SUPPLEMENTAL
RCRA INVESTIGATION (RFI)
WORKPLAN

Former Norton Company/Nashua Tape Products Facility
2600 Seventh Avenue
Watervliet, New York
EPA ID No. NYD 066829599
NYSDEC Index Number: CO 4-20001205-3375

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SECTION 1.0

INTRODUCTION

This workplan has been prepared to summarize data collection activities associated with a Supplemental RCRA Facility Investigation (RFI) at the former Norton Company (Norton)/Nashua Tape Products (Nashua) manufacturing facility located at 2600 Seventh Avenue, Watervliet, New York. A Site Location Map is provided as Figure 1-1, and a Site Layout Map is provided as Figure 1-2.

The draft RFI Workplan was submitted to the New York State Department of Environmental Conservation (NYSDEC) on September 5, 2002. Following various discussions, revisions, and a meeting between representatives of Saint-Gobain Corporation (Saint-Gobain) and the NYSDEC, the final draft RFI Workplan was submitted to the NYSDEC on July 3, 2003, and subsequently approved by the NYSDEC on July 10, 2003. This Supplemental RFI Workplan has been modified based on written comments from the NYSDEC & the New York State Department of Health (NYSDOH) dated March 25, April 19, May 9 & 20, 2005, and subsequent discussions.

The principal objectives of the original RFI are to: 1) further define the spatial distribution and magnitude of residual subsurface impact associated with the four solid waste management units (SWMUs) identified in the June 4, 2002 NYSDEC Order on Consent Index No. CO: 4-20001205-3375 and eight other areas of concern (AOCs) identified at the Site (see Figure 1-3); and 2) assess the necessity and scope of future corrective actions, if any, subject to NYSDEC's prior approval. The principal objectives of this Supplemental RFI are to: 1) further define the spatial distribution and magnitude of residual toluene located off site to the north of the Former Tank Farm SWMU (see Figures 1-4 & 1-5); and 2) perform a vapor intrusion evaluation at selected residences located along Alden Street (see Figure 1-6).

Proposed Supplemental RFI data collection activities include: 1) installation of borings, and collection of soil and ground-water samples; 2) completion of selected borings as small-diameter ground-water monitoring points; 3) collection of liquid-level and ground-water quality data from the small-diameter ground-water monitoring points; 4) ground-water quality sampling at existing private wells; 5) installation of residential sub-slab vapor monitoring points (VMPs); 6) collection of vapor samples from residential sub-slab VMPs; 7) collection of indoor air samples from the same residences; and 8) a preliminary assessment of potential corrective actions, subject to NYSDEC's prior review and approval.

The Supplemental RFI will be conducted in an iterative manner. Preliminary Supplemental RFI activities will consist of public outreach. The NYSDEC, the NYSDOH, and Saint-Gobain will coordinate a public availability session with neighborhood residents to outline the proposed activities and answer questions. Saint-Gobain will negotiate access agreements with each of the four property owners where Supplemental RFI activities are proposed (see Figure 1-6).

Phase I of the Supplemental RFI will consist of the delineation of residual toluene via installation of borings and monitoring points (small diameter wells) as described in Section 3.0. Subsequent rounds of borings will be installed, if necessary, to complete delineation sampling. Phase II will focus on ground-water sampling and the establishment of temporal (seasonal) concentration trends in areas exhibiting residual toluene (see Section 4.0). Similarly, Phase I of the indoor air investigation will consist of VMP installation at selected residences as described in Section 5.0, and Phase II will focus on sub-slab vapor and ambient air sampling as summarized in Section 6.0. If necessary, supplemental living space ambient air samples will be collected and/or VMPs will be installed at additional residences to complete the indoor air investigation. Phase III of the Supplemental RFI will evaluate the necessity and type of potential remedial actions (see Section 7.0), if any, subject to NYSDEC review and approval.

Quality Assurance/Quality Control (QA/QC) for all activities will be conducted in accordance with the procedures outlined in Sections 8.0, 9.0 & 10.0. A Quality Assurance Project Plan (QAPP) is included as Attachment I.

All field work will be performed in compliance with applicable OSHA regulations and the site-specific master Health and Safety Plan (HASP) previously provided as Attachment B of the September 2001 RCRA Facility Assessment (Enhanced RFA) Workplan. Subcontractors will be required to develop their own site-specific HASPs that, at a minimum, comply with conditions/protocol identified in the master HASP.

Following receipt of the analytical data from all phases of the Supplemental RFI, Saint-Gobain will prepare a report summarizing the results of the original RFI and the Supplemental RFI for submittal to the NYSDEC as discussed in Section 11.0. If warranted, a meeting between Saint-Gobain and the NYSDEC will be scheduled to discuss the results of the Supplemental RFI, and review the necessity and scope of further response actions (investigative and/or corrective measures), if any, for the Site.

SECTION 2.0

SUMMARY OF PREVIOUS RFI ACTIVITIES IN THE VICINITY OF ALDEN STREET

Following NYSDEC approval of the July 2003 RFI workplan, RFI field activities were initiated at the former Norton/Nashua Site in August 2003. Based on photoionization detector (PID) field screening readings, and confirmatory soil and ground-water analytical data obtained from soil borings and monitoring wells installed in the Former Tank Farm SWMU, the RFI was continued off-site to the north towards Alden Street.

2.1 Off-Site RFI Activities

Access to the railroad right-of-way north of the Site (see Figure 1-3) was obtained in November 2003. Soil borings (SB-128 through SB-137; SB-158) and monitoring wells (MP-5 through MP-7) were installed in the right-of-way in December 2003 (see Figure 1-4). Following development, the wells were sampled in February & June 2004. Based upon the sampling results (see Section 2.2), Saint-Gobain and the NYSDEC determined at a June 2004 meeting that the soil boring program would continue north to investigate the vicinity of Alden Street.

After obtaining a road opening permit from the Town of Colonie, soil borings and corresponding monitoring points (SB-159 through SB-163; MP-13 through MP-17) were installed adjacent to Alden Street in August 2004 (see Figure 1-5); additional soil borings (SB-164 through SB-175), monitoring points (MP-18 through MP-21), and a vapor monitoring point couplet (VP) were installed adjacent to Alden Street in September 2004. In October 2004, soil borings and a monitoring point (SB-176 through SB-180, MP-22) were installed in Craig Street (see Figure 1-5), and a geophysical survey was completed. Additional details on these activities are available in the Monthly RFI Update Reports submitted to the NYSDEC.

2.2 Off-Site RFI Results

Based on PID field screening results and confirmatory laboratory analytical data, evidence of residual soil impact along the southern railroad tracks south of the embankment (see Figure 1-4) was limited to the three borings installed immediately north of the Former Tank Farm (SB-128, SB-129 & SB-132). Toluene was detected in soil samples from borings SB-128 & SB-129 at concentrations of 180 micrograms per kilogram (µg/kg) and 120,000 µg/kg, respectively (sample SB-132 was not analyzed), and heptane was detected in sample SB-129 at a concentration of 39,000 µg/kg. Evidence of significant residual soil impact was not detected at the lateral soil borings installed in this area (SB-130, SB-131 & SB-158) – toluene and heptane concentrations were non-detect (ND) or less than 5 µg/kg. Off-site field screening results and soil analytical data are summarized in Table 2-1. A geoprobe ground-water sample collected at boring SB-158 was ND for all volatile organic compound (VOC) analytes. Geoprobe ground-water analytical data are summarized in Table 2-2.

Similarly, evidence of residual soil impact based on PID field screening in the vicinity of the northern railroad tracks (see Figure 1-5) was present at three central soil borings (SB-133, SB-134 & SB-137), but absent at two lateral delineation borings (SB-135 & SB-136) installed north of the Former Tank Farm (see Table 2-1). Toluene concentrations in ground-water samples collected from geoprobe borings in the vicinity of the northern railroad tracks ranged from 12 and 15 micrograms per liter (µg/L) at the two lateral borings to 120 µg/L at central boring SB-133 (see Table 2-2).

Three small-diameter monitoring points were installed in the vicinity of the northern railroad tracks (see Figure 1-4). During the most recent ground-water sampling event (October 2004), toluene concentrations ranged from ND at lateral monitoring points MP-5 & MP-7 to 120/150 µg/L at central monitoring point MP-6. Monitoring point ground-water sampling results are summarized in Table 2-3.

The same narrow distribution of toluene in ground water is apparent in the soil borings installed along Alden Street (see Figure 1-5). All PID field screening readings obtained from these borings were less than 5 parts per million by volume (ppmv) except for centrally located borings SB-159 (1,800 ppmv) & SB-163 (3,500 ppmv). Elevated PID readings were limited to the saturated soil zone except as noted below (see Table 2-1).

A total of nine small-diameter monitoring points (MP-13 through MP-21) were installed in the vicinity of Alden Street (see Figure 1-5). During the most recent ground-water sampling event (September or October 2004; see Table 2-3), toluene concentrations were ND in all samples except MP-14 (850 μg/L) & MP-17 (4,800 μg/L).

To further delineate the width of the residual toluene impact in ground water, soil borings SB-171 through SB-175 were installed on either side of boring SB-159 (see Figure 1-5). The maximum (water table) PID field screening reading at boring SB-172 (located 8 feet west of SB-159) was 4,500 ppmv, but maximum PID readings at SB-175 (11.5 feet west of SB-159) & SB-173 (15 feet west of SB-159) were 0 ppmv and 7 ppmv, respectively. (Note: a PID reading of 60 ppmv was obtained at SB-173 from a depth of 0 to 5 feet; however, a soil sample collected from this depth was ND for all VOC analytes – see Table 2-1). The maximum PID field screening reading at boring SB-174 (10 feet east of SB-159) was 1,100 ppmv, but the maximum PID reading at SB-175 (20 feet east of SB-159) was 0.0 ppmv. The lateral borings limit the width of toluene impact in ground water along the south side of Alden Street to less than 32 feet.

Six soil borings were installed along the south side of Craig Street (see Figure 1-5). All PID field screening readings were ND and all VOC analytes (except for compounds also detected in trip/field blanks) were ND in soil samples (see Table 2-1). All VOC analytes were ND in geoprobe ground-water samples except for a J-flagged toluene detection (1.0 J μg/L) in geoprobe ground-water sample SB-178 (see Table 2-2). All VOC analytes were ND in the ground-water sample collected from monitoring point MP-22 in November 2004 (see Table 2-3).

A vapor monitoring couplet, consisting of VP-1, screened from a depth of 1 to 3 feet, and VP-2, screened from a depth of 5.5 to 7.5 feet, was installed in the north side of Alden Street. Depth to water in this area is approximately 8 to 9 feet.

Vapor samples (and an ambient outdoor air sample) were collected by connecting each VP to a Summa canister equipped with an eight-hour regulator. The laboratory analytical results, summarized in Table 2-4, indicate that toluene vapor concentrations were 24 parts per billion by volume (ppbv) in sample VP-1, 2 ppbv in sample VP-2, and 1 ppbv in the ambient outdoor air sample. Methyl tertiary butyl ether (MTBE), benzene, toluene, ethylbenzene, and xylenes (BTEX), and other fuel components were also detected in the shallow vapor sample in addition to several chlorinated VOCs that are not associated with the former Norton/Nashua Site.

SECTION 3.0

PHASE I – INSTALLATION OF SOIL BORINGS AND MONITORING POINTS

A soil boring program will be conducted to: 1) qualitatively/semi-quantitatively evaluate (screen) areas of potential residual impact; and 2) collect samples for the quantitative (i.e., laboratory) assessment of the presence/absence and extent of residual soil and/or ground-water contamination. Based on previous RFI soil sampling, a PID field screening reading of 100 ppmv has proven to be a conservative criterion for evidence of residual soil impact. Therefore, during the current investigation PID readings exceeding 100 ppmv will be considered evidence of residual soil impact, and necessitate lateral expansion of the boring array in accordance with the decision matrix set forth in Table 3-1. Field screening methods are further discussed in Section 3.2. Except as noted in Section 3.2, a minimum of one soil sample will be collected from each geoprobe boring for confirmatory laboratory analysis.

If residual impact as defined above is detected during field screening, the Geoprobe drilling rig may be utilized to collect a water sample (see Section 3.3), and additional borings, as appropriate, will be installed at 20-foot intervals in the same direction (and then laterally as necessary) until the areal extent of residual impact is defined based on the above-noted field screening criteria. Alternatively, Saint-Gobain may choose to increase the spacing interval to identify the outermost/delimiting locations. If confirmatory laboratory data from an individual outermost/delimiting geoprobe boring location indicate that soil quality data exceeds applicable NYSDEC recommended soil cleanup objectives (as identified in Technical and Administrative Guidance Memorandum [TAGM] #4046, dated January 24, 1994), additional geoprobe borings will be installed during subsequent mobilizations to complete spatial delineation to the applicable soil cleanup objective via laboratory analysis of soil samples.

3.1 Proposed Soil Boring Locations

Ten soil boring locations (see Figure 1-6) have been identified for the initial investigation in the residential area north of Alden Street as discussed below. These ten locations will be used to field screen soil and ground/water quality in the vicinity of the four homes closest to MP-17. The proposed boring locations will be finalized after reviewing access issues with the respective property owners.

3.2 Soil Boring Installation and Field Screening Methods

Soil borings will be installed utilizing a Geoprobe drilling rig. Continuous soil samples will be obtained via Geoprobe recovery "sleeves" (i.e., disposable four-foot acetate liners placed in the macro-core sampler) that will be extracted by the Geoprobe, opened with a liner or utility knife, and screened with a PID to select the portion of the recovered soil sample that will immediately be placed in appropriate bottleware for possible laboratory analysis. Samples will be packed to minimize headspace in the container (refer to Table 3-2 for other details).

A small portion (approximately 100 grams) of the remaining soil exhibiting the highest PID reading in the geoprobe liner will be placed in a sealable plastic bag, shaken for 15-30 seconds, and allowed to equilibrate to ambient temperature for several minutes before piercing the bag to obtain a PID field screening reading. The PID (MiniRae2000 [or equivalent]) will be calibrated twice daily or after any two hour break, and equipped with an 11.6 eV lamp.

In accordance with the decision matrix set forth in Table 3-3, a minimum of one soil sample from each boring will be submitted for laboratory analysis (see Section 3.3). The soil sample interval submitted for laboratory analysis from each boring will be selected according to the following order of priority: 1) the soil interval with the highest PID reading; or, if there is no evidence of residual impact, 2) the soil interval collected immediately above the water table.

After field screening to collect soil samples for laboratory analysis, remaining soil in the recovered geoprobe liner will be used for field descriptions. Soil sample field descriptions will include assessment via Unified Soil Classification System (USCS) for 1) composition, 2) consistency and density, 3) color, 4) moisture content, 5) grain size/sorting, and 6) presence/absence of staining, discoloration, and odors.

Soil borings will be advanced to two feet below the water table (approximate total depth 10 to 12 feet), or approximately four feet below the water table if it has been determined that a ground-water sample will also be collected (see Section 3.4). Based on previous work in the vicinity of Alden Street, it is expected that any residual impact will be limited to the soil interval immediately above or at the water table. However, if there is a bimodal vertical distribution of residual soil impact within a boring (i.e., impacted intervals are separated by at least four feet), a second soil sample will be submitted for laboratory analysis from that geoprobe boring.

In the event that the number of soil borings is expanded to delineate the spatial distribution of residual impact, Saint-Gobain may choose not to run soil samples for laboratory analysis from selected secondary soil boring locations that are not serving as outermost/delimiting locations (i.e., these boring locations are not required to define the areal extent of residual soil impact via confirmatory laboratory data). However, Saint-Gobain will collect additional soil samples for laboratory analysis during a subsequent mobilization if it is later determined that selected locations in such areas are essential for further assessment or remedial design evaluation.

Soil borings will be abandoned by backfilling with soil cuttings obtained above the water table, which demonstrate a PID field screening reading of ND, and/or clean sand. The surface will be restored with cold patch or concrete as applicable in paved areas, or the original sod and soil plug in grassed areas. Any excess soil cuttings will be temporarily stored in 55-gallon drums prior to characterization and proper disposal.

At the completion of each boring (and prior to leaving the site), all equipment that has been exposed to site soils or ground water will be decontaminated utilizing an Alconox wash and tap water rinse. The handling and disposal of liquids generated during the decontamination process is discussed in Section 9.0.

3.3 Soil Boring Sample Analyses

Soil samples will be collected in appropriate laboratory bottleware (see Table 3-2), properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory analysis for VOCs via EPA Method 8260 plus heptane and tentatively identified compounds (TICs). Soil samples for VOC analysis will be collected to minimize headspace. Two selected water table soil samples will be analyzed for total organic carbon (TOC) via EPA Method via EPA Method 415.1, and two vertically separated samples will be submitted for grain size analysis via ASTM D-422. All soil analyses will include Category B laboratory deliverables.

3.4 Geoprobe Ground-Water Sampling

At the ten proposed soil boring locations (see Section 3.1), ground-water samples will be collected utilizing the Geoprobe Screen Point sampler equipped with a four-foot screen length (or similar device). In the event that the number of borings is expanded to delineate the spatial distribution of residual impact, Saint-Gobain may choose not to collect (or may discard) ground-water samples for laboratory analysis from selected secondary soil boring locations that are not serving as outermost/delimiting locations (i.e., these boring locations are not required to define the areal extent of residual ground-water impact via confirmatory laboratory data). However, Saint-Gobain will collect additional ground-water samples for laboratory analysis during a subsequent mobilization if it is later determined that selected locations in such areas are essential for further assessment or remedial design evaluation.

The Geoprobe ground-water sampler will be installed across the water table and the rods retracted to expose the screened interval, allowing ground water to enter the sampler. A peristaltic pump will be used to purge the boring of bulk sediments and reduce turbidity. Ground-water samples will be collected after the stabilization of temperature, conductivity, and pH in the purge water. If the boring goes dry during purging, ground-water samples will be collected following the recharge of sufficient ground water for sampling. The handling and disposal of purge water is discussed in Section 4.6.

3.5 Geoprobe Ground-Water Sample Analyses

Ground-water samples will be collected in appropriate laboratory bottleware (see Table 3-2), properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt via courier or overnight delivery. Ground-water samples will be analyzed for VOCs via EPA Method 8260 plus heptane. A summary of relevant sampling protocol have been provided in Table 3-2 (see Attachment I for additional details). All analyses will include Category B laboratory deliverables.

3.6 Installation of Small-Diameter Ground-Water Monitoring Points

A minimum of two small-diameter ground-water monitoring point locations north of Alden Street will be selected. Based on PID field screening results obtained during the soil boring program, and preliminary Geoprobe ground-water sample laboratory analytical data, additional small-diameter ground-water monitoring points may be added. Proposed monitoring point locations will be finalized with the NYSDEC Case Engineer and access for drilling will be confirmed with individual property owners. Mobilization for small-diameter ground-water monitoring point installation will occur within 30 days of confirming access for drilling.

Small diameter ground-water monitoring point borings will be installed by a Geoprobe drilling rig to a total depth approximately ten feet below the level of the water table (or to refusal) to allow for seasonal ground-water fluctuations. Continuous soil samples will be obtained via Geoprobe recovery "sleeves" and field screened as discussed in Section 3.2. However, soil and ground-water samples will not be collected from the small diameter ground-water monitoring point borings for laboratory analysis (unless previously discussed with the NYSDEC) because these borings will be installed adjacent to previously sampled locations.

Small-diameter ground-water monitoring points will be constructed of two-inch diameter, flush-threaded joint, Schedule 40 PVC riser and screen (fifteen feet 0.010-inch slot size), and bottom plug. The annulus of each monitoring point will be filled with a #1 or #2 sand pack extending a minimum of one foot above the screened interval, sealed with approximately one to two feet of bentonite, and then grouted to the surface. Alternatively, Geoprobe "pre-pack" well and filter kits may be used to complete these monitoring points.

Each ground-water monitoring point will be completed with a bolt-down, flush-mounted vault anchored by a concrete skirt. Each monitoring point will be equipped with a locking gripper-plug to prevent unauthorized access.

Following installation, each ground-water monitoring point will be properly developed to remove fine-grained sediments from the sand pack and screen. Well development water will be staged and processed in a similar manner as ground-water sampling purge water (described in Section 4.6).

Following completion of the proposed Supplemental RFI field activities, the newly installed small-diameter monitoring points will be surveyed to establish horizontal position and vertical elevation. Survey information will be used to prepare revised site base maps depicting monitoring locations, ground-water flow maps, isoconcentration maps, and other figures that will be included in the RFI Final and Summary Report (see Section 11.0).

SECTION 4.0

PHASE II – GROUND-WATER SAMPLING

4.1 Liquid-Level Data Collection

Synoptic rounds of liquid-level data that are collected prior to quarterly RFI ground-water sampling (see Section 5.0, July 2003 RFI) will include all small-diameter monitoring points installed in conjunction with this Supplemental RFI (see Section 3.6). Immediately after each well cap is removed, a PID will be used to measure VOC vapor concentrations in the well. Liquid-level data will be collected using an interface probe capable of detecting free-phase product. The total depth of the well will be determined by lowering the probe to the bottom of the well and recording the depth. The interface probe will be decontaminated after use at each well by the methods outlined in Section 9.0.

4.2 Ground-Water Sampling – Supplemental RFI Monitoring Points

All small-diameter monitoring points installed in conjunction with this Supplemental RFI will be sampled on a quarterly basis for a minimum of four sampling events (one year) to establish temporal (seasonal) concentration trends. Sampling will coincide with quarterly RFI ground-water sampling events (see Section 5.0, July 2003 RFI). Available ground-water sampling data will be included in the RFI Summary Report (see Section 11.0).

Monitoring wells points will be sampled via the micropurge sampling method used during the 2001 "Enhanced RFA" sampling event. The United States Environmental Protection Agency (USEPA) has encouraged the use of this method because of its reproducibility, accuracy, and cost-effectiveness (additional details are available in the April 1996 USEPA reference document).

A micropurging pump capable of a flow rate of approximately 0.1 to 0.5 liters per minute (i.e., peristaltic/bladder pump) will be used to minimize turbulence in the well bore and hydraulic stress on the formation. The pump intake will be positioned in the middle of the saturated portion of the screened interval of the well. Water quality indicator parameters (temperature, pH, specific conductivity, oxidation-reduction potential [ORP], and dissolved oxygen [DO]) will be monitored during purging with a continuous "flow-through" cell device (YSI-600XL or equivalent). Readings will be taken every three to five minutes until the following stabilization rates are achieved: pH ± 0.1 standard units, specific conductivity ± 3%, ORP ± 10 mV, and DO ± 10%. After the water quality parameters have stabilized, ground-water samples will be collected directly from the pump effluent line using dedicated tubing and pump bladders at each well.

4.3 Ground-Water Analyses

Ground-water samples will be collected in appropriate laboratory bottleware (see Table 4-1), properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt via courier or overnight delivery. All monitoring well samples will be analyzed for VOCs via EPA Method 8260 plus heptane and TICs. A summary of relevant sampling protocol has been provided in Table 4-1. All analyses will include Category B laboratory deliverables.

4.4 Supplemental Analyses

In addition to the analyses discussed in Section 4.3, one or more Supplemental RFI ground-water monitoring locations will be sampled for the following electron acceptor and other natural bioattenuation parameters during the first ground-water sampling event (see Table 4-1): redox, pH, and O_2 (via field instrumentation), Fe^{+2} (via field chemical analysis kit), Fe^{+3} (from total iron via EPA Method 7380), nitrate/nitrite (EPA Method 300.0), ortho-phosphate (EPA Method 300.0), sulfate (EPA Method 300.0), alkalinity (EPA Method 310.1),

methane/ethane/ethene (Misc. GC Methods), hydrogen sulfide to determine H_2 (from pH and sulfide via EPA Method 376.1), and total heterotrophic bacteria and toluene-xylene (TX)-degrading bacteria microbial counts (via Standard Plate Count Methods). These analyses will be used to determine the extent of intrinsic bioremediation occurring in the vicinity of Alden Street and evaluate the appropriateness of enhanced bioremediation (i.e., the addition of oxygen and/or nutrients) as a future corrective measure.

4.5 Ground-Water Sampling – Private Wells

Although all homes in the Maplewood neighborhood are serviced by municipal water, based on information obtained from the residents, there is at least one active private well in the neighborhood that may be used for lawn/garden watering purposes. Ground-water quality sampling will be conducted at this well (and any other private wells in the vicinity of Alden and Craig Streets that are located during the course of Supplemental RFI field activities).

The private well will be inspected before sampling. If the existing pump in the private well pump is operable (and with the owner's permission), the private well will be sampled by purging the well running the extant pump for approximately 10 to 15 minutes, and then sampling directly from the pump outflow.

If the existing well pump is not operable, and if there is adequate access to the well, a sampling pump intake will be inserted into the well bore without moving any existing private well piping and/or equipment, and ground-water sampling techniques will be identical to those discussed in Section 4.2. If the private well piping and/or pump prevents access to the well, alternative methods of sampling the well will be discussed with the NYSDEC Case Engineer and the property owner.

Ground-water samples will be collected in appropriate laboratory bottleware (see Table 4-1), properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt via courier or overnight delivery. All private well samples will be analyzed for VOCs via EPA Method 8260 plus heptane and TICs. A summary of relevant sampling protocol has been provided in Table 4-1. All analyses will include Category B laboratory deliverables.

4.6 Purge Water Disposal

Purge water generated during ground-water sampling will be temporarily containerized in 55-gallon drums, which will be stored at an approved staging location at the site, pending laboratory analysis of the ground-water samples. Based on the sampling results, the purge water (and well development water) will be: 1) processed through a treatment vessel (bucket) filled with liquid-phase granular activated carbon (GAC) if contaminant concentrations in the ground-water samples do not exceed NYSDEC Standards/Guidance Values set forth in NYSDEC TOGS 1.1.1, and discharged to the surface in the vicinity of the well with the highest contaminant concentrations (i.e., in the Former Tank Farm area); or 2) shipped to a permitted disposal facility if contaminant levels in the ground-water samples are above concentrations in NYSDEC TOGS 1.1.1. Any GAC used for the treatment of contaminated purge or redevelopment water will be containerized and properly disposed.

SECTION 5.0

PHASE I – SUB-SLAB VAPOR MONITORING POINT (VMP) INSTALLATION

Four private residences north of Alden Street have been selected for sub-slab vapor and indoor air sampling (see Figure 1-6). Access will be negotiated with the owner of each residence to allow the installation and sampling of a sub-slab vapor monitoring point (VMP) and subsequent indoor air sampling.

5.1 Pre-Installation Survey and Selection of VMP Location

At this time, construction of the four residences (e.g., basement, first floor on slab, crawlspace, etc.) is unknown. A pre-installation survey will be conducted at each residence to: 1) review the layout and construction of the structure; 2) select a possible VMP location, if applicable; 3) review the proposed VMP location with the homeowner and receive permission to proceed with VMP installation; and 4) inventory household products present in the immediate sampling area (and throughout the residence); 5) interview the homeowner; and 6) perform other preliminary activities associated with sub-slab vapor and indoor air sampling (see Section 6.0).

The lowest accessible area at each residence will be inspected for a foundation to determine if the installation of a sub-slab VMP is appropriate. If a "floating" slab is present (i.e., the slab is not attached to the foundation/structural walls), a VMP will be installed. If VMP installation is not appropriate, the contingency outlined in Section 5.2 will be followed.

The slab/barrier will be inspected for water leaks, cracks, floor drains, sump holes, and other penetrations, and field screened with a PID. The proposed VMP location, preferably in the lowest portion of the slab away from walls and penetrations, and closest to the area of contamination, will be reviewed with the homeowner and NYSDEC/NYSDOH for approval.

5.2 Soil Gas Sampling Point (SGSP) Contingency

If a concrete slab or other suitable barrier is not present at a residence (i.e., there is a dirt floor or a gravel crawlspace), a VMP will not be installed. Instead, a contingent soil gas sampling point (SGSP) will be used to collect a vapor sample from beneath the floor of this residence in association with the first round of VMP sampling (see Section 6.0). Contingent SGSP construction, installation, and sampling details will be discussed with the NYSDEC/NYSDOH and presented for review and approval as an addendum to this workplan.

5.3 VMP Installation

Prior to VMP installation, the floor of the slab/barrier will be prepared. If possible, any carpeting or other floor coverings present will be removed to expose the underlying concrete slab. (Note: all proposed activities will be reviewed with the homeowner prior to implementation.) If a concrete slab is not present, alternate VMP installation techniques will be proposed and reviewed with the NYSDEC.

The VMP assembly, patterned after DiGiulio (2004), will consist of a 1/4-inch outer diameter (OD) threaded pipe approximately 2 to 2.5 inches long. The pipe will be open at the bottom end and equipped with a 1/4-inch inner diameter (ID) threaded to compression fitting (or nipple) at the top end (see Figure 5-1). A recessed plug will be used to seal the compression fitting (or nipple). All VMP materials will be made of brass or stainless steel.

An oversize diameter “outer” hole approximately one-inch in diameter will be installed with a hammer drill (or similar) to a depth of one to two inches in the concrete slab. A smaller diameter “inner” hole (approximately three-eighths of inch in diameter) will be installed with a hammer drill (or similar) through the remainder of the slab, and extended approximately two to three inches below the slab.

The VMP assembly will be placed in the smaller diameter hole. The bottom of the VMP assembly will not extend below the base of the slab, and the top of VMP assembly will not extend above the top of the slab (see Figure 5-1).

The VMP assembly will be sealed in place with quick-drying expanding portland or hydraulic cement taking care to fill the annular space between the VMP assembly and the "outer" hole wall without blocking the upper fitting (see Figure 5-2). The cement will be allowed to cure for a minimum of 24 hours before any sampling is performed. Any floor coverings will be returned to their original position until pre-sampling activities are initiated.

SECTION 6.0

PHASE II – SUB-SLAB VAPOR AND INDOOR AIR SAMPLING

Sub-slab vapor and ambient indoor/outdoor air samples will be collected at the four homes identified along Alden Street. Sub-slab vapor and ambient air sampling protocol is based upon the following guidance documents: 1) the NYSDOH Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York, and Indoor Air Sampling & Analysis Guidance, dated February 2005; 2) USEPA Office of Soil Waste and Emergency Response (OSWER) Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil, (Subsurface Vapor Intrusion Guidance), dated November 2002; 3) RCRA Draft Supplemental Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (Vapor Intrusion Guidance), dated December 2001; 4) Massachusetts Department of Environmental Protection, Indoor Air Sampling & Evaluation Guide, dated April 2002; and 5) Colorado Department of Public Health and Environment, Indoor Air Guidance, dated September 2004.

Sub-slab vapor/ambient air samples will be collected in the vicinity of Alden Street during a minimum of two mobilizations. The first mobilization, proposed for Summer 2005, will consist of VMP sampling (or contingent SGSP sampling, see Section 5.2) at the four identified residences and the concurrent collection of an outdoor ambient air sample (and replicate). Results will be forwarded to NYSDEC & NYSDOH for review and discussion. The second mobilization, proposed for the next heating season (general time frame approximately November 15, 2005 to March 31, 2006), will consist, at minimum, of confirmatory VMP sampling, and the collection of concurrent ambient indoor air samples (including at least one replicate sample) and an ambient outdoor air sample. A sub-slab vapor/ambient air sampling summary matrix is presented as Table 6-1.

6.1 Pre-Sampling Inspection

A pre-sampling inspection will be conducted at least 24 hours prior to the scheduled sampling time, preferably in conjunction with VMP installation (see Section 5.0). During the pre-sampling inspection, an Indoor Air Quality Questionnaire and Building Characteristics Inventory form (see Appendix A), as outlined in the draft February 2005 NYSDOH guidance document, will be completed. The pre-sampling inspection will include: 1) a brief interview of the residents; 2) preparation of floor plans for the basement (if present) and first floor of each residence (see Appendix A); 3) an inventory of household products and other potentially contributing substances (see below) present in the proposed sampling areas and throughout the home; and 4) PID field screening of the proposed sampling area.

The goal of the household inventory is to identify household products (or other substances stored or present in the home) that could potentially interfere with the testing and/or contribute site-specific compounds of concern (COCs) to the vapor samples. Because toluene is the only site-specific COC identified in the vicinity of Alden Street, the inventory (and any required mitigation) will focus on potential toluene sources. If present, and with the homeowner's permission, potential toluene sources will be mitigated by moving the items to an alternate location, tightening container seals, etc. Any ventilation activities associated with mitigation will be completed at least 24 hours prior to sampling.

Following the pre-sampling inspection, a sampling appointment will be scheduled with the residents. The residents will be given a handout asking them to refrain from the following activities during the 24 hours prior to testing (adopted from NYSDOH, 2005):

- opening any windows, fireplace dampers, opening, or vents
- operating ventilation fans unless special arrangements are made
- using wood stoves, fireplaces, or auxiliary heating equipment (e.g., kerosene heaters)
- smoking in the house
- painting in the house
- using cosmetics, including hair spray, nail polish, nail polish remover, etc.
- using perfume/cologne

- cleaning, waxing, or polishing furniture or floors with petroleum or oil-based products
- using air fresheners or odor eliminators
- engaging in any hobbies/activities that use materials containing VOCs
- applying pesticides
- operating or storing automobiles in an attached garage
- allowing containers of gasoline or oil to remain within the house (except fuel oil tanks)

6.2 Sub-Slab VMP Sampling

On the day of VMP sampling, a final site inspection and PID field screening survey will be performed to document conditions in the residence at the time of sampling. The integrity of the VMP will also be inspected. The VMP will be attached via Teflon tubing to a certified-clean 6L Summa canister equipped with a particulate filter and a 4-hour regulator preset by the laboratory. The pre-sample vacuum of the Summa canister will be recorded (initial vacuum must be greater than 25 inches of mercury) and the canister valve opened to begin sub-slab vapor collection.

VMP sub-slab samples will be recovered approximately 4 hours later. After completing concurrent outdoor ambient air sampling activities, VMP sampling will be terminated as follows: 1) record the final Summa canister vacuum; 2) close the sampling valve; 3) disconnect all sample tubing; 4) plug the VMP; and 5) return any floor coverings. VMP sub-slab samples will be submitted for laboratory analysis of VOCs via EPA Method TO-15 plus TICs.

6.3 Indoor Air Sampling

In conjunction with the second round of VMP sampling (i.e., the heating season sample), concurrent ambient indoor air samples will be collected from the lowest accessible level (i.e., basement/crawlspace, or first floor if no basement present) plus the next higher living space (i.e., first floor, or second floor if no basement present) at each of the four residences, and from one

outdoor location. In addition, a blind replicate indoor air sample (see Section 8.4) will be collected at one residence during the second round of VMP sampling by co-locating two Summa canisters with equal initial vacuums.

Ambient indoor air samples will be collected as follows. A certified-clean 6L Summa canister, equipped with a particulate filter and a 4-hour regulator preset by the laboratory, will be placed in the center of the sampling area approximately three feet off the floor (where physically possible) to collect a representative "breathing air" sample. The Summa canister will not be attached to any tubing. The pre-sample vacuum of the Summa canister will be recorded (initial vacuum must be greater than 25 inches of mercury) and the Summa canister valve opened to begin sub-slab vapor collection. A similar procedure will be followed for collection of the outdoor ambient air sample.

The residents will be asked to stay out of the active sampling area, if possible, for the duration of testing, or to restrict their movements in the active sampling area and avoid opening and/or closing doors and windows in the home. Ambient air samples will be recovered approximately 4 hours later. Indoor (and outdoor) ambient air sampling activities will be terminated as follows: 1) record the final Summa canister vacuum; 2) close the sampling valve; 3) proceed with termination of concurrent VMP sampling at the same location if applicable (see Section 6.2). Ambient indoor/outdoor air samples will be submitted for laboratory analysis of VOCs via EPA Method TO-15 plus TICs.

6.4 Contingent Sub-Slab Vapor/Indoor Air Sampling

Following initial receipt (prior to validation), sub-slab vapor and ambient indoor air sampling data will be used to evaluate the need for additional VMP and/or ambient indoor air sampling locations at the four residences proposed for sampling as part of the Supplemental RFI investigation. Preliminary sub-slab vapor and ambient indoor/outdoor air sampling data, in

conjunction with the soil and ground-water sampling data (see Sections 3.0 & 4.0), will also be used to evaluate the necessity of expanding the area of the indoor air investigation to additional homes. The preliminary data assessment will be reviewed and discussed with the NYSDEC Case Engineer.

SECTION 7.0

PHASE III – CORRECTIVE MEASURE EVALUATION

Based upon: 1) the Site characterization data obtained in Phases I & II of the Supplemental RFI; 2) information on ground-water flow direction, hydraulic conductivity, temporal COC trends, and other geologic/hydrogeologic data; and 3) a review of possible migration pathways and a preliminary risk assessment, Saint-Gobain will, subject to final approval by the NYSDEC, determine the need for a Corrective Measure evaluation in the vicinity of Alden Street. If required, the Corrective Measure evaluation will include: 1) a statement of remedial objectives; 2) identification of potential treatment areas; and 3) initial screening of Corrective Measure alternatives using a Technology Screening Matrix patterned after a USEPA model (Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA; October 1989).

The Corrective Measure evaluation will be used to: 1) design any feasibility testing that will be proposed as part of a future Corrective Measure Study (CMS); and 2) subject to a final determination by the NYSDEC, identify the necessity of any Interim Corrective Measures (ICMs) at the Site. Based on the information obtained during previous phases of the RFI, it is the opinion of Saint-Gobain that an ICM will not be required in the vicinity of Alden Street because an Imminent Hazard to human health or the environment is not present, but the collection of sub-slab/indoor air samples is necessary to complete the assessment.

SECTION 8.0

QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

The objective of the sampling QA/QC program is to ensure the reliability and integrity of all data generated as part of the monitoring program. The QA/QC program will follow procedures outlined in Attachment I, and will also be consistent, to the extent applicable, with NYSDEC RCRA QAPP Guidance (3/29/91). The QA/QC program will involve, as appropriate, the collection of trip blanks, matrix spike/matrix spike duplicate (MS/MSD) samples, equipment blanks, blind replicate samples, and duplicate (split) samples. QA/QC sample collection is summarized in Table 8-1.

8.1 Trip Blanks

One trip blank sample will be analyzed for each ground-water sampling cooler utilized. Trip blanks will be analyzed for VOC target parameters. The trip blanks will be prepared and supplied by the laboratory, and transported and handled in the same manner as other ground-water sampling bottleware. The trip blank will be received in the field within one day of laboratory preparation and cannot be held at the field site for more than two days.

8.2 MS/MSD Samples

One set of MS/MSD samples will be collected for every twenty samples from each applicable medium (ground water and soil) and analyzed for the complete set of target parameters. Care will be taken to ensure that each MS/MSD pair can be considered a homogeneous sample split in two (however, there will be no mechanical mixing of soil samples that will be analyzed for VOCs). The MS/MSD samples will be identified as such and given a sample designation that is consistent with other analytical samples.

8.3 Equipment Blanks

One equipment blank sample will be collected from each medium sampled (ground water, soil, and sub-slab vapor/ambient air) during each mobilization. The equipment blank samples will be analyzed for the complete list of target analytes. The ground-water equipment blank sample will be obtained by pouring demonstrated analyte-free water through or over the sampling device so that the rinsate flows directly into the laboratory cleaned sample containers. The soil equipment blank sample will be obtained by pouring demonstrated analyte-free water through or over the previously decontaminated sampling device so that the rinsate flows directly into the laboratory cleaned sample containers. The sub-slab vapor/ambient air equipment blank sample will be obtained by introducing a prepared gas sample (laboratory certified "clean air") directly into a laboratory cleaned Summa canister.

8.4 Blind Replicate Sampling

One blind replicate sample will be collected for every twenty samples collected from each medium (ground water, soil, and ambient air) and analyzed for the complete set of target analytes. Care will be taken to ensure that each blind replicate can be considered a homogeneous sample split (however, there will be no mechanical mixing of soil samples that will be analyzed for VOCs). Replicate ambient air samples will be collected via two co-located Summa canisters (first event – outdoor air location; heating season event – indoor air location).

Each blind replicate will be given a sample designation that is consistent with other analytical samples collected from the same medium to prevent the analyzing laboratory from identifying the blind replicates samples. Identification of the blind replicate samples will be provided to the NYSDEC prior to data validation (see Section 10.0).

SECTION 9.0

DECONTAMINATION PROCEDURES

All non-disposable sampling and data procurement equipment will be decontaminated using the following procedures:

1) manual scrub with alconox and potable water using a brush;
2) thorough rinse with potable water;
3) triple rinse with distilled water (ASTM Type II); and
4) air dry.

Any liquids generated during the decontamination process will be captured in properly labeled containers as described in Section 4.6, and held pending receipt of laboratory analytical results. Decontamination liquids will be treated or shipped off site for proper disposal according to the same criteria outlined in Section 4.6 for purge and development water.

SECTION 10.0

LABORATORY ANALYSIS

All soil and ground-water samples will be submitted to Adirondack Environmental Services, Inc., of Albany, New York, and all sub-slab vapor/ambient air samples will be submitted to Lancaster Laboratories, Inc. of Lancaster, Pennsylvania, for analysis via standard turn around times. Both laboratories are certified by the New York State Department of Health – Environmental Laboratory Approval Program (NYSDOH-ELAP). All samples will be analyzed following NYSDEC, ASP (June 2000) CLP procedures with complete NYSDEC CLP/Category B laboratory deliverables including TICs. The laboratory's most relevant TO-15 MDL study (Lancaster Laboratories, Inc.) will also to be submitted with the data.

Data validation will be performed by the NYSDEC in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999. Where possible, the data review will involve the assessment of PARCC parameters, namely, Precision, Accuracy, Representativeness, Completeness, and Comparability.

As outlined in Section 8.0, one equipment blank sample will be collected for each media (ground water, soil, and sub-slab vapor/ambient air) during each mobilization and analyzed for all target parameters. A sample or sample delivery group may be qualified if the equipment blank contains detectable concentrations of target analytes; however, the data may still be used qualitatively to assess decontamination procedures and/or ambient site conditions. A similar procedure will be followed for the utilization of trip/travel blanks.

The laboratory report may qualify the sample concentration with a "B", which indicates that a target analyte has been detected in the laboratory method blank. Data which have been qualified with a "B" will be utilized quantitatively only if the following criteria apply: 1) historical data suggests this specific compound was utilized at the facility; 2) the compound has

been detected in previous analytical sampling; or 3) the laboratory case narrative states the presence of this compound is not the result of laboratory contamination. Consistent detection of compounds in the method blank suggests a laboratory contamination problem, and more importantly, problems with the internal laboratory QA/QC procedures.

The laboratory will often estimate analyte concentrations when samples are below, or greatly exceed, quantification limits. Concentrations below the laboratory method detection limit, qualified with a "J", will be used for quantitative interpretation as it represents the "best" estimate of a specific analyte concentration. Under NYSDEC ASP methods the laboratory should not report concentrations that exceed the highest concentration within the calibration range. The analysis should be rerun using an appropriate dilution factor.

Analytical data packages received from the contract laboratory will be compared with the list of analyses requested on the chain-of-custody record and the project Workplan to ensure all analyses were performed as requested. If an analytical sample exceeds the method-specific holding time (see Tables 3-2 & 4-1), the sample will be rejected for quantitative interpretation, and the data will be utilized only in a qualitative manner.

Practical quantitation limits for each analyte should meet the Contract Required Quantitation Limit (CRQL) as per NYSDEC ASP, revised June 2000. Surrogate recoveries, GC/MS calibrations, system performance checks, and other internal laboratory QA/QC results will be reviewed to assure that the laboratory analysis met all applicable performance criteria.

SECTION 11.0

SCHEDULE & REPORTING

Per NYSDEC CO: 4-20001205-3375, Supplemental RFI Workplan revisions will be submitted within 45 days of receipt of comments from the NYSDEC (or within 30 days of a meeting with the NYSDEC to discuss the Supplemental RFI Workplan, if determined to be necessary). Per NYSDEC CO: 4-20001205-3375 field work is to be initiated within 30 days of receipt of Supplemental RFI Workplan approval from the NYSDEC; the completion of a public availability session and receipt of access from private property owners will also be necessary prior to initiating field work. Progress reports summarizing the status of all activities associated with implementation of the approved Supplemental RFI Workplan, including access negotiations, will be submitted to the NYSDEC on a monthly basis.

The first phase of field work will consist of the installation of the soil borings and small-diameter monitoring points proposed in Section 3.0. A Geoprobe drilling rig will be used to collect soil and ground-water samples that will be submitted for standard laboratory turn-around times (two to three weeks). Small-diameter monitoring points will be installed within 30 days of receipt of: 1) preliminary laboratory data; 2) NYSDEC approval of proposed monitoring point locations; and 3) confirmation of homeowner access. Monitoring point ground-water sampling will be performed at least 14 days, but no more than 30 days, after monitoring point development activities are completed. Monitoring point ground-water samples will be submitted for standard laboratory turn-around times (two to three weeks).

Within 30 days of receipt of preliminary laboratory data (prior to NYSDEC validation), any required supplemental boring locations will be finalized and submitted to the NYSDEC for approval. Within 30 days of receipt of NYSDEC approval, installation of any required supplemental soil borings will be initiated.

Homeowner schedules permitting, installation of the residential VMPs discussed in Section 5.0 will be performed concurrently with the installation of soil borings. If possible, the first round of VMP sampling (or contingent SGSP sampling, see Section 5.2) and concurrent outdoor ambient air sampling will be performed during the same mobilization as small-diameter monitoring point installation (or monitoring point sampling). Sub-slab vapor samples will be submitted for standard laboratory turn-around times (three to four weeks). The second round of VMP sampling (or contingent SGSP sampling), and concurrent indoor/outdoor ambient air sampling (see Section 6.0), will be performed during the 2005-2006 heating season.

Copies of all final soil, ground-water, and sub-slab vapor/ambient air sampling laboratory data packages will be forwarded upon receipt to the NYSDEC for data validation. If warranted, a meeting between Saint-Gobain and the NYSDEC will be scheduled to discuss the results of the Supplemental RFI, and review the necessity and scope of further response actions (investigative and/or corrective measures), if any, for the Site.

Within 60 days of receipt of data validation from NYSDEC, Saint-Gobain will submit the draft RFI Final/Summary Report to the NYSDEC for review and comment. A finalized Report will be submitted for approval within 45 days of receipt of comments from the NYSDEC (or if a meeting with the NYSDEC to discuss the draft RFI Report is determined to be necessary, within 30 days of the meeting). An updated summary of the proposed RFI schedule is provided as Table 11-1.

The RFI Final/Summary Report will describe all procedures, methods, and results for all activities conducted during the RFI. This information will include a summary of current site conditions, a description of the type and extent of contamination at the Site (with maps and cross sections summarizing the hydrogeologic data), a preliminary analysis of sources, migration pathways and potential receptors, and an assessment of the need for Corrective Measures, including any associated feasibility testing, subject to a final determination by the NYSDEC.

SECTION 12.0

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TABLES

Table 2-1
Summary of Off-Site Soil Analytical Data - VOCs
RCRA Investigation
Former Norton/Nashua Facility
Watervliet, New York

Sample Designation	Sampling Date	Sample Depth (feet)	PID Reading Sample (ppmv)	PID Reading Max. (ppmv)	Max. PID Interval (feet)	Acetone (µg/kg)	Chloro-form (µg/kg)	Methylene chloride (µg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	m,p-Xylene (µg/kg)	o-Xylene (µg/kg)	Heptane (µg/kg)	Total VOC TICs (µg/kg)
SB-128	12/1/2003	10.5 - 11.5	300	300	10 - 15	<12	<6	<6	**4 J**	**180**	<6	<6	<12	ND
SB-129	12/1/2003	8 - 9	>9999	>9999	5 - 10	<12000	<6000	<6000	<6000	**120,000**	<6000	<6000	**39,000**	**70,000 J**
SB-130	12/1/2003	4 - 5	12.0	12.0	0 - 5	**57**	<6	**2 BJ**	<6	**5 J**	<6	<6	<12	**40 J**
SB-131	12/1/2003	4.5 - 5.5	0.1	2.5 (1)	10 - 15	**9 BJ**	<6	**2 BJ**	<6	**3 J**	<6	<6	<11	**30 J**
SB-132	12/1/2003	6.5 - 7.5	70.0	5,000 (1)	10 - 15	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-133	12/1/2003	8.5 - 9.5	2.5	1,300 (1)	10 - 15	NA	NA	NA	NA	NA	NA	NA	NA	NA
SB-134	12/2/2003	7 - 8	3.0	4,000 (1)	10 - 15	**17 B**	<6	**3 BJ**	<6	**2 J**	<6	<6	<11	**29 J**
SB-135	12/2/2003	4 - 5	40.0	40.0	0 - 10	<12	<6	**10 B**	<6	<6	<6	<6	<12	**10 J**
SB-136	12/2/2003	8 - 9	1.1	1.1	5 - 10	<12	<6	**5 BJ**	<6	<6	<6	<6	<12	**7 J**
SB-137	12/3/2003	NS	NS	NS	NS	(boring for well MP-6)			NS	NS	NS	NS	NS	NS
SB-158	1/22/2004	8 - 9	0.4	0.9 (1)	10 - 15	<11	<5	**2 BJ**	<5	<5	<5	<5	<11	**10 BJ**
SB-159	8/11/2004	NS	NS	1,800 (1)	10 - 15	(boring for well MP-14)			NS	NS	NS	NS	NS	NS
SB-160	8/11/2004	NS	NS	2 - 4	5 - 10	(boring for well MP-16)			NS	NS	NS	NS	NS	NS
SB-161	8/11/2004	NS	NS	1 - 2	5 - 10	(boring for well MP-15)			NS	NS	NS	NS	NS	NS
SB-162	8/11/2004	NS	NS	0.0	0 - 15	(boring for well MP-13)			NS	NS	NS	NS	NS	NS
SB-163	8/11/2004	NS	NS	3,500 (1)	10 - 15	(boring for well MP-17)			NS	NS	NS	NS	NS	NS
SB-164	9/8/2004	NS	NS	0.0	0 - 3	(boring for well VP-1)			NS	NS	NS	NS	NS	NS
SB-165	9/8/2004	NS	NS	0.0	0 - 7.5	(boring for well VP-2)			NS	NS	NS	NS	NS	NS
SB-166	9/8/2004	NS	NS	0.0	0 - 15	(boring for well MP-18)			NS	NS	NS	NS	NS	NS
SB-167	9/8/2004	NS	NS	0.0	0 - 15	(boring for well MP-19)			NS	NS	NS	NS	NS	NS
SB-168	9/8/2004	NS	NS	1.0	10 - 15	(boring for well MP-20)			NS	NS	NS	NS	NS	NS
SB-169	9/8/2004	NS	NS	0.2	10 - 13	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-170	9/8/2004	NS	NS	0.3	0 - 15	(boring for well MP-21)			NS	NS	NS	NS	NS	NS

(1) max. PID below water table

Table 2-1
Summary of Off-Site Soil Analytical Data - VOCs
RCRA Investigation
Former Norton/Nashua Facility
Watervliet, New York

Sample Designation	Sampling Date	Sample Depth (feet)	PID Reading		Max. PID Interval (feet)	Acetone (µg/kg)	Chloro-form (µg/kg)	Methylene chloride (µg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	m,p-Xylene (µg/kg)	o-Xylene (µg/kg)	Heptane (µg/kg)	Total VOC TICs (µg/kg)
			Sample (ppmv)	Max. (ppmv)										
SB-171	9/10/2004	NS	NS	0.3	0 - 10	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-172	9/10/2004	NS	NS	4,500 (1)	10 - 15	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-173	9/10/2004	3 - 3.5	60	60	3 - 3.5	<11	<11	<11	<11	<11	<11	<11	<11	**9 J**
SB-174	9/10/2004	NS	NS	1,100 (1)	10 - 15	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-175	9/10/2004	NS	NS	0.0	0 - 15	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-176	10/25/2004	7.5 - 8	0.0	0.0	0 - 15	<11	<11	<11	<11	<11	<11	<11	<11	**28 BJ**
SB-177	10/25/2004	8.5 - 9	0.0	0.0	0 - 15	<11	<11	<11	<11	<11	<11	<11	<11	**28 BJ**
SB-178	10/25/2004	9 - 10	0.0	0.0	0 - 15	<11	<11	**9 J**	<11	<11	<11	<11	<11	**38 BJ**
SB-179	10/26/2004	7.5 - 8	0.0	0.0	0 - 15	<11	<11	<11	<11	<11	<11	<11	<11	**18 BJ**
SB-180	10/26/2004	8 - 9	0.0	0.0	0 - 15	**10 J**	<11	<11	<11	<11	<11	<11	<11	**30 BJ**
SB-180	10/26/2004	8 - 9 (Dup.)	0.0	0.0	0 - 15	<11	<11	<11	<11	<11	<11	<11	<11	**29 BJ**
Trip Blank	12/2/2003	---	---	---	---	**11 B**	<5	**10 B**	<5	<5	<5	<5	<10	**6 J**
Trip Blank	12/4/2003	---	---	---	---	<10	<5	<5	<5	<5	<5	<5	<10	**5 J**
Trip Blank	1/22/2004	---	---	---	---	<10	**2 J**	<5	<5	<5	<5	<5	<10	**13 J**
Trip Blank	9/9/2004	---				**14 B**	<10	**6 J**	<10	<10	<10	<10	<10	**10 BJ**
Trip Blank	10/26/2004	---				<10	<10	<10	<10	<10	<10	<10	<10	**29 BJ**
Field Blank	12/4/2003	---	---	---	---	<10	<5	**3 BJ**	<5	<5	<5	<5	<10	**5 J**
Field Blank	1/22/2004	---	---	---	---	<10	<5	<5	<5	<5	<5	<5	<10	**7 J**

(1) max. PID below water table

ppmv = parts per million by volume; µg/kg = micrograms per kilogram; PID = photoionization detector; TICs = tentatively identified compounds; VOCs = volatile organic compounds.

B = compound detected in blank; Dup. = duplicate sample; J = estimated concentration; NA = not analyzed; ND = not detected; NS = not sampled.

Trip and Field Blanks were liquid samples; results are presented in micrograms per liter (µg/L).

VOCs analyzed via EPA Method 8260 plus heptane and TICs. Only detected analytes are listed above. A complete list of analytes is provided in the laboratory report.

Table 2-1
Summary of Off-Site Soil Analytical Data - SVOCs
RCRA Investigation
Former Norton/Nashua Facility
Watervliet, New York

Sample Designation	Sampling Date	Sample Depth (feet)	PID Reading Sample (ppmv)	PID Reading Max. (ppmv)	Max. PID Interval (feet)	bis-(2-Ethyl-hexyl)phthalate (µg/kg)	di-n-Butyl Phthalate (µg/kg)	Benzo(b) fluoranthene (µg/kg)	Benzo(k) fluoranthene (µg/kg)	Benzo(g,h,i) perylene (µg/kg)	Dibenzo (a,h) anthracene (µg/kg)	Indeno(1,2,3-cd)pyrene (µg/kg)	Pyrene (µg/kg)	Total SVOC TICs (µg/kg)
SB-128	12/1/2003	10.5 - 11.5	300	300	10 - 15	<390	<390	<390	<390	<390	<390	<390	<390	**40,400 BJ**
SB-129	12/1/2003	8 - 9	>9999	>9999	5 - 10	**77 J**	<400	<400	<400	<400	<400	<400	<400	**32,000 BJ**
SB-130	12/1/2003	4 - 5	12.0	12.0	0 - 5	<410	<410	<410	<410	<410	<410	<410	<410	**40,600 BJ**
SB-131	12/1/2003	4.5 - 5.5	0.1	2.5 [(1)]	10 - 15	<370	<370	<370	<370	<370	<370	<370	<370	**30,000 BJ**
SB-132	12/1/2003	6.5 - 7.5	70.0	5,000 [(1)]	10 - 15	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-133	12/1/2003	8.5 - 9.5	2.5	1,300 [(1)]	10 - 15	NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-134	12/2/2003	7 - 8	3.0	4,000 [(1)]	10 - 15	<370	<370	<370	<370	<370	<370	<370	<370	**30,200 BJ**
SB-135	12/2/2003	4 - 5	40.0	40.0	0 - 10	<400	<400	<400	<400	<400	<400	<400	<400	**30,000 BJ**
SB-136	12/2/2003	8 - 9	1.1	1.1	5 - 10	<390	<390	<390	<390	<390	<390	<390	<390	**30,400 BJ**
SB-137	12/3/2003	NS	(boring for well MP-6)			NS	NS	NS	NS	NS	NS	NS	NS	NS
SB-158	1/22/2004	8 - 9	0.4	0.9 [(1)]	10 - 15	<360	<360	<360	<360	<360	<360	<360	<360	**2,000 BJ**
Field Blank	9/15/2003	---	**---**	**---**	**---**	<5	<5	<5	<5	<5	<5	<5	<5	<5
Field Blank	12/4/2003	---	**---**	**---**	**---**	**14**	<5	<5	<5	<5	<5	<5	<5	**3 JN**
Field Blank	1/22/2004	---	**---**	**---**	**---**	<5	<5	<5	<5	<5	<5	<5	<5	ND

[(1)] max. PID below water table

ppmv = parts per million by volume, µg/kg = micrograms per kilogram, TICs = tentatively identified compounds, SVOCs = semi-volatile organic compounds.
B = compound detected in blank; J = estimated concentration; N = presumptive evidence of a compound (TICs only); ND = not detected; NS = not sampled.
Field Blanks were liquid samples; results are presented in micrograms per liter (µg/L).
SVOCs analyzed via EPA Method 8270 plus TICs. Only detected analytes are listed above. A complete list of analytes is provided in the laboratory report.

Table 2-2
Summary of Off-Site Ground-Water Analytical Data - Geoprobe Samples
Former Norton/Nashua Facility
Watervliet, New York

VOCs

Sample Designation	Sampling Date	Acetone (µg/L)	Chloro-form (µg/L)	Methylene chloride (µg/L)	Benzene (µg/L)	Toluene (µg/L)	m,p-Xylene (µg/L)	o-Xylene (µg/L)	Heptane (µg/L)	Total VOC TICs (µg/L)
SB-133	12/1/2003	<10	<5	**13 B**	<5	**120**	**2 J**	**3 J**	**16**	**42 J**
SB-135	12/2/2003	<10	<5	**10 B**	<5	**12**	<5	<5	<10	ND
SB-136	12/2/2003	<10	<5	**13 B**	<5	**15**	<5	<5	<10	**6 J**
SB-136A [1]	12/2/2003	**11 B**	<5	**10 B**	<5	**12**	<5	<5	<10	**6 J**
SB-158	1/22/2004	<10	<5	<5	<5	<5	<5	<5	<10	**7 J**
MP-17 [2]	8/12/2004	<5000	<5000	<5000	<5000	**68,000** [3]	<5000	<5000	<5000	**4,000 BJ**
SB-176	10/25/2004	<10	<10	<10	<10	<10	<10	<10	<10	**19 BJ**
SB-178	10/25/2004	<10	<10	<10	<10	**1 J**	<10	<10	<10	**30 BJ**
SB-179	10/26/2004	<10	<10	<10	<10	<10	<10	<10	<10	**30 BJ**
SB-180	10/26/2004	<10	<10	<10	<10	<10	<10	<10	<10	**29 BJ**
Trip Blank	12/2/2003	**11 B**	<5	**10 B**	<5	<5	<5	<5	<10	**6 J**
Trip Blank	1/22/2004	<10	<5	**2 J**	<5	<5	<5	<5	<10	**13 J**
Trip Blank	10/26/2004	<10	<10	<10	<10	<10	<10	<10	<10	**29 BJ**
Field Blank	12/4/2003	<10	**3 BJ**	<5	<5	<5	<5	<5	<10	ND
Field Blank	10/27/2004	<10	<10	<10	<10	<10	<10	<10	<10	**16 BJ**
Field Blank	1/22/2004	<10	<5	<5	<5	<5	<5	<5	<10	**15 J**

[1] SB-136A is a duplicate sample [2] Geoprobe sample collected at SB-163 [2] NYSDEC data validation qualified this result as "estimated"

SVOCs

Sample Designation	Sampling Date	Bis-(2-ethyl-hexyl)phthalate (µg/L)	di-n-Butyl phthalate (µg/L)	Benzo(b) fluoranthene (µg/L)	Benzo(k) fluoranthene (µg/L)	Benzo(g,h,i) perylene (µg/L)	Dibenzo(a,h) anthracene (µg/L)	Indeno(1,2,3-cd)pyrene (µg/L)	Pyrene (µg/L)	Total SVOC TICs (µg/L)
SB-133	12/1/2003	**1 BJ**	<5	<5	<5	<5	<5	<5	<5	**7 J**
SB-135	12/2/2003	**1.0 BJ**	<5	<5	<5	<5	<5	<5	<5	**7 J**
SB-158	1/22/2004	<5	**1 BJ**	**0.6 J**	**1 J**	**1 J**	**0.8 J**	**1 J**	<5	**4 J**
Field Blank	12/4/2003	**8**	<5	<5	<5	<5	<5	<5	<5	**2 JN**
Field Blank	1/22/2004	<5	<5	<5	<5	<5	<5	<5	<5	ND

µg/L = micrograms per liter; VOCs = volatile organic compounds; SVOCs = semi-volatile organic compounds; TICs = tentatively identified compounds;
B = compound detected in blank; J = estimated concentration; N = presumptive evidence of a compound (TICs only); ND = not detected.
VOCs analyzed via EPA Method 8260 plus heptane and TICs. SVOCs analyzed via EPA Method 8270 plus TICs. Only detected analytes are listed above.
A complete list of analytes is provided in the laboratory report.

Table 2-3
Summary of Off-Site Ground-Water Analytical Data - Monitoring Points
Former Norton/Nashua Facility
Watervliet, New York

VOCs

Sample Designation	Sampling Date	Acetone (µg/L)	Chloro-form (µg/L)	Methylene Chloride (µg/L)	Benzene (µg/L)	Toluene (µg/L)	m,p-Xylenes (µg/L)	Heptane (µg/L)	Total VOC TICs (µg/L)
DGC-8	19-Feb-04	<20000	<10000	<10000	<10000	**200,000**	<10000	<20000	**20,000 BJ**
	15-Jun-04	**2,100 BJ**	<5000	<5000	<5000	**190,000**	<5000	<10000	ND
Dup.	15-Jun-04	<10000	<5000	<5000	<5000	**110,000**	<5000	<10000	ND
MP-5	18-Feb-04	<10	**1 J**	**4 BJ**	<5	**44**	<5	<10	**12 BJ**
	14-Jun-04	<10	<5	<5	<5	<5	<5	<10	ND
	27-Oct-04	<10	<10	<10	<10	<10	<10	<10	**26 BJ**
MP-6	18-Feb-04	<1000	<500	**270 BJ**	<500	**10,000**	<500	<1000	ND
	14-Jun-04	**410 BJ**	<500	<500	<500	**9,100**	<500	<1000	ND
	27-Oct-04	<10	<10	<10	<10	**120**	<10	<10	**26 BJ**
Dup.	27-Oct-04	**36**	<10	<10	<10	**150**	<10	<10	**25 BJ**
MP-7	18-Feb-04	<10	**2 J**	**5 B**	<5	**4 J**	<5	<10	**5 BJ**
	14-Jun-04	<10	<5	<5	<5	**3 BJ**	<5	<10	ND
	27-Oct-04	<10	<10	<10	<10	<10	<10	<10	**28 BJ**
MP-13	9-Sep-04	<10	<10	<10	<10	<10	<10	<10	**10 BJ**
MP-14	9-Sep-04	**76**	<50	<50	<50	**850** [4]	<10	<50	ND
MP-15	9-Sep-04	**12**	<10	<10	<10	<10	<10	<10	**12 BJ**
Dup.	9-Sep-04	<10	<10	<10	<10	<10	<10	<10	**10 J**
MP-16	9-Sep-04	**13 B**	<10	<10	<10	<10	<10	<10	**20 BJ**
MP-17	7-Sep-04	<1000	<1000	<1000	<1000	**10,000** [4]	<1000	<1000	**700 BJ**
	27-Oct-04	<250	<250	<250	<250	**4,800**	<250	<250	**400 BJ**
MP-18	27-Oct-04	<10	<10	<10	<10	<10	<10	<10	**17 BJ**
MP-19	27-Oct-04	**13**	<10	<10	<10	<10	<10	<10	**26 BJ**
MP-20 [1]	27-Oct-04	**10**	**12**	<10	<10	<10	<10	<10	**16 BJ**
MP-21	27-Oct-04	<10	<10	<10	<10	<10	<10	<10	**26 BJ**
MP-22	15-Nov-04	<10	<10	<10	<10	<10	<10	<10	**10 BJ**
TB	18-Feb-04	<10	<5	**5 BJ**	<5	<5	<5	<10	**11 J**
	19-Feb-04	<10	<5	**10 B**	<5	<5	<5	<10	**5 J**
[2]	16-Jun-04	**19 B**	<5	**8**	<5	<5	<5	<10	ND
	7-Sep-04	**14 B**	<10	**6 J**	<10	<10	<10	<10	**10 BJ**
	9-Sep-04	<10	<10	<10	<10	<10	<10	<10	**9 BJ**
	26-Oct-04	<10	<10	<10	<10	<10	<10	<10	**29 BJ**
	28-Oct-04	<10	<10	<10	<10	<10	<10	<10	**8 BJ**
	15-Nov-04	**19**	<10	<10	<10	<10	<10	<10	**5 BJ**
FB	20-Feb-04	<10	<5	**10 B**	<5	<5	<5	<10	ND
	15-Jun-04	<10	<5	<5	<5	**3 BJ**	<5	<10	ND
[3]	9-Sep-04	<10	**12**	<10	<10	**2 J**	<10	<10	**20 J**
	27-Oct-04	<10	<10	<10	<10	<10	<10	<10	**16 BJ**
	15-Nov-04	**15**	<10	<10	<10	<10	<10	<10	ND

[1] Bromodichloromethane was detected in the MW-20 sample at an estimated concentration of 3 J µg/L.

[2] 2-butanone detected in the June 16, 2004 TB sample at a concentration of 18 µg/L.

[3] Bromodichloromethane was detected in the September 9, 2004 FB sample at an estimated concentration of 6 J µg/L.

[4] NYSDEC data validation qualified these results as "estimated and biased low".

µg/L = micrograms per liter; VOCs = volatile organic compounds; TICs = tentatively identified compounds; TB = trip blank; FB = field blank; Dup. = duplicate sample; B = detected in the laboratory blank; J = estimated concentration, detected below the quantitation limit; ND = not detected.

VOCs analysis via EPA Method 8260 plus heptane and TICs. Only selected and detected analytes are listed above. A complete list of analytes is provided in the laboratory reports.

Results for monitoring well DGC-8, located in the on-site Former Tank Farm area, are included for reference.

Table 2-3
Summary of Off-Site Ground-Water Analytical Data - Monitoring Points
Former Norton/Nashua Facility
Watervliet, NY

SVOCs

Sample Designation	Sampling Date	Phenol (µg/kg)	2-Methyl phenol (µg/L)	4-Methyl phenol (µg/L)	Naph-thalene (µg/L)	bis (2-Ethyl-hexyl) phthalate (µg/L)	di-n-Butyl phthalate (µg/L)	Benzo(b) fluoranthene (µg/kg)	Benzo(k) fluoranthene (µg/kg)	Pyrene (µg/kg)	Total SVOC TICs (µg/L)
DGC-8	19-Feb-04	<5	**38**	**47**	**0.6 J**	<5	**0.5 J**	<5	<5	<5	<5
MP-5	18-Feb-04	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MP-6	18-Feb-04	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MP-7	18-Feb-04	<5	<5	<5	<5	<5	<5	<5	<5	<5	**9 JN**
FB	20-Feb-04	**0.5 J**	**79**	**49**	<5	<5	<5	<5	<5	<5	<5

µg/L = micrograms per liter; TICs = tentatively identified compounds; FB = field blank; J = estimated concentration, detected below the quantitation limit;
N = presumptive evidence of a compound.
Benzo(g,h,i)perylene, dibenzo(a)anthracene, and indeno(1,2,3-cd)pyrene were not detected in the above samples.
SVOC analysis via EPA Method 8270. Only selected and detected analytes are listed above. A complete list of analytes is provided in the laboratory report.
Results for monitoring well DGC-8, located in the on-site Former Tank Farm area, are included for reference.

Table 2-4
Summary of Vapor-Phase Analytical Data -
Off-Site Vapor Monitoring Point Samples
Former Norton/Nashua Facility
Watervliet, NY

Sample Designation **Sample Date**	**VMP-1 (1-3)** 9/10/2004	**VMP-2 (5.5-7.5)** 9/10/2004	**Ambient** 9/10/2004
Methane (mg/m^3)	**2.9 J**	**4.8 J**	**4.4 J**
Acetone (ppbv)	**26 D**	**6**	**4**
Acrolein	**6**	**0.6 J**	<0.5
Benzene	**1**	**0.2 J**	<0.2
2-Butanone	**18**	**1**	**0.6 J**
Carbon Disulfide	**2**	<0.2	<0.5
Carbon Tetrachloride	**0.4 J**	<0.2	<0.2
Chloroform	**0.4 J**	<0.2	<0.2
Chloromethane	**1**	**0.7 J**	**0.8 J**
Cumene	**0.8 J**	<0.2	<0.2
1,2-Dichloroethane	**1**	<0.2	<0.2
Dichlorodifluoromethane	**0.7 J**	**0.7 J**	**0.7 J**
Dichlorofluoromethane	**0.4 J**	<0.2	<0.2
Ethylbenzene	**7**	**1 J**	**0.5 J**
4-Ethyltoluene	**3**	**0.2 J**	<0.2
Heptane	**6**	**0.3 J**	<0.2
Hexane	**14**	**0.4 J**	<0.2
Isooctane	**1**	**0.3 J**	<0.2
4-Methyl-2-Pentanone	**1 J**	<0.5	<0.5
Methyl t-Butyl Ether	**110 D**	<0.2	<0.2
Methylene Chloride	**3**	<0.5	<0.5
Octane	**3**	<0.2	<0.2
Pentane	**27 D**	**0.8 J**	<0.2
Propene	**28**	**1**	**0.6 J**
Styrene	**3**	<0.2	<0.2
tert-Butyl Alcohol	<0.2	**0.5 J**	<0.2
Tetrachloroethene	**0.4 J**	<0.2	<0.2
Toluene	**24**	**2**	**1**
1,1,1-Trichloroethane	**29 D**	**1**	<0.2
Trichlorofluoromethane	**0.4 J**	**0.3 J**	**0.3 J**
1,2,4-Trimethylbenzene	**4**	**0.3 J**	<0.2
1,3,5-Trimethylbenzene	**1**	<0.2	<0.2
Vinyl Chloride	**0.5 J**	<0.2	<0.2
m/p-Xylene	**22**	**3**	**1**
o-Xylene	**5**	**0.7 J**	**0.4 J**
TOTAL non-methane VOCs	**349**	**20**	**10**
TOTAL VOC TICs	**887 J**	**458 J**	**174 J**

All results presented in parts per billion by volume (ppbv) except methane (in milligrams per cubic meter; mg/m^3).
VOCs = volatile organic compounds; TICs = tentatively identified compounds; D = laboratory diluted sample analyzed; J = estimated concentration, compound detected below the quantitation limit.
All samples collected via Summa canisters equipped with six-hour sample regulators and analyzed for VOCs via EPA Method TO-15 plus TICs and methane via EPA Modified Method 18.
Only detected analytes are listed above. A complete list of analytes is provided in the laboratory report.

Table 3-1
Field Decision Matrix - Installation of Additional Geoprobe Borings
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

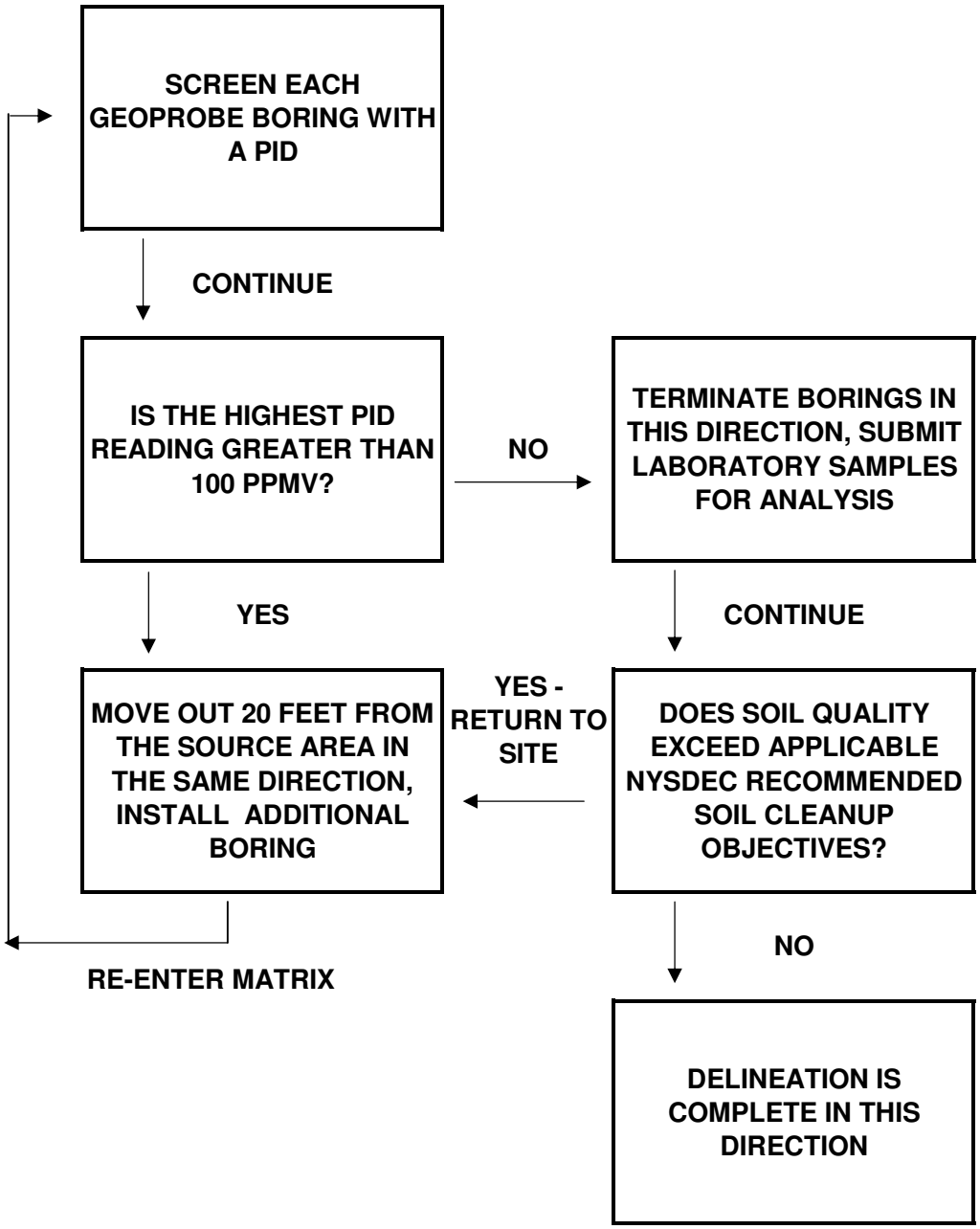
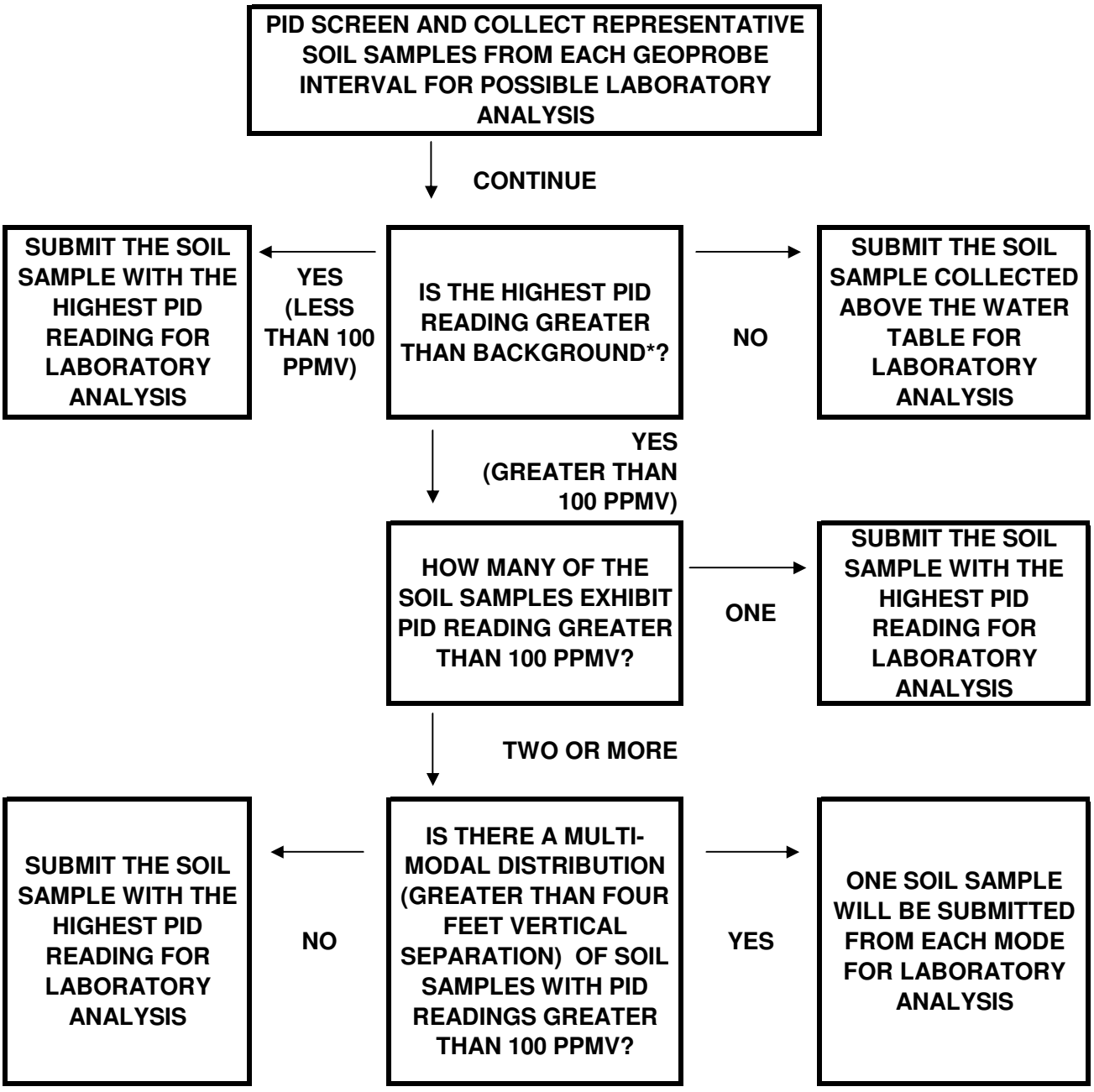


Table 3-2
Sample Summary Matrix - Phase I - Geoprobe Soil & Ground-Water Sampling
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Locations	Parameter	Analytical Method	Container and Preservative	Analysis Holding Time
Soil	10 Geoprobe boring sample locations (see text)	TCL Volatiles plus heptane and TICs	EPA 8260	4 oz. glass w/septum (no headspace), Cool to 4°C	14 days
Soil	2 Geoprobe boring sample locations (see text)	Total Organic Carbon	EPA 415.1	20 grams glass, Cool to 4°C	28 days
Soil	1 Geoprobe boring - 2 sample locations (see text)	Grain Size Analysis	ASTM D-22	500 grams glass, Cool to 4°C	not applicable
Water	10 Geoprobe boring sample locations (see text)	TCL Volatiles plus heptane and TICs	EPA 8260	3 x 40ml glass vials w/teflon lined enclosure (no headspace) HCl to pH <2, Cool to 4°C	14 days

Table 3-3
Field Decision Matrix - Collection of Soil Samples for Laboratory Analysis
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY



* background will be determined by screening an empty plastic bag with the field PID

Table 4-1
Sample Summary Matrix - Phase II - Small-Diameter Monitoring Point Sampling
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Locations	Parameter	Analytical Method	Container and Preservative	Analysis Holding Time
Water	Small-Diameter Monitoring Points (see text)	TCL Volatiles plus heptane and TICs	EPA 8260	3 x 40ml glass vials w/teflon lined enclosure (no headspace) HCl to pH <2, Cool to 4°C	14 days
Supplemental Water	(2) Selected Small-Diameter Monitoring Points	alkalinity	EPA 310.1	200ml plastic	14 days
		hydrogen sulfide	EPA 376.1	500ml plastic, NaOH/Zinc Acetate	7 days
		total iron	EPA 200.7	250ml plastic, HNO_3 to pH <2	6 mos.
		methane/ethane/ethene	Misc. GC	1 x 40ml glass vial	14 days
		nitrate/nitrite	EPA 300.0	100ml plastic, H_2SO_4 to pH <2	28 days
		phosphate	EPA 365.1	100ml plastic, H_2SO_4 to pH <2	28 days
		sulfate	EPA 300.0	100ml plastic	28 days
		microbial counts	Standard Plate Count Methods	laboratory-specific TBD	laboratory-specific TBD

Table 6-1
Sample Summary Matrix - Phase II - Sub-Slab Vapor/Ambient Air Sampling
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix/ Sample Type	Sample Locations	No. of Samples*	Parameter	Analytical Method	Sample Container (no preservative)	Analysis Holding Time
ROUND I (Summer 2005)						
Sub-Slab Vapor	1 sample at each of the 4 Residential VMP sample locations (or contingent SGSP, see text)	4	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
Ambient Outdoor Air	2 co-located replicate samples at 1 outdoor location (see text)	2	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
ROUND II (2005-2006 Heating Season)						
Sub-Slab Vapor	1 sample at each of the 4 Residential VMP sample locations (or contingent SGSP, see text)	4	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
Ambient Indoor Air	2 samples (basement/crawlspace & first floor) at each of the 4 residential locations, plus 1 co-located replicate sample (see text)	9	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
Ambient Outdoor Air	1 sample at 1 outdoor location (see text)	1	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days

* does not include additional QA/QC sample(s) - see Table 8-1

Table 8-1
QA/QC Sample Summary Matrix
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Type	Frequency	Analytical Parameters
Soil	Equipment Blank	one sample per each mobilization	TCL Volatiles plus heptane and TICs
	MS/MSD Samples	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
	Blind Replicate Sample	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
Water	Equipment Blank	one sample per each mobilization	TCL Volatiles plus heptane and TICs
	MS/MSD Samples	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
	Blind Replicate Sample	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
	Trip Blank	one sample per cooler	TCL Volatiles plus heptane and TICs
Sub-Slab Vapor/ Ambient Air	Equipment Blank	one sample per each mobilization	Volatiles
	Outdoor Ambient Air	one sample each sampling day	Volatiles
Ambient Air	Blind Replicate Sample	one sample each sampling day	Volatiles

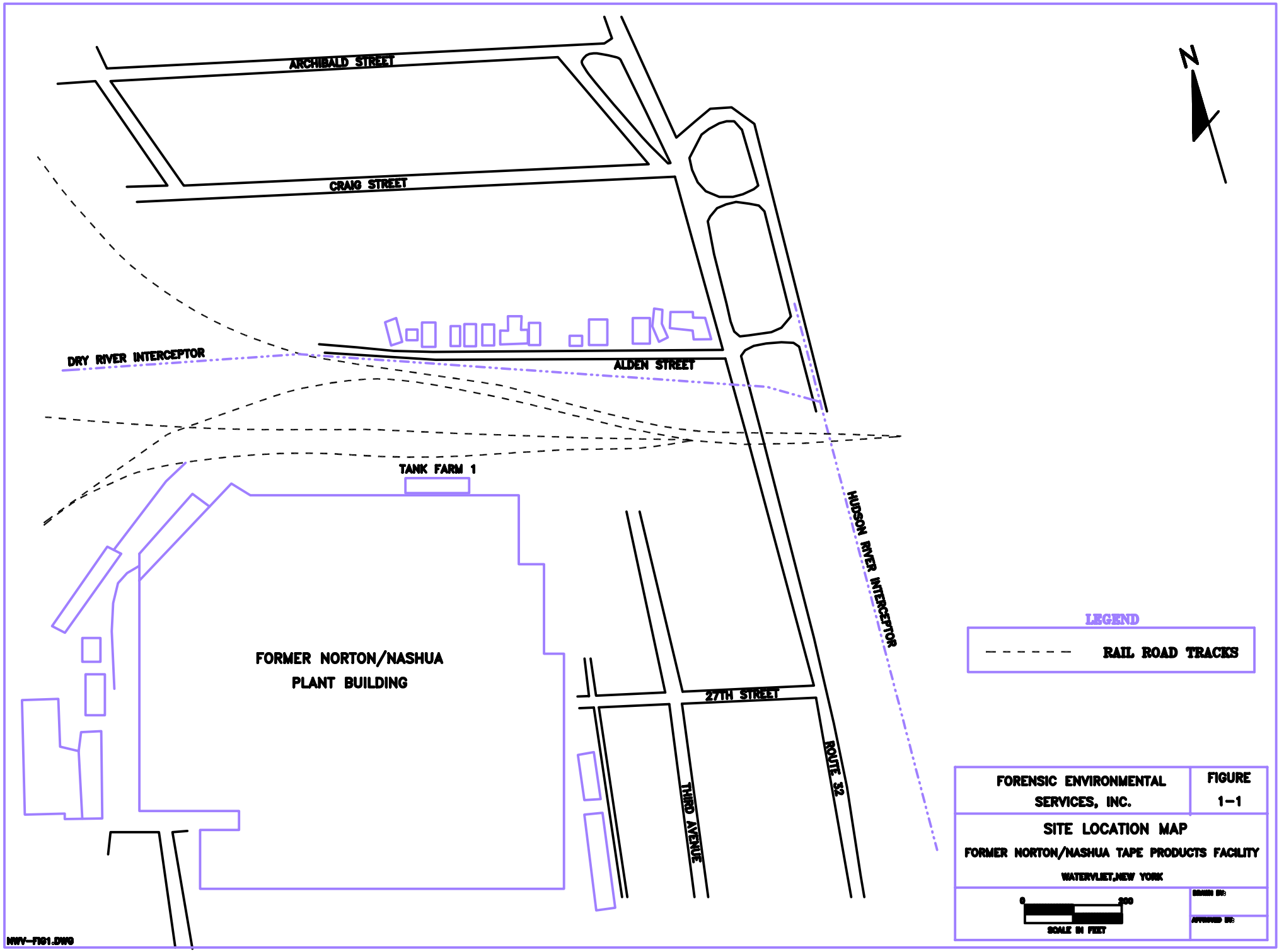
Soil and water - Volatile analysis via EPA Method 8260
Vapor - Volatile analysis via EPA Method TO-15

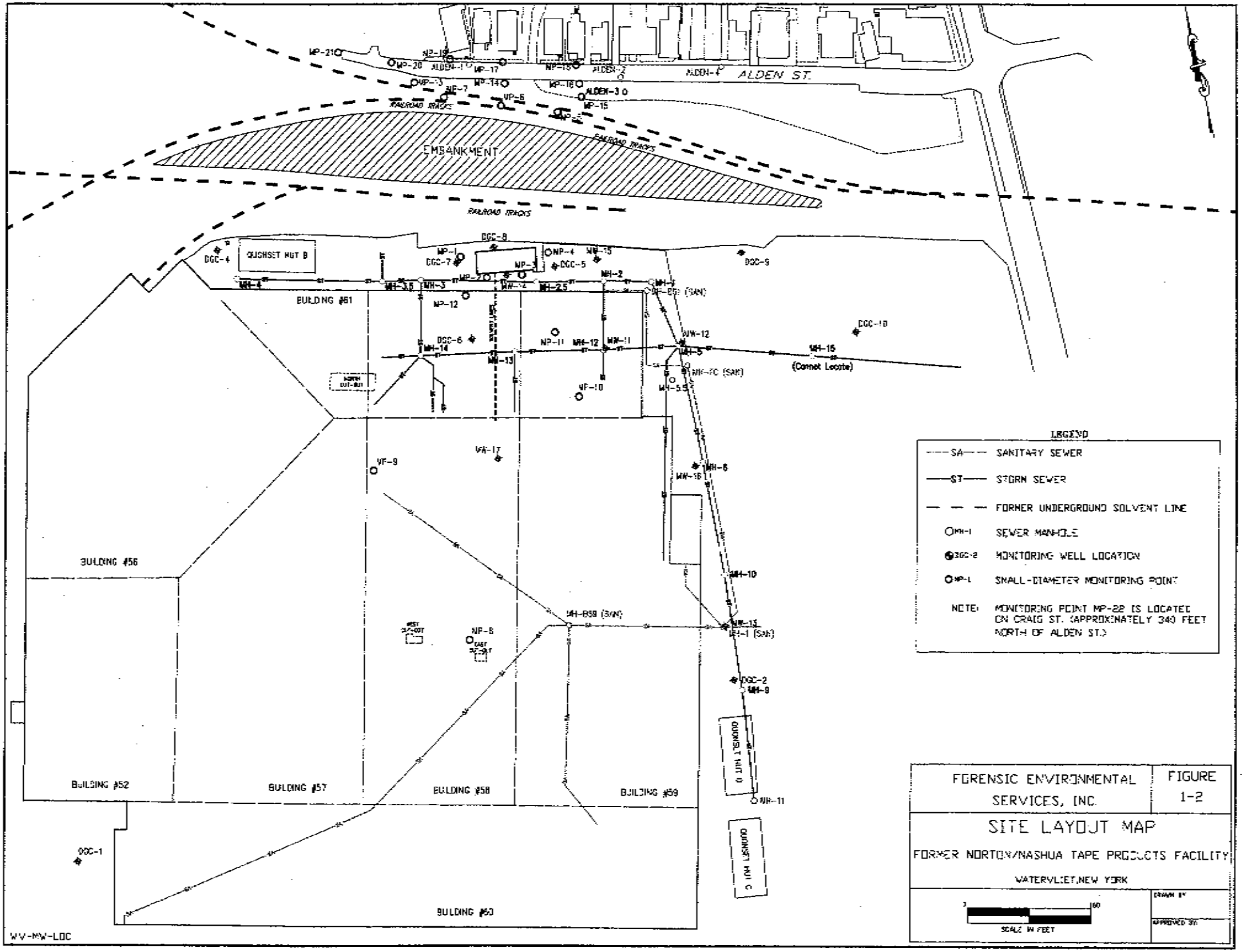
Table 11-1
Tentative RFI/Supplemental RFI Project Schedule
Former Norton/Nashua Tape Facility
Watervliet, New York

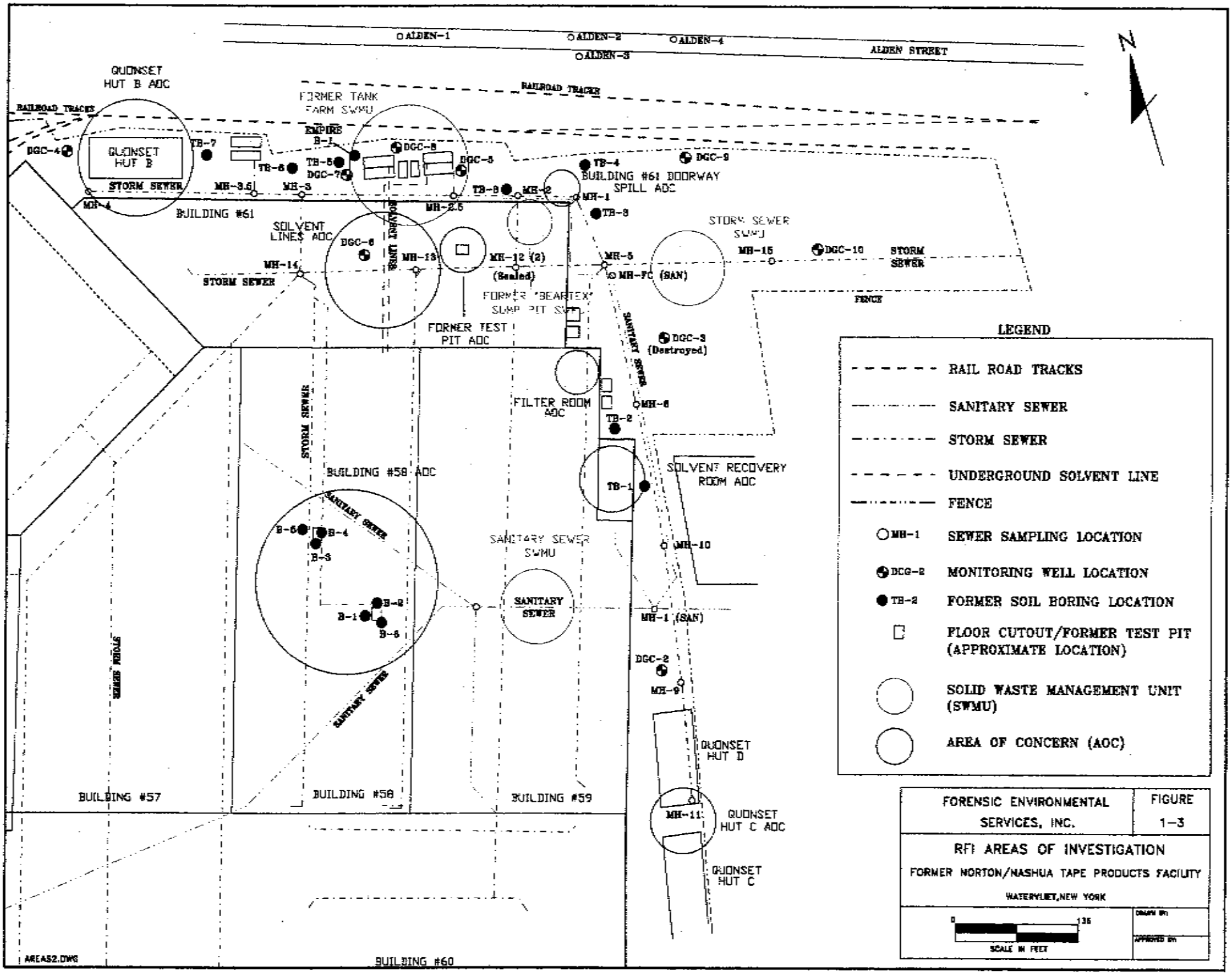
	2Q 2005			3Q 2005			4Q 2005			1Q2006
	4	5	6	7	8	9	10	11	12	
Supplemental RFI Activities*										
Prepare/Submit Supplemental RFI Workplan, NYSDEC Review										
Public Availability Session, Obtain Access										
Phase I - Install Soil Borings										
Laboratory Analysis & NYSDEC Data Validation										
Phase I - Install Monitoring Points										
Phase II - Ground-Water Sampling										
Laboratory Analysis & NYSDEC Data Validation										
Phase I - Install Residential Vapor Monitoring Points (VMPs)										
Phase II - VMP Sampling - Round I										
Laboratory Analysis & NYSDEC Data Validation										
Phase II - VMP Sampling - Round II/Indoor Air Sampling										
Laboratory Analysis & NYSDEC Data Validation										
Supplemental Borings/Contingent Air Samples										
Phase III - Corrective Measures Screening/Evaluation										
Joint Meeting to Discuss Supplemental RFI Results										
RFI Tasks*										
Preparation & Submittal of Draft RFI Report										

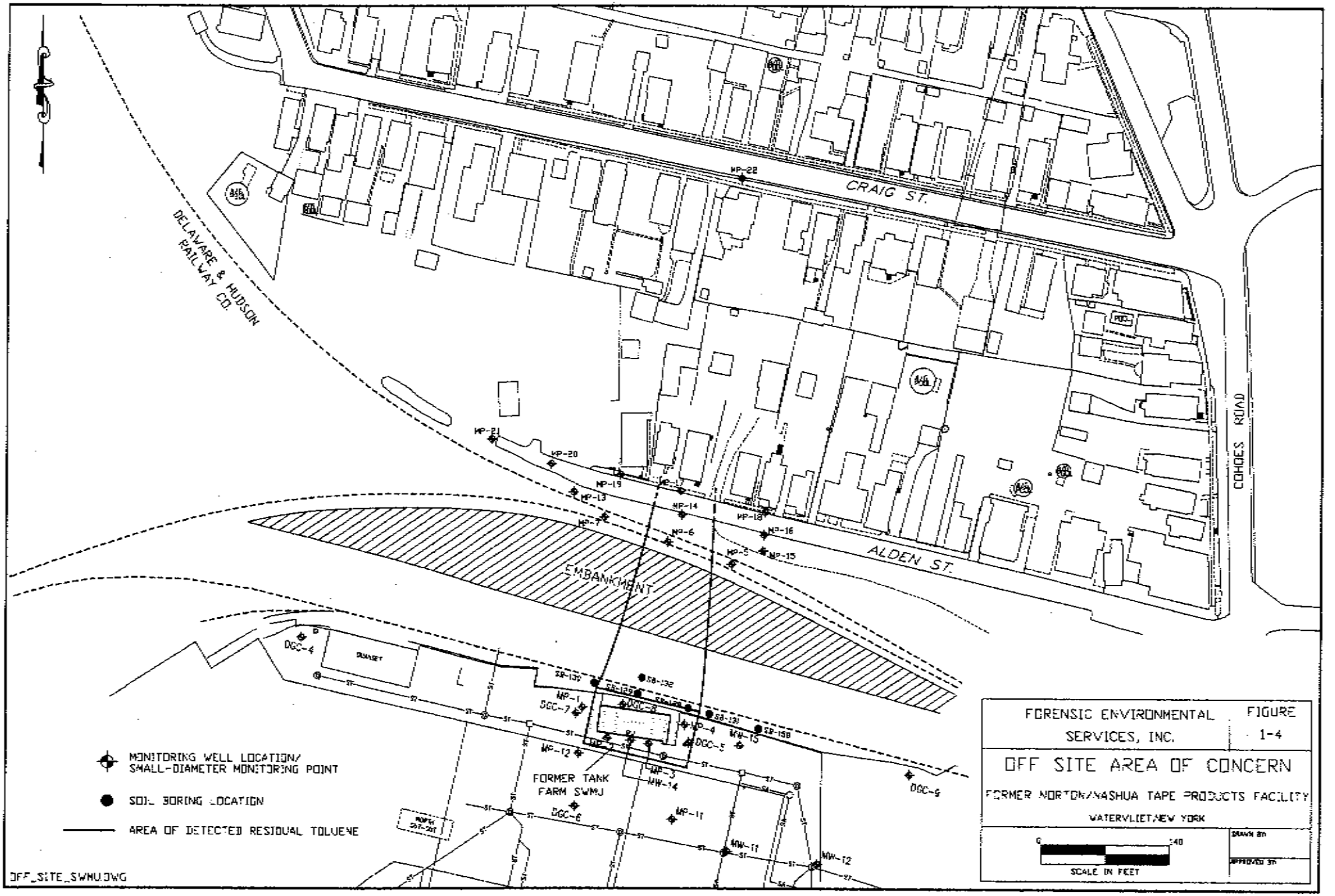
* Final schedule may be dictated by access to complete off-site investigation on the residential properties.

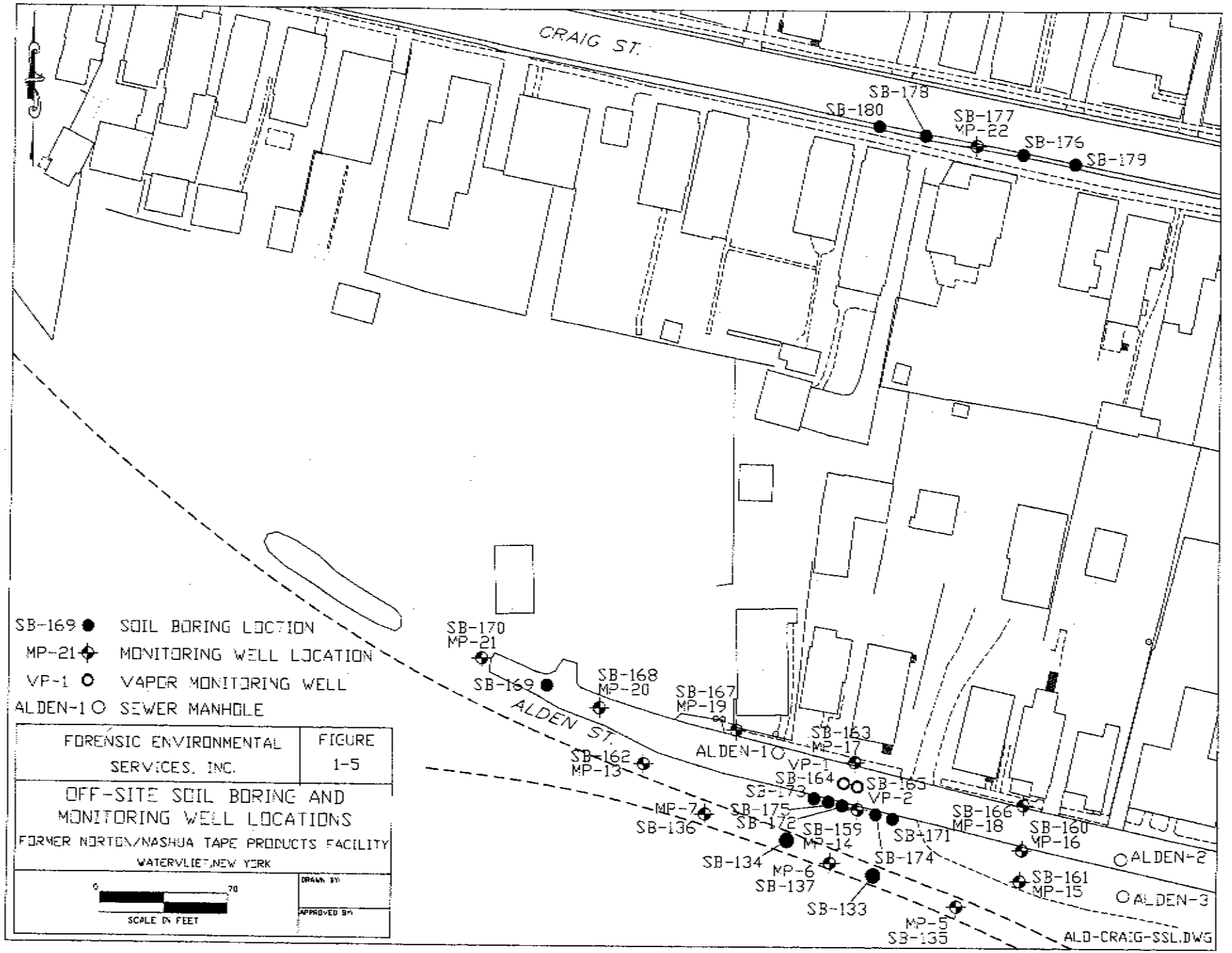
FIGURES


ARCHIBALD STREET
CRAIG STREET
DRY RIVER INTERCEPTOR
ALDEN STREET
TANK FARM 1
FORMER NORTON/NASHUA
PLANT BUILDING
HUDSON RIVER INTERCEPTOR
27TH STREET
THIRD AVENUE
ROUTE 32
N
LEGEND
RAIL ROAD TRACKS
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 1-1
SITE LOCATION MAP
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET,NEW YORK
0
200
SCALE IN FEET
DRAWN BY:
APPROVED BY:
NWV-FIG1.DWG


ALDEN ST.
EMBANKMENT
RAILROAD TRACKS
RAILROAD TRACKS
RAILROAD TRACKS
QUONSET HUT B
BUILDING #61
BUILDING #56
BUILDING #52
BUILDING #57
BUILDING #58
BUILDING #59
BUILDING #60
QUONSET HUT C
QUONSET HUT D
(Comet Locate)
MH-8SS (SAN)
MH-FC (SAN)
MH-1 (SAN)
NORTH OUT-FALL
EAST OUT-FALL
WEST OUT-FALL
LEGEND
SA SANITARY SEWER
ST STORM SEWER
FORMER UNDERGROUND SOLVENT LINE
MH-1 SEWER MANHOLE
DGC-2 MONITORING WELL LOCATION
MP-1 SMALL-DIAMETER MONITORING POINT
NOTE: MONITORING POINT MP-22 IS LOCATED ON CRAIG ST. (APPROXIMATELY 340 FEET NORTH OF ALDEN ST.)
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 1-2
SITE LAYOUT MAP
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
SCALE IN FEET
DRAWN BY
APPROVED BY
WV-MW-LOC


ALDEN-1
ALDEN-2
ALDEN-3
ALDEN-4
ALDEN STREET
N
RAILROAD TRACKS
QUONSET HUT B AOC
QUONSET HUT B
FORMER TANK FARM SWMU
EMPIRE B-1
DGC-4
TB-7
TB-6
TB-5
DGC-7
DGC-8
DGC-5
TB-4
DGC-9
BUILDING #61 DOORWAY SPILL AOC
STORM SEWER
MH-3.5
MH-3
MH-4
MH-2.5
TB-3
MH-2
MH-1
TB-8
BUILDING #61
SOLVENT LINES AOC
DGC-6
MH-13
MH-12 (2) (Sealed)
MH-14
STORM SEWER
FORMER TEST PIT AOC
FORMER "BEARTEX" SUMP PIT SWMU
STORM SEWER SWMU
MH-15
DGC-10
STORM SEWER
MH-5
MH-7C (SAN)
FENCE
SANITARY SEWER
DGC-3 (Destroyed)
FILTER ROOM AOC
MH-6
TB-2
STORM SEWER
BUILDING #58 AOC
SOLVENT RECOVERY ROOM AOC
TB-1
B-5
B-4
B-3
SANITARY SEWER
SANITARY SEWER SWMU
MH-10
B-2
B-1
B-6
SANITARY
SEWER
MH-1 (SAN)
DGC-2
MH-9
SANITARY SEWER
QUONSET HUT D
BUILDING #57
BUILDING #58
BUILDING #59
MH-11
QUONSET HUT C AOC
QUONSET HUT C
BUILDING #60
AREAS2.DWG
LEGEND
RAIL ROAD TRACKS
SANITARY SEWER
STORM SEWER
UNDERGROUND SOLVENT LINE
FENCE
MH-1 SEWER SAMPLING LOCATION
DGC-2 MONITORING WELL LOCATION
TB-2 FORMER SOIL BORING LOCATION
FLOOR CUTOUT/FORMER TEST PIT (APPROXIMATE LOCATION)
SOLID WASTE MANAGEMENT UNIT (SWMU)
AREA OF CONCERN (AOC)
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 1-3
RFI AREAS OF INVESTIGATION
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
0
135
SCALE IN FEET
DRAWN BY:
APPROVED BY:


CRAIG ST.
DELAWARE & HUDSON RAILWAY CO.
ALDEN ST.
EMBANKMENT
COHOES
FORMER TANK FARM SWMU
MONITORING WELL LOCATION/ SMALL-DIAMETER MONITORING POINT
SOIL BORING LOCATION
AREA OF DETECTED RESIDUAL TOLUENE
OFF_SITE_SWMU.DWG
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 1-4
OFF SITE AREA OF CONCERN
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
SCALE IN FEET
DRAWN BY
APPROVED BY


CRAIG ST.
SB-178
SB-180
SB-177
MP-22
SB-176
SB-179
SB-169 SOIL BORING LOCTION
MP-21 MONITORING WELL LOCATION
VP-1 VAPOR MONITORING WELL
ALDEN-1 SEWER MANHOLE
SB-170
MP-21
SB-169
SB-168
MP-20
SB-167
MP-19
ALDEN ST.
SB-162
MP-13
ALDEN-1
SB-163
MP-17
VP-1
SB-164
SB-165
VP-2
SB-173
MP-7
SB-136
SB-175
SB-172
SB-159
MP-14
SB-171
SB-166
MP-18
SB-160
MP-16
ALDEN-2
SB-134
MP-6
SB-137
SB-174
SB-161
MP-15
ALDEN-3
SB-133
MP-5
SB-135
ALD-CRAIG-SSL.DWG
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 1-5
OFF-SITE SOIL BORING AND MONITORING WELL LOCATIONS
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
0
70
SCALE IN FEET
DRAWN BY:
APPROVED BY:

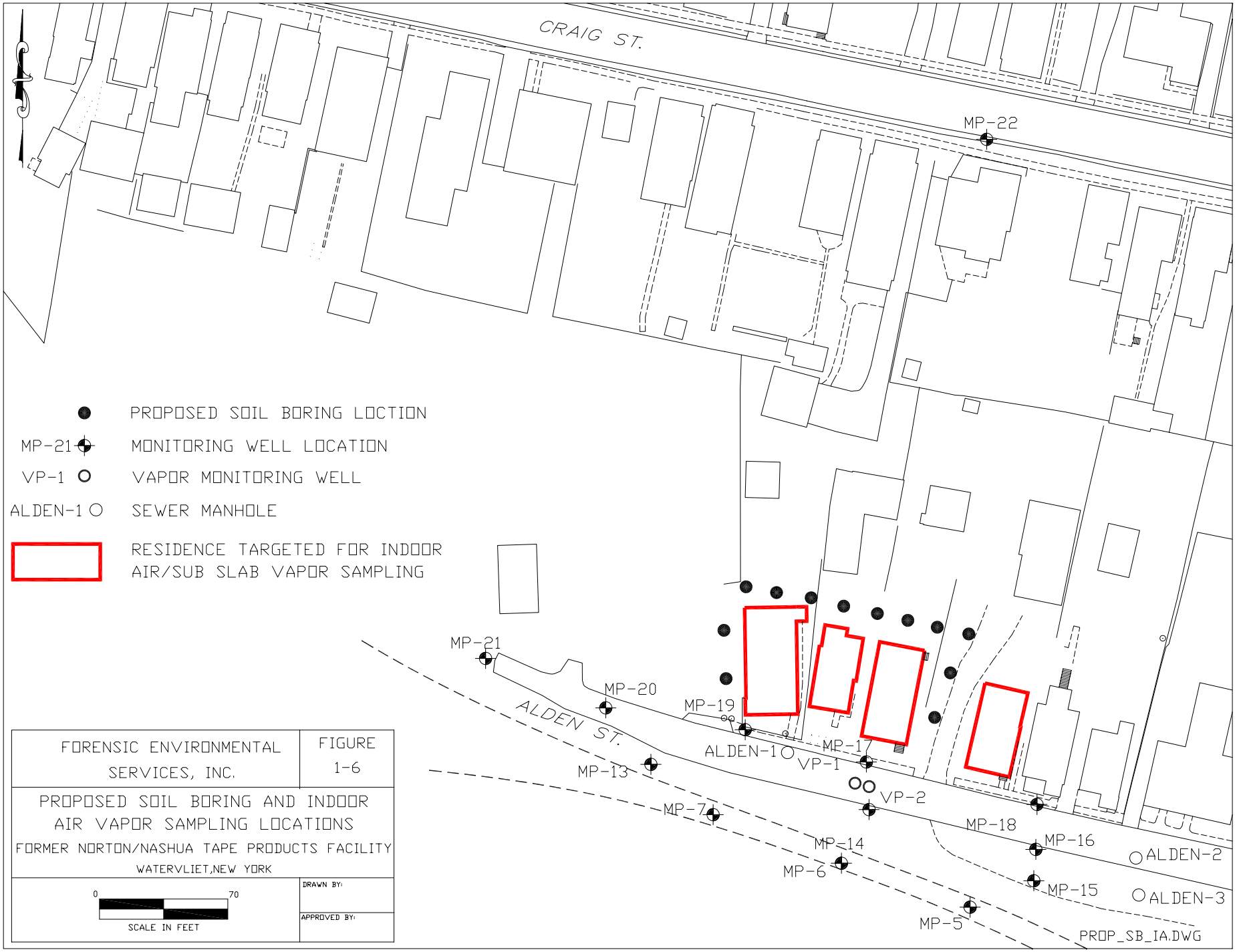
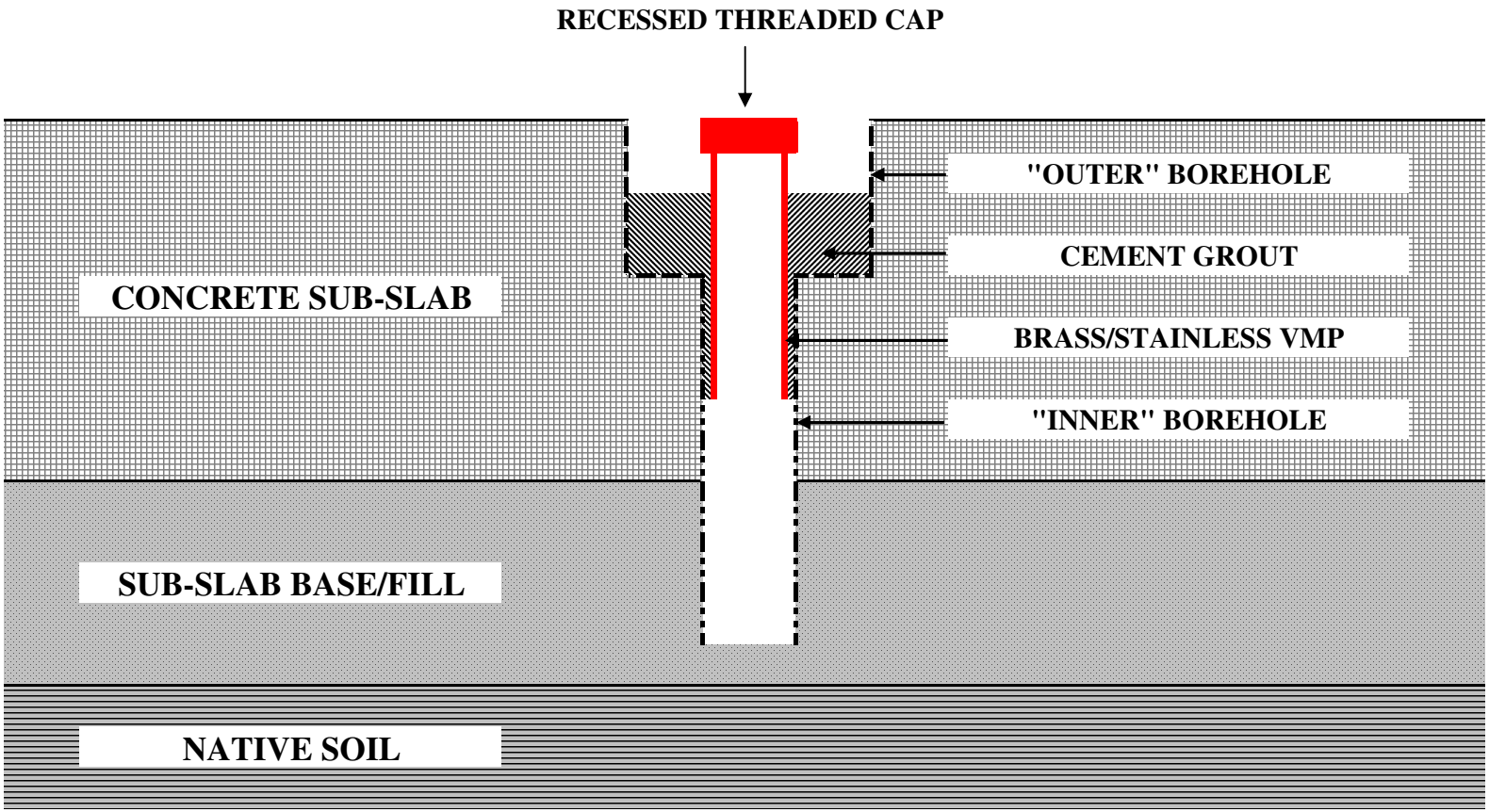

CRAIG ST.
MP-22
PROPOSED SOIL BORING LOCTION
MP-21 MONITORING WELL LOCATION
VP-1 VAPOR MONITORING WELL
ALDEN-1 SEWER MANHOLE
RESIDENCE TARGETED FOR INDOOR AIR/SUB SLAB VAPOR SAMPLING
MP-21
MP-20
MP-19
ALDEN ST.
ALDEN-1
MP-1
VP-1
VP-2
MP-13
MP-7
MP-18
MP-16
ALDEN-2
MP-14
MP-6
MP-15
ALDEN-3
MP-5
PROP_SB_IA.DWG
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 1-6
PROPOSED SOIL BORING AND INDOOR AIR VAPOR SAMPLING LOCATIONS
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET,NEW YORK
0
70
SCALE IN FEET
DRAWN BY:
APPROVED BY:

Figure 5-1
Schematic Drawing of Vapor Monitoring Point
Former Norton/Nashua Tape Facility
Watervliet, New York



APPENDIX A

INDOOR AIR QUALITY QUESTIONNAIRE
AND BUILDING CHARACTERISTICS INVENTORY

(from the NYSDOH FEBRUARY 2005
INDOOR AIR SAMPLING & ANALYSIS GUIDANCE)

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. **HEATING, VENTING and AIR CONDITIONING** (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in: Basement Outdoors Main Floor Other_____

Air conditioning: Central Air Window units Open Windows None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA
Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y / N Where?_____

f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____

g. Is there smoking in the building? Y / N How frequently? _____

h. Have cleaning products been used recently? Y / N When & Type? _____

i. Have cosmetic products been used recently? Y / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented? _____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type? _____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

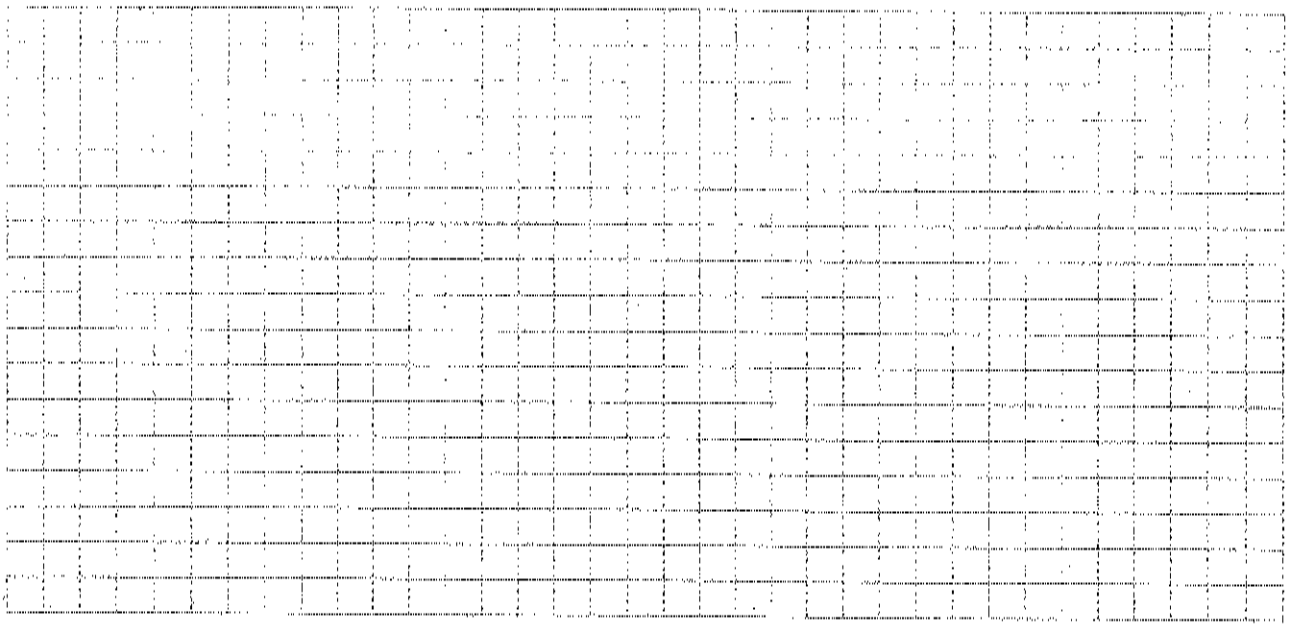
c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

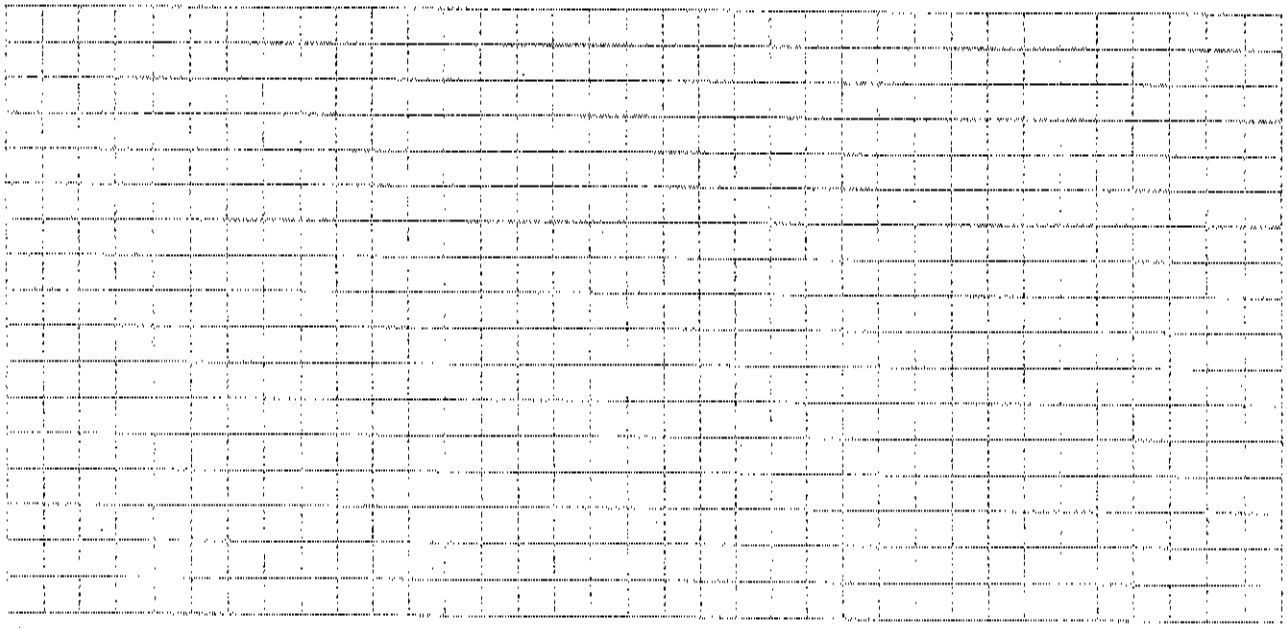
11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement:



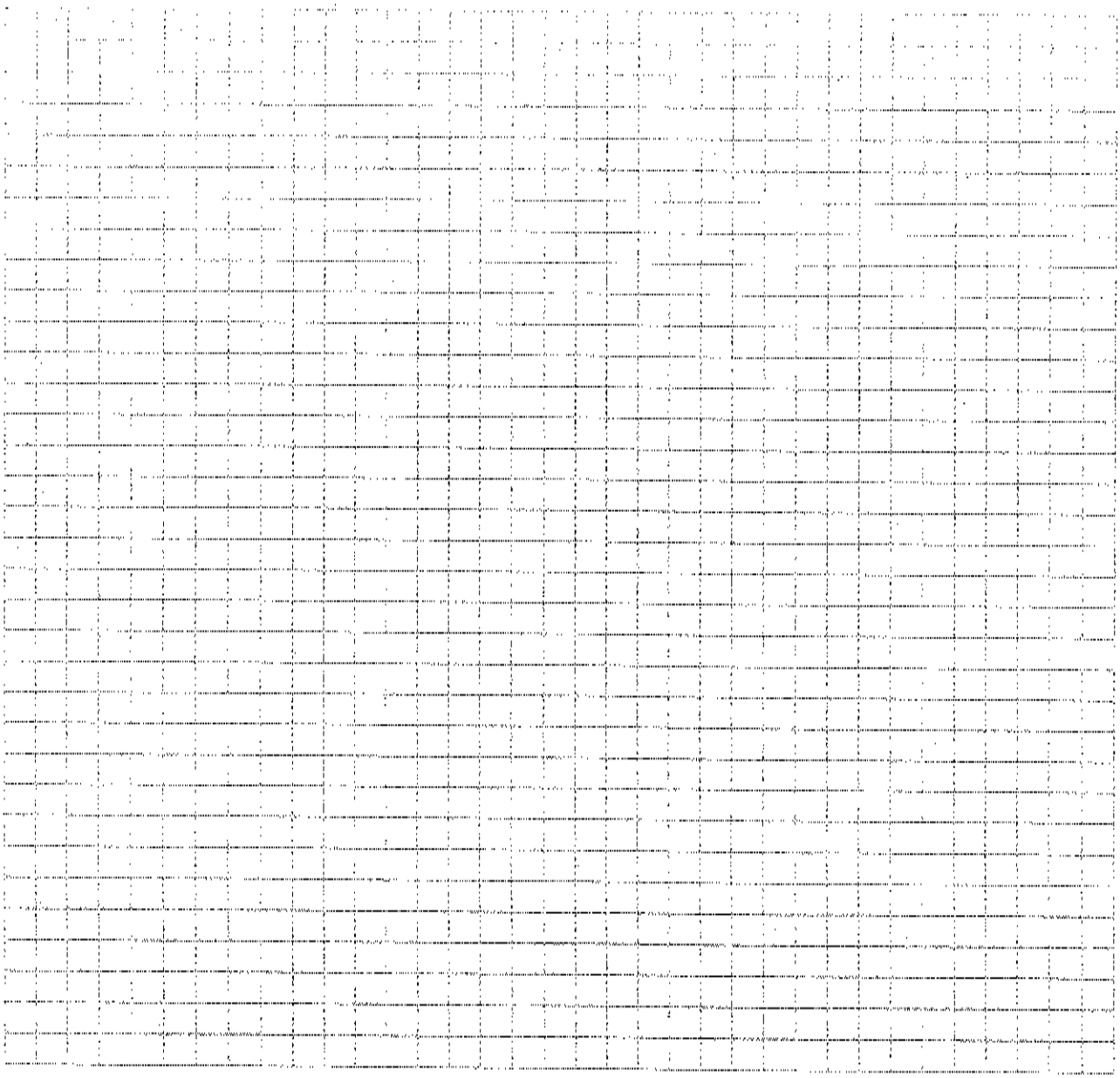
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N

* Describe the condition of the product containers as **Unopened (UO)**, **Used (U)**, or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

ATTACHMENT I

QUALITY ASSURANCE PROJECT PLAN (QAPP)

SUPPLEMENTAL RCRA INVESTIGATION (RFI)
QUALITY ASSURANCE PROJECT PLAN (QAPP)

Former Norton Company/Nashua Tape Products Facility
2600 Seventh Avenue
Watervliet, New York
EPA ID No. NYD 066829599
NYSDEC Index Number: CO 4-20001205-3375

May 2005

Prepared for:
Saint-Gobain Corporation
750 East Swedesford Road
P.O. Box 860
Valley Forge, Pennsylvania 19482
(610) 594-3940

Prepared by:
Forensic Environmental Services, Inc.
113 John Robert Thomas Drive
Exton, Pennsylvania 19341
(610) 594-3940

SECTION A

PROJECT MANAGEMENT

A1 PROJECT TITLE PAGE

SUPPLEMENTAL RCRA INVESTIGATION (RFI)
Former Norton Company/Nashua Tape Products Facility
2600 Seventh Avenue, Watervliet, New York
EPA ID No. NYD 066829599
NYSDEC Index Number: CO 4-20001205-3375

New York State Department of Environmental Conservation (NYSDEC) Case Engineer:	Victor Valaitis
NYSDEC Case Geologist:	Larry Rosenmann
NYSDEC Case Chemist:	John Miller
Forensic Environmental Services, Inc. (FES) Project Manager:	Robert Zei
FES Field Manager:	Bryan Machella
Saint-Gobain Corporation (Saint-Gobain) Site Contact:	Paul Rappleyea

A2 TABLE OF CONTENTS

(continued)

TABLE OF CONTENTS (continued)

(continued)

TABLE OF CONTENTS (continued)

A3 DISTRIBUTION LIST

NYSDEC, Bureau of Hazardous Waste Management:	Bureau Chief
NYSDEC, Division of Solid & Hazardous Materials:	Regional Engineer
NYSDEC, Division of Environmental Enforcement:	RCRA Enforcement Attorney
NYSDEC Case Engineer:	Victor Valaitis
New York State Department of Health:	Tamara S. Girard, MPH
Albany County Health Department:	Ronald. L. Groves, P.E.
FES Project Manager:	Robert Zei
Saint-Gobain Abrasives Engineer:	Paul Rappleyea
Saint-Gobain Senior Counsel:	Lauren P. Alterman, Esq.
Liberty Mutual Environmental Department:	Russell B. Gregg, Esq.
Nashua Corporation Vice President and General Counsel:	Robert S. Amrein, Esq.
Nashua Corporation External Counsel:	Thomas S. West, Esq.
Tyco General Counsel:	M. Brian Moroze, Esq.
Tyco External Counsel:	William A. Hurst, Esq.
Cloverleaf Distribution, LLC (property owner):	Brian K. Helf

A4 INTRODUCTION AND PROJECT ORGANIZATION

A4.1 Introduction

This Quality Assurance Project Plan (QAPP) describes the quality assurance/quality control (QA/QC) procedures that will be used during Supplemental RCRA Facility Investigation (RFI) activities associated with the former Norton Company (Norton)/Nashua Tape Products (Nashua) manufacturing facility located at 2600 Seventh Avenue, Watervliet, New York (Figure A-1). Forensic Environmental Services, Inc. (FES) has been retained by Saint-Gobain Corporation (Saint-Gobain) to develop and implement the Supplemental RFI, and the associated QAPP required by the New York State Department of Environmental Conservation (NYSDEC).

The purpose of the QAPP is to identify relevant QA/QC processes to ensure that reliable data are collected and maintained. This QAPP has been developed in accordance with "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations" (August 1994) and "EPA Guidance for Quality Assurance Project Plans" (February 1998). The format of this QAPP is generally consistent with the referenced EPA documents.

Supplemental RFI activities, which will focus on an off-site area of concern (AOC) located approximately 300 feet north of the former Norton/Nashua Site adjacent to several single-family dwellings along Alden Street (Figure A-2), will include:

- Installation of soil borings and collection of soil and ground-water samples for field screening and laboratory analysis
- Installation of small-diameter ground-water monitoring points
- Collection of liquid-level data and ground-water samples from the small-diameter monitoring points for laboratory analysis
- Installation of vapor monitoring points (VMPs) at four residences
- Collections of sub-slab vapor and outdoor/indoor air samples for laboratory analysis

Additional details are provided in the Supplemental RFI Workplan (FES, May 2005).

A4.2 Project and Task Organization

FES, on behalf of SGPP, will function as the Site Manager for Supplemental RFI activities associated with the former Norton/Nashua Site. FES will be responsible for the successful implementation and conformance with the QAPP. Key personnel positions are summarized below:

- Project Manager (Robert Zei, FES): Responsible for implementation of the Program, including conformance to the scope of work. The Project Manager will organize and manage field activities, coordinate personnel and subcontractors, and evaluate technical data and conclusions. The Project Manager will be responsible for communications with regulatory agency personnel and compliance with all regulatory directives. The Project Manager will also review data collection efforts and results throughout the project to ensure compliance with program objectives.

- Field Manager (Bryan Machella, FES): Responsible for daily coordination of field activities, including implementation of the sampling program, scheduling of subcontractors and other site personnel, maintenance of sampling supplies and equipment, and calibration of sampling equipment.

- Project Quality Assurance Manager (Robert Zei, FES): Responsible for reviewing project work procedures, documents, and reports for conformance to the scope of work, and maintaining all project documentation. Responsible for reviewing laboratory data for compliance with data quality objectives.

- Project Health and Safety Officer (Bryan Machella, FES): Responsible for implementing the site-specific health and safety directives detailed in the Health and Safety Plan (HASP).

- Site Contact (Paul Rappleyea, Saint-Gobain): Responsible for coordination of local public outreach. Will serve as point-of-contact for residents in the Maplewood Neighborhood with questions on access issues, field activities, laboratory analytical reports, etc.

In addition to the above personnel, the following contractors and subcontractors are currently identified as participants in the Supplemental Site Investigation Program:

- Environmental Cleanup Solutions (ECS) of Scotia, New York: Contractor responsible for soil boring and monitoring well installation activities.

- Laberge Engineering & Consulting Group Ltd. (Laberge Group) of Albany, New York: Contractor responsible for providing requisite site survey data and a base map for the subject property and area of investigation.

- Adirondack Environmental Services, Inc. (Adirondack) of Albany, New York: Contractor responsible for soil and ground-water analytical laboratory services. The corresponding laboratory QA Manager will oversee the laboratory's QA program, ensure that proper QA/QC procedures are implemented as required, maintain laboratory QA records, review and address any non-conformities, and report data, supporting QA information, and any response actions taken to address QC issues.

- Lancaster Laboratories, Inc. (Lancaster Labs) of Lancaster, Pennsylvania: Contractor responsible for sub-slab vapor/ambient air analytical laboratory services. The corresponding laboratory QA Manager will oversee the laboratory's QA program, ensure that proper QA/QC procedures are implemented as required, maintain laboratory QA records, review and address any non-conformities, and report data, supporting QA information, and any response actions taken to address QC issues.

Saint-Gobain reserves the right to make substitutions and/or additions to the above list, if needed, to ensure that project objectives are met. The NYSDEC will be notified of any changes to the list of active contractors and subcontractors.

FES personnel will direct the project contractors and subcontractors in consultation with Saint-Gobain. Specifically, the FES Project Manager and Field Manager will coordinate contractor and subcontractor efforts to ensure that project objectives are satisfied.

A5 PROBLEM DEFINITION AND BACKGROUND

The principal objectives of the original RFI are to: 1) further define the spatial distribution and magnitude of residual subsurface impact associated with the four solid waste management units (SWMUs) identified in the June 4, 2002 NYSDEC Order on Consent Index No. CO: 4-20001205-3375 and eight other AOCs identified at the Site; and 2) assess the necessity and scope of future corrective actions, if any, subject to NYSDEC's prior approval. The principal objectives of the Supplemental RFI are to: 1) further define the spatial distribution and magnitude of residual toluene impact that extends off site to the north under Alden Street (see Figure A-2); and 2) collect sub-slab vapor and indoor/outdoor ambient air samples as part of a vapor intrusion evaluation at selected residences located along Alden Street.

Saint-Gobain and the NYSDEC signed NYSDEC Order on Consent Index No. CO: 4-20001205-3375 dated June 4, 2002. A draft RFI Workplan was submitted to the NYSDEC on September 5, 2002. Following various discussions, revisions, and a meeting between representatives of Saint-Gobain and the NYSDEC, the final draft RFI Workplan was submitted to the NYSDEC on July 3, 2003, approved by the NYSDEC on July 10, 2003, and RFI field activities were initiated in August 2003.

Based on field screening data and confirmatory soil and ground-water analytical data obtained from soil borings and monitoring wells installed in the Former Tank Farm SWMU, RFI activities were extended into the railroad right-of-way located north of the Site (towards Alden Street). Access to the railroad right-of-way was obtained in November 2003, and soil borings and monitoring wells were installed in the right-of-way in December 2003 (see Figure A-2). Following development, the monitoring wells were sampled in February & June 2004. Based upon the ground-water sampling results, Saint-Gobain and the NYSDEC determined at a June 2004 meeting that the soil boring program would continue north to investigate the vicinity of Alden Street.

After obtaining a road opening permit from the Town of Colonie, soil borings and corresponding monitoring points were installed adjacent to Alden Street in August 2004. Boring and monitoring point locations are depicted on Figure A-3. Additional soil borings, monitoring points, and a vapor monitoring couplet were installed adjacent to Alden Street in September 2004. In October 2004, soil borings and a monitoring point were installed in Craig Street (see Figure A-3), and a geophysical survey was completed.

Additional details on the previously conducted off-site activities are available in the Monthly RFI Update Reports submitted to the NYSDEC by FES on behalf of Saint-Gobain. A brief summary of the field and laboratory analytical results obtained from off-site activities completed to date is presented in Section 2.2 of the Supplemental RFI Workplan (FES, May 2005).

A6 TASK DESCRIPTION

Tasks associated with the Supplemental RFI include the collection of geoprobe soil and ground-water samples, monitoring point ground-water samples, and sub-slab vapor/ambient air samples, laboratory sample analysis, data quality evaluation, data management, and report preparation. Details, including a proposed schedule, are provided below. At this time, no extraordinary personnel or equipment needs are anticipated for the completion of these tasks.

A6.1 Sample Collection

Proposed Supplemental RFI activities include the collection of off-site soil, ground-water, and sub-slab vapor/ambient air samples for laboratory analysis (see Figure A-4). A minimum of ten Geoprobe soil borings will be installed to collect soil and ground-water samples for qualitative screening and quantitative (i.e., laboratory) assessment of the presence/absence and extent of residual soil and/or ground-water contamination. Sub-slab vapor samples and ambient outdoor/indoor air samples will be collected at four locations north of Alden Street (see Figure A-4) as part of a vapor intrusion evaluation.

A6.1.1 Soil Field Screening Samples

A photoionization detector (PID) will be used to field screen geoprobe soil samples. Details are provided in Section B2.1.1 and the Supplemental RFI Workplan (FES, May 2005). For field screening purposes, PID readings exceeding 100 parts per million by volume (ppmv) will be considered evidence of residual soil and/or ground-water impact.

A6.1.2 Geoprobe Soil and Ground-Water Laboratory Samples

Soil and ground-water samples collected with the Geoprobe drilling rig will be submitted for laboratory analysis of Target Compound List (TCL) volatile organic compounds (VOCs) via EPA Method 8260 plus heptane and tentatively identified compounds (TICs). Selected geoprobe

soil samples will be submitted for Total Organic Carbon (TOC) analysis via EPA Method 415.1 and grain size analysis via ASTM Method D-22. Details on the collection of these samples are provided in Sections B2.1.1 & B2.1.2, and the Supplemental RFI Workplan (FES, May 2005).

A6.1.3 Monitoring Point (and Private Well) Ground-Water Laboratory Samples

Ground-water samples collected from small-diameter monitoring points (and any private wells) will be analyzed for TCL VOCs via EPA Method 8260 plus heptane and TICs. One or more ground-water samples will also be analyzed for the following electron acceptor/natural bioattenuation parameters: redox, pH, and O_2 (via field instrumentation), Fe^{+2} (via field chemical analysis kit), Fe^{+3} (calculated from total iron via EPA Method 7380), nitrate/nitrite (EPA Method 300.0), orthophosphate (EPA Method 300.0), sulfate (EPA Method 300.0) alkalinity (EPA Method 310.1), methane/ethane/ethene (Misc. GC Methods), hydrogen sulfide to determine H_2 (from pH and sulfide via EPA Method 376.1), and total heterotrophic bacteria and toluene-xylene (TX)-degrading bacteria microbial counts (via Standard Plate Count Methods). Details on the collection of ground-water samples for laboratory analysis from small-diameter ground-water monitoring points are provided in Section B2.1.3 and the Supplemental RFI Workplan (FES, May 2005).

A6.1.4 Sub-Slab Vapor and Ambient Air Laboratory Samples

Air purged from sub-slab VMPs will be field screened with a PID. Details on the collection of sub-slab vapor samples are provided in Section B2.1 and the Supplemental RFI Workplan (FES, May 2005). Sub-slab vapor and ambient outdoor/indoor air samples will be submitted for laboratory analysis of VOCs via EPA Method TO-15.

A6.2 Laboratory Analysis and Deliverables

Laboratory analysis of soil and ground-water samples will be completed by Adirondack. Laboratory analysis of all sub-slab vapor/ambient air samples will be completed by Lancaster Labs. All analyses will be performed using standard EPA methods unless otherwise indicated, and meet all targets specified by the NYSDEC 1991/2000 NYSDEC Analytical Service Protocol (ASP) Superfund Contract Laboratory Program (CLP). Each laboratory will provide a complete data report in hard copy and electronic format. A list of samples and corresponding analyses is provided in Table A-1.

A6.3 Data Quality Evaluation

The two components of data quality evaluation are: 1) data verification, confirming that proper procedures were followed and control limits were achieved; and 2) data validation, evaluating the quality and usability of the data in the context of project objectives. FES will complete verification and validation of field data as outlined in Section D. Each laboratory will perform preliminary verification of analytical data based on laboratory standard operating procedures (SOPs) and QA procedures. FES will also provide preliminary verification and validation of laboratory analytical data. Final verification and validation of laboratory data will be conducted by the NYSDEC as discussed in Section D.

A6.4 Data Management

Final management of all field and laboratory data will be performed by FES. Additional details on data management, including information on data processing and storage, are provided in Section B10.

A6.5 Reports

Results of the Supplemental RFI will be included in the summary RFI Report. The summary RFI Report will describe all Supplemental RFI results and include a summary of current site conditions, a description of the type and extent of contamination at the Site (with maps and cross sections summarizing the hydrogeologic data), a preliminary analysis of sources, migration pathways and potential receptors, and an assessment of the need for further corrective actions, including any associated feasibility testing, subject to a final determination by the NYSDEC. Details on other reports associated with the Supplemental RFI are provided in Section C2.

A6.6 Project Schedule

Per NYSDEC CO: 4-20001205-3375, Supplemental RFI Workplan revisions will be submitted within 45 days of receipt of comments from the NYSDEC (or within 30 days of a meeting with the NYSDEC to discuss the Supplemental RFI Workplan, if determined to be necessary). Field work will be initiated within 30 days of receipt of Supplemental RFI Workplan approval from the NYSDEC; the completion of a public availability session and receipt of access from private property owners will also be necessary prior to initiating field work.

The first phase of field work will consist of the installation of soil borings via Geoprobe drilling rig and the collection of soil and ground-water samples that will be submitted for standard laboratory turn-around times (two to three weeks). Small-diameter monitoring points will be installed within 30 days of receipt of: 1) preliminary laboratory data; 2) NYSDEC approval of proposed monitoring point locations; and 3) confirmation of homeowner access. Monitoring point ground-water sampling will be performed at least 14 days, but no more than 30 days, after monitoring point development activities are completed. Monitoring point ground-water samples will be submitted for standard laboratory turn-around times (two to three weeks).

Within 30 days of receipt of preliminary laboratory data (prior to NYSDEC validation), any required supplemental boring locations will be finalized and submitted to the NYSDEC for approval. Within 30 days of receipt of NYSDEC approval, installation of any required supplemental soil borings will be initiated.

Homeowner schedules permitting, installation of residential VMPs will be performed concurrently with the installation of soil borings. If possible, the first round of VMP and concurrent ambient outdoor air sampling will be performed during the same mobilization as small-diameter monitoring point installation (or monitoring point sampling). The second round of VMP and concurrent ambient indoor/outdoor air sampling will be performed during the 2005-2006 heating season (general time frame November 15, 2005 through March 31, 2005). Sub-slab vapor and ambient air samples will be submitted for standard laboratory turn-around times (three to four weeks).

Copies of all final soil, ground-water, and sub-slab vapor/ambient air sampling laboratory data packages will be forwarded upon receipt to the NYSDEC for data validation. Within 60 days of receipt of data validation from NYSDEC, the draft RFI Final/Summary Report will be submitted to the NYSDEC for review and comment. A finalized Report will be submitted for approval within 45 days of receipt of comments from the NYSDEC (or if a meeting with the NYSDEC to discuss the draft RFI Report is determined to be necessary, within 30 days of the meeting). A summary of the proposed RFI schedule is provided as Table A-2.

A7 DATA QUALITY REQUIREMENTS

The implemented Quality Assurance program will be consistent with EPA's "graded approach" which allows for various data quality objectives (DQOs) and error tolerances pending the intended use of the data. Data of both a quantitative and qualitative nature will be collected and utilized during Supplemental RFI activities. All quantitative data collected and utilized for regulatory compliance will undergo a formalized validation procedure.

Project DQOs have been established for the following data quality indicators: precision, accuracy, representativeness, completeness, and comparability (PARCC) to ensure that the data collected during Supplemental RFI activities are sufficient and of proper quality for their proposed uses. Conformance with the DQOs outlined in this QAPP will be used to determine the degree of uncertainty associated with the investigation results. The relevant data quality indicators are reviewed in detail below.

A7.1 Precision

Precision measures the reproducibility of measurements under a prescribed set of similar conditions via quantification of the variability of the measurements. The reproducibility (agreement) of the measurements is expressed as a range (minimum and maximum values) or standard deviation; relative range (for duplicates) and coefficient of variation (relative standard deviation) are also used to specify precision.

Precision is a combination of sampling and analytical factors. Duplicate samples will be used to estimate field precision, and laboratory MS/MSD samples will be used to determine analytical precision. The latter is more easily quantified because specific analytical method data are well-documented, whereas field precision is site-specific and influenced by each particular field method. The project objective is to equal or exceed laboratory precision for the same analytical methods on similar samples (but see the discussion in Section B1.4).

Precision is expressed as the relative percent difference (% RPD) in duplicate samples utilizing the following formula:

$$\% \text{ RPD} = 100 * 2[\text{absolute value}(X_1 - X_2)/(X_1 + X_2)]$$

where X_1 & X_2 represent the reported analyte concentrations for each duplicate sample.

A7.2 Accuracy (Bias)

Accuracy is the degree of agreement between a measurement (or the average of a group of measurements) and the true value. Accuracy is influenced by random error (precision, see above) and systematic error (bias) introduced during sampling and analysis. High precision and low bias are necessary for high accuracy. Accuracy is determined by adding a matrix or blank spike (surrogate) of known concentration to the sample, and is expressed as:

$$\% \text{ Recovery (P)} = (R/S) * 100, \text{ or } \% \text{ Bias} = (P-100)$$

where R = the reported surrogate concentration, and S = the spike surrogate concentration.

The DQO is to equal or exceed the accuracy demonstrated for the same analytical methods (see NYSDEC 1991/2000 ASP Superfund CLP) on similar samples (but see the discussion in Section B1.4).

A7.3 Representativeness

Representativeness, primarily used to describe field data, is the degree to which the data represent the field population for a sampling location or condition. As such, representativeness is dependent on the field sampling procedures, which are discussed in more detail in Section B1. The proposed field sampling methods have been selected to optimize the representativeness of samples from each matrix (soil, ground water, and sub-slab vapor/ambient air).

The representativeness of field data can be qualitatively assessed by collecting multiple samples (ground-water and sub-slab vapor/ambient air) from the same sampling locations at different times. Analytical results outside the range of presumed natural variability would suggest a non-representative data set.

A7.4 Comparability

Comparability is a qualitative term expressing the degree to which two data sets can be considered equivalent. When used to describe laboratory analytical data, comparability is assessed based on sample holding times, method type, internal QA/QC issues, and overall analytical quantitation results. Inter-laboratory data are considered comparable when both laboratories utilize: 1) instrument standards identified by the National Institute of Standards and Technology (NIST) or NYSDEC sources; 2) standard EPA methodologies; 3) consistent units to report data from similar matrices; 4) appropriate quality control as part of the laboratory's QA/QC program; and 5) participation in inter-laboratory studies to document laboratory performance.

When used to describe field sampling data, comparability is assessed based on data set size, time of collection, measuring devices/sampling techniques, rules for excluding selected measurements, etc. The significance of any comparability issues between field data sets is dependent upon the size of each data set, and the proposed use of the data.

A7.5 Completeness

Completeness is the amount of valid data obtained versus the total number of measurements with a target goal of 95% for soil and ground-water screening samples and 100% for confirmatory ground-water and sub-slab vapor/ambient air samples. Data will be considered useable unless qualified during data validation by the NYSDEC, or otherwise rejected.

Failure to meet the completeness goals may simply result in a loss of statistical power during data evaluation or may require the collection of additional field data. Available valid (non-rejected) data must be assessed to determine if the project goals have been met.

A7.6 Additional Data Quality Indicators

Additional laboratory Data Quality Indicators include: 1) reporting and/or quantitation limits; 2) surrogate/spike recovery; 3) instrument sensitivity; 4) instrument memory effects; and 5) method repeatability. During the data validation process significant deviations from optimal performance levels (or targets specified by the NYSDEC 1991/2000 ASP Superfund CLP) for the above indicators will be noted and their potential effect on overall data quality reviewed. The NYSDOH has requested that the laboratory achieve a reporting limit of one microgram per cubic meter ($\mu g/m^3$) for sub-slab vapor/ambient air sample COCs (toluene).

A8 SPECIAL TRAINING REQUIREMENTS/CERTIFICATION

All project team personnel have extensive environmental sampling experience. The rules and guidelines set forth in the Occupational Safety and Health Act (OSHA) Part 1910 (Title 29 Code of Federal Regulations CFR Part 1910.120) will be implemented for all project activities. All project workers involved in hazardous or potentially hazardous work will have met the requirements set forth in 29 CFR 1910.120(e), which include forty hours of classroom training in hazardous waste site safety, three days of field experience working under a trained, experienced supervisor, and eight hours of annual refresher training. Documentation of the completion of the training requirements will be maintained in personnel files.

Training and certification of laboratory personnel must meet the individual laboratory's (Adirondack or Lancaster Labs) QA requirements. Each laboratory will maintain documentation of appropriate training and certifications in its respective personnel files.

A9 DOCUMENTATION AND RECORDS

This section discusses the maintenance of records and documents associated with field activities, including sampling, and laboratory analyses.

A9.1 Field Documents

All field activities will be documented in the site-specific project field notebooks. Field notebooks will sequentially record all field activities on a daily basis. If two or more field personnel are working simultaneously on the project, supplemental field notebooks may be used. Information entered in the field notebook will include at a minimum:

- Date, weather conditions; personnel present, and proposed tasks;
- A detailed description of the work completed including sketches, diagrams, and location maps where appropriate;
- Instrument calibrations performed;
- Equipment and supplies used;
- All field measurements obtained (except as noted below);
- Any problems and/or deviations from the workplan; and
- A summary, including volume estimates, of any wastes generated for later disposal.

In addition to the project field notebooks, supplemental field data forms, such as soil boring logs, well completion diagrams, ground-water sampling forms, and indoor air quality questionnaires and building characteristics inventories described elsewhere in this QAPP, will be used to record field data. In general, original field data will be recorded in the field notebook and the supplemental data form will be completed at a later time, but in some instances (i.e., homeowner interview) it may be more appropriate to use the supplemental field data forms to record the original data. In the latter instance, the field notebook should clearly indicate that the corresponding field information is found on the supplemental data field form.

Additional field documents will include chain-of-custody (COC) forms, photographs, and the aforementioned supplemental field data forms. During field activities, the Field Manager will maintain the field documents to ensure that field procedures, measurement, and observations will be recorded in detail. In the absence of field activities, the Project Manager will retain the field notebook and all supplemental field data forms, and secure them in the central project file.

A9.2 Laboratory Documents

Activities related to sample analysis will be documented by each laboratory and maintained as described in Section B10.2. Laboratory analytical data packages will be complete NYSDEC CLP/Category B laboratory deliverables including TICs (Lancaster Laboratories will also submit its most relevant TO-15 MDL study) and meet the RCRA Analytical and Raw Data Deliverables requirements specified in Attachment A of the June 2002 Order on Consent (see Appendix A).

Analytical data packages received from the contract laboratory (in either paper or electronic format) will be inspected for completeness and compared with the list of analyses requested on the chain-of-custody record and in the project work plan to ensure all analyses were performed. Following inspection, a copy of each analytical data package (in either paper or electronic format) will be forwarded to the NYSDEC for data validation.

Subsequent to inspection and analysis conformation, the data package will be tabulated into an electronic spreadsheet format (e.g., Microsoft Excel), and dedicated to a project specific directory on an FES computer hard drive. In addition, tabulated computer data files will be backed up on a project-dedicated compact disk. All laboratory deliverables will be maintained in a neat and orderly manner by the Project Manager and secured in the central project file.

A9.3 Reference Documents

The Project Manager will be responsible for the maintenance of all project reference materials, which may include:

- Maps (topographic, geologic, other);
- Survey Data;
- Construction Details (utility locations and as-built drawings);
- Sub-Contractor Reports and Correspondence; and
- Permits.

All reference materials will be reviewed by the Project Manager, prior to being secured in the central file.

SECTION B

DATA MEASUREMENT AND ACQUISITION

B1 SAMPLING PROCESS DESIGN

This section describes the relevant components of the project design: key parameters being investigated, sampling plan design and rationale, selection and number of samples, where, when, and how samples will be collected, and classification of measurements as critical/non-critical. Any non-standard methods will be used in a qualitative manner and additional validation will not be necessary for these data. The project schedule is discussed in Section A6.6. The complete sampling design is described in detail in the Supplemental RFI Workplan (FES, May 2005).

Field sampling activities are being conducted to assess the presence/absence and extent of environmental impact (toluene) in vadose zone soils, and the aquifer system, as well as in basement sub-slab vapors and ambient indoor air in selected residences along Alden Street. In addition to quantitative analytical data characterizing the presence, nature, and extent of environmental impact, sampling efforts will be performed to characterize physical properties of the subsurface soils. Supplemental RFI activities are summarized below.

B1.1 Soil Boring Program

A minimum of ten Geoprobe soil borings will be installed on private residential properties north of Alden Street (see Figure A-4) to collect samples for the quantitative (i.e., laboratory) assessment of the presence/absence and extent of residual soil and/or ground-water contamination. Boring locations were selected based upon the field and laboratory data obtained during previous RFI activities. Prior field and laboratory data are summarized in the Supplemental RFI Workplan (FES, May 2005).

If residual impact (defined as PID readings exceeding 100 ppmv) is detected in a given soil sample, additional borings, as appropriate, will be installed at 20-foot intervals in the same direction (and then laterally as necessary) until the aerial extent of residual soil impact is defined. Final boring locations will be based upon physical access restraints and receipt of access from the property owner.

Overall supervision of Soil Boring Program will be provided by the FES Project Manager. Field operations will be supervised by an FES geologist who will be responsible for the following tasks:

- Finalizing drilling locations and coordinating access;
- Securing the drilling area and implementing any necessary work zone safety procedures in accordance with the site-specific HASP;
- Supervising the drilling subcontractor during soil boring/monitoring point installation;
- HASP-related ambient air monitoring;
- Logging each soil boring;
- Field screening and collection of soil samples for laboratory analysis;
- Contingent geoprobe ground-water sample collection;
- Handling, labeling, and shipment/delivery of all samples;
- Completion of relevant field notes, soil boring logs/well construction diagrams; and
- Daily reporting to the FES Project Manager.

Soil borings will be installed utilizing a Geoprobe Model 6610DT drilling rig, or similar, equipped with a 2-inch diameter drilling point. Continuous soil samples will be obtained via 2-inch diameter dedicated Geoprobe recovery "sleeves" (i.e., disposable five-foot or four-foot acetate liners placed in the macro-core sampler) that will be extracted by the Geoprobe at each location and sampled for VOCs or supplemental parameters as discussed in Section B2.1.1.

After collecting soil samples for laboratory analysis, remaining soil in the recovered geoprobe liner will be used for field descriptions of the physical characteristics of each soil sample interval including assessment via Unified Soil Classification System (USCS) for 1) composition, 2) consistency and density, 3) color, 4) moisture content, 5) grain size/sorting, and 6) presence/absence of staining, discoloration, and odors. All field observations obtained during soil boring installation and soil sampling will be recorded in a project dedicated field notebook as well as electronically on a soil boring log (see Appendix B).

Based on previous work adjacent to Alden Street, it is expected that residual impact will be limited to the soil interval immediately above or at the water table (approximate depth 8 to 9 feet), so borings will be advanced to a total depth of 12 feet. Ground-water samples will be collected from selected borings utilizing the Geoprobe sampler as discussed in Section B2.1.2.

B1.2 Small-Diameter Monitoring Point Program

Following review of field data and preliminary laboratory data with the NYSDEC Case Engineer, a minimum of two small-diameter ground-water monitoring point locations will be identified north of Alden Street. The small diameter monitoring points will be used to collect liquid-level data and monitor ground-water quality data in this area.

Monitoring point borings will be installed by a Geoprobe Model 6610DT drilling rig, or similar, initially equipped with a 2-inch diameter drilling point to a total depth approximately ten feet below the level of the water table (or to bedrock refusal) to allow for seasonal ground-water fluctuations. During monitoring point installation, continuous soil samples will be obtained via Geoprobe recovery “sleeves” and field screened as discussed in Section B1.1; however, soil and ground-water samples will not be collected for laboratory analysis during monitoring point installation (unless previously discussed with the NYSDEC) because these borings will be installed immediately adjacent to previously sampled locations.

After collecting the field screening samples, the Geoprobe drilling rig will be used to install a 3.5-inch diameter steel casing to the bottom of the boring. A 3.25-inch diameter Geoprobe "pre-pack" well and filter kit, consisting of 1.5-inch diameter, flush-threaded joint Schedule 40 PVC riser, screen (15 feet; 0.010-inch slot size), and bottom plug will be installed in the steel casing so the screened interval of the monitoring point "straddles" the seasonal water table position. The steel casing will then be removed and the remaining well annulus filled with a #1 or #2 sand pack extending a minimum of one foot above the top of the screened interval, sealed with approximately one to two feet of bentonite, and then grouted to the surface. Alternatively, small-diameter ground-water monitoring points may be constructed in the steel casing using two-inch diameter, flush-threaded joint, Schedule 40 PVC riser, screen (15 feet; 0.010-inch slot size), and bottom plug, and then completed as described above.

Each small-diameter monitoring point will be completed with a bolt-down, flush-mounted vault anchored by a concrete skirt, and equipped with a locking gripper-plug to prevent unauthorized access. All field observations obtained during monitoring point installation will be recorded in a project dedicated field notebook as well as electronically on a well construction diagram (see Appendix B).

Following installation, each small-diameter monitoring point will be properly developed to remove fine-grained sediments from the sand pack and screen, and to establish communication between the well and the aquifer. Well development will be performed by surging and pumping utilizing a submersible or peristaltic pump. The well will be considered developed when the discharge is clear, after five well volumes have been removed, or after 30 minutes of surging and pumping, whichever comes first. Water generated during of well development will be containerized in properly-labeled 55-gallon drums and temporarily staged at the former Norton/Nashua site pending subsequent characterization and disposal (see Section B2.1.7).

Following installation, a New York licensed surveyor (Laberge Group) will survey the off-site monitoring points to existing site features and elevations, and a USGS benchmark elevation datum to establish horizontal position and vertical elevation to the nearest 0.01 foot in accordance with the Code of Practice for Land Surveyors adopted by the New York State Association of Professional Land Surveyors as last revised on July 18, 1997. Survey information will be used to revise site base maps depicting sampling locations, ground-water flow maps, isoconcentration maps, and other figures that will be included in the summary RFI Report.

Subsequent to a two-week equilibration period, liquid-level data will be collected from all newly-installed off-site monitoring points. Prior to ground-water sampling (see Section B2.1.3), a synoptic round of liquid-level data will be obtained from all off-site monitoring points (see Figure A-4) according to the following protocol:

- Begin by inspecting each monitoring well/point vault and well for general integrity and note any deficiencies in the project field notebook.

- Unlock the well, remove the well cap, and immediately collect a PID field screening reading for VOC vapor concentrations in the well. Record the PID reading in the project field notebook.

- Slowly lower an interface probe capable of detecting free-phase product (FPP) into the well until the probe emits an audible or visual signal indicating FPP (continuous signal) or water (intermittent signal).

- Record the probe depth (depth to product, DTP; or depth to water, DTW; as appropriate) in the project field notebook to the nearest 0.01 foot using the north mark on the top of the well casing as a reference point.

- If FPP was detected, further lower the probe until it emits an audible or visual signal indicating water (intermittent signal). Record the DTW in the project field notebook to the nearest 0.01 foot using the same top of casing reference point.

- Determine the total depth (TD) of the well by slowly lowering the probe until it touches the bottom of the well (cable becomes slack). Record the TD in the project field notebook to the nearest 0.01 foot using the same top of casing reference point.

- Decontaminate the interface probe after use at each well by the methods outlined in Section B2.1.6.

B1.3 Sub-Slab Vapor and Ambient Indoor Air Monitoring Program

Four private residences north of Alden Street (see Figure A-4) have been selected for sub-slab vapor and indoor air sampling for the quantitative (i.e., laboratory) assessment of the potential impact of toluene to indoor air. Sampling locations were selected based upon the field and laboratory data obtained during previous RFI activities, which are summarized in the Supplemental RFI Workplan (FES, May 2005). Access will be negotiated to allow the installation and sampling of a sub-slab VMP at each home, and to collect ambient indoor air samples in the basement (or crawlspace, if present) and the first floor of each home.

Installation and sampling protocol for sub-slab VMPs is based upon the following guidance documents: 1) NYSDOH Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York/Indoor Air Sampling & Analysis Guidance, February 2005; 3) USEPA Office of Soil Waste and Emergency Response (OSWER) Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil, (Subsurface Vapor Intrusion Guidance), November 2002; 4) RCRA Draft Supplemental Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway, December 2001; 5) Massachusetts Department of Environmental Protection, Indoor Air Sampling & Evaluation Guide, April 2002; and 6) Colorado Department of Public Health and Environment, Indoor Air Guidance, September 2004.

B1.3.1 Pre-Installation Survey and Selection of VMP Location

At this time, construction of the four residences (e.g., basement, first floor on slab, crawlspace, etc.) is unknown. The lowest accessible area at each residence will be inspected for a foundation or other barrier (plastic liner, etc.) to determine if installation of a sub-slab VMP is appropriate. If a concrete slab or other suitable barrier is not present at a residence (i.e., there is a dirt floor or a gravel crawlspace), a VMP will not be installed and contingent soil gas sampling will be performed at that residence as discussed in the Supplemental RFI Workplan (FES, May 2005).

The slab will be inspected for water leaks, cracks, floor drains, sump holes, and other penetrations, and field screened with a PID. The proposed VMP location, preferably in the lowest portion of the floor away from walls and penetrations, and closest to the area of contamination, will be reviewed with the homeowner and NYSDEC/NYSDOH for approval. The pre-installation survey will also include an inventory of household products present in the sampling area and throughout the house, an interview with the homeowner, and completion of the February 2005 NYSDOH Indoor Air Quality Questionnaire and Building Characteristics Inventory form (see Appendix A, FES Supplemental RFI Workplan, May 2005).

B1.3.2 VMP Installation and Sampling

Prior to VMP installation and with the homeowner's permission, the slab/barrier will be prepared by removing any floor coverings and exposing the concrete slab. As depicted on Figure B-1, an oversize diameter "outer" hole approximately one-inch in diameter will be installed with a hammer drill (or similar) to a depth of one to two inches in the concrete slab. A smaller diameter "inner" hole (approximately 3/8-inch in diameter) will be installed with a hammer drill (or similar) through the remainder of the slab, and extended approximately two to three inches below the slab.

All VMP materials will be made of brass or stainless steel. The VMP assembly, patterned after DiGiulio (2004), will consist of a 1/4-inch outer diameter (OD) threaded pipe approximately 2 to 2.5 inches long, open at the bottom end, and equipped with a 1/4-inch inner diameter (ID) threaded to compression fitting (or nipple) at the top end (see Figure B-1). A recessed plug will be used to seal the compression fitting (or nipple).

The VMP assembly will be installed in the boring and sealed in place with quick-drying expanding portland or hydraulic cement taking care to fill the annular space between the VMP assembly and the "outer" hole wall without blocking the upper fitting (see Figure B-1).

Additional details on VMP installation are provided in the Supplemental RFI Workplan (FES, May 2005). VMP sampling is discussed in Section B2.1.4.

B1.3.3 Ambient Indoor Air Sampling

Preparation for the ambient indoor air sampling program will consist of the pre-installation survey described in Section B1.3.1. The goal of the household inventory is to identify household products (or other substances stored or present in the home) that could potentially interfere with the testing and/or contribute site-specific COCs to the sub-slab vapor or ambient indoor air samples. Because toluene is the only site-specific COC identified in the vicinity of Alden Street, the inventory (and any required mitigation) will focus on potential toluene sources.

If present, and with the homeowner's permission, potential toluene sources will be mitigated by moving the items to an alternate location, tightening container seals, etc. Any ventilation activities associated with mitigation will be completed at least 24 hours prior to proposed ambient indoor air sampling.

Following the pre-sampling inspection, a sampling appointment will be scheduled with the residents. The residents will be given a handout asking them to refrain from a series of activities that could alter ambient air VOC concentrations during the 24 hours prior to testing. Additional details are provided in the Supplemental RFI Workplan (FES, May 2005). Ambient air sampling will be performed as discussed in Section B2.1.5.

B1.4 Classification of Measurements as Critical or Non-Critical

Soil PID field screening data are considered "critical" (i.e., required to achieve project objectives or limits on decision errors) as defined by the EPA (1998) in the sense that they will be used to determine if the soil boring program will be expanded. If residual impact (defined as

PID readings exceeding 100 ppmv) is detected in a given soil sample, additional borings, as appropriate, will be installed at 20-foot intervals in the same direction (and then laterally as necessary) until the aerial extent of residual soil impact is defined.

However, soil PID field screening data are also considered "non-critical" (i.e., for informational or background purposes only) as defined by the EPA (1998) in the sense that confirmatory laboratory analysis of soil samples will ultimately determine if additional borings will be installed during subsequent mobilization(s) and if the off-site soil boring program is complete. All other field measurements collected during soil boring installations (soil descriptions, etc.) are classified as non-critical.

All laboratory VOC soil data are considered critical for the reasons discussed above. Supplemental laboratory soil data (TOC & grain size analysis) that will be used in conjunction with qualitative screening and evaluation of biodegradation are classified as non-critical.

Laboratory analysis of geoprobe laboratory ground-water samples is classified as non-critical because the geoprobe sampling device does not obtain a "true" aquifer ground-water sample and tends to bias sampling analytical results "high" due to the presence of fine suspended sediments. Ground-water data collected from permanent monitoring points for VOC laboratory analysis are classified as critical because they will be used to determine the extent of toluene impact in ground water. Ground-water samples submitted for non-VOC analysis (i.e., bioattenuation parameters) are considered to be non-critical because they will be used for qualitative screening and evaluation of off-site conditions.

Ambient indoor air PID screening readings and tedlar bag vapor sample screening data are classified as non-critical. Although ambient indoor air PID screening readings are important because they will be used to prepare each residence for sampling, the final evaluation of indoor air quality and potential risk to human health will be based on the sub-slab vapor and ambient air laboratory analytical data, which are therefore classified as critical.

B2 SAMPLING METHODS REQUIREMENTS

This section describes the sampling methods, possible Corrective Actions associated with sampling methods, bottleware, and other sampling requirements.

B2.1 Sampling Methods

Sampling methods for the collection of soil, ground-water, and sub-slab vapor/ambient air samples for subsequent laboratory analysis are detailed below. Additional information on sampling methods is provided in the Supplemental RFI Workplan (FES, May 2005).

B2.1.1 Geoprobe Soil Sampling

Continuous soil samples will be obtained via 2-inch diameter dedicated Geoprobe recovery "sleeves" (i.e., disposable five-foot or four-foot acetate liners placed in the macro-core sampler) that will be extracted by the Geoprobe at each location to characterize subsurface conditions. Each recovered liner sleeve will immediately be opened with a utility knife on a clean, flat, plastic-lined surface and screened with a PID (MiniRae2000, or equivalent, equipped with an 11.6 eV lamp) to qualitatively select a portion of the sample with the highest PID reading for possible laboratory analysis of VOCs.

The selected soil sample will be placed into appropriate laboratory-supplied bottleware (see Section B2.3) utilizing latex gloves and a clean spoon or spatula, and packed to minimize headspace in the container. The sample will be properly labeled, placed in a cooler with ice, and chilled to 4°C. Immediately following collection of the soil sample, a small portion (approximately 100 grams) of the remaining soil in the geoprobe liner exhibiting the highest PID reading will be placed in a sealable plastic bag, shaken for 15-30 seconds, and allowed to equilibrate to ambient temperature (or placed inside a heated vehicle if sampling during the winter months) for several minutes before piercing the bag to obtain a PID field screening reading. The above procedure will be continued at each soil boring for all sampling sleeves.

In accordance with the decision matrix set forth in Table B-1, a minimum of one soil sample from each boring will be submitted for laboratory analysis of VOCs. The soil sample interval submitted for laboratory analysis from each boring will be: 1) the soil interval with the highest PID field screening reading; or, if there is no evidence of residual impact, 2) the soil interval collected immediately above the water table. The soil sample(s) identified for laboratory analysis will be properly entered on a chain of custody form. Other soil samples collected from that specific boring will be discarded except as noted below.

It is expected that any residual impact will be limited to the soil interval immediately above or at the water table. However, if there is a bimodal vertical distribution of residual soil impact within a boring (i.e., impacted intervals are separated by at least four feet), a second soil sample will be submitted for laboratory analysis from that soil boring location.

Two soil samples will be collected at the depth of the water table for TOC laboratory analysis; one sample from a soil boring that does not display evidence of residual impact, and the other sample from a boring displaying evidence of residual impact. If the latter condition is not present, the second soil sample will be collected from a spatially separated soil boring location.

A minimum of two vertical spaced (intervals separated by at least four feet) soil samples will be collected from a single soil boring for laboratory grain size analysis. One soil sample will be collected at (or just below) the water table, and the second sample will be collected from a shallower boring interval. Ideally, the samples for grain size analysis will be collected from a soil boring that displays evidence of residual impact, but if this condition is not present, a centrally located boring will be sampled.

B2.1.2 Geoprobe Ground-Water Sampling

Ground-water samples will be collected from selected borings utilizing the Geoprobe "screen-point" sampler equipped with a four-foot screen length (or similar device). The Geoprobe ground-water sampler will be installed across the water table and the rods retracted to

expose the screened interval, allowing ground water to enter the sampler. A peristaltic pump and dedicated polyethylene tubing and silicone pump "bladders" will be used to purge the boring of bulk sediments and reduce turbidity. Ground-water samples will be collected after the stabilization of temperature, conductivity, and pH in the purge water in accordance with the low flow ground-water sampling methods outlined in Section B2.1.3.

If the Geoprobe boring goes dry during purging, ground-water samples will be collected following the recharge of sufficient ground water for sampling. Purge water generated during ground-water sampling activities will be containerized in properly labeled 55-gallon drums and temporarily staged pending subsequent characterization and disposal (see Section B2.1.7).

The sampler will wear a new pair of latex gloves at each sampling location. Ground-water samples will be pumped directly into appropriate laboratory-supplied bottleware (see Section B2.3), minimizing sample agitation and the formation of air bubbles. Each sample container will be filled to capacity to eliminate any headspace. The ground-water sample will be properly labeled, placed in a cooler with ice, chilled to 4°C, and properly entered on a chain of custody form. All field observations obtained during ground-water sampling will be recorded in a project dedicated field notebook.

B2.1.3 Low Flow Ground-Water Sampling

Subsequent to a two-week equilibration period, ground-water samples will be collected from all newly-installed off-site monitoring points. Any private wells identified in the general vicinity of Alden Street will be sampled in a similar manner.

Following liquid-level data collection (see Section B1.2), ground-water samples will be collected via the micropurge sampling method. The USEPA has encouraged the use of this method because of its reproducibility, accuracy, and cost-effectiveness (additional details are available in the 1996 USEPA reference documents).

A micropurging pump capable of a flow rate of approximately 0.1 to 0.5 liters per minute (i.e., peristaltic/bladder pump) will be used to minimize turbulence in the well bore and hydraulic stress on the formation. The pump will be positioned in the middle of the saturated portion of the screened interval of the well.

Water quality indicator parameters: temperature, pH, specific conductivity, oxidation-reduction potential (ORP), and dissolved oxygen (DO) will be monitored during purging with a continuous "flow-through" cell device (YSI-600XL or equivalent). Readings will be taken every three to five minutes until the following stabilization rates are achieved: pH ± 0.1 standard units, specific conductivity ± 3%, ORP ± 10 millivolts (mV), and DO ± 10%. After the water quality parameters have stabilized, ground-water samples will be collected directly from the pump effluent line (using dedicated tubing and pump bladders at each well).

The sampler will wear a new pair of latex gloves at each ground-water sampling location. Ground-water samples will be pumped directly into appropriate laboratory-supplied bottleware, minimizing sample agitation and the formation of air bubbles. Each sample container for VOC analysis will be filled to capacity to eliminate any headspace, properly labeled, placed in a cooler with ice, chilled to 4°C, and properly entered on a chain of custody form. Field measurements and observations obtained during well purging and sampling will be entered on a Ground-Water Well Sampling Form (a sample form is provided in Appendix B).

B2.1.4 VMP Sampling

Sub-slab vapor samples will be collected at four homes identified along Alden Street (see Figure A-4). VMP sampling protocol is based upon the guidance documents cited in Section B1.3. The first sampling step will include the pre-sampling inspection discussed in Section B1.3.1. On the actual day of sampling, a final site inspection and PID field screening survey will be performed to document conditions in the residence at the time of sub-slab vapor sample collection. The integrity of the VMP will also be inspected prior to sampling.

Each VMP will be attached via Teflon tubing to a certified-clean 6L Summa canister equipped with a particulate filter and a 4-hour regulator preset by the laboratory. The pre-sample vacuum of the Summa canister will be recorded (initial vacuum must be greater than 25 inches of mercury) and the canister valve opened to begin sub-slab vapor collection. Following initiation of VMP sampling during the heating season, concurrent indoor air sampling at the residence will begin (see Section B2.1.5). VMP samples will be recovered approximately 4 hours later.

After completing concurrent outdoor ambient air sampling activities (and concurrent indoor air sampling during the heating season), VMP sampling will be terminated as follows: 1) record the final Summa canister vacuum; 2) close the sampling valve; 3) disconnect all sample tubing; 4) plug the VMP; and 5) return any floor coverings. Sub-slab vapor samples will be submitted for laboratory analysis of VOCs via EPA Method TO-15 plus TICs.

B2.1.5 Ambient Indoor/Outdoor Air Sampling

An ambient outdoor air sample will be collected concurrently with each VMP sub-slab vapor sampling event (see previous section). Ambient indoor air samples will be collected from the basement (or crawlspace, if present) and first floor at each of the four residences identified in the previous section, concurrently with VMP sub-slab vapor sampling during a "heating season" sampling event (see the Supplemental RFI Workplan, FES, May 2005). Ambient air sampling protocol is based upon the guidance documents cited in Section B1.3.

A certified-clean 6L Summa canister, equipped with a particulate filter and a 4-hour regulator preset by the laboratory, will be placed in the center of the basement and first floor living space approximately three feet off the floor to collect a representative "breathing air" sample. The pre-sample vacuum of the Summa canister will be recorded (initial vacuum must be greater than 25 inches of mercury), the Summa canister valve opened to begin sub-slab vapor collection, and the sampler will vacate the active sampling area.

The residents will be asked to stay out of the active sampling area, if possible, for the duration of testing, or to restrict their movements in the active sampling area and avoid opening and/or closing doors and windows. Ambient air samples will be recovered approximately 4 hours later. Indoor (and ambient outdoor) air sampling activities will be terminated as follows: 1) record the final Summa canister vacuum; 2) close the sampling valve; and 3) proceed with termination of concurrent VMP sampling at the same location (see previous section). Ambient indoor/outdoor air samples will be submitted for laboratory analysis of VOCs via EPA Method TO-15.

B2.1.6 Field Decontamination Procedures

All non-disposable sampling and data procurement equipment will be decontaminated using the following procedures:

1) manual scrub with alconox and potable water using a brush;
2) thorough rinse with potable water;
3) triple rinse with distilled water (ASTM Type II); and
4) air dry.

Any liquids generated during the decontamination process will be containerized in properly labeled 55-gallon drums and temporarily staged at the former Norton/Nashua site pending subsequent characterization and disposal.

B2.1.7 Disposal of Investigation-Derived Wastes

Soil cuttings, monitoring well development and purge water, and decontamination water generated during soil boring, ground-water monitoring point installation, geoprobe ground-water sampling, and VMP installation activities will be containerized in properly-labeled 55-gallon drums and temporarily staged at the former Norton/Nashua site for subsequent classification and disposal. Waste manifest documentation and any associated analytical results will be provided in the RFI Summary Report.

B2.2 Corrective Actions

At the discretion of the Project Manager, a field audit may be performed by the Project Manager or a designated FES or Saint-Gobain representative (Site Contact) to monitor ongoing project activities being conducted by FES employees and designated contractors (see Section C1.1). The audit will include a review of compliance with proper protocol for field sampling techniques.

Results of the audit will be discussed with field personnel upon completion and any observed issues of non-compliance will be thoroughly reviewed with field personnel. If an issue of non-compliance is observed during the initial field audit, and the Project Manager determines the issue is "correctable", a follow-up audit will be conducted to document subsequent compliance. If the Project Manager determines the non-compliance issue is not "correctable" due to technical or other reasons, the Project Manager will meet with the Project Team to determine the proper Response Action (see Section C1.2). Representatives from the NYSDEC will be consulted prior to institution of any changes that could materially affect achievement of project objectives and scope-of-work.

If a complete set of samples is rejected during the data verification and validation process (see Section D), sample collection methods will be reviewed to determine if changes are necessary. Representatives from the NYSDEC will be consulted prior to institution of any changes that could materially affect achievement of project objectives and scope-of-work. If no changes to the sampling methodology are necessary, replacement samples will be collected following the same procedures described in this section.

B2.3 Sample Requirements

Sample requirements including sample containers, sample size, preservatives, and holding times are summarized in Table A-1. All sample containers will be supplied by the laboratory and certified clean by the supplier. The laboratory will maintain the certifications. Glass containers will include Teflon inserts to improve the quality of the container seal. All required preservatives will be added to the sample bottleware by the laboratory prior to shipment.

B3 SAMPLE HANDLING AND CUSTODY REQUIREMENTS

All soil, ground-water, and sub-slab vapor/ambient air samples will be collected in laboratory supplied, certified-clean containers. The type of sample container, volume of sample collected, and preservative requirements will be determined by the analytical method and the laboratory QAPP (see Table A-1). Sample containers will be labeled with the project name, sample number, sample location, time and date of collection, and the sampler's initials. All soil and ground-water samples, including field and trip blanks, will be maintained at a temperature of 4°C while stored on site and during shipment to the laboratory.

Following sampling, the project name, sample number, sample location, time and date of collection, and the sampler's initials will be entered on a sample COC form that will accompany all bottleware/samples during shipment from the laboratory to the field, during on-site storage and sample collection, and during return transportation to the laboratory. Sample COC forms for Adirondack (soil and ground-water samples) and Lancaster Labs (sub-slab vapor/ambient air samples) are provided in Appendix C.

The sampler will sign (with date and time) the COC form upon relinquishing the samples to the Field Manager. The Project Field Manager will be responsible for sample tracking in the field. All samples will remain in the custody of the FES Field Manager until relinquishing the samples to the laboratory or the sample courier. Custody is defined as: 1) in a secured location with restricted access; 2) in the possession of the Field Manager; or 3) secured in a container with a tamper-evident custody seal. The latter will be affixed to the shipment container if the samples are not being directly relinquished to the laboratory or a laboratory courier.

The Project Field Manager will sign (with date and time) the COC form upon relinquishing the samples to the laboratory or the courier. A copy of the COC form will be retained by the Field Manager, and all relevant field information with respect to sample collection will be recorded in indelible ink in a project-dedicated field notebook.

All soil and ground-water samples will be delivered directly to Adirondack, or picked up by laboratory courier, within 36 hours of sampling. Sub-slab vapor/ambient air samples will be shipped to Lancaster Labs via overnight courier (e.g., Fed-Ex) within 24 hours of sampling. A copy of the shipping receipt will be maintained in the project files. The laboratory will check in the samples upon receipt and notify the FES Project Manager of any damaged samples, COC form discrepancies, or temperature non-conformances within 24 hours.

B4 ANALYTICAL METHODS REQUIREMENTS

All soil and ground-water samples will be submitted to Adirondack, and all sub-slab vapor/ambient air samples will be submitted to Lancaster Labs for analysis via standard turn-around times. Selected samples may be submitted for rush turn around analysis if deemed applicable by Saint-Gobain or requested by the NYSDEC Case Engineer.

Soil and ground-water samples will be analyzed for TCL VOCs, TICs, and heptane via EPA Method 8260. Sub-slab vapor/ambient air samples will be analyzed for VOCs by EPA Method TO-15 plus TICs. A summary of sample analyses, bottleware, associated preservatives, and holding times is presented in Table A-1.

Adirondack and Lancaster Labs are certified by the New York State Department of Health – Environmental Laboratory Approval Program (NYSDOH-ELAP). All samples will be analyzed following NYSDEC, ASP (June 2000) CLP procedures with complete NYSDEC CLP/Category B laboratory deliverables including TICs. The NYSDOH has requested that the laboratory achieve a reporting limit of one $\mu g/m^3$ for sub-slab vapor/ambient air COCs (toluene).

In addition to the above analyses, two Supplemental RFI soil boring locations will be sampled for analysis of TOC via EPA Method 415.1, and two soil samples will be collected from a single boring location for laboratory grain size analysis via ASTM Method D-22 (see Table A-1). One or more Supplemental RFI ground-water monitoring locations will also be sampled for the following electron acceptor and other natural bioattenuation parameters (see Table A-1): redox, pH, and O_2 (via field instrumentation), Fe^{+2} (via field chemical analysis kit), Fe^{+3} (from total iron via EPA Method 7380), nitrate/nitrite (EPA Method 300.0), phosphate (EPA Method 300.0), sulfate (EPA Method 300.0), alkalinity (EPA Method 310.1), methane/ethane/ethene (Misc. GC Methods), hydrogen sulfide to determine H_2 (from pH and sulfide via EPA Method 376.1), and total heterotrophic bacteria and toluene-xylene (TX)-degrading bacteria microbial counts (via Standard Plate Count Methods).

B5 QUALITY CONTROL REQUIREMENTS

This section reviews field and laboratory Quality Assurance/Quality Control (QA/QC) sampling procedures to evaluate the precision and bias of the sample collection and laboratory analytical methods.

B5.1 Field QA/QC Samples

The objective of the field QA/QC sampling program is to ensure the reliability and integrity of all data generated as part of the monitoring program by assessing: potential sources of contamination unrelated to the samples, reproducibility of sampling methods, and matrix variability at specific sampling locations. The field QA/QC program will involve the collection of trip blanks, matrix spike/matrix spike duplicate (MS/MSD) samples, equipment blanks, and blind replicate samples. Field QA/QC sample collection is summarized in Table B-2.

B5.1.1 Trip Blanks

Trip blanks are used to assess laboratory sample bottleware preparation and bottleware handling in the field. Trip blanks will be prepared and supplied by the laboratory, transported and handled in the field in the same manner as other sampling bottleware, and returned to the laboratory for analysis. The presence of VOC analytes in the trip blank may indicate cross-contamination of bottleware in the laboratory or exposure to contaminants during transport or in the field.

One trip blank sample will be included with each group of samples (cooler) delivered to the laboratory for VOC analysis (either soil or ground-water samples). Trip blanks will be analyzed for VOC target parameters. Trip blanks will be received in the field within one day of laboratory preparation and cannot be held at the field site for more than two days.

B5.1.2 MS/MSD Samples

MS samples are used to evaluate instrument and method performance based on same matrix samples. MSD samples are used to determine the precision of the laboratory method and instrumentation. The "percent recovery" calculated from the MS/MSD analysis is used to assess potential method matrix interference effects.

One set of MS/MSD samples will be collected for every twenty samples from each applicable medium (ground water and soil) and analyzed for the complete set of target VOC parameters. Care will be taken to ensure that each MS/MSD pair can be considered a homogeneous sample split in two; however, there will be no mechanical/physical mixing of samples. The MS/MSD samples will be identified as such and given a sample designation that is consistent with other analytical samples.

B5.1.3 Equipment Blanks

Equipment blanks (also known as field blanks) are collected to assess the effectiveness of decontamination procedures (see Section B2.1.6) when non-dedicated equipment is used (potential cross-contamination), and to assess possible absorption of analytes from dedicated equipment/materials (via raw sampling materials). One equipment blank sample will be collected from each medium sampled (ground water, soil, and sub-slab vapor/ambient air) during each mobilization and analyzed for the complete list of VOC target analytes.

Soil equipment blank samples will be obtained by pouring demonstrated analyte-free water through and over the Geoprobe macro-core sampler so that the rinsate flows directly into the laboratory supplied sample containers. Ground-water equipment blank samples will be obtained by pouring demonstrated analyte-free water through the sampling device so that the rinsate flows directly into the laboratory supplied sample containers. Sub-slab vapor/ambient air equipment blanks sample will be obtained by introducing a prepared gas sample (laboratory certified "clean air") directly into a laboratory supplied Summa canister.

B5.1.4 Blind Replicate Samples

Blind replicate samples will be collected to assess reproducibility of field (and laboratory) sampling methods and matrix variability at specific sampling locations. One blind replicate sample will be collected for every twenty samples collected from each medium (ground water, soil and ambient air) and analyzed for the complete set of target analytes.

Care will be taken to ensure that each blind replicate can be considered a homogeneous sample split; however, there will be no mechanical/physical mixing of samples. Blind replicate ambient air samples will be collected by co-locating two Summa canisters with equal initial vacuums.

Each blind replicate sample will be given a sample designation that is consistent with other analytical samples collected from the same medium to prevent the analyzing laboratory from identifying the blind replicates samples as such. Identification of the blind replicate samples will be provided to the NYSDEC prior to data validation.

B5.2 Laboratory QA/QC Samples

The objective of the laboratory QA/QC sampling program is to ensure the reliability and integrity of all data generated as part of the monitoring program by assessing: reproducibility and variability of the analytical methods, potential introduction of contamination in the laboratory, and potential method matrix interference effects. The laboratory QA/QC program will involve the analysis of method blanks, MS/MSD samples (see Section B5.1.2), and blind replicate samples (see Section B5.1.4). Additional QC procedures are associated with laboratory QA procedures and SOPs, and the specific analytical methods. If any discrepancies exist between laboratory QA manuals and SOPs, and NYSDEC requirements, the latter will take precedence.

B5.2.1 Method Blanks

Method blanks are samples of deionized water, which are subjected to every step of the laboratory method and are analyzed at the same time as the field samples. Method blanks are used to access potential introduction of contamination to the samples by the laboratory due to the method, technique, or instrument as the field samples are prepared and analyzed. Consistent detection of compounds in the method blank suggests a laboratory contamination problem, and more importantly, problems with internal laboratory QA/QC procedures. The laboratory will analyze one method blank for every twenty field samples analyzed.

B5.2.2 Replicate Samples

The laboratory will prepare internal replicate samples to assess reproducibility of the laboratory analytical methods. Laboratory replicate samples will be designated "RE" and analyzed for the same set of target analytes as the original sample.

As discussed in Section B5.1.4, blind replicate samples will also be submitted to the laboratory. Blind replicate samples will be given a sample designation that is consistent with other analytical samples collected from the same medium to prevent the analyzing laboratory from identifying the blind replicates samples as such.

B6 INSTRUMENT/EQUIPMENT TESTING & MAINTENANCE

Field instrumentation/equipment will be maintained in accordance with manufacturer's specifications. Any maintenance and/or repair, or replacement of field equipment will be documented in the project field notebook.

Testing and maintenance of laboratory analytical instrumentation/equipment will be conducted by the laboratory in accordance with manufacturer's specifications and laboratory SOPs. Instrument maintenance and repair will be documented in laboratory maintenance logs or record books.

B7 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

B7.1 Field Equipment Calibration

Field equipment will be calibrated as outlined below. If field equipment fails to meet calibration standards, necessary response actions will be performed including replacement of equipment and/or standards to ensure that collected field data meet all QAPP requirements. Qualitative field readings may be adequate for some proposed activities; however, supplemental RFI activities will be repeated if necessary to collect usable field data.

B7.1.1 Photoionization Detector (PID)

A PID (MiniRae2000, or equivalent, equipped with an 11.6 eV lamp) will be utilized to qualitatively assess field conditions, and to ensure site health and safety protocols are maintained during site investigation activities in accordance with the site-specific Health and Safety Plan. To ensure the quality of the data obtained, the PID will be calibrated to the manufacturer's standards, which are as follows:

- Obtain calibration standard gas for isobutylene (100 ppm);
- Enter the calibration standard (100 ppm) for isobutylene on the PID;
- Attach the calibration gas to PID and slowly allow gas to enter the unit; and
- Calibration the PID to match the standard reading in ppm.

PID calibration will occur twice daily (start of day and early afternoon) or after any two hour break. The results of each PID calibration event will be recorded in the field log book.

Due to the sensitivity of the PID to climatic changes, calibration of the instrument to the calibration standard may be difficult during adverse weather conditions (extreme humidity or cold). In these instances, qualitative readings will be referenced to variations above or below the ambient concentration readings.

B7.1.2 Flow-Through Cell

A multi-parameter water quality testing instrument with flow-through cell (YSI 600 XL, or equivalent) will be utilized to qualitatively assess ground-water conditions during purging activities related to ground-water sampling (Geoprobe ground-water and monitoring point sampling). Per the manufacturer's specifications, the water quality testing instrument will be calibrated on a daily basis prior to sampling to standards for conductivity (1,000 microsiemens per cm; µs/cm), dissolved oxygen (100%), and pH (4.00, 7.00 & 10.00 pH units). The results of each water meter calibration event will be recorded in the field log book.

B7.2 Laboratory Instrument/Equipment Calibration and Frequency

Each laboratory contractor (Adirondack or Lancaster Labs) will be responsible for properly calibrating and maintaining all equipment in accordance with the 1991/2000 NYSDEC ASP Superfund CLP, corresponding manufacturer specifications, and internal laboratory QA manuals and SOPs. Calibrations should be verified with appropriate check standards and calibration blanks before initiation of each analysis. Calibration standards should maintain traceability to the NIST. Calibration and preparation of standards should be documented in a laboratory logbook.

B8 INSPECTION/ACCEPTANCE OF FIELD SUPPLIES AND CONSUMABLES

Supplies and other consumables can potentially affect project data quality. All sampling bottleware will be supplied by the laboratory and certified clean. All supplies and consumables, including laboratory bottleware, will be thoroughly inspected for defects and/or the presence of potential impurities or contaminants. Supplies and other consumables will be rejected for use if compromised.

Non-dedicated supplies will be limited to the extent practicable. Any non-dedicated supplies that must be reused will be decontaminated according to the following procedure:

1) manual scrub with alconox and potable water using a brush;
2) thorough rinse with potable water;
3) triple rinse with laboratory-supplied distilled water (ASTM Type II); and
4) air dry.

B9 DATA ACQUISITION REQUIREMENTS (NON-DIRECT MEASUREMENTS)

Non-direct measurements include data obtained from historical databases, programs, literature files, etc. Acquisition of non-direct measurements is not proposed as part of Supplemental RFI activities at this time.

B10 DATA MANAGEMENT

The proposed Supplemental RFI activities will generate field and laboratory data. This section discusses the management and final repositories for these data.

B10.1 Field-Generated Data

As discussed elsewhere in this QAPP, all field activities will be documented in the site-specific project field notebooks, and supplemental field data forms, such as soil boring logs, well completion diagrams, ground-water sampling forms, and indoor air quality questionnaires and building characteristics inventories, will be used to record field data. In general, original field data will be recorded in the field notebook and a supplemental form will be completed later, but in some instances (i.e., homeowner interview) it may be more appropriate to use the supplemental field data forms to record the original data. In the latter instance, the field notebook should clearly indicate that the corresponding field information is found on the supplemental field data form.

Following the completion of all field activities, the Field Manager will supervise the transfer of the data into electronic format, primarily a spreadsheet (e.g., Microsoft Excel); however, if appropriate, some data may be entered into a word processor (e.g., Microsoft Word) or a database (e.g., Microsoft Access). Examples of field data that will be transferred are: soil boring log and well installation details, field PID screening readings, liquid-level measurements, and ground-water purging and sampling data. Other information in the field notebooks will remain in longhand and will not otherwise be transcribed or scanned.

The Field Manager, or a second individual, will review all spreadsheet (and any other) data entries for accuracy and completeness. The electronic project files will be stored on a project-specific computer hard drive at FES and on compact disks for back-up purposes.

B10.2 Laboratory-Generated Data

Each laboratory must maintain a data management system that complies with NYSDEC ASP (1991/2000) CLP requirements. Manual data entry at the laboratory may include sample storage logs, instrument maintenance logs, calibration logs, sample preparation worksheets, standard logbooks, etc. All manual data should be reviewed and confirmed by the analyst before reporting, and proofed when transferred into electronic format.

Analytical data packages received from the contract laboratory (in either paper or electronic format) will be inspected for completeness and compared with the list of analyses requested on the chain-of-custody record and in the project work plan to ensure all analyses were performed. Following inspection, a copy of each analytical data package (in either paper or electronic format) will be forwarded to the NYSDEC for data validation.

Subsequent to inspection and analysis conformation, the laboratory data package will be tabulated into an electronic spreadsheet format (e.g., Microsoft Excel), proofed by a second individual, and placed in a project-specific directory on an FES computer hard drive. In addition, tabulated computer data files will be backed up on project-dedicated compact disks. Original laboratory deliverables will be maintained in a neat and orderly manner by the Project Manager and secured in the central FES project file

SECTION C

PROJECT ASSESSMENT AND OVERSIGHT

This section of the QAPP addresses activities for assessing the effectiveness of project implementation and quality assurance procedures. The purpose of the Project Assessment and Oversight component is to ensure that the QAPP is implemented as prescribed, and that corrective measures, if warranted, are imposed in a timely and effective manner.

C1 ASSESSMENTS AND RESPONSE ACTIONS

Quality assessments and response actions, as necessary, will be performed during data collection and data evaluation periods for the following items:

- Adherence to scope-of-work;
- Achievement of project objectives;
- Performance evaluation; and
- Data quality assessment.

A management assessment program headed by the Project Manager will review these elements to ensure that reliable assessment data are collected to evaluate system performance and site conditions. Although this program will not be formalized to the extent that file notes are generated and reports issued except as noted below, the Field Manager will be in contact with the management team via telephone calls, facsimiles, and mailings to facilitate review and evaluation of the collected data on a daily basis. Only those issues relating to "significant" implementation problems, potential liability issues, or other concerns that jeopardize project objectives, will warrant a memo to the project file.

Assessments will be performed on the quality and quantity of data obtained so that issues related to contaminant distribution and transport can be properly quantified. Criteria utilized to assess the effectiveness of the project will be both qualitative and quantitative. Qualitative evaluations will be performed by the management team, client, and NYSDEC representatives to assess issues related to scope-of-work, achievement of project objectives, and performance evaluations. These evaluations will be conducted in a joint manner, with each party providing input and recommendations.

Quantitative criteria will be utilized to assess laboratory data quality. Specifically, laboratory QA/QC procedures will be reviewed to determine the quality of reported data. Issues to be considered during this process will include an evaluation of sample holding times, surrogate recovery, blank contamination, and field QA/QC control processes; however, the NYSDEC will provide final validation of all laboratory analytical data.

C.1.1 Field Audits

All Supplemental RFI field activities must be conducted in accordance with the procedures detailed in this QAPP. At the discretion of the Project Manager, a field audit may be performed to monitor ongoing project activities being conducted by FES employees and designated contractors.

The field audit will be performed by the Project Manager or a designated FES or Saint-Gobain representative (Site Contact). The audit will include a review of compliance with proper protocol for the following field activities, as applicable:

- Health-and-safety procedures, including proper personal protective equipment, secure work zones, ambient air monitoring, etc.
- Equipment calibration and documentation;

- Soil, ground-water, and/or sub-slab vapor/ambient air sampling techniques;
- Sample documentation including labels and chain-of-custody forms; and/or
- Decontamination procedures.

Results of the audit will be discussed with field personnel upon completion and any observed issues of non-compliance will be thoroughly reviewed with field personnel. A written summary will be prepared by the auditor for the project file.

If an issue of non-compliance is observed during the initial field audit, and the Project Manager determines the issue is "correctable", a follow-up audit will be conducted to document subsequent compliance. If the Project Manager determines the non-compliance issue is not "correctable" due to technical or other reasons, the Project Manager will meet with the Project Team to determine the proper Response Action (see next item).

C.1.2 Response Actions

In the event that project activities do not proceed according to the Work Plan and QAPP, appropriate response actions will be defined and implemented as soon as practicable. Responsibility for implementation of appropriate response actions will be with the Field Manager and Project Manager. Continued daily discussions between the Field Manager and Project Manager will serve as the mechanism for verifying and validating the quality of data collection. Ultimate responsibility for successful implementation of the project, as well as institution of appropriate response actions, will be with the Project Manager, who via frequent communication with the client representative, will ensure that supplemental site investigation activities are implemented in a manner consistent with project objectives. Representatives from the NYSDEC will be consulted prior to institution of any changes in response actions that could materially affect achievement of project objectives and scope-of-work.

C2 REPORTS TO MANAGEMENT/NYSDEC

C2.1 Reports to Management

Specific reports to internal management (Saint-Gobain & FES) documenting assessment and oversight efforts will not be generated; however, as part of their responsibility with respect to project implementation, management personnel will monitor the following during supplemental RFI activities:

- Status of project relative to budget, scope-of-work, and achievement of objectives;
- Adherence to quality control programs and procedures;
- Results of periodic data quality assessments; and
- Status of appropriate response measures, if any.

The Project Team will hold periodic meetings to discuss project status. Issues and problems deemed to be significant with respect to the quality of data, adherence to scope-of-work, or reporting mechanisms will be documented in the project file and maintained as part of the project records.

C2.2 Reports to the NYSDEC

In addition to the summary RFI Report (see the July 2003 RFI Workplan prepared by FES), monthly project updates will be submitted to the NYSDEC per Order on Consent Index No. CO: 4-20001205-3375 dated June 4, 2002. The monthly reports will:

- Summarize project field activities conducted during the reporting period;
- Document any changes in project response actions, personnel, or other relevant project information;
- Provide any newly completed draft figures and/or data tables (pending final data validation by the NYSDEC); and
- Provide an updated project schedule.

Each monthly report will be distributed to the NYSDEC, the current owner of the former Norton/Nashua property, and other stipulated parties. Monthly reports will be submitted until the completion of the summary RFI Report.

SECTION D

DATA VALIDATION AND USABILITY

Field and laboratory analytical data will be verified and validated according to the criteria and procedures outlined in this section. Data quality and usability will be evaluated and a discussion included in the summary RFI Report.

D1 DATA REVIEW, VALIDATION, AND VERIFICATION REQUIREMENTS

Formal verification and validation of all field data will be performed by FES. FES will review all field data before it is entered into electronic databases and/or spreadsheets. All data entries will be verified. Any errors found during the verification process will be corrected before release of the summary RFI Report.

FES will perform preliminary data validation of the entire analytical data set independent of any internal review by the contract laboratory (Adirondack or Lancaster Labs) by comparing the quality control checks associated with the data to the prescribed acceptance criteria. The acceptance criteria contain four major elements: field blanks, trip blanks, duplicate samples, holding times, and laboratory qualifiers. Each element will be reviewed to ensure project DQOs are met.

Final data validation will be performed by the NYSDEC for PARCC components. Holding times, GC/MS calibrations, sample preparation, surrogate and MS/MSD recoveries, method blank data, standard retention times, system performance checks, and other internal laboratory QA/QC results will be reviewed to assure that the laboratory analysis met all applicable performance criteria, and the RCRA Analytical and Raw Data Deliverables requirements specified in Attachment A of the June 2002 Order on Consent (see Appendix A).

D2 VALIDATION AND VERIFICATION METHODS

The FES Field Manager will review field data on a daily basis during preparation of samples, COC forms, the project field notebook, and supplemental field data forms. All field data will be verified after entry into electronic format (database, spreadsheet, or other).

FES will perform preliminary data validation of the entire analytical data set. Analytical data packages received from each contract laboratory will be compared with the list of analyses requested on the chain-of-custody record and the project work plan to ensure all required analyses were performed. The sample chain-of-custody record will be checked to ensure that all laboratory QA/QC procedures were followed throughout the analysis and to demonstrate adherence to the protocol outlined in the selected deliverables. Preliminary data validation will also include a comparison of QC checks associated with the data to the prescribed acceptance criteria via holding times, field blanks, trip blanks, duplicate samples, and laboratory qualifiers.

Final data validation will be performed by the NYSDEC in accordance with the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999 and other guidance documents identified by the NYSDEC Case Chemist. Where possible, the data review will involve the assessment of PARCC parameters, namely, Precision, Accuracy, Representativeness, Completeness, and Comparability, and must meet the RCRA Analytical and Raw Data Deliverables requirements specified in Attachment A of the June 2002 Order on Consent (see Appendix A), and any other applicable NYSDEC QA/QC performance criteria. During the data validation process significant deviations from optimal performance levels (or targets specified by the NYSDEC 1991/2000 ASP Superfund CLP) will be noted and their potential effect on overall data quality reviewed.

D3 RECONCILIATION WITH DATA QUALITY OBJECTIVES

If the data validation process indicates that the laboratory analytical data fail to meet project DQOs, the laboratory in question will be requested to take response actions required to meet the standards or an alternate laboratory will be contracted. After consultation with the NYSDEC, replacement samples will be collected as necessary for subsequent laboratory analysis.

The summary RFI Report will present a synopsis of the data validation procedures and conclusions, and will include the NYSDEC data validation reports. Any data qualifications will be noted on summary data tables and figures, and any instances of nonconforming or rejected data will be documented. Specific examples of nonconforming data that may used in a qualitative manner after data validation review are cited below.

D3.1 Sample Holding Times

The holding times for laboratory analytical samples are dictated by the specific method requested (see Table A-1). If an analytical sample exceeds the method-specific holding time, the sample will be rejected for quantitative interpretation, but the data may be utilized in a qualitative manner as appropriate.

D3.2 Equipment and Trip Blanks

A sample or sample delivery group may be qualified if the equipment blank contains detectable concentrations of target analytes; however, the data may be used qualitatively to assess the quality of decontamination procedures or ambient site/equipment conditions. A similar procedure will be followed for the utilization of trip/travel blanks.

D3.3 Duplicate Samples

Duplicate sample results will be reviewed, and if incongruent, an evaluation will be made to determine if the entire data set should be rejected for lack of accuracy or representativeness.

D3.4 Laboratory QA/QC Qualifiers

The laboratory will often estimate analyte concentrations when samples are below, or greatly exceed, quantification limits. Concentrations below the laboratory method detection limit, qualified with a "J", will be used for quantitative interpretation as it represents the "best" estimate of a specific analyte concentration. Under NYSDEC ASP methods the laboratory should not report concentrations that exceed the highest concentration within the calibration range. The laboratory should rerun the analysis using an appropriate dilution factor.

The laboratory report may qualify the sample concentration with a "B", which indicates that a target analyte has been detected in the laboratory method blank (see Section B5.2.1). Data which have been qualified with a "B" will be utilized quantitatively only if the following criteria apply: 1) historical data suggests this specific compound was utilized at the facility; 2) the compound has been detected in previous analytical sampling; or 3) the laboratory case narrative states the presence of this compound is not the result of laboratory contamination. Consistent detection of compounds in the method blank would suggest a laboratory contamination problem, and more importantly, problems with the internal laboratory QA/QC procedures.

REFERENCES

Colorado Department of Public Health and Environment, 2004. Indoor Air Guidance. September 2004.

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USEPA, 1998. EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5. EPA/600/R-98/018. February 1998.

USEPA, 2001. RCRA Draft Supplemental Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway (Vapor Intrusion Guidance). December 2001.

USEPA, 2002. OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil, (Subsurface Vapor Intrusion Guidance). EPA530-F-02-052. November 2002.

QAPP - TABLES

Table A-1
Sample Summary Matrix - Phase I - Geoprobe Soil & Ground-Water Sampling
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Number and Locations	Parameter	Analytical Method	Container(s) and Preservative	Analysis Holding Time
Soil	Minimum 10 Geoprobe boring locations (see text)	TCL Volatiles plus heptane and TICs	EPA 8260	1 x 4 oz. glass w/septum (no headspace), Cool to 4°C	14 days
Soil	2 Geoprobe boring sample locations (see text)	Total Organic Carbon	EPA 415.1	20 grams glass, Cool to 4°C	28 days
Soil	1 Geoprobe boring, 2 sample locations (see text)	Grain Size Analysis	ASTM D-22	500 grams glass, Cool to 4°C	not applicable
Water	Minimum 10 Geoprobe boring locations (see text)	TCL Volatiles plus heptane and TICs	EPA 8260	3 x 40ml glass vials w/teflon lined enclosure (no headspace) HCl to pH <2, Cool to 4°C	14 days

Table A-1
Sample Summary Matrix - Phase II - Small-Diameter Monitoring Point Sampling
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Number and Locations	Parameter	Analytical Method	Container(s) and Preservative	Analysis Holding Time
Water	Minimum 2 Small-Diameter Monitoring Points (see text)	TCL Volatiles plus heptane and TICs	EPA 8260	3 x 40ml glass vials w/teflon lined enclosure (no headspace) HCl to pH <2, Cool to 4°C	14 days
Supplemental Water	1-2 Selected Small-Diameter Monitoring Points (see text)	alkalinity	EPA 310.1	1 x 200ml plastic	14 days
		hydrogen sulfide	EPA 376.1	1 x 500ml plastic, NaOH/zinc acetate	7 days
		total iron	EPA 200.7	1 x 250ml plastic, HNO_3 to pH <2	6 mos.
		methane/ethane/ethene	Misc. GC	1 x 40ml glass vial	14 days
		nitrate/nitrite	EPA 300.0	1 x 100ml plastic, H_2SO_4 to pH <2	28 days
		phosphate	EPA 365.1	1 x 100ml plastic, H_2SO_4 to pH <2	28 days
		sulfate	EPA 300.0	1 x 100ml plastic	28 days
		microbial counts (see text)	Standard Plate Count Methods	laboratory-specific - TBD (3 x 40 ml glass, non-preserved)	laboratory-specific (48 hrs.)

Table A-1
Sample Summary Matrix - Phase II - Sub-Slab Vapor/Ambient Air Sampling
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix/ Sample Type	Sample Locations	No. of Samples*	Parameter	Analytical Method	Sample Container (no preservative)	Analysis Holding Time
ROUND I (Summer 2005)						
Sub-Slab Vapor	1 sample at each of the 4 Residential VMP sample locations (or contingent SGSP, see text)	4	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
Ambient Outdoor Air	2 co-located replicate samples at 1 outdoor location (see text)	2	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
ROUND II (2005-2006 Heating Season)						
Sub-Slab Vapor	1 sample at each of the 4 Residential VMP sample locations (or contingent SGSP, see text)	4	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
Ambient Indoor Air	2 samples (basement/crawlspace & first floor) at each of the 4 residential locations, plus 1 co-located replicate sample (see text)	9	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days
Ambient Outdoor Air	1 sample at 1 outdoor location (see text)	1	TCL Volatiles plus TICs	EPA TO-15	6 Liter Summa Canister equipped w/ 4-hour sample regulator	14 days

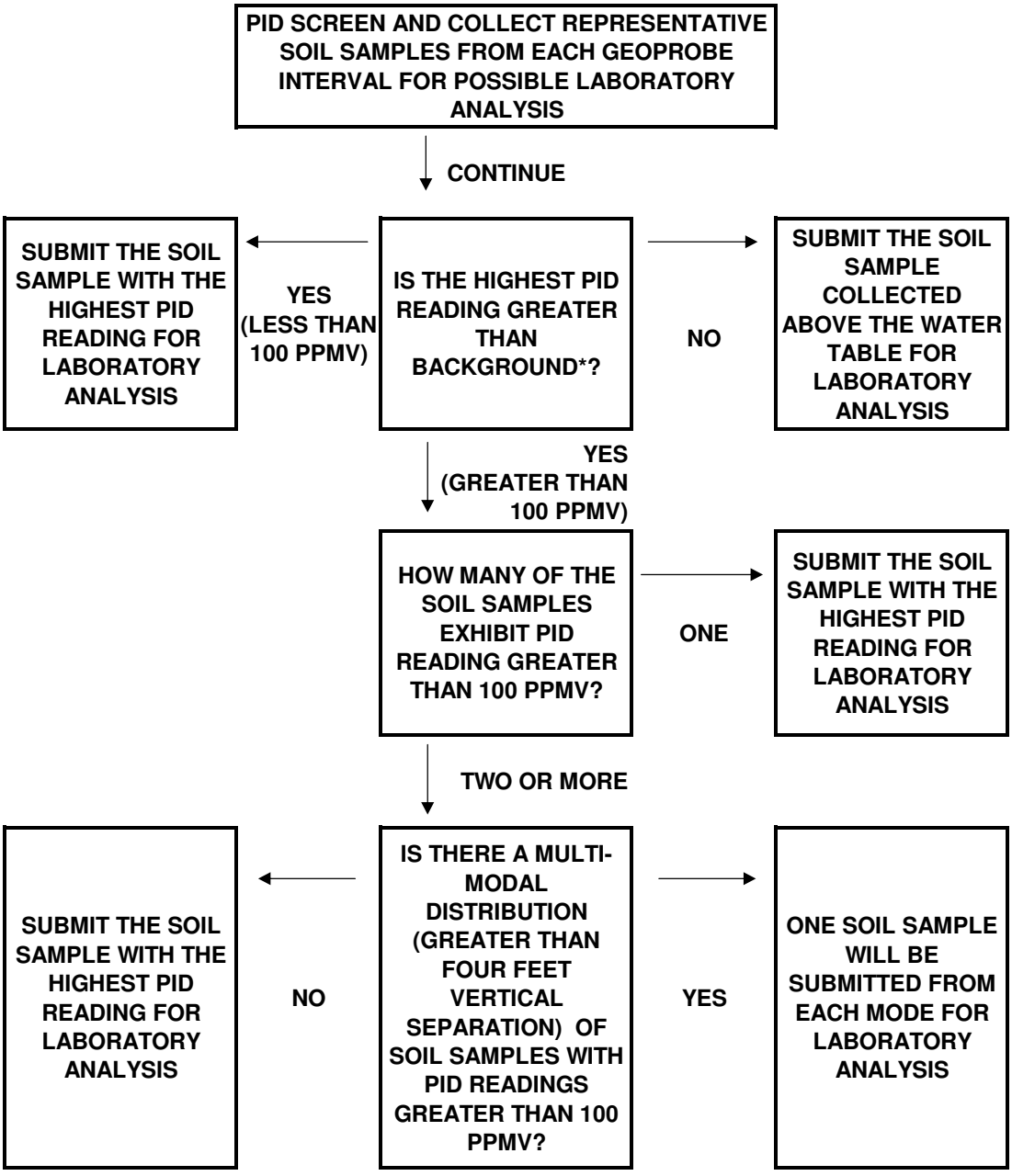
* does not include additional QA/QC sample(s) - see Table B-2

Table A-2
Tentative RFI/Supplemental RFI Project Schedule
Former Norton/Nashua Tape Facility
Watervliet, New York

	2Q 2005			3Q 2005			4Q 2005			1Q2006
	4	5	6	7	8	9	10	11	12	
Supplemental RFI Activities*										
Prepare/Submit Supplemental RFI Workplan, NYSDEC Review										
Public Availability Session, Obtain Access										
Phase I - Install Soil Borings										
Laboratory Analysis & NYSDEC Data Validation										
Phase I - Install Monitoring Points										
Phase II - Ground-Water Sampling										
Laboratory Analysis & NYSDEC Data Validation										
Phase I - Install Residential Vapor Monitoring Points (VMPs)										
Phase II - VMP Sampling - Round I										
Laboratory Analysis & NYSDEC Data Validation										
Phase II - VMP Sampling - Round II/Indoor Air Sampling										
Laboratory Analysis & NYSDEC Data Validation										
Supplemental Borings/Contingent Air Samples										
Phase III - Corrective Measures Screening/Evaluation										
Joint Meeting to Discuss Supplemental RFI Results										
RFI Tasks*										
Preparation & Submittal of Draft RFI Report										

* Final schedule may be dictated by access to complete off-site investigation on the residential properties.

Table B-1
Field Decision Matrix - Collection of Soil Samples for Laboratory Analysis
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY



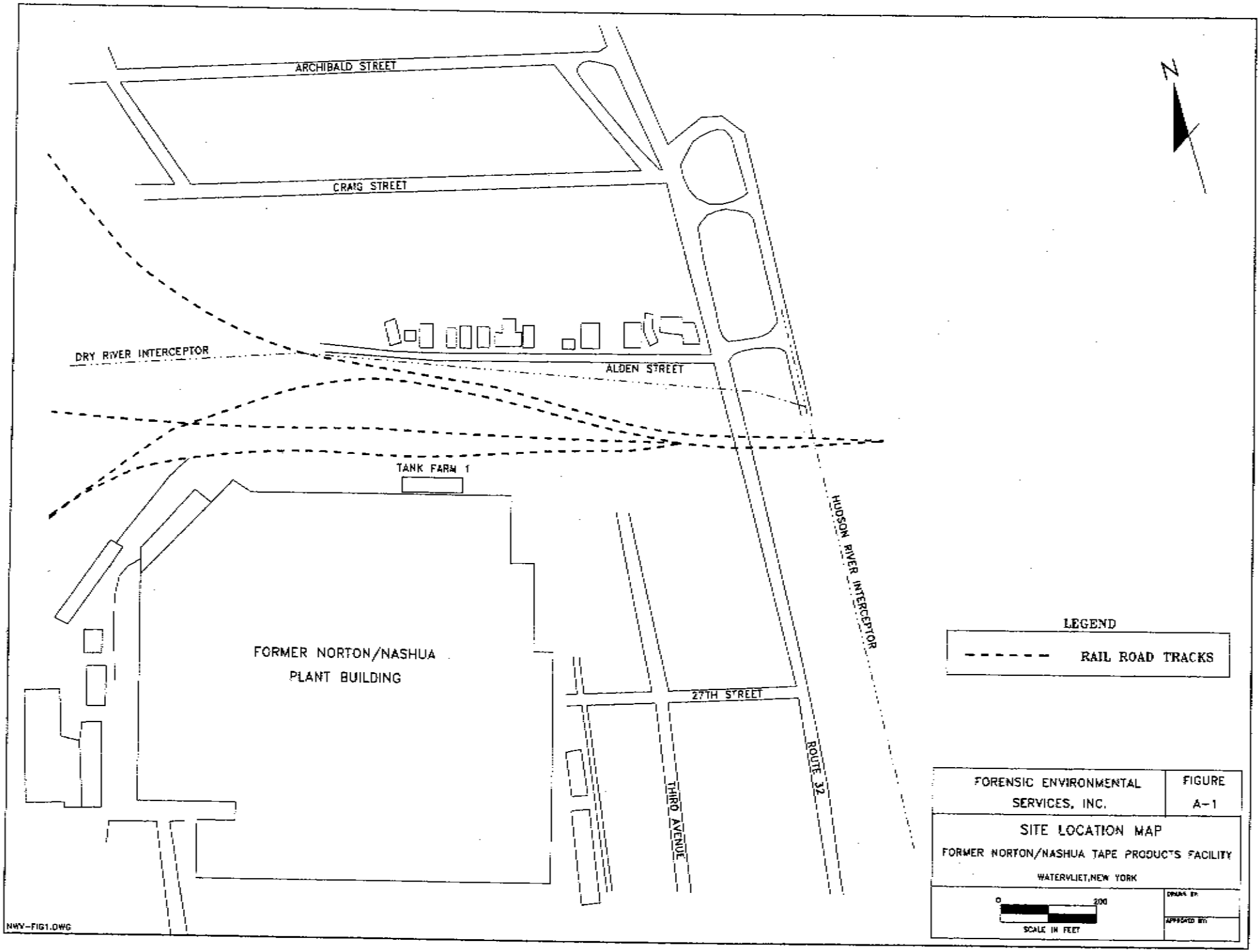
* background will be determined by screening an empty plastic bag with the field PID

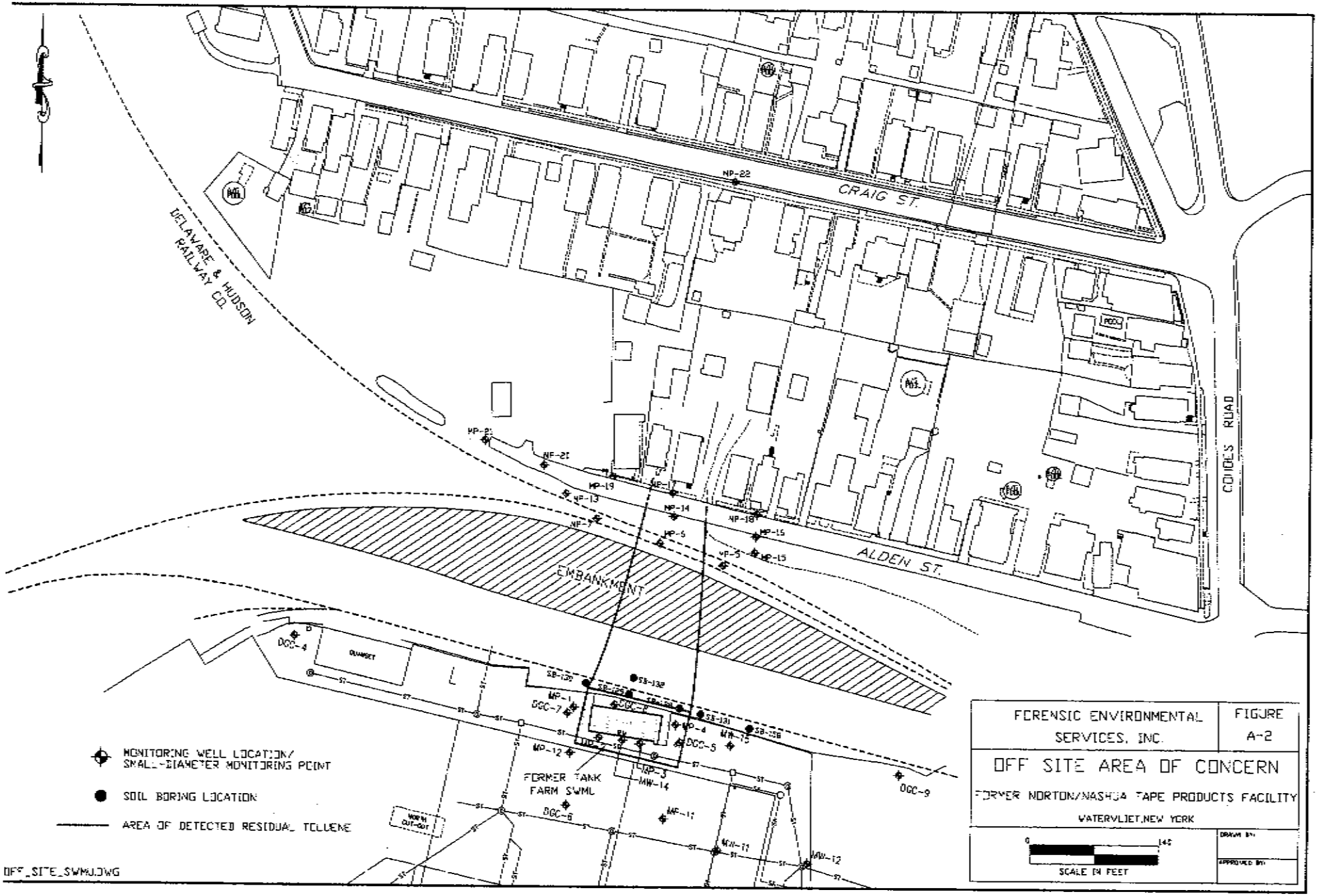
Table B-2
QA/QC Sample Summary Matrix
Supplemental RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

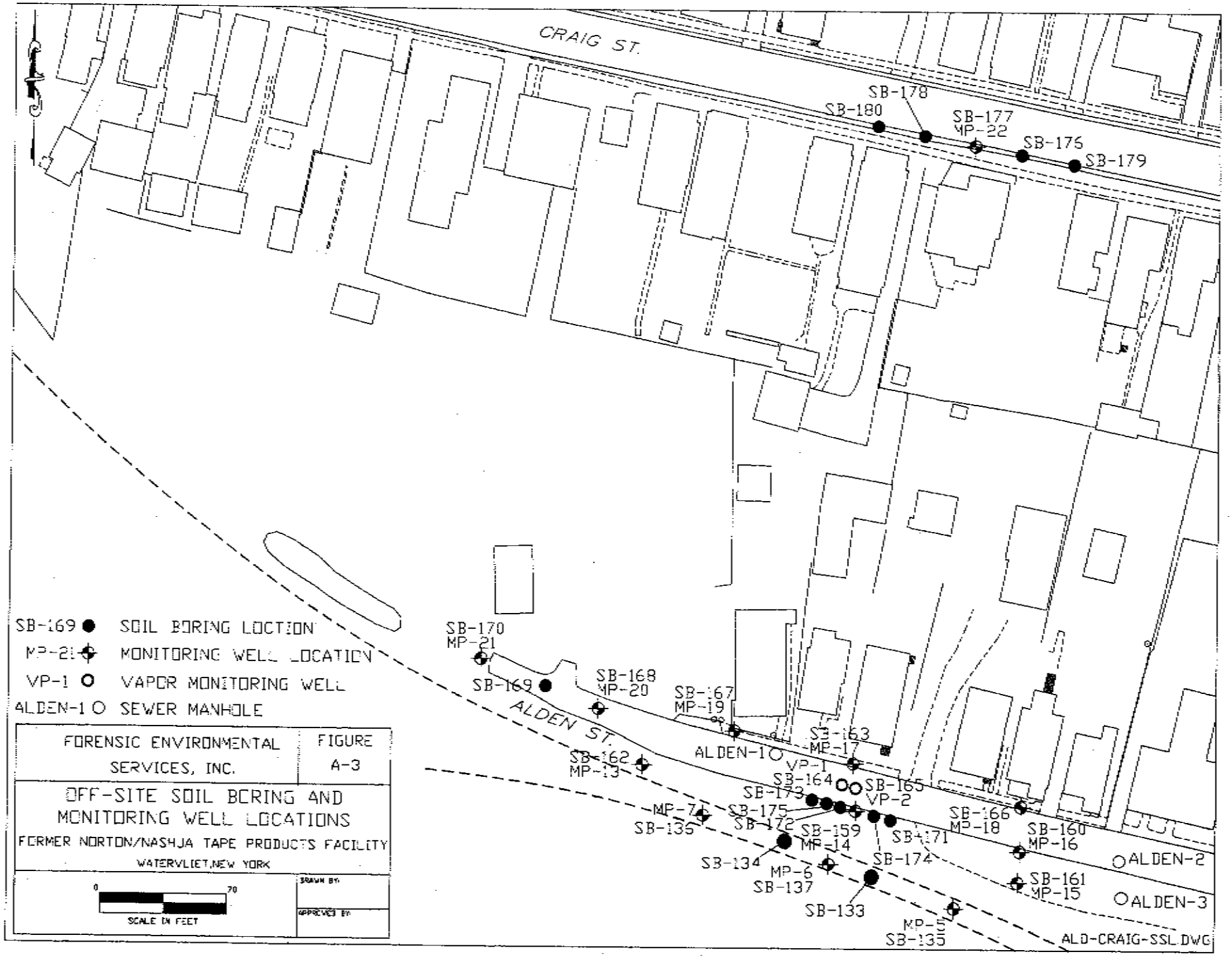
Matrix	Sample Type	Frequency	Analytical Parameters
Soil	Equipment Blank	one sample per each mobilization	TCL Volatiles plus heptane and TICs
	MS/MSD Samples	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
	Blind Replicate Sample	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
Water	Equipment Blank	one sample per each mobilization	TCL Volatiles plus heptane and TICs
	MS/MSD Samples	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
	Blind Replicate Sample	one sample per every 20 samples	TCL Volatiles plus heptane and TICs
	Trip Blank	one sample per cooler	TCL Volatiles plus heptane and TICs
Vapor	Equipment Blank	one sample per each mobilization	TO-15 Volatiles and TICs
	Ambient Air	one sample each sampling day	TO-15 Volatiles and TICs
	Blind Replicate Sample	one sample each sampling day	TO-15 Volatiles and TICs

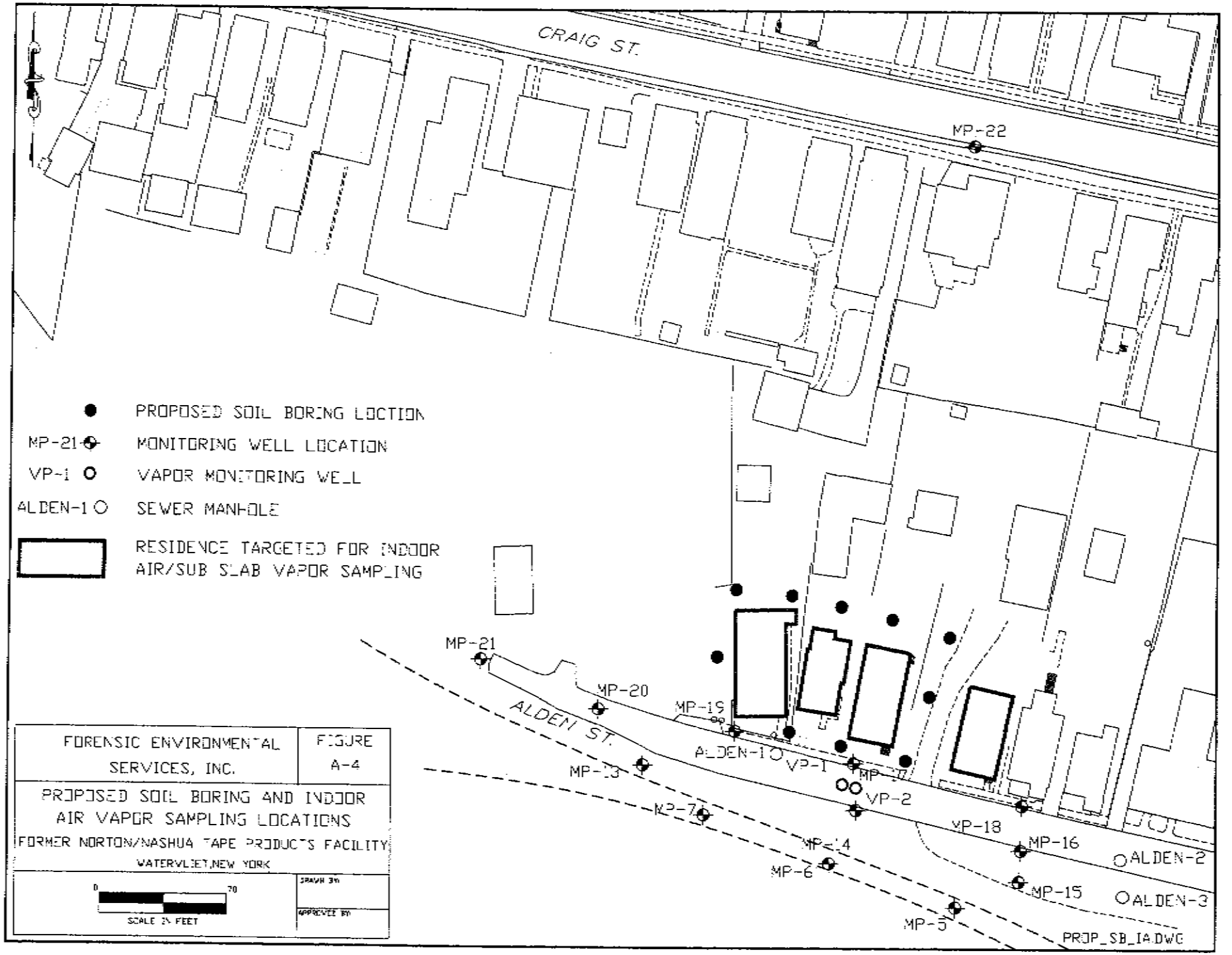
Soil and Water - Volatile analysis via EPA Method 8260.
Vapor - Volatile analysis via EPA Method TO-15.

QAPP - FIGURES


ARCHIBALD STREET
CRAIG STREET
DRY RIVER INTERCEPTOR
ALDEN STREET
TANK FARM 1
FORMER NORTON/NASHUA
PLANT BUILDING
HUDSON RIVER INTERCEPTOR
27TH STREET
THIRD AVENUE
ROUTE 32
N
LEGEND
RAIL ROAD TRACKS
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE A-1
SITE LOCATION MAP
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
0
200
SCALE IN FEET
DRAWN BY:
APPROVED BY:
NWV-FIG1.DWG

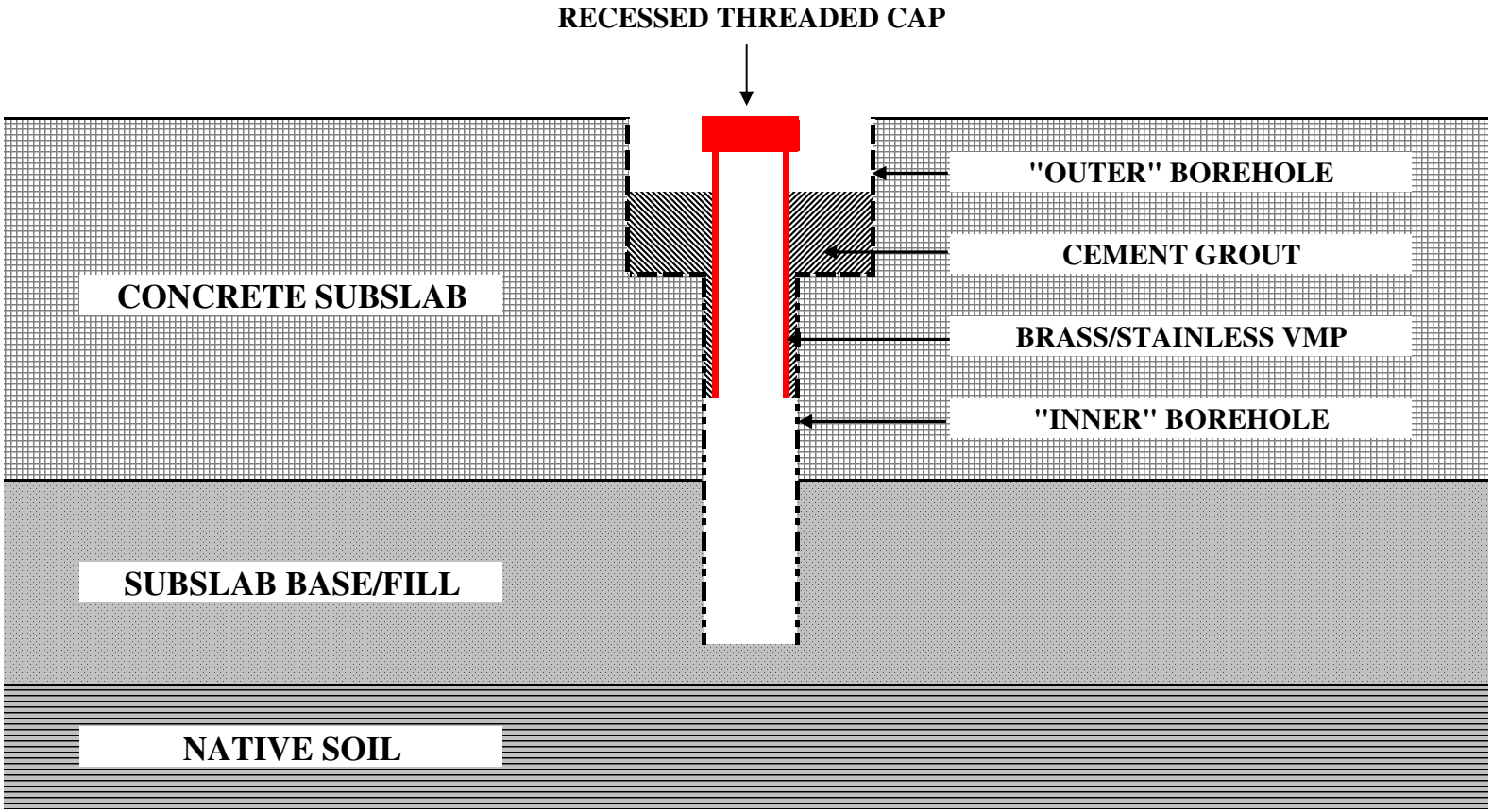

CRAIG ST.
DELAWARE & HUDSON RAILWAY CO.
COHOES ROAD
ALDEN ST.
EMBANKMENT
FORMER TANK FARM SWMU
MONITORING WELL LOCATION/ SMALL-DIAMETER MONITORING POINT
SOIL BORING LOCATION
AREA OF DETECTED RESIDUAL TOLUENE
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE A-2
OFF SITE AREA OF CONCERN
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
SCALE IN FEET
OFF_SITE_SWMU.DWG


CRAIG ST.
SB-178
SB-180
SB-177
MP-22
SB-176
SB-179
SB-169 SOIL BORING LOCTION
MP-21 MONITORING WELL LOCATION
VP-1 VAPOR MONITORING WELL
ALDEN-1 SEWER MANHOLE
SB-170
MP-21
SB-169
SB-168
MP-20
SB-167
MP-19
ALDEN ST.
SB-162
MP-13
ALDEN-1
SB-163
MP-17
VP-1
SB-164
SB-165
VP-2
SB-173
MP-7
SB-135
SB-175
SB-172
SB-159
MP-14
SB-171
SB-174
SB-166
MP-18
SB-160
MP-16
ALDEN-2
SB-134
MP-6
SB-137
SB-133
SB-161
MP-15
ALDEN-3
MP-5
SB-135
ALD-CRAIG-SSL.DWG
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE A-3
OFF-SITE SOIL BORING AND MONITORING WELL LOCATIONS
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET,NEW YORK
0
70
SCALE IN FEET
DRAWN BY:
APPROVED BY:



FORENSIC ENVIRONMENTAL SERVICES, INC.	FIGURE A-4
PROPOSED SOIL BORING AND INDOOR AIR VAPOR SAMPLING LOCATIONS FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY WATERVLIET, NEW YORK	
0 70 SCALE IN FEET	DRAWN BY: APPROVED BY:

Figure B-1
Vapor Monitoring Point (VMP) Schematic
Former Norton/Nashua Tape Facility
Watervliet, New York



QAPP - APPENDIX A

ATTACHMENTS A-1 & A-2
ORDER ON CONSENT INDEX NO. CO 4-20001205-3375
NYSDEC RCRA ANALYTICAL DATA AND
RAW DATA DELIVERABLE REQUIREMENTS

Attachment - A-1

COMPONENTS REQUIRED FOR RCRA ANALYTICAL DATA SUBMITTED TO NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Norton Company

(NOTE: This is one of two deliverables tables. See also Attachment A-2, "Raw Data Deliverables" for additional requirements for data validation.)

A Report Narrative should accompany each submission, summarizing the contents, results and all relevant circumstances of the work. It should describe the data validation and explain discrepancies.

A. Parameter requested.

B. Sample Number or Numbers, Matrix, and:

1. Date and time collected;
2. Date extracted and/or digested;
3. Date and time analyzed;
4. Chain of custody report and/or form, including confirmation of unbroken chain of custody, intact sample packaging and container seals and adequate temperature and/or other preservation; and
5. Field Sampling Log.

C. Results [b,e,f]

1. Sample Results;
2. Duplicate;
3. Blanks[a];
4. Matrix Spike; matrix spike duplicate; blank spike;
5. Surrogate recoveries, if applicable;
6. Standard reference materials results; and
7. Low level matrix spike recoveries, to confirm method detection limit (MDL) in the matrix.

D. Supporting QA/QC[b,d]

1. Sample preparation and analysis methods, and sample cleanup procedures;
2. Sample preparation and sample cleanup logs;
3. Analysis run logs:
4. Method detection limits, instrument detection limits[c], Method used to determine MDL in the matrix;

5. Calibration data (correlation coefficient or percent relative standard deviation and calibration check sample results);
6. Percent solids for soils, sludges, sediments, and where otherwise applicable;
7. Example calculations;
8. Data validation procedures, results, and completed data validation checklists; and
9. Documentation which illustrates how blank water is determined to be analyte-free.

In addition to submitting the above, all sample data and its QA/QC data as specified in the approved methods and SW-846, 3rd edition (or more current edition), must be maintained accessible to NYSDEC either in hard copy or on magnetic tape or disk (computer data files). The data, if requested by NYSDEC, should be formatted as described in SW-846, 3rd edition, Chapter 1, where applicable. This requirement may be changed in the future to mandate computer data files, accessible to NYSDEC on request.

- If CLP protocols are performed, then CLP deliverables are required, but all of the items listed in this Appendix must be submitted unless otherwise stated in the approved plan.

[a] The data should include all blanks (trip, equipment rinse, method and instrument blanks) as specified in the sampling and analysis plan, guidance and regulation.

[b] Supporting QA/QC should be specific to the RCRA samples analyzed.

[c] Every effort practicable must be made to achieve detection limits below regulatory limits and comparable to or better than the Practical Quantification Limits specified in the EPA-approved methods. In no case, will reporting limits above the specified PQL's be accepted without extensive and complete documentation to the Department.

[d] The supporting data should be provided to NYSDEC upon request, without restriction. Calibration data must include date and time of analysis.

[e] Frequencies of blanks, duplicates, spikes, surrogates, calibrations, standard reference materials, etc., should be as stated in the approved sampling and analysis plan, the approved analytical methods and the SW-846 3rd edition, Chapter 1, requirements. If there are any perceived conflicts, these should be resolved with NYSDEC in advance of sampling.

[f] Spiking for metals, organics or other parameters must be done before sample preparation (i.e., before digestions, extractions etc.) unless otherwise stated in the approved plan. Furnace analysis for metals will still require post-digestion spikes on all samples analyzed by this technique.

Attachment - A-2

RAW DATA DELIVERABLES

For the purpose of data validation or confirming the data validation, the Department may select a number of samples for which raw data deliverables may be required in addition to the main data and QA/QC requirements enumerated in Attachment A-1. This selection may be determined before the initial data report is received by the Department or after review of the initial data report. Raw data deliverables may also be stated to be required in the approved sampling and analysis plan for any or all of the samples. If requested by the Department, at a minimum, the following supporting information and raw data must be submitted, for the selection of samples:

1. The Report Narrative pertaining to the selection of data, including a detailed description of any problems associated with the data and how the problems were resolved.

2. The Chain-of-Custody forms for the selected samples.

3. The laboratory I.D. numbers corresponding to the field sample numbers.

4. Sample preparation logs, analytical run logs, GPC and other sample cleanup logs and related chromatograms, fully labelled; documentation of sample changes or reactions during preparation; documentation of sample pH where applicable.

5. Key explaining notations on the data sheets that are relevant to the usage of the data; and explanation of data corrections or other anomalies, including all data voided.

6. Standards information sheets documenting the composition and concentrations of standards used in the analyses.

7. Standards preparation logs.

8. Organics reconstructed ion chromatograms (RICs), as described in the NYSDEC ASP.

9. Quantitation reports.

10. Copies of organics raw spectra and copies of background-subtracted mass spectra of detected target compounds and non-target compounds (TICs), labelled, as described in the NYSDEC ASP, and the corresponding standard mass spectra (or best-match spectra in the case of TICs).

11. Organics extracted ion current profiles (EICPs) for samples and their related standards, fully labeled.

12. The standards raw data corresponding to the sample data for initial and continuing calibrations, with sources and preparation dates

13. All the sample raw data and QC raw data pertaining to the samples, such as the data from instrument tunings, blanks, spikes (of matrices and blanks) , detection limit determinations in water and in the matrices, low-level spiking of matrices to confirm PQLs, interference check samples, ICP serial dilutions, CRDL standards, LCSs, post-digestion spikes, MSAs, linear range analyses, etc

14. Calculations showing how final results are obtained from values printed on the quantitation reports; copies of formulas used (even by software packages) , and values for all terms in the formulas.

15. Chromatograms and data system printouts for all standards (individual and multicomponent) for the PCB and pesticides analyses.

16. All direct real-time instrument read-outs, fully labelled.

The raw data submission should contain all the information needed to confirm, recalculate and validate the reported results for the selected samples.

QAPP - APPENDIX B

FES SUPPLEMENTAL FIELD DATA FORMS

Log of Soil Boring

Project Name: Saint-Gobain, Watervliet	Project Number: 029.08	Location: Watervliet, New York
Boring Number:	Date Drilled:	Logged by:
Drilling Company:	Drilling Method:	Sampling Method:
Well Installed:	Casing Material / Diameter:	Total Depth (feet):

Notes:

Depth (feet)	Sample Interval (feet)	Recovery (feet)	PID (ppm)	Sample Interval	Soil Classification / Description color, texture, structure
0					
5					
10					
15					

MONITORING WELL CONSTRUCTION DIAGRAM

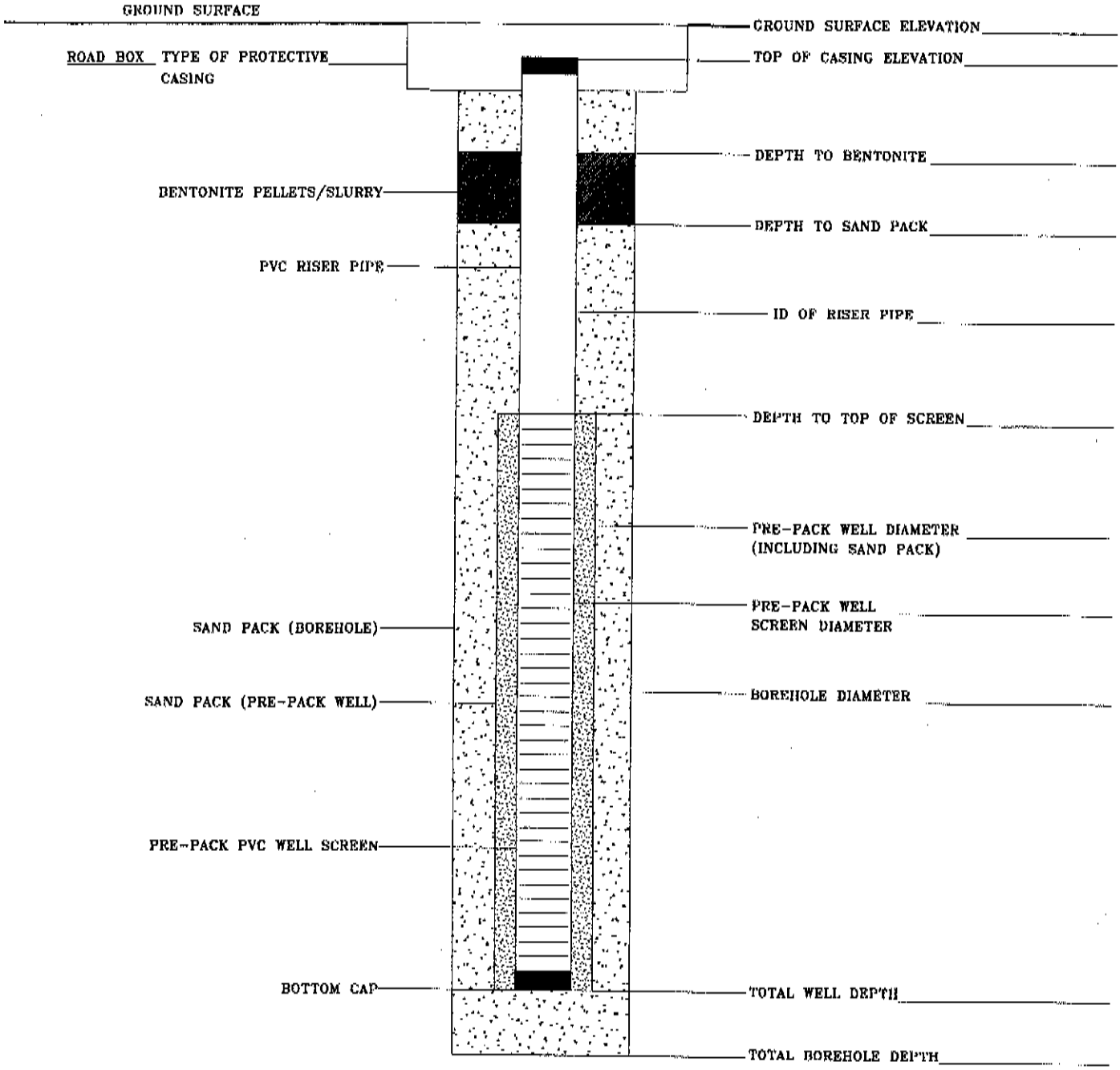
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK

DATE OF INSTALLATION _____

DRILLING COMPANY _____

WELL DESIGNATION _____

WELL DESCRIPTION GROUND-WATER MONITORING



MW-LOG.DWG

Forensic Environmental Services, Inc.

Well Sampling Form

Date:		Sampler:	
Project/Site:	SGPP - Watervliet	Location:	Watervliet, New York
Well ID:			
Inner Casing diameter:	inches	Casing Material:	

Weather Conditions:

Total Depth of Well (from top inner casing): feet

Depth to Water (DTW) (from top inner casing): feet

Well Screened Interval: feet

Linear feet of water in well:

Is DTW included in a complete round of pre-sampling synoptic water level measurements? yes no

Thickness of floating product (if any): None feet Time:

Description of floating product: None

Purge Method: Peristaltic pump

Purge Start Time: Purge End Time: Purge Rate (gals/minute):

Total Volume Purged: gallons

	Temperature °C	Spec. Cond. (µs/cm)	pH (pH units)	Diss. Oxygen (ppm)	Redox (mV)	Depth to Water (ft)
Initial:						
3 Minutes:						
6 Minutes:						
9 Minutes:						
12 Minutes:						
15 Minutes:						
18 Minutes:						
21 Minutes:						
24 Minutes:						
27 Minutes:						
30 Minutes:						
33 Minutes:						
Stabilization Rate	---	+/- 3%	+/- 0.1	+/- 10%	+/- 10 mv	---

Sampling Method: Low Flow

Sampling Start Time: Sampling End Time:

Field Observations (turbidity, recharge rate, odor, sheens, PID/FID readings):

Purge Water Status (containerized & # of containers, filtered and discharged, w/ discharge location):

Comments:

QAPP - APPENDIX C

SAMPLE LABORATORY
CHAIN-OF-CUSTODY (COC) FORMS

Analysis Request / Environmental Services Chain of Custody

Lancaster Laboratories
Where quality is a science.

For Lancaster Laboratories use only

Acct. #_____ Group#_____ Sample # _____

COC # 0025613

Please print. Instructions on reverse side correspond with circled numbers.

(1) Client: _____ Acct. #: _____

Project Name/#: _____ PWSID #: _____

Project Manager: _____ P.O.#: _____

Sampler: _____ Quote #: _____

Name of state where samples were collected: _____

(2) Sample Identification	Date Collected	Time Collected	(3) Grab	Composite	(4) Matrix: Soil	Water (☐ Potable ☐ NPDES Check if Applicable)	Other	Total # of Containers	(5) Analyses Requested	Remarks	(6) Temperature of samples upon receipt (if requested)

For Lab Use Only
FSC: _____
SCR #: _____

(7) **Turnaround Time Requested** (TAT) (please circle): Normal Rush
(Rush TAT is subject to Lancaster Laboratories approval and surcharge.)
Date results are needed: _____
Rush results requested by (please circle): Phone Fax E-mail
Phone #: _____ Fax #: _____
E-mail address: _____

(8) **Data Package Options** (please circle if required)
QC Summary Type VI (Raw Data)
Type I (Tier I) GLP
Type II (Tier II) Other
Type III (NJ Red. Del.)
Type IV (CLP)

SDG Complete? Yes No

Site-specific QC required? Yes No
(If yes, indicate QC sample and submit triplicate volume.)
Internal Chain of Custody required? Yes No

(9) Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time

Directions For Completing This Form

(1) Client: Your company's name

Acct. #: Your account number with Lancaster Laboratories

Project Name/#: The way your company refers to the work involved with these samples. You may want to include project location as part of the description.

PWSID: Potable Water Source ID#

Project Manager: The person at your company responsible for overseeing the project

P.O.#: Your company's purchase order number

Sampler: The name of the person who collected the samples

Quote #: The reference number that appears on your quote (if Lancaster Laboratories gave you a number)

State where sample was collected: Please indicate where the sample was taken, e.g., PA, NJ, etc.

(2) Sample Identification: The unique sample description you want to appear on the analytical report

Date Collected/Time Collected: When the sample was collected

(3) Grab: Check here if sample was taken at one time from a single spot

Composite: Check here if samples were taken from more than one spot, or periodically, and combined to make one sample

(4) Matrix: Check the type of sample you are submitting. If it is a water sample, please indicate if it is a potable water or if it is an NPDES sample.

Number of Containers: Indicate the total number of containers for each sampling point

(5) Analyses Requested: Write the name of each analysis (or an abbreviation of it) here, and use the **catalog number** that appears at the beginning of each line in the *Schedule of Services*. Be sure to indicate which analyses are to be performed on which samples.

(6) Remarks: List special instructions about the sample here (e.g., hazardous elements, high levels of analyte, etc.). The space can also be used (if needed) for listing additional analyses.

(7) Turnaround Time Requested: Circle **Normal** if you want routine TAT, which is usually within 10-15 days. If you need your results faster, call ahead to schedule **Rush** work.

Rush Results Requested by: Circle **Fax** or **Phone** and include the number.

(8) Data Package Options: Call our Client Services Group (717-656-2300) if you have questions about these choices.

SDG Complete? Indicate **Yes** if this is a complete sample delivery group or **No** if you will be submitting additional samples to be included in the same data package.

Note: We need to have one quality control (QC) sample for every 20 samples you send, if you are requesting site-specific QC. Please give us this sample in triplicate volume and identify it by writing "QC" in the **Remarks** column.

The internal chain of custody is a hand-to-hand documentation recording a sample's movement throughout the company. We routinely start a chain of custody for data package samples unless we are told otherwise. There is a $25 **per sample** charge for the chain-of-custody documentation.

(9) Relinquished by/Received by: The form must be signed each time the sample changes hands. We can supply chain-of-custody seals for the outside of your packages if you require them.

Thank you for using Lancaster Laboratories.

Please call our Client Services Group (717-656-2300) if you have any questions about completing this form.

Adirondack Environmental Services, Inc.
314 North Pearl Street
Albany, New York 12207
518-434-4546/434-0891 FAX

CHAIN OF CUSTODY RECORD

A full service analytical research laboratory offering solutions to environmental concerns

Client Name:	Address:	
Send Report To:	Project Name (Location)	Samplers: (Names)
Client Phone No: Client Fax No:	PO Number:	Samplers: (Signature)

AES Sample Number	Client Sample Identification & Location	Date Sampled	Time A=a.m. P=p.m.	Sample Type Matrix	Comp	Grab	Number of Cont's	Analysis Required
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					
			A / P					

Turnaround Time Request:	Special Instructions/Remarks	
☐ 1 Day ☐ 3 Day ☐ Normal ☐ 2 Day ☐ 5 Day		
CC Report To:		
Relinquished by: (Signature)	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Received for Laboratory by:	Date/Time

Temperature	Properly Preserved	Received Within Holding Times
Ambient or Chilled	Y N	Y N
Notes:	Notes:	Notes:

WHITE - Lab Copy YELLOW - Sampler Copy PINK - Generator Copy

Adirondack Environmental Services, Inc.

ADDENDUM to the SUPPLEMENTAL RCRA INVESTIGATION (RFI) WORKPLAN

Former Norton Company/Nashua Tape Products Facility
2600 Seventh Avenue
Watervliet, New York
EPA ID No. NYD 066829599
NYSDEC Index Number: CO 4-20001205-3375

January 2006

Prepared for:
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ADDENDUM to the SUPPLEMENTAL
RCRA INVESTIGATION (RFI) WORKPLAN

Former Norton/Nashua Tape Products Facility
2600 Seventh Avenue
Watervliet, New York

SECTION 1.0

INTRODUCTION

This Addendum has been prepared to the May 2005 Supplemental RCRA Facility Investigation (RFI) Workplan submitted by Forensic Environmental Services, Inc. on behalf of Saint-Gobain Corporation (Saint-Gobain) per New York State Department of Environmental Conservation (NYSDEC) Order on Consent Index No. CO: 4-20001205-3375 dated June 4, 2002 for the former Norton Company (Norton)/Nashua Tape Products (Nashua) manufacturing facility located at 2600 Seventh Avenue, Watervliet, New York. The Supplemental RFI Workplan was approved by the NYSDEC on June 23, 2005.

As discussed in Sections 5.1 & 5.2 of the Supplemental RFI Workplan, if a concrete slab or other suitable barrier is not present (i.e., there is a dirt floor or a gravel crawlspace) at any of the four residences proposed for sampling along Alden Street (see Figure 1-1), a VMP will not be installed, and a contingent soil vapor probe (SVP) will be substituted. Construction, installation, and sampling details associated with contingent SVPs were to be discussed with the NYSDEC/New York State Department of Health (NYSDOH), and presented for review and approval as an addendum to the Supplemental RFI workplan.

Based on preliminary discussions with the four Alden Street property owners, only one of the four residences reportedly has a full concrete slab (presently unconfirmed). Therefore, this Addendum has been prepared to address the construction, installation, and sampling of contingent SVPs at the remaining locations. Except for the modifications proposed in this Addendum, all Supplemental RFI activities will be performed as outlined in the May 2005 Supplemental RFI and associated Quality Assurance Project Plan (QAPP).

SECTION 2.0

PHASE I – SOIL VAPOR SAMPLING CONTINGENCY

Four private residences north of Alden Street were previously identified for sub-slab vapor and indoor air sampling (see Figure 1-1). Access is currently being negotiated with the owner of each residence to allow the installation and sampling of a sub-slab/soil vapor monitoring point and indoor air sampling.

2.1 Soil Vapor Sampling Contingency

At this time, the exact construction of the four residences (e.g., basement, first floor on slab, crawlspace, etc.) is unknown, but based on preliminary conversations with the property owners, a full concrete slab is reportedly present at only one location (presently unconfirmed). Therefore, the contingency discussed in Section 5.2 of the May 2005 Supplemental RFI Workplan will likely be necessary at some or all of these locations. At these residences, sub-slab VMPs will not be installed. Instead, contingent SVPs will be used to collect soil vapor samples as discussed below.

2.2 Pre-Installation Survey and Selection of Sampling Method/Location

Conditions in the lowest accessible area at each residence will be reviewed with the NYSDEC/NYSDOH to determine if the installation of a sub-slab VMP, as outlined in the May 2005 Supplemental 2005 Workplan, is appropriate. If a sub-slab VMP is not appropriate, the preferred alternative is an indoor modified soil vapor probe (SVP).

Construction and installation of the indoor modified SVP will follow the draft February 2005 NYSDEC guidance document for SVPs with the following modifications:

1) Surface preparation - Plastic sheeting will be affixed to the basement (or crawlspace) floor in the immediate area of the SVP to minimize any disturbance (and reduce potential surface air infiltration).

2) SVP Installation - Due to access constraints, the preferred method of installation via direct push technology will not be possible. Depending on physical access, the use of a portable power auger (drill) may be substituted.

3) Length of Sampling Zone and Slurry Seal - Depth to water (DTW) from the floor of the residence is probably less than four feet (DTW is less than eight feet from the ground surface). Installing an SVP with a 1-2 foot sampling zone and a 3 foot slurry seal would likely intercept the water table, so a 1.0 foot sampling zone with a 1.5-2 foot slurry seal (to the top of the boring) will be used.

4) SVP Completion - The SVP will be completed as a "flush-mount" point. However, if the location will not constitute a "trip" hazard (and with the homeowner's permission), additional bentonite may be "mounded" adjacent to the SVP on the plastic sheeting to improve the surface seal.

Any additional modifications to "standard" SVP construction and installation that are necessary as a result of the proposed indoor location will be reviewed in the field with the NYSDEC/NYSDEC prior to implementation. If physical constraints or other conditions prevent the installation of a modified SVP inside the residence, the alternative of installing an SVP adjacent to the residence at an outdoor location will be reviewed in the field with the NYSDEC/NYSDEC prior to implementation. Construction and installation of the outdoor SVP would follow the draft February 2005 NYSDOH guidance document.

Permission to proceed with the final SVP location will be obtained from the homeowner. Contingent SVPs will be installed at least 24 hours prior to sampling to allow the bentonite seal to hydrate. Following installation of the SVP, the residence will be returned its original condition to the extent practicable.

2.3 Contingent Soil Vapor (and Ambient Air) Sampling

Contingent soil vapor and ambient air sampling protocol is based upon the February 2005 NYSDOH Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York, and the May 2005 Supplemental RFI Workplan. Contingent soil vapor/ambient air samples will be collected in the vicinity of Alden Street during the heating season (general time frame approximately November 15, 2005 to March 31, 2006).

A pre-sampling inspection to document conditions in the residence will be conducted at least 24 hours prior to the scheduled sampling time as outlined in the May 2005 Supplemental RFI Workplan. A final site inspection and PID field screening survey will also be performed on the day of sampling, and the integrity of the SVP will be inspected at that time.

Unless otherwise specified herein, contingent SVP sampling will be conducted according to the protocol outlined for sub-slab VMPs in the May 2005 Supplemental RFI Workplan. Immediately prior to, and immediately after, SVP sampling, tracer gas monitoring will be conducted per the February 2005 NYSDOH guidance document to confirm the integrity of the SVP (and associated fittings). Details are provided in Appendix A.

Contingent SVPs will be sampled by removing the SVP tubing plug and connecting approximately 1 foot of dedicated ¼-inch ID Teflon tubing to the SVP compression fitting (or nipple) and a low-flow peristaltic pump (i.e., flow rate 0.2 liters per minute or less). The peristaltic pump will be activated to collect a one-liter (L) Tedlar bag sample for tracer gas and photoionization detector (PID) field screening. The extraction of one liter of air will also serve to purge the SVP of the required 1-3 volumes. (Note: the total volume of a two-inch diameter SVP with a one foot sampling zone and 2.0 feet of sample tubing is approximately 0.63 liters.)

After the Tedlar bag is filled, the peristaltic pump will be deactivated, the Tedlar bag sealed, and the Teflon tubing from the SVP will be attached to a 6-L Summa canister equipped with a particulate filter and a 4-hour regulator preset by the laboratory. The pre-sample vacuum of the Summa canister will be recorded (initial vacuum must be greater than 25 inches of mercury) and the canister valve opened to begin vapor collection at an extraction rate of approximately 0.025 liters per minute (6 liters/240 minutes).

Concurrent ambient indoor air samples will be collected at each contingent SVP sampling location (along with one outdoor ambient air sample for all four homes) as outlined in the May 2005 Supplemental RFI Workplan. Contingent soil vapor samples will be submitted for laboratory analysis of VOCs via EPA Method TO-15 plus TICs at the NYSDOH requested reporting limit of one microgram per cubic meter ($\mu g/m^3$) for vapor sample compounds of concern (COCs; i.e., toluene).

SECTION 3.0

REFERENCES

Forensic Environmental Services, Inc., 2005. Supplemental RCRA Facility Investigation (RFI) Workplan, May 2005.

New York State Department of Health, 2005. Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Public Comment Draft, February 2005.

APPENDIX A

Tracer Gas Monitoring Protocol

APPENDIX A

Tracer Gas Monitoring Protocol

Tracer gas monitoring will be performed per the February 2005 NYSDOH guidance document immediately before and immediately after collection of environmental samples from all contingent soil vapor probes (SVPs) to confirm the integrity of each SVP (and associated fittings). Pre-sampling tracer gas monitoring will be performed as follows:

- Remove the SVP plug and connect the open end of approximately two to three feet of dedicated ¼-inch ID Teflon tubing to the SVP compression fitting (or nipple). Use the SVP plug to seal the open end of the tubing.

- Insert the plugged end of the Teflon tubing through the opening on the top of the tracer gas flux chamber. Seal the tubing penetration with beeswax.

- Place a piece of plastic sheeting measuring approximately 2 feet by 2 feet over the contingent SVP and seal the sheeting to the slab/floor with duct tape. Puncture the plastic sheeting to expose the SVP compression fitting (or nipple). Seal the flux chamber to the surface with beeswax.

- Open the inlet valve and outlet valve on the flux chamber and connect a short length of Teflon tubing to each.

- Connect the helium source to the inlet valve tubing and open the valve on the helium source allowing helium to enter the flux chamber. Any excess vapor pressure will be relieved via the outlet valve (see above).

- Activate the helium detector and connect it to the outlet valve tubing. Continue to introduce helium into the flux chamber until helium is detected at the outlet valve. Close the helium source valve and flux chamber inlet valve.

- Record the % helium in the flux chamber. Close the outlet valve.

- Unplug the sample tubing and connect to a low-flow peristaltic pump. Collect a one-liter (L) Tedlar bag sample at a flow rate of less than 0.2 liters per minute (lpm).

- After the Tedlar bag is filled, deactivate the pump, seal the Tedlar bag, and connect the sample tubing to a 6L Summa canister positioned adjacent to the flux chamber.

- Screen the Tedlar bag sample for helium by connecting it to the helium detector. If no helium is detected in the Tedlar bag sample (or if the ratio of the helium in the Tedlar bag versus the flux chamber is less than 1:5), proceed with SVP sampling.

- Seal the Tedlar bag sample and set it aside for later volatile organic compound (VOC) screening with a photoionization detector (PID) outside of the residence.

- If pre-sampling tracer gas monitoring indicates a 20% leak by volume or greater, check the integrity of the SVP and all fittings, correct if possible, and return to the first step of pre-sampling tracer gas monitoring. If the integrity of the fitting cannot be corrected in the field (i.e., the SVP needs to be resealed or is defective), terminate SVP sampling (and any concurrent indoor air sampling) until the problem is corrected.

Post-sampling tracer gas monitoring will be performed as follows:

- Terminate SVP sampling by recording the post-sample vacuum, closing the Summa canister sample valve, and disconnecting and plugging the sampling tubing.

- Screen the flux chamber by connecting the helium detector to the outlet valve tubing and opening the outlet valve. If helium is not detected, recharge the flux chamber until helium is detected at the outlet valve. Close the helium source valve and flux chamber inlet and outlet valves.

- Unplug the SVP sample tubing and connect to a low-flow peristaltic pump. Collect a 1-L Tedlar bag sample at a flow rate of less than 0.2 lpm.

- After the Tedlar bag is filled, deactivate the pump, and seal the SVP and Tedlar bag.

- Screen the Tedlar bag sample for helium by connecting it to the helium detector. If no helium is detected in the Tedlar bag sample (or if the ratio of the helium in the Tedlar bag versus the flux chamber is less than 1:5), tracer gas monitoring is complete. Remove the sample tubing and plug the SVP. Restore the floor to its previous condition to the extent practicable. Submit the Summa canister for laboratory analysis.

- Seal the Tedlar bag sample and set it aside for later VOC screening with a PID outside of the residence.

- If post-sampling tracer gas monitoring indicates a 20% leak by volume or greater, set aside the Summa canister (and any concurrent ambient indoor air samples) for optional lab submittal. Check the integrity of the SVP and all fittings, correct if possible, and begin collection of a replacement SVP sample starting with pre-sample tracer gas monitoring (or schedule a follow-up sampling date with the residents). If the integrity of the fittings cannot be corrected in the field (i.e., the SVP needs to be resealed or is defective), postpone additional sampling until the problem is corrected, and restore the sampling area as described above.

FIGURES