.50E+01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
cis-1,2-Dichloroethene	0.5	70	70	NA	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
cis-1,3-Dichloropropene	0.5			4.19E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Cyclohexane	0.5			9.78E+01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	9.7	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Dibromochloromethane	0.5	80		2.82E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Dichlorodifluoromethane	0.5	1000		1.43E+00	**2.7**	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Ethylbenzene	0.5	700	700	3.02E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Isopropylbenzene	0.5			8.51E+01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	1 J	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
m,p-Xylene	0.5	10000	10000	2.38E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Methyl acetate	0.5			NA	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Methyl tert-butyl ether	0.5	40	35	3.90E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Methylcyclohexane	0.5			NA	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Methylene chloride	0.5	5		3.90E+01	0.5 U	1.2 J	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
o-Xylene	0.5	10000	10000	3.31E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Styrene	0.5	100	100	8.89E+02	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Tetrachloroethene	0.5	5	5	5.70E-01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Toluene	0.5	1000	1000	1.84E+03	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
trans-1,2-Dichloroethene	0.5	100	100	3.60E+01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
trans-1,3-Dichloropropene	0.5			4.19E+00	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Trichloroethene	0.5	5	5	2.48E+00	0.5 U	5 U	0.24 J	5 U	0.5 U	**4.8** J	0.5 U	**3.2** J	0.5 U	5 U	0.44 J	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.15 J	5 U	0.5 U	5
Trichlorofluoromethane	0.5	2100		1.77E+01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
Vinyl chloride	0.5	2	2	1.45E-01	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5 U	0.5 U	5
				Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
				Sample Date:	20 May 10	01 Dec 10	18 May 10	30 Nov 10	19 May 10	01 Dec 10	19 May 10	01 Dec 10	18 May 10	30 Nov 10	18 May 10	01 Dec 10	20 May 10	01 Dec 10	19 May 10	29 Nov 10	20 May 10	02 Dec 10	19 May 10	29 Nov 10	18 May 10	29 N

Notes:

1. U = below detection limit, J = quantitation approximate, D = diluted sample result, CRQL = Contract Required Quantitation Limit

2. VT GWPR = Vermont Groundwater Protection Rule standard.

3. MCL = Maximum Contaminant Level: EPA's National Primary Drinking Water Regulations, updated May 2009.

4. Indoor air screening levels based on 10-6 cancer risk or Hazard Quotient of 0.1 based on updated toxicity values in IRIS or EPA RSL tables 2010, or EPA Region 1 memo March 11, 2010.

5. Bolded entry indicates exceedance of Indoor Air Screening Value.

6. Shaded values indicates detection limits exceed Screening Value.

7. All concentrations listed in micrograms per liter (µg/L).

2010 Shallow Overburden Groundwater VOC Concentrations
Commerce Street Plume Superfund Site
Williston, Vermont

				Sample Location:		MI-08		OE-2B			MW-08S	MW-11S
				Month:	Dec.	May	Nov./Dec.	May	Nov./Dec.		Nov./Dec.	Nov./Dec.
				Sample Name:	/50	A2Q18	A3M51	A2Q20	A3M68	A3M30	A3M62	A3M66
				Station ID:	-1110A	MI-008-052010A	MI-008-1110A	OE-02B-052010A	OE-02B-1110A	DUP-1110A	MW-008S-1110A	MW-011S-1110A
Chemical	**CRQL**	**VT GWPR**	**MCL**	**Indoor Air Screening Value[4]**								
1,1,1-Trichloroethane	0.5	200	200	7.11E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	0.5			2.80E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5			1.40E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	0.5	5	5	4.51E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	0.68 J	5 U
1,1-Dichloroethane	0.5	70		6.62E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	0.5	7	7	1.87E+01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2,3-Trichlorobenzene	0.5			NA	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	0.5	70	70	3.45E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	0.5		0.2	6.75E-02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	0.5			1.53E-01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	0.5	600	600	2.55E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	0.5	5	5	1.94E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	0.5	5	5	2.11E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	0.5	600		NA	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	0.5	75	75	2.25E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
1,4-Dioxane	100			1.61E+03	U		100 U		100 U	100 U	100 U	100 U
2-Butanone	5	4200		2.15E+05	U	5 U	10 U	5 U	10 U	10 U	10 U	10 U
2-Hexanone	5			7.87E+02	U	5 U	10 U	5 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	5			5.32E+04	U	5 U	10 U	5 U	10 U	10 U	10 U	10 U
Acetone	5	700		2.17E+06	U	5 U	10 U	5 U	10 U	4.7 J	10 U	4.1 J
Benzene	0.5	5	5	1.37E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromochloromethane	0.5	90		NA	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	0.5	80		7.59E-01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromoform	0.5			1.01E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Bromomethane	0.5	10		1.67E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Carbon disulfide	0.5			1.19E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	0.5	5	5	3.59E-01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chlorobenzene	0.5	100	100	3.93E+01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chloroethane	0.5			2.20E+03	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chloroform	0.5	80	80	7.05E-01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Chloromethane	0.5	30		2.50E+01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	0.5	70	70	NA	U	0.5 U	5 U	0.5 U	5 U	5 U	4.1 J	5 U
cis-1,3-Dichloropropene	0.5			4.19E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Cyclohexane	0.5			9.78E+01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	0.5	80		2.82E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	0.5	1000		1.43E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Ethylbenzene	0.5	700	700	3.02E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Isopropylbenzene	0.5			8.51E+01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
m,p-Xylene	0.5	10000	10000	2.38E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methyl acetate	0.5			NA	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methyl tert-butyl ether	0.5	40	35	3.90E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	0.5			NA	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Methylene chloride	0.5	5		3.90E+01	U	0.5 U	4.8 J	0.5 U	5 U	5 U	5 U	5 U
o-Xylene	0.5	10000	10000	3.31E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Styrene	0.5	100	100	8.89E+02	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	0.5	5	5	5.70E-01	U	**0.63**	5 U	0.5 U	5 U	5 U	**25**	5 U
Toluene	0.5	1000	1000	1.84E+03	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	0.5	100	100	3.60E+01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	0.5			4.19E+00	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Trichloroethene	0.5	5	5	2.48E+00	U	0.19 J	5 U	0.5 U	5 U	5 U	**3400 D**	5 U
Trichlorofluoromethane	0.5	2100		1.77E+01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
Vinyl chloride	0.5	2	2	1.45E-01	U	0.5 U	5 U	0.5 U	5 U	5 U	5 U	5 U
				Dilution Factor:		1	1	1	1	1	1/25	1
				Sample Date:	ov 10	20 May 10	02 Dec 10	20 May 10	30 Nov 10	30 Nov 10	30 Nov 10	01 Dec 10