REMEDIAL ACTION WORK PLAN (RAWP)

For:

CIABATTONI PROPERTY

ID# C 344068

153 South Liberty Drive
Stony Point, Rockland County, New York

Prepared for:

Mr. Josh Beyer, P.E.
Director of Development
Sembler/Treasure New York Joint Venture
c/o Sembler Florida, Inc.
5858 Central Avenue
Saint Petersburg, FL 33707

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
BROWNFIELDS CLEANUP PROGRAM
21 South Putt Corners Road
New Paltz, NY 12561

Prepared by:

A2L Engineering & Technologies, P.A.
10220 Harney Road NE
Thonotosassa, Florida 33592

June 2010
050409

I Certify that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with applicable DER guidance.

Lawrence Gerard Schmaltz, P.E.
Registered Professional Engineer (086608)

Date

TABLE OF CONTENTS

FIGURES

1.0 INTRODUCTION

A2L Engineering & Technologies, P.A. was retained by Sembler/Treasure New York Joint Venture to prepare a Remedial Action Work Plan (RAWP) pursuant to the Brownfield Cleanup Program (Subpart 375-3), administered by the New York State Department of Environmental Conservation (NYSDEC). A description of the site history and project history, including previous assessments, is included herein.

The current owner of the site is Sembler/Treasure New York Joint Venture. The Brownfield designated site is listed by Rockland County as tax lot #20.15-1-17 at approximately 0.23 acres in total area.

1.1 Facility History

The site has historically operated as a gasoline service station with initial construction in 1953 and operating under various ownerships and management until August 2003 when all underground storage tanks were removed and the station vacated. When the underground storage tanks (UST's) were removed, petroleum contamination within the soils was identified in the gasoline and waste oil tank farm areas.

1.2 Project History

Historical documentation indicates that the original tanks (installed 1953) were removed in 1980 by Ira D. Conklin & Sons, Inc. (IDC) and replaced with three (3) 10,000 gallon gasoline underground storage tanks (UST's) and two dispensers. In 1982, a complaint was filed by Annie's Diner which stated that the gas station was dumping oil behind the building. There was no documentation within the file indicating that any oil dumping had occurred or that any waste oil contaminated soils were cleaned up at the site.

A NYSDEC Spill Report Form was submitted on November 18, 1995 due to the failure of the tank tightness testing. The tank was retested and passed, and received incident closure from the NYSDEC on March 26, 1998. In August 2003, IDC removed the three (3) 10,000 gallon gasoline underground storage tanks (UST's) and one (1) 550 gallon waste oil UST. During the coincidental excavation process, it was established that the soil was contaminated and a NYSDEC Spill Report Form was submitted on August 20, 2003. Approximately 600 tons of soil were subequently removed from the tank excavation area and 150 tons of soil removed from the waste oil UST excavation. Laboratory results for the soil extracted during over excavation of the former UST area identified contaminants above the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) #4046

Recommended Soil Cleanup Objective (RSCO) level at the east wall (under South Liberty Drive) and in the bottom of the excavation. Upon inspection of the site, the Rockland County Department of Health representative requested the removal of the hydraulic lifts and dispensers on the site. On November 1, 2004, the removal of three (3) in-ground hydraulic lifts and the dispenser island commenced. At that time approximately 1,780 tons of petroleum contaminated soil were removed from both excavations. No groundwater sampling was performed as a result of the discovery of contaminated soils. A letter from IDC to Majac Enterprises (UST Owners) on December 28, 2004 suggested the presence of contaminated soil along the south wall of the hydraulic lift excavation.

A Phase II Environmental Site Assessment, prepared by A2L Technologies (A2L), was published in April 2006 and documented the initial site investigation of the former service station facility. During this investigation the soils and groundwater around the former - underground storage tank farm, waste oil tank, dispenser island and the hydraulic lifts were screened and sampled for petroleum hydrocarbon contamination. The summary of the findings is presented below.

- Nine direct push soil borings were installed in the following areas: two within the former waste oil UST tank farm; two within the former gasoline UST tank farm and dispenser area; one northwest of the former gasoline UST tank farm; one in the former interior hydraulic lift location; and three along the back side of the service station building. Soil samples were collected and analyzed in the field for physical evidence of contamination (i.e. odor, staining, elevated Organic Vapor Analyzer (OVA) readings). A sample was collected from 4' to 6' below land surface (BLS) within the waste oil UST tank farm area and analyzed for Spill Technology and Remediation Series (STARS) volatile organic compounds (VOCs), STARS semivolatile organic compounds (SVOCs) and 8 RCRA metals. A sample was collected from 17' to 19' BLS from the former gasoline UST tank farm area and analyzed for STARS VOCs and 8 RCRA metals. A sample was collected from 6' to 8' BLS within the former interior hydraulic lift area and analyzed for STARS VOCs, STARS SVOCs, PCBs and 8 RCRA metals. A sample was collected from 0' to 2' BLS from behind the service station building and analyzed for STARS VOCs, STARS SVOCs and 8 RCRA metals.
- The water table was encountered at approximately 17' - 25' below ground surface (depending on the location). The groundwater level is consistent with that

documented during the removal of the tanks.

- Natural geologic units encountered at the site below the gravelly back fill material consisted of reddish brown and grayish brown silty sand and gravel underlain by a well sorted medium sand. Bedrock was not encountered during the investigation.
- Physical evidence of contamination (i.e. staining, odors, Photoionization Detector (PID) measurements) was observed from the soil samples extracted from the waste oil UST area, UST and dispenser area, and in-ground hydraulic lift.
- No levels of VOC's, above the laboratory limits of detection, were established within the sampled soil in the area of the former waste oil UST.
- No levels of VOC's, above the laboratory limits of detection, were identified within the sampled soil in the area of the alleged dumping at the rear of the gas station building.
- No levels of VOC's, above the laboratory limits of detection, were identified within the sampled soil in the area of the former in-ground hydraulic lifts. Additionally, benzene was detected slightly above TOGS value in the groundwater sample, with selenium being the only dissolved metal exceeding the regulatory limit.
- Based on the results of sampling, groundwater at the former dispenser island and UST area have been impacted by numerous petroleum constituents above NYSDEC groundwater quality standards. Based on the analytical results from a monitoring well in the Right-of-Way, the groundwater impact extends off-site.
- Metals concentrations exceeding the regulatory limits were established within the soil samples (chromium) and groundwater samples (totals - barium, chromium, lead, selenium, silver and dissolved selenium). The source of the elevated metals is unknown, and may be due to background conditions.

Based on the findings of the April 2006 Phase II Environmental Site Assessment a supplemental Site Assessment Report, performed by A2L, was prepared and addressed additional soils and groundwater sampling at the site, primarily for the evaluation of the former UST system operated at the site. The report was issued in December of 2006 and the findings are presented below.

- Five monitoring wells were installed using a direct push rotary drill rig at predetermined locations on the site, around and within the former UST system area. Soil borings 1, 3, 4, 5 were advanced to 20 feet below land surface and finished as 2" monitoring wells with a locking caps.

- Natural geologic units encountered at the site below the gravelly backfill material consist of reddish-brown and grayish-brown silty sand and gravel underlain by a well sorted medium sand. Bedrock was not encountered during the investigation.
- All soil screening PID results were found to be at non-detectable levels, however a strong petroleum odor was detected from 16' - 20' below grade during the installation of monitoring well MW-03 (former UST area).
- Chromium was detected in all three soil samples collected (including the upgradient "background" sample) at concentrations ranging from 38 to 61 milligrams/kilogram (mg/kg), exceeding the RSCO value of 10 mg/kg. The Eastern USA background chromium soil concentration of 15 to 40 mg/kg was exceeded at the SB-03 and SB-05 sample locations.
- Numerous analytes were detected in three of the four sampled monitoring wells, including gasoline constituents and breakdown compounds. Samples from Monitoring wells MW-3 and MW-4 were determined to contain VOC compounds in excess of NYSDEC TOGS values. Several analytes were detected in the sample collected from monitoring well MW-03 and included: ethylbenzene (63 µg/l); total xylenes (56 µg/l); isopropylbenzene (32 µg/l); n-propylbenzene (76 µg/l); 1,3,5-trimethylbenzene (27 µg/l); 1,2,4-trimethylbenzene (120 µg/l, estimated); sec-butylbenzene (11 µg/l); napthalene (48 µg/l, estimated). The analytes in the sample collected from MW-04 at levels exceeding their respective state groundwater quality standards included: benzene (310 µg/l); toluene (470 µg/l); ethylbenzene (310 µg/l); total xylenes (750 µg/l); isopropylbenzene (54 µg/l); n-propylbenzene (52 µg/l); 1,3,5-trimethylbenzene (100 µg/l); 1,2,4-trimethylbenzene (260 µg/l); p-isopropyltoluene (6.9 µg/l) napthalene (73 µg/l, estimated).
- Groundwater flow direction was determined to be to the east towards South Liberty Drive.

Based on the results of the Supplemental Site Assessment, it appears that the groundwater samples collected indicate that the contamination plume originating from the former UST area has migrated eastward and extends off-site into the right of way of Route 9W/202. Additionally, chromium was detected in all three soil samples collected (including the upgradient "background" sample) at concentrations ranging from 38 to 61 mg/kg, exceeding the RSCO value of 10 mg/kg. The Eastern USA background chromium soil concentration of 15 to 40 mg/kg was exceeded at the SB-03 and SB-05 sample locations.

Ground water monitoring on October 7-8, 2009 revealed concentrations of numerous metals below their respective unrestricted residential concentrations. The October 2009 sampling revealed the BTEX plume has decreased significantly from the May 2008 sampling event. Refer to Section 2.2 for discussion.

1.3 Site Remediation

Remediation at this site has been limited to several soil removal events associated with the decommissioning of the service station facility formerly present on the site and during the installation of the storm water retention tanks. In August 2003, approximately 600 tons of soil were removed from the UST tank farm and distribution area excavation and 150 tons of soil removed from the waste oil UST excavation. In November 2004, the removal of two in-ground hydraulic lifts and the dispenser island commenced. Approximately 1,780 tons of petroleum contaminated soil were removed from both excavations.

During the installation of the current storm water system, in November 2007, twenty additional (20) tons of petroleum contaminated soils (>50 ppm via PID) were removed from the center of the eastern property boundary along South Liberty Drive (adjacent to MW-6). Excessively contaminated soils were limited to the area from approximately two (2) feet to eight (8) feet BLS.

No other identified assessment or remediation activities have been performed at the subject site. Engineering controls have included the placement of a cover system over the site, consisting of pavement, concrete, or at least one foot of clean soil cover. Refer to Figure 8 for further information.

2.0 REMEDIAL INVESTIGATION RESULTS

2.1 Unsaturated Soil Quality Investigation Results

Soil impacts were noted during the sampling event. Stainless steel split spoon samplers were used to probe surficial soils at each of the monitoring wells. The soil samples were screened using head space analysis with a PID. The soil sample containing the highest OVA reading and/or physical evidence of contamination (staining or odor) in each boring was submitted to the laboratory for analysis. The RIWP approved laboratory analysis included the following: New York State Spill Technology and Remediation Series Memo # 1 (STARS) Volatile Organic Compounds via EPA Method 8260B, lead (Pb) and chromium (Cr) EPA Method 6010 for(mass analysis), hexavalent and trivalent chromium

(Cr^{+6} & Cr^{+3}) using analytical method SW-846 7196A and TCLP analysis using EPA Method 1311.

2.1.1 Onsite Soil Sampling Results

Concentrations of regulated petroleum contaminants were identified in samples of soils collected from soil borings SB4 (at 18' bls) and SB6 (at 18' bls). The soil samples, from the borings at 18 feet bls, identified concentrations of ethylbenzene above residential unrestricted use soil cleanup objectives (SCO) as defined in Table 375-6.8(b). Concentrations of naphthalene were identified in SB4 above the unrestricted residential SCO. Additionally, concentrations of total xylene, isopropylbenzene, propylbenzene, 1,3,5 and 1,2,4 trimethylbenzene and n-butylbenzene were identified at 18 foot bls within both soil samples. However, all were below the restricted commercial SCO.

Organic vapor analysis of the soil samples collected during the investigation, using a photoionization detector (PID), identified that only SB-4 and SB-6 exhibited elevated concentrations. The results at SB-4 identified a pocket of soil at eight feet (8') below land surface (BLS) and twenty feet (20') BLS where the PID results were 120 ppm and 1074 ppm, respectively. Additionally, the PID results at SB-6 were 114 ppm at twelve feet (12') BLS, 177 ppm at 16 feet (16') BLS and 617 ppm at 18 feet (18') BLS.

Refer to Figures 3A and Figure 3B for locations.

The greatest concentration of surficial excessively contaminated soils were discovered along the east-central site boundary with South Liberty Drive. Due to underground utilities and other right of way issues, no additional assessment was able to be performed within the right of way. The subsoil may be contaminated below the eight plus inches of asphalt pavement covering the roadway, but it is suspected of being at deeper locations. No further migration of the soil contamination is anticipated due to the source area abatement in 2003. No free product has been observed in subsurface soils or groundwater.

2.1.2 Offsite Soil Sampling Results

Soil samples were collected at five off-site locations at 0 - 6" below native ground surface to establish background levels of Cr^{+6} & Cr^{+3}, and total Pb. The results of the five soil samples obtained from off-site, on property, locations identified that concentrations Cr^{+3}, Cr^{+6}, and Pb were present within each sample analyzed.

Off-site soil samples were found to contain concentrations of Cr^{+3} and Cr^{+6}

below current 6 NYCRR Part 375-6.8(a) restrictive use concentrations. One of the off site samples, SB10-1, taken from the western hillside, was found to contain lead (Pb) concentrations (244 mg/kg) in excess of current 6 NYCRR Part 375-6.8(a) Soil Cleanup Objective Tables (SCOT) for unrestrictive use. This sample is well below the residential restricted concentration defined in 6 NYCRR Part 375-6.8(b) Restrictive Use Soil Cleanup Objectives (RUSC). The remaining four samples were found to contain lead (Pb) concentrations below current 6 NYCRR Part 375-6.8(a) & (b) SCOT and RUSC use concentrations.

2.1.3 Soil Vapor Investigation Results

The soil vapor investigation was performed due to the presence of petroleum contaminated soil and groundwater at the subject site and the potential for vapor intrusion into the structure. The building currently on the site was under construction at the time of the investigation. The exterior building shell was completed with interior finish work underway and was not formally occupied. The investigation included the collection of sub-slab, interior ambient, exterior ambient, and exterior sub-grade air samples at the site, in accordance with the RIWP. The air samples collected were analyzed by EPA Method TO-15 for Volatile Organic Compounds in air. Samples were extracted from two locations within the bank building (ambient and sub-slab), three locations at the perimeter of the exterior of the building (sub-grade), and one location upwind (ambient) from the subject site.

In order to evaluate the potential presence of vapor intrusion into the structure, the New York State Department of Health (Center for Environmental Health, Bureau of Environmental Exposure Investigation) document "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" was referenced for applicable guidelines. At the time of this report, New York State does not have any formalized standards, criteria or guidance values for concentrations of compounds in soil or sub-slab vapor aside from the levels established in the aforementioned document Table 3.3. Therefore, the results of each sampling location were evaluated with the consideration of several additional factors which include: nature and extent of contamination in all environmental media, factors that affect vapor migration and intrusion, completed or proposed remedial actions, source of volatile chemicals, and background of volatile chemicals in air.

The results of the sampling indicated concentrations of Isopropanol, Propene, Pentane, Acetone, and 2-Butenone at both interior ambient locations. The sub-slab samples indicated the same constituents found at the interior, but at one to four orders of magnitude lower than the interior concentrations.

Isopropanol was used as the tracer gas to determine the presence of a breach in the concrete slab seal during sampling. The sub-slab concentration is negligible in comparison to the indoor concentration. The sub-slab Isopropanol concentration was equal to the levels found at each of the exterior sub-grade points and ambient exterior upwind sample. Chloroethane was present at very low concentrations (7.1 & 1.4 ug/m3) within the sub-slab sample but not detected within the interior ambient sample. Based upon the results of the sampling, the reported air concentrations at the time, were not indicative of a soil vapor intrusion concern. Additional mitigating factors supporting this conclusion include:

- 6 mil polyethylene vapor barrier is present beneath the 6" continuous poured reinforced concrete slab from the interior space.

2.2 Groundwater Quality Investigation Results

The groundwater laboratory analysis, for the May 2008 sampling event, did identify varying concentrations of gasoline range petroleum hydrocarbons within monitoring wells MW-3, MW-4 and MW-6.

No contaminants of concern were identified within samples extracted from monitoring wells MW-1, MW-2 and MW-5. Concentrations of isopropylbenzene (9.0µg/l), n-propylbenzene (9.0µg/l) and sec-butylbenzene (7.0µg/l) were identified in groundwater analyzed from MW-3. The concentrations observed were above Class GA fresh groundwater concentrations, for Isopropylbenzene, and sec-butylbenzene. The NYSDOH principal organic contaminant (POC) drinking water concentrations are exceeded for all contaminants observed.

Monitoring well MW-4 contained concentrations of benzene (8.0µg/l), toluene (13.0µg/l), ethylbenzene (190.0µg/l), total xylenes (120.0µg/l), isopropylbenzene (44.0µg/l), n-Propylbenzene (110.0µg/l), 1,3,5 trimethylbenzene (46.0µg/l), 1,2,4 trimethylbenzene (31.0µg/l), sec-butylbenzene (18.0µg/l), p-isopropyltoluene (5.0µg/l), n-butylbenzene (16.0µg/l), and naphthalene (31.0µg/l). The concentrations observed were above Class GA fresh groundwater concentrations for benzene, toluene, ethylbenzene, total xylenes, Isopropylbenzene, 1,3,5 trimethylbenzene, 1,2,4 trimethylbenzene, sec-butylbenzene, n-

butylbenzene and naphthalene. Additionally, all observed levels exceeded the NYSDOH POC drinking water concentrations.

Monitoring well MW-6, located along the property boundary of the right of way with South Liberty Drive, contained the highest petroleum compound concentrations. The ground water sample collected at MW-6 had to be diluted in the laboratory prior to being analyzed. Groundwater was found to contain: benzene (290.0µg/l), toluene (170.0µg/l), ethylebenzene (610.0µg/l), total xylenes (638.0µg/l), isopropylbenzene (110.0µg/l), n-Propylbenzene (200.0µg/l), 1,3,5 trimethylbenzene (290.0µg/l), 1,2,4 trimethylbenzene (320.0µg/l), sec-butylbenzene (16.0µg/l), p-isopropyltoluene (9.0µg/l), n-butylbenzene (30.0µg/l), and naphthalene (170.0µg/l). The concentrations observed were above Class GA fresh groundwater concentrations for benzene, toluene, ethylbenzene, total xylenes, Isopropylbenzene, 1,3,5 trimethylbenzene, 1,2,4 trimethylbenzene, sec-butylbenzene, n-butylbenzene and naphthalene. Additionally, all observed levels exceeded the NYSDOH POC drinking water concentrations.

The October 2009 ground water sampling event revealed that the volatiles concentrations had been reduced significantly. MW-4 revealed concentrations of benzene at 2.6 µg/L, ethylbenzene at 2.1 µg/L, and isopropylbenzene at 29 µg/L. MW-6 revealed concentrations of benzene at 8.5 µg/L, toluene at 17 µg/L, ethylbenzene at 270 µg/L, total xylenes of 77 µg/L, cyclohexane of 170 µg/L, methylcyclohexane of 97 µg/L, and 2-methylnaphthalene of 19 µg/L. These concentrations are significantly lower than those during the May 2008 sampling event, in some cases an order of magnitude less. Further, these results significantly reduce the contaminant plume under the subject site. The October 2009 sampling also revealed concentrations of magnesium at MW-1, MW-2, MW-3, MW-4, MW-5 and MW-6 of 24700 µg/L, 59500 µg/L, 21400 µg/L, 39300 µg/L, 36300 µg/L, and 8650 µg/L, respectively. The concentrations at MW-2, MW-4, and MW-5 exceeded the Class GA fresh groundwater concentrations. Further, the October 2009 sampling revealed concentrations of manganese at MW-1, MW-2, MW-3, MW-4, MW-5 and MW-6 of 5.7 µg/L, 10.2 µg/L, 3100 µg/L, 3660 µg/L, 1720 µg/L, and 2030 µg/L, respectively. The concentrations at MW-3, MW-4, MW-5 and MW-6 exceeded the Class GA fresh groundwater concentrations.

It is evident that groundwater below the site has been impacted by concentrations of petroleum products. The depth to groundwater as monitored within the existing sub-artesian permanent wells was from eight feet to approximately eighteen feet bls across the

site. Groundwater flow direction, as anticipated, is to the east-southeast with the mass of the groundwater concentrations extending below South Liberty Drive. As the mass of contamination degrades and moves eastward, the onsite impacts will diminish. The phenomena of advective transport, dissolution and diffusion will be occurring at the site and downgradient and will thus cause a natural degradation of the contaminant plume.

3.0 REMEDIATION ALTERNATIVES

Options for soil remediation are controlled by several factors, including facility use, geology, contaminant species, etc. Therefore, these parameters and others were reviewed as follows:

3.1 Site Specific Remediation Criteria and Limitations

PARAMETER	SITE SPECIFIC INFORMATION
Lithology	Clayey silts
Contaminant Species	BTEX/MTBE; PAH
Depth to Groundwater	8' - 18'
Soil Contamination	Yes - deep
Free Product	No
Latest Sampling Event	10/2009
Hydraulic Conductivity	10^{-5} cm/s (estimated) - Freeze & Cherry
Property use	Commercial - paved parking and roadway in area of residual contamination

This RAWP has been developed to address the site specific findings so as to reach the Remedial Action Objectives (RAOs) of the remedial program, as defined by NYCRR Part 375. The site specific ROAs are as follows:

The RAOs for the protection of public health are as follows:

Groundwater:

- Prevent people from drinking groundwater with contaminant levels exceeding drinking water standards.

- Prevent contact with contaminated groundwater.

Soil:

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of contaminants volatilizing from the soil.

Soil Vapor:

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into the indoor air of buildings at the site.

The RAOs for the protection of the environment are as follows:

Groundwater:

- Restore the on-site groundwater aquifer to meet ambient groundwater quality criteria, to the extent feasible.

Soil:

- Limit migration of contaminants that would result in groundwater or surface water contamination at the downgradient property boundary.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

3.2 Remediation Alternatives Analysis

Based on the site criteria and limitations, and the Remedial Action Objectives, an analysis of potential remediation technologies has been performed. These technologies have been reviewed for inclusion in the Remedial Alternatives discussed in Section 3.2.3.

3.2.1 Soil Remediation Technologies

METHOD	DESCRIPTION	ADVANTAGES	DISADVANTAGES
Excavation/Disposal	Excavation of soils, disposal or thermal destruction	1. Fastest way to remove greatest amount of mass. 2. Source is removed from site	1. Somewhat costly method 2. Considerable site and operations disruption
Soil Vapor Extraction	Vacuum extraction of hydrocarbon vapors from vadose zone using vapor extraction well points.	1. In-situ method. No soil removal is necessary, and thus no shut down of area operations	1. High up front costs 2. Long term operation
Bioventing	Introduction of oxygen into vadose zone by forcing air into soil matrix. Natural biodegradation is enhanced with this method.	1. Very little site disturbance 2. Fairly inexpensive	1. Slow remediation time 2. Less volatile compounds hard to biovent
Engineering & Institutional Controls	Utilize site specific and deed controls to eliminate health and environmental risk	1. Low cost 2. Ease of implementation 3. No site disturbance 4. Manages risk to environment and health	1. Contamination remains

3.2.2 Ground Water Remediation Technologies

METHOD	DESCRIPTION	ADVANTAGES	DISADVANTAGES
Pump & Treat	Exaction of ground water and treatment above the surface.	1. Simple and proven technology 2. Works well for initial mass removal for high concentrations of dissolved-phase	1. Somewhat costly method 2. Considerable site and operations disruption 3. Low efficiency when concentrations become low and asymptotic
Vacuum Extraction	Vacuum-enhance extraction of hydrocarbon-contaminated water	1. Vacuum can overcome limitations of diffusion-driven hydrocarbon removal	1. High up front costs 2. Considerable site disruption 3. Can "overpump" when concentrations are low
Air Sparging	Introduction of oxygen into saturated zone by forcing air into subsurface. Natural biodegradation is enhanced with this method.	1. Less site disturbance 2. Fairly inexpensive 3. Proven technology	1. Slow remediation time 2. Less volatile compounds hard to remediate

METHOD	DESCRIPTION	ADVANTAGES	DISADVANTAGES
Engineering & Institutional Controls	Utilize site specific and deed controls to eliminate health and environmental risk	1. Low cost 2. Ease of implementation 3. No site disturbance 4. Manages risk to environment and health	1. Contamination remains

3.2.3 Remedial Alternatives Discussion

Two comprehensive remedial alternatives have been selected for further analysis for the subject site. The first alternative will be one that could be used to achieve a Track 1 remedy as described in 6 NYCRR Part 375.3.8(e)(1), and the second alternative selected could be used to achieve a Track 4 remedy at the subject site.

Track 1 Remedial Alternative:

A Track 1 Remedy would include the remediation of soils and groundwater to a level of Unrestricted Use SCOs, in order to create a remedy that is protective of human health and the environment without restrictions. In order to meet these criteria, active remediation would be required for both soils and groundwater. The first alternative consideration is as follows:

Soil Remediation Alternative: Excavation and Off Site Disposal (described above):

- Excavation of all soils that exhibit concentrations of contaminants of concern in excess of Unrestricted Use SCOs, down to bedrock if necessary.
- Off-site disposal of the excavated soils.
- Backfilling of excavated areas with clean fill.

Groundwater Remediation Alternative: Pump & Treat (described above):

- Installation of recovery wells in area of ground water contamination.
- Installation of submersible pumps to extract ground water from recovery wells.
- Installation of ground water remediation system including extraction pump controllers, recovered water piping system, air stripper for treatment of recovered water, and post-treatment carbon polishing vessels.

- Installation of infiltration gallery to discharge treated ground water back into the subsurface.

This alternative includes extensive site disruption. The existing building would have to be demolished in order to fully excavate the site, the surface finishes (landscaping, paving, etc.) would be destroyed and would require replacement. Further, a location of a recharge gallery would be necessary, as well as a long-term location for the treatment system components (a fenced area for a treatment system trailer, or individual components on a concrete slab). The pump and treat system would require monthly operations and maintenance visits to collect measurement data to determine flow rates, total flow, effluent flow, as well as effluent sampling to confirm that the discharged water was receiving adequate treatment. Based on previous experiences, it is anticipated that the pump and treat system would operate continuously for 2 - 3 years. Site disruption due to the presence of the system, monthly O&M visits, and periodic groundwater monitoring sample events would continue for at least one year. This alternative would address all environmental media (soil {excavation and disposal}, groundwater {extraction and treatment}, and vapor {removal of vapor source by excavation}).

Track 4 Remedial Alternative:

A Track 4 remedy would combine removal of contaminated soils with engineering and institutional controls to prevent remaining contamination from affecting human health and the environment. A Track 4 remedy would include restricting the site to commercial use only and placement of other restrictions on the property. Restricted Use SCOs are the goal when working towards a Track 4 cleanup. The Track 4 Alternative considered is as follows:

- Implementation of Interim Remedial Measures (IRMs) including the excavation of heavily contaminated soils during tank removal, hydraulic lift removal, and stormwater system installation. Soils disposed of off-site at a proper facility.
- Implement an Engineering Control in the form of construction of a site-wide cover system consisting of impervious surfaces such as concrete and asphalt pavement, or at least one foot of clean soil cover.

- Implementation of an institutional control in the form of an environmental easement, which would:
    a. require the remedial party, or site owner, to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);
    b. restrict future use to commercial usage;
    c. restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;
    d. prohibit agricultural or vegetable gardens on the controlled property; and
    e. require compliance with the Department-approved Site Management Plan.
- Prevention of further migration of an on-site plume at the site boundary through source removal performed in the IRM stage, and placement of engineering controls and maintenance of institutional controls.
- Development of a Site Management Plan, which would include, amongst other items, a requirement that any future buildings constructed on the site be evaluated for soil vapor intrusion, or be constructed with a system designed to mitigate the potential for soil vapor mitigation. These restrictions form an effective set of engineering and institutional controls that will have removed contaminated source material, reduced or eliminated movement of remaining contaminants, eliminated exposure pathways, and provided for long-term maintenance of the remedy.

The comparison of these two alternatives follows:

Track 1 Remedy	Track 4 Remedy
Much higher expense up front for site remediation	Lower short term costs
Considerable short-term and long term site disruption	Remedial component requires less disruption prior to development, and controls component provides minimal site disruption after site development
Monthly O&M visits	Annual sampling & inspections
Eventual unrestricted use	Permanent restricted use limitations
Short-term impact to community includes traffic disruption during excavation and system installation, extended remedial activities and an open construction site	IRMs already completed. Minimal disruption to local community
Remediation methods are proven effective with years of data	Methods have been proven effective with years of data
	Volunteer-preferred alternative

3.3 Remediation Alternative Selection

Based on the usage of the subject site, the low concentrations, and the ability to isolate and eliminate the environmental and health risk, the use of engineering and institutional controls will be used as the long term remediation method, with the already completed Interim Remedial Measures (IRM). As discussed above, the remedial selection will include:

- Implementation of Interim Remedial Measures (IRMs) including the excavation of heavily contaminated soils during tank removal, hydraulic lift removal, and stormwater system installation. Soils disposed of off-site at a proper facility.
- Implement an Engineering Control in the form of construction of a site-wide cover system consisting of impervious surfaces such as concrete and asphalt pavement, or at least one foot of clean soil cover.
- Implementation of an institution control in the form of an environmental easement, which would:
    a. require the remedial party, or site owner, to complete and

submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);

b. restrict future use to commercial usage;

c. restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Department, NYSDOH or County DOH;

d. prohibit agricultural or vegetable gardens on the controlled property; and

e. require compliance with the Department-approved Site Management Plan.

- Development of a Site Management Plan, which would include, amongst other items, a requirement that any future buildings constructed on the site be evaluated for soil vapor intrusion, or be constructed with a system designed to mitigate the potential for soil vapor mitigation.

The long term implementation of this alternative will consist of annual monitoring of the existing monitoring wells, annual inspections to confirm that the site-wide cover is being properly maintained and that the ground water is not being utilized. These requirements are defined in the Site Management Plan which will be the document used to manage this site into the future. The use of this document and the reference to the document in the environmental easement make the implementation of the alternative both viable and reliable, as the requirements in the easement pass to any future owners. Further, the monitoring requirements will also pass to any further owner. All of these requirements are enforceable by the NYSDEC and the NYSDOH. Annual inspections will be used to provide a certification to the NYSDEC and NYSDOH that the engineering and institutional controls are being appropriately applied pursuant to the Site Management Plan.

The Track 4 Remedy prescribed herein is the desired remedy by the volunteer as it is the least disruptive in both the short term and long term for this subject site. The site is very small and the residual amounts of contamination remaining can be easily managed to protect the on site and off site human population and environment. Further, the implementation of this alternative will have virtually no impact on the local community.

The remedy selected has already included the removal of the bulk of the contaminant mass, as the majority of the mass resided in the soils that have been removed

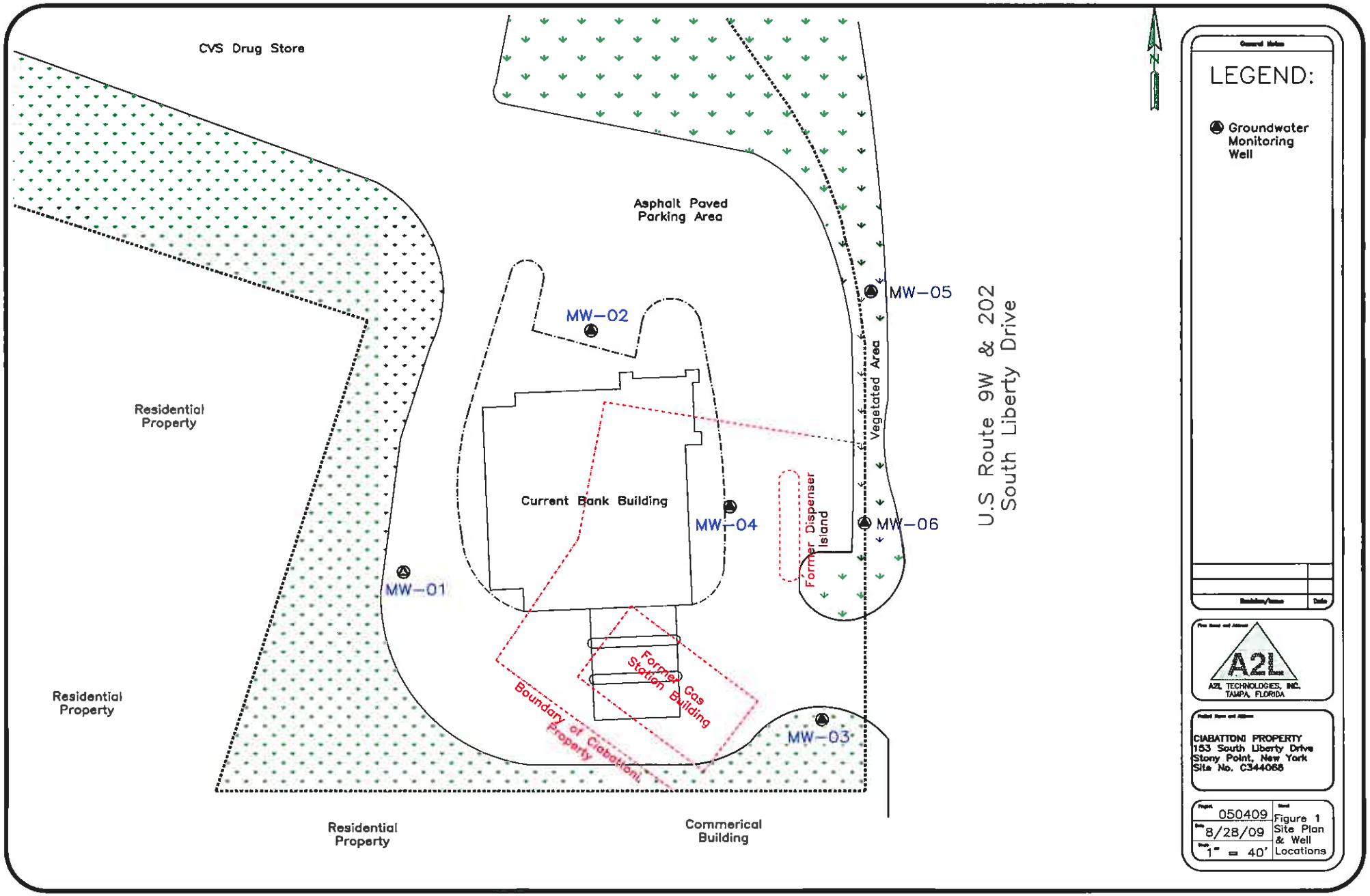
and disposed of off site. Human exposure elimination and environmental protection are provided by the site-wide cover that forms a barrier from the residual contamination below. With the source area of contamination removed, the ground water will be subject to natural breakdown though the phenomena of dissolution and dispersion. Through this phenomena, further migration beyond the site boundary will be mitigated. Annual sampling of boundary wells will be used to verify this mitigation.

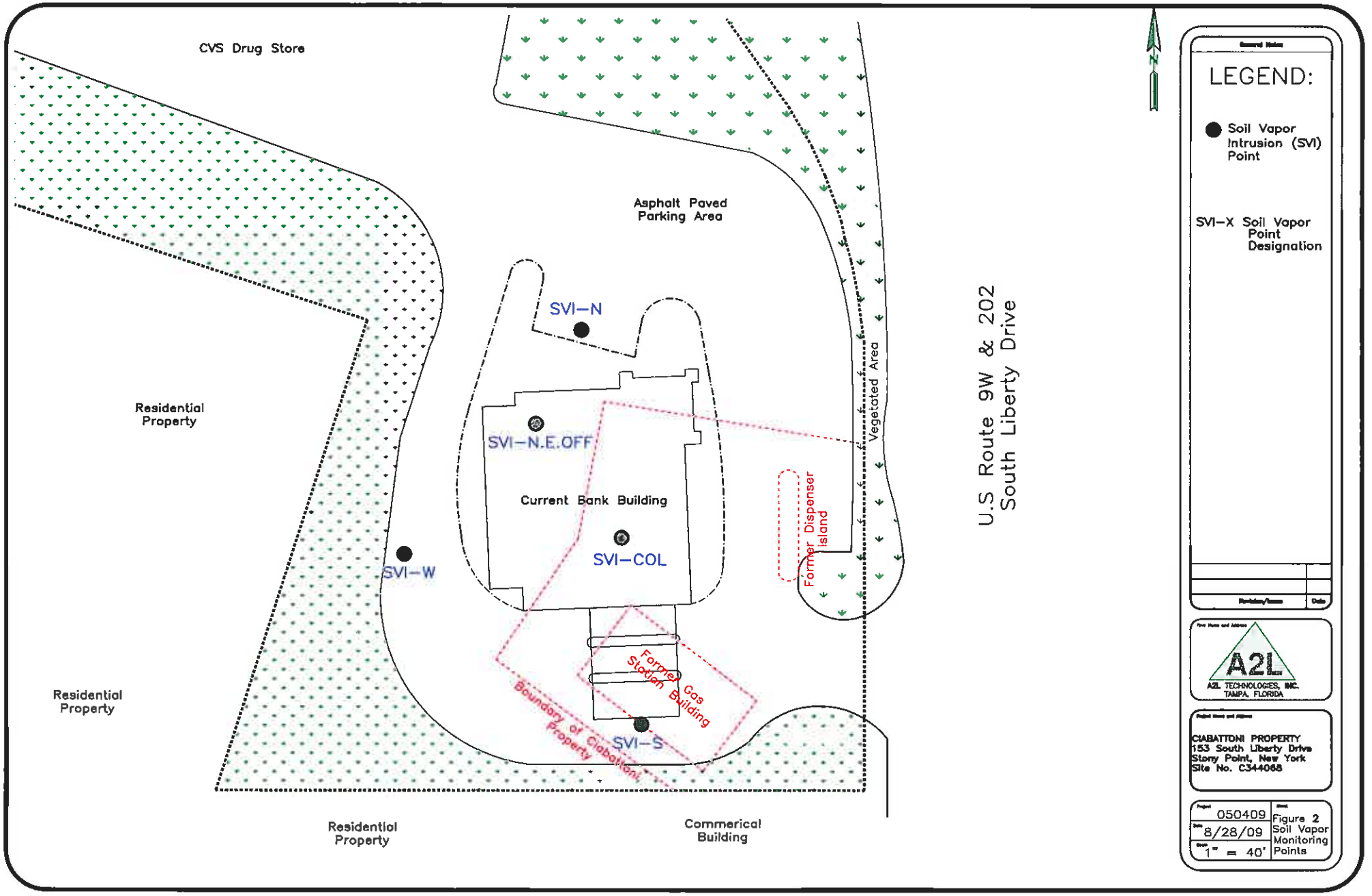
4.0 SUMMARY AND CONCLUSIONS

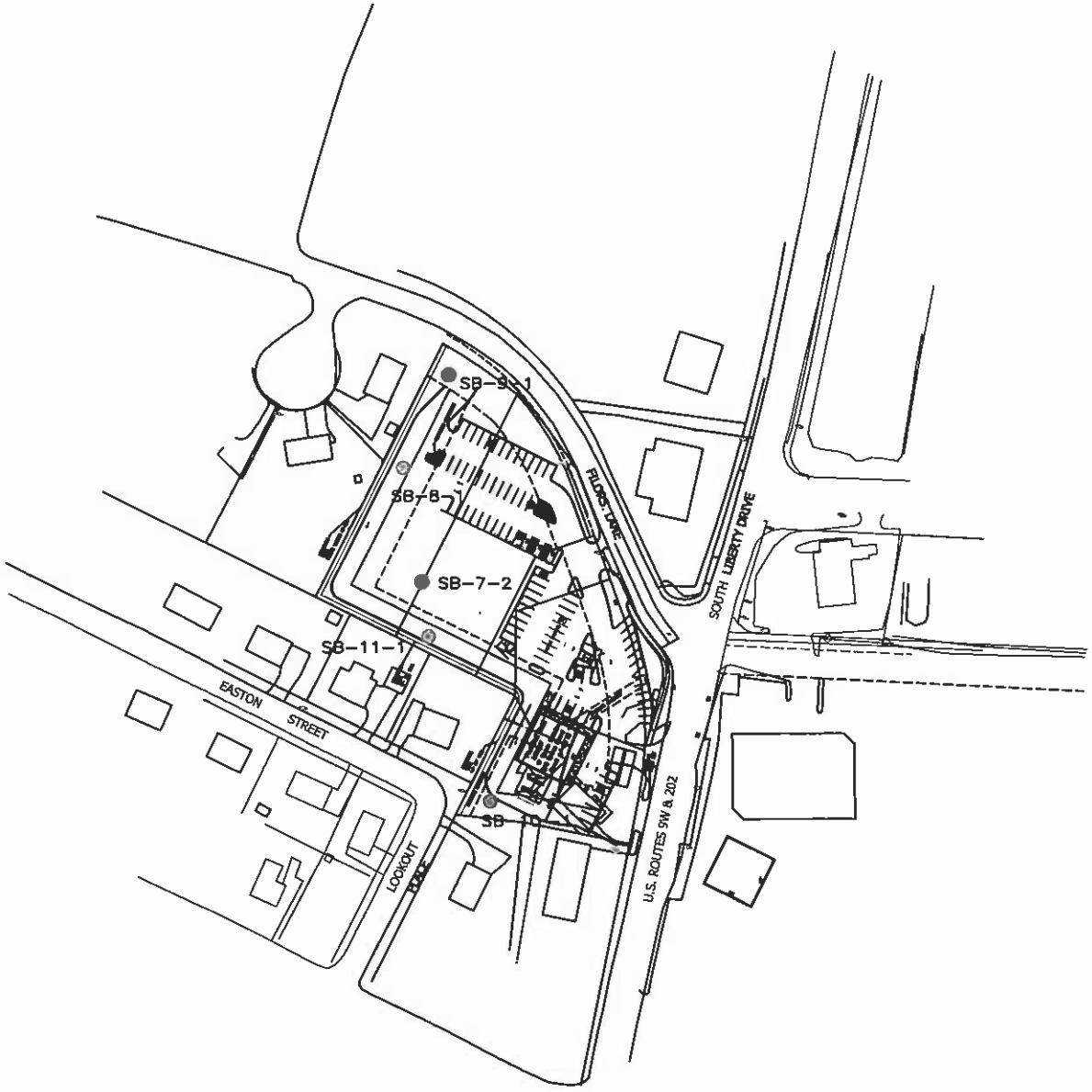
Sembler/Treasure NY has elected to pursue Track 4 as defined in 6 NYCRR Part 375-3.8(e)(4)(b) for commercial use.

Sembler/Treasure NY will record an environmental easement on the Ciabattoni Property limiting all future site use to commercial usage and requiring compliance with the Department-approved Site Management Plan.

FIGURES


CVS Drug Store
Asphalt Paved Parking Area
MW-02
MW-05
Vegetated Area
Residential Property
Current Bank Building
MW-04
Former Dispenser Island
MW-06
U.S Route 9W & 202
South Liberty Drive
MW-01
Former Gas Station Building
Boundary of Ciabattoni Property
MW-03
Residential Property
Residential Property
Commerical Building
N
LEGEND:
Groundwater Monitoring Well
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
8/28/09
1" = 40'
Figure 1
Site Plan
& Well
Locations
FNAME
REVDATE
USER


CVS Drug Store
Asphalt Paved Parking Area
SVI–N
Residential Property
SVI–N.E.OFF
Current Bank Building
Vegetated Area
Former Dispenser Island
SVI–W
SVI–COL
Former Gas Station Building
Boundary of Ciabattoni Property
SVI–S
Residential Property
Residential Property
Commerical Building
U.S Route 9W & 202
South Liberty Drive
N
LEGEND:
Soil Vapor Intrusion (SVI) Point
SVI–X Soil Vapor Point Designation
A2L
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
8/28/09
1" = 40'
Figure 2
Soil Vapor Monitoring Points



NOTE: BASE DRAWING IS SITE SURVEY BY ATZL, SCATASSA & ZIGLER, P.C.

LEGEND:

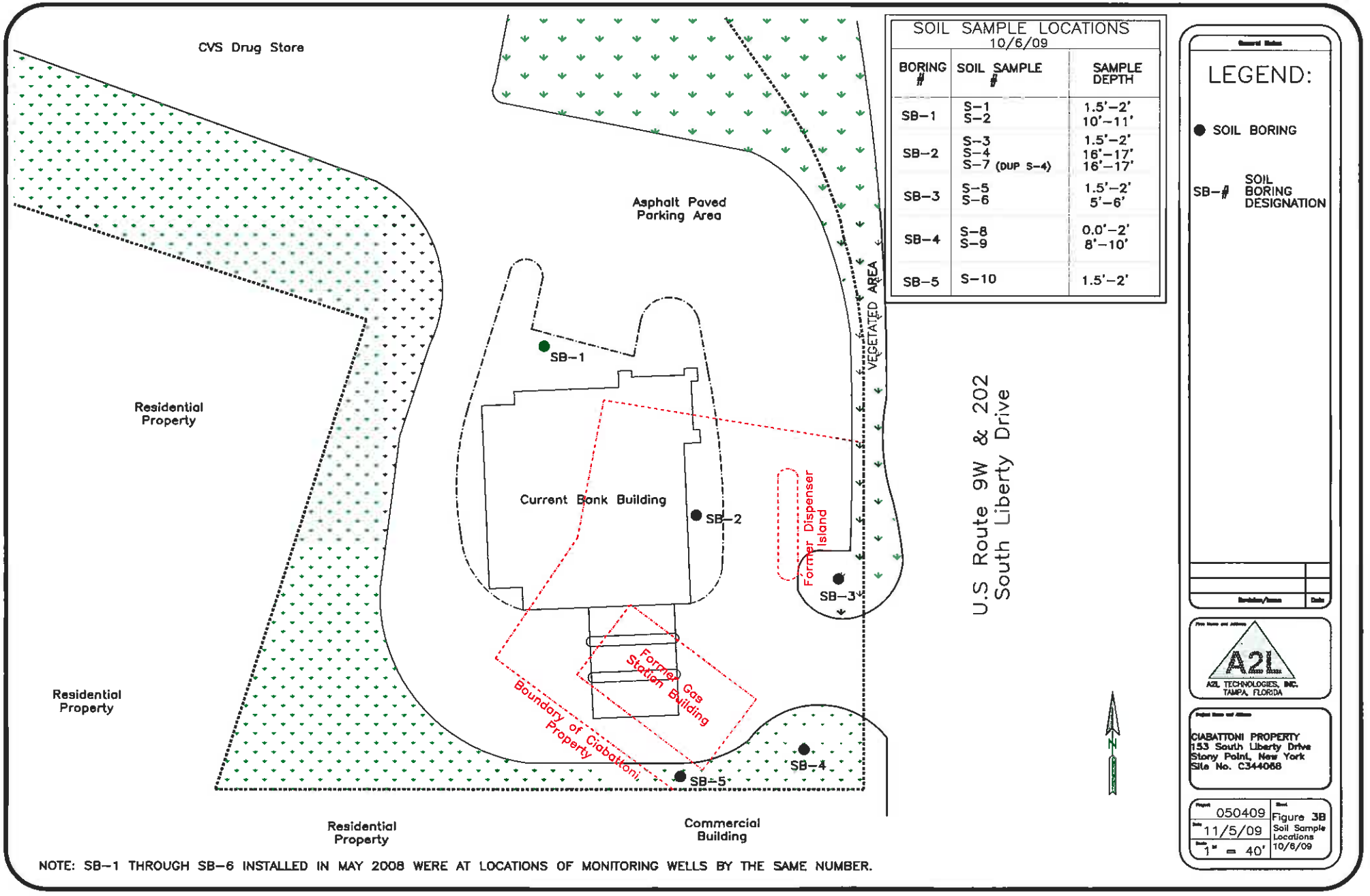
- SOIL BORING
- SB-# SOIL BORING DESIGNATION

A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA

CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068

Project: 050409	Figure 3A Off-Site Soil Sample Locations
Date: 2/26/10	
Scale: NTS	

FNAME
REVDATE
USER



SOIL SAMPLE LOCATIONS
10/6/09

BORING #	SOIL SAMPLE #	SAMPLE DEPTH
SB-1	S-1 S-2	1.5'-2' 10'-11'
SB-2	S-3 S-4 S-7 (DUP S-4)	1.5'-2' 16'-17' 16'-17'
SB-3	S-5 S-6	1.5'-2' 5'-6'
SB-4	S-8 S-9	0.0'-2' 8'-10'
SB-5	S-10	1.5'-2'

NOTE: SB-1 THROUGH SB-6 INSTALLED IN MAY 2008 WERE AT LOCATIONS OF MONITORING WELLS BY THE SAME NUMBER.

LEGEND:

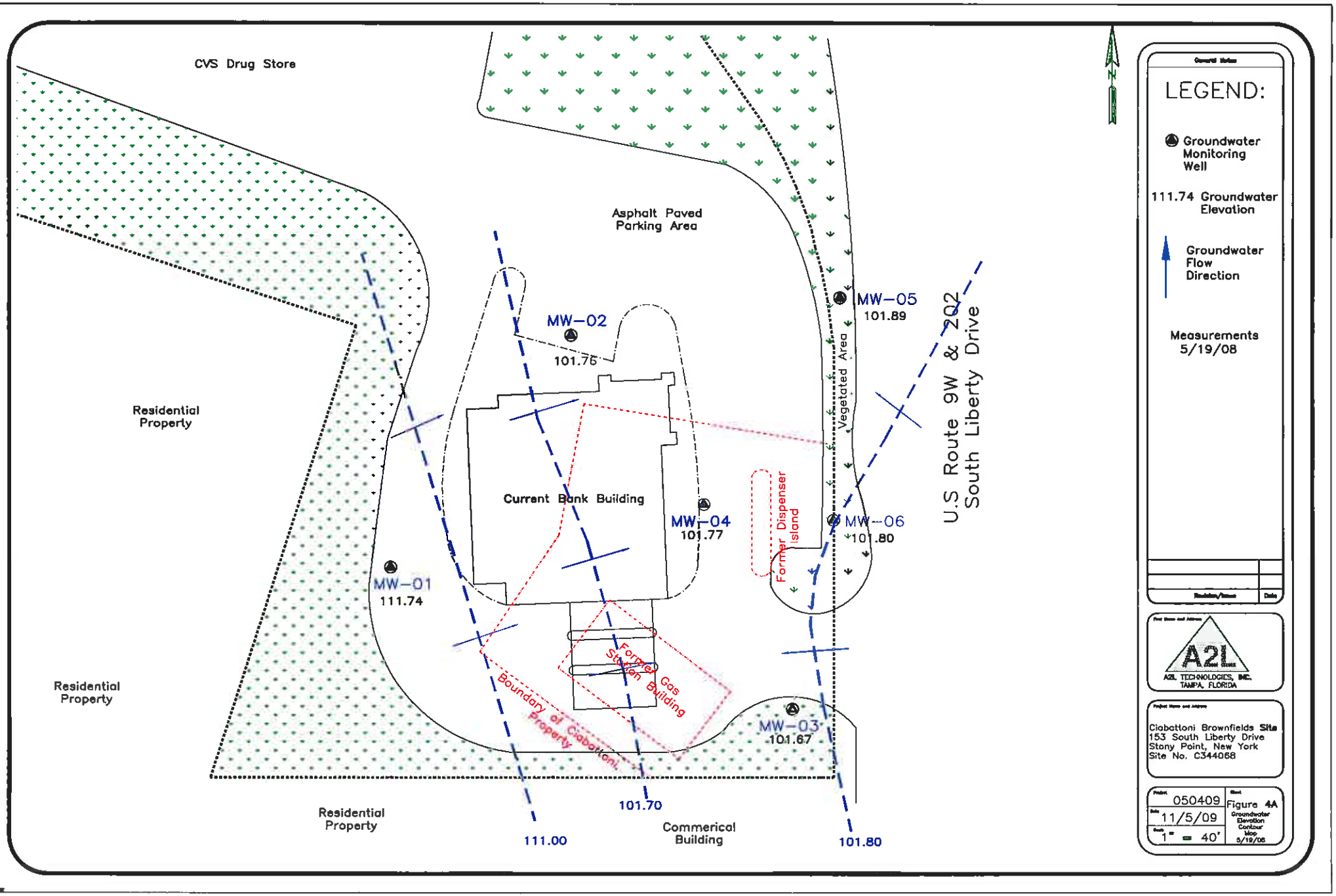
- SOIL BORING
- SB-# SOIL BORING DESIGNATION

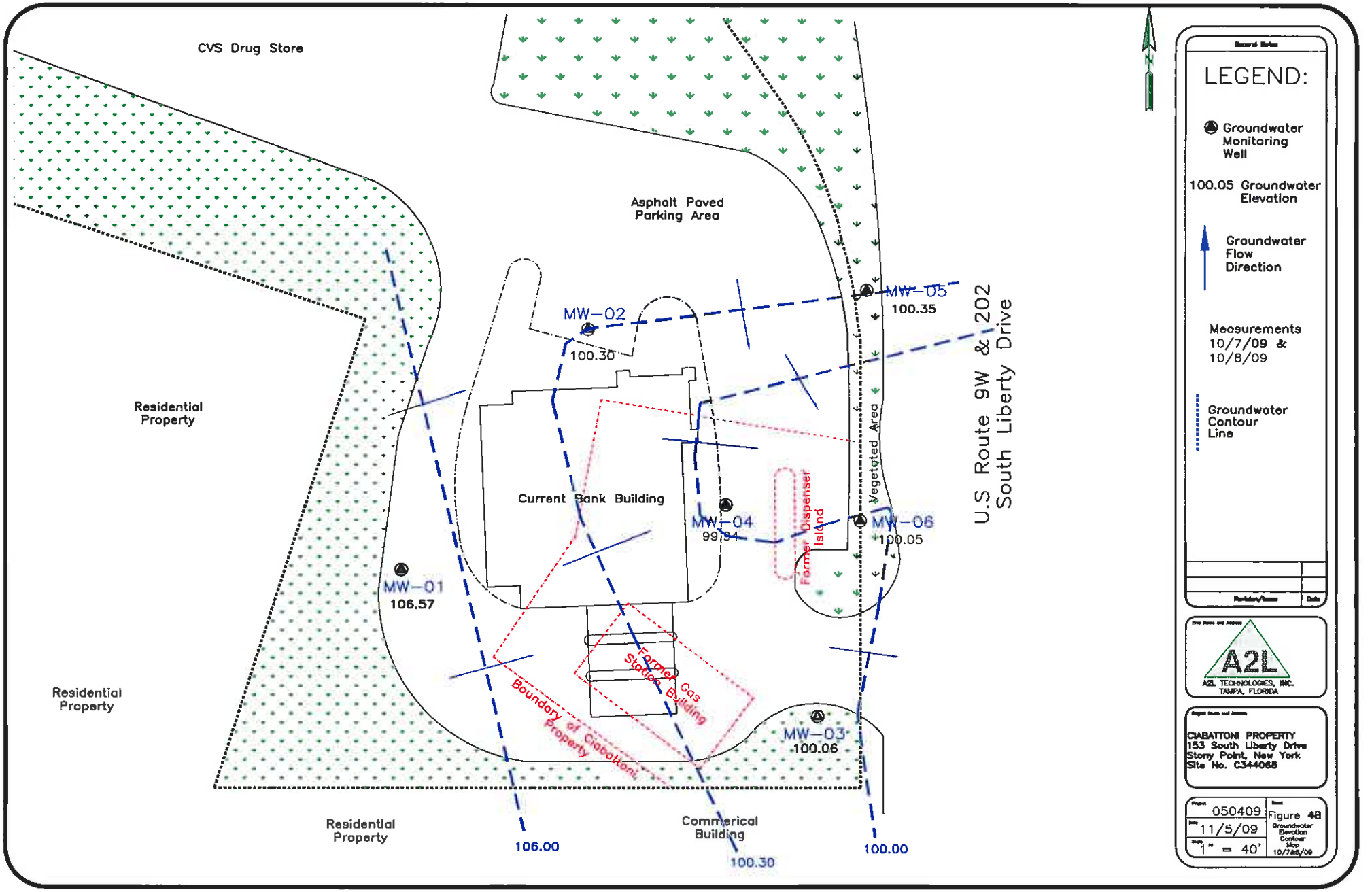
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA

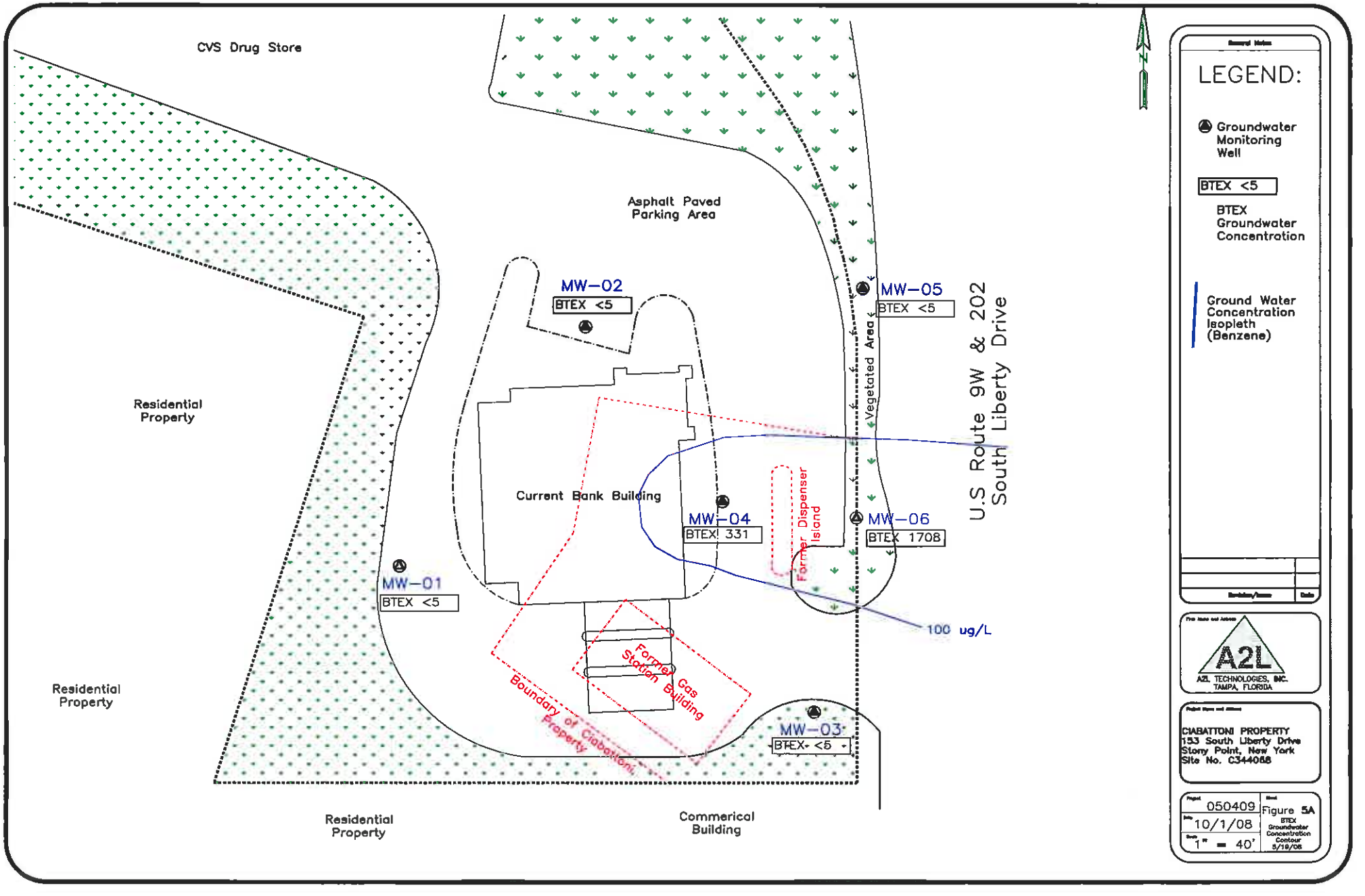
CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344088

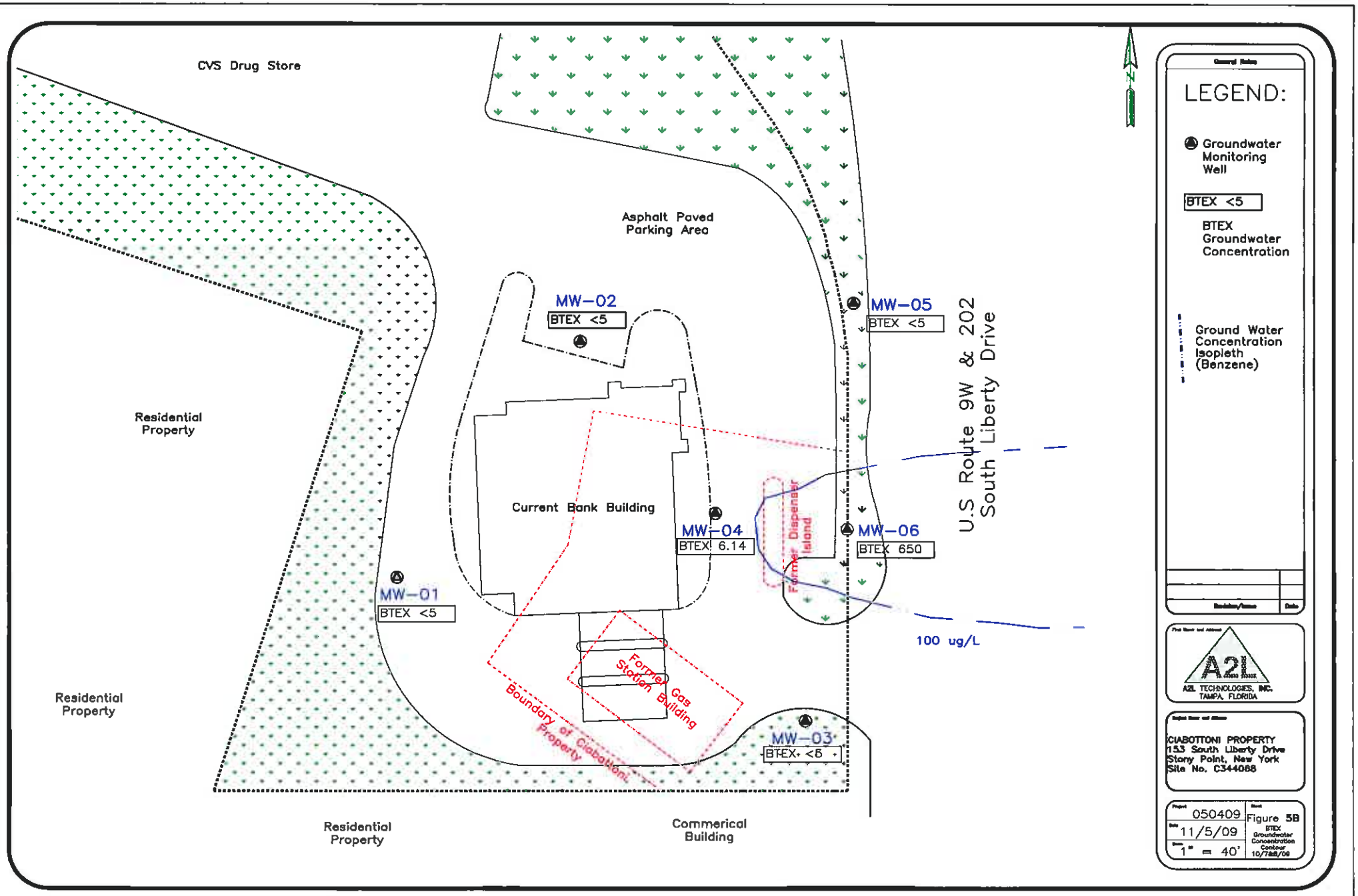
Project 050409	Sheet Figure 3B Soil Sample Locations 10/6/09
Date 11/5/09	
Scale 1" = 40'	

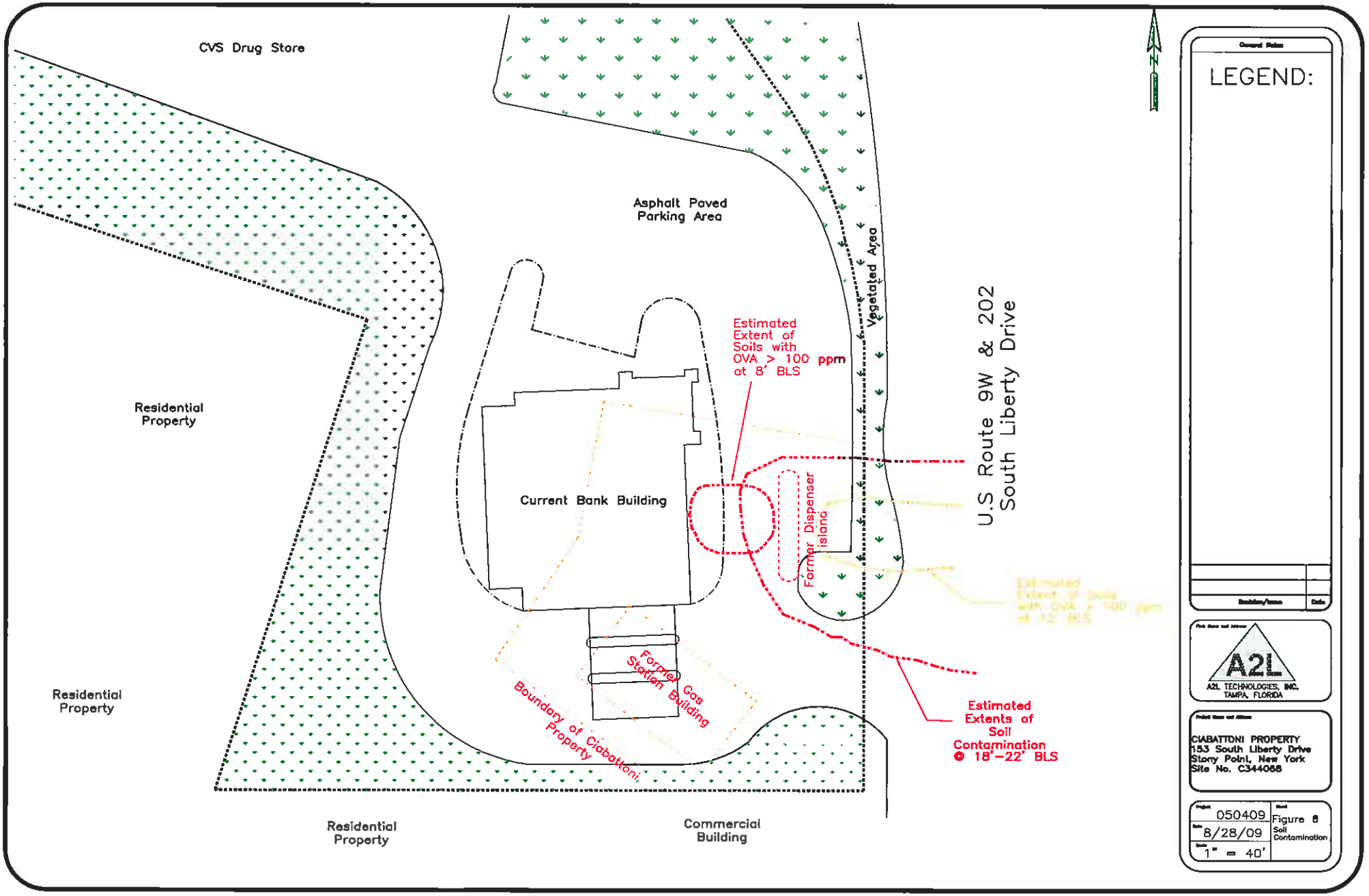
FNAME
REVDATE
USER

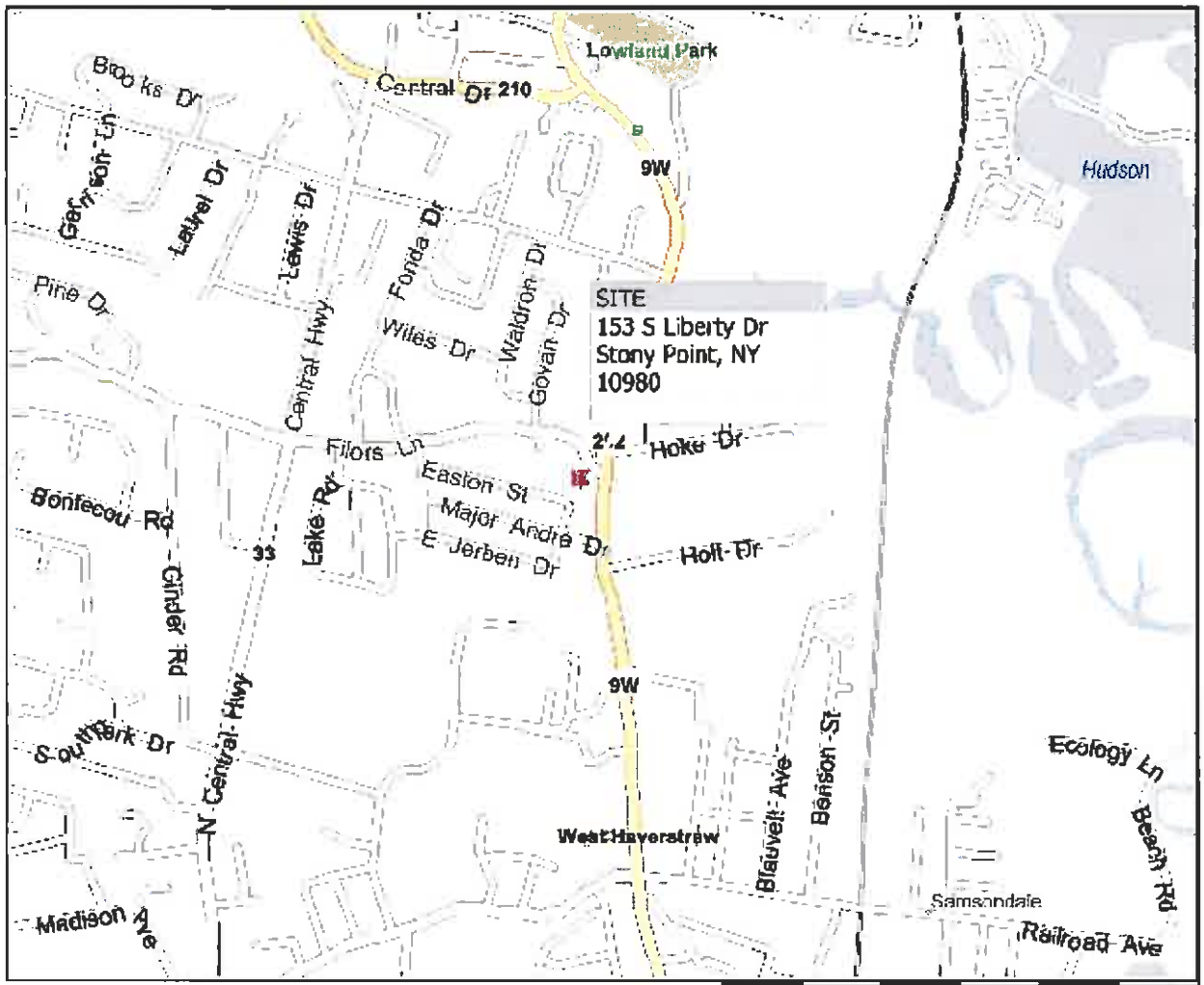

CVS Drug Store
Asphalt Paved Parking Area
Residential Property
Residential Property
Residential Property
Commerical Building
Current Bank Building
Vegetated Area
Former Dispenser Island
Former Gas Station Building
Boundary of Ciabattoni Property
U.S Route 9W & 202
South Liberty Drive
MW-01
111.74
MW-02
101.76
MW-03
101.67
MW-04
101.77
MW-05
101.89
MW-06
101.80
111.00
101.70
101.80
N
LEGEND:
Groundwater Monitoring Well
111.74 Groundwater Elevation
Groundwater Flow Direction
Measurements 5/19/08
A2L
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
Ciabattoni Brownfields Site
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
Figure 4A
11/5/09
1" = 40'
Groundwater Elevation Contour Map 5/19/09


CVS Drug Store
Asphalt Paved Parking Area
Residential Property
Residential Property
Residential Property
Commerical Building
Current Bank Building
Former Dispenser Island
Former Gas Station Building
Vegetated Area
Boundary of Ciabattoni Property
U.S Route 9W & 202
South Liberty Drive
MW-01
106.57
MW-02
100.30
MW-03
100.06
MW-04
99.94
MW-05
100.35
MW-06
100.05
106.00
100.30
100.00
LEGEND:
Groundwater Monitoring Well
100.05 Groundwater Elevation
Groundwater Flow Direction
Measurements 10/7/09 & 10/8/09
Groundwater Contour Line
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
Figure 4B
11/5/09
1" = 40'
Groundwater Elevation Contour Map 10/7&8/09


CVS Drug Store
Asphalt Paved Parking Area
MW-02
BTEX <5
MW-05
BTEX <5
Vegetated Area
U.S Route 9W & 202
South Liberty Drive
Residential Property
Current Bank Building
MW-04
BTEX 331
Former Dispenser Island
MW-06
BTEX 1708
MW-01
BTEX <5
100 ug/L
Former Gas Station Building
Boundary of Ciabattoni Property
MW-03
BTEX <5
Residential Property
Residential Property
Commerical Building
N
LEGEND:
Groundwater Monitoring Well
BTEX <5
BTEX Groundwater Concentration
Ground Water Concentration Isopleth (Benzene)
A2L
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
Figure 5A
BTEX Groundwater Concentration Contour 5/19/08
10/1/08
1" = 40'
FNAME
REVDATE
USER


CVS Drug Store
Asphalt Paved Parking Area
Residential Property
Residential Property
Residential Property
Commerical Building
Current Bank Building
MW-01
BTEX <5
MW-02
BTEX <5
MW-03
BTEX <5
MW-04
BTEX 6.14
MW-05
BTEX <5
MW-06
BTEX 650
Former Dispenser Island
Former Gas Station Building
Boundary of Ciabottoni Property
U.S Route 9W & 202
South Liberty Drive
100 ug/L
N
LEGEND:
Groundwater Monitoring Well
BTEX <5
BTEX Groundwater Concentration
Ground Water Concentration Isopleth (Benzene)
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
CIABOTTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
Figure 5B
11/5/09
BTEX Groundwater Concentration Contour 10/7&8/09
1" = 40'


CVS Drug Store
Asphalt Paved Parking Area
Vegetated Area
Residential Property
Residential Property
Residential Property
Commercial Building
Current Bank Building
Former Dispenser Island
Former Gas Station Building
Boundary of Ciabattoni Property
Estimated Extent of Soils with OVA > 100 ppm at 8' BLS
Estimated Extents of Soil Contamination @ 18'-22' BLS
U.S Route 9W & 202
South Liberty Drive
N
LEGEND:
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
Figure 6
8/28/09
Soil Contamination
1" = 40'
FNAME
REVDATE
USER



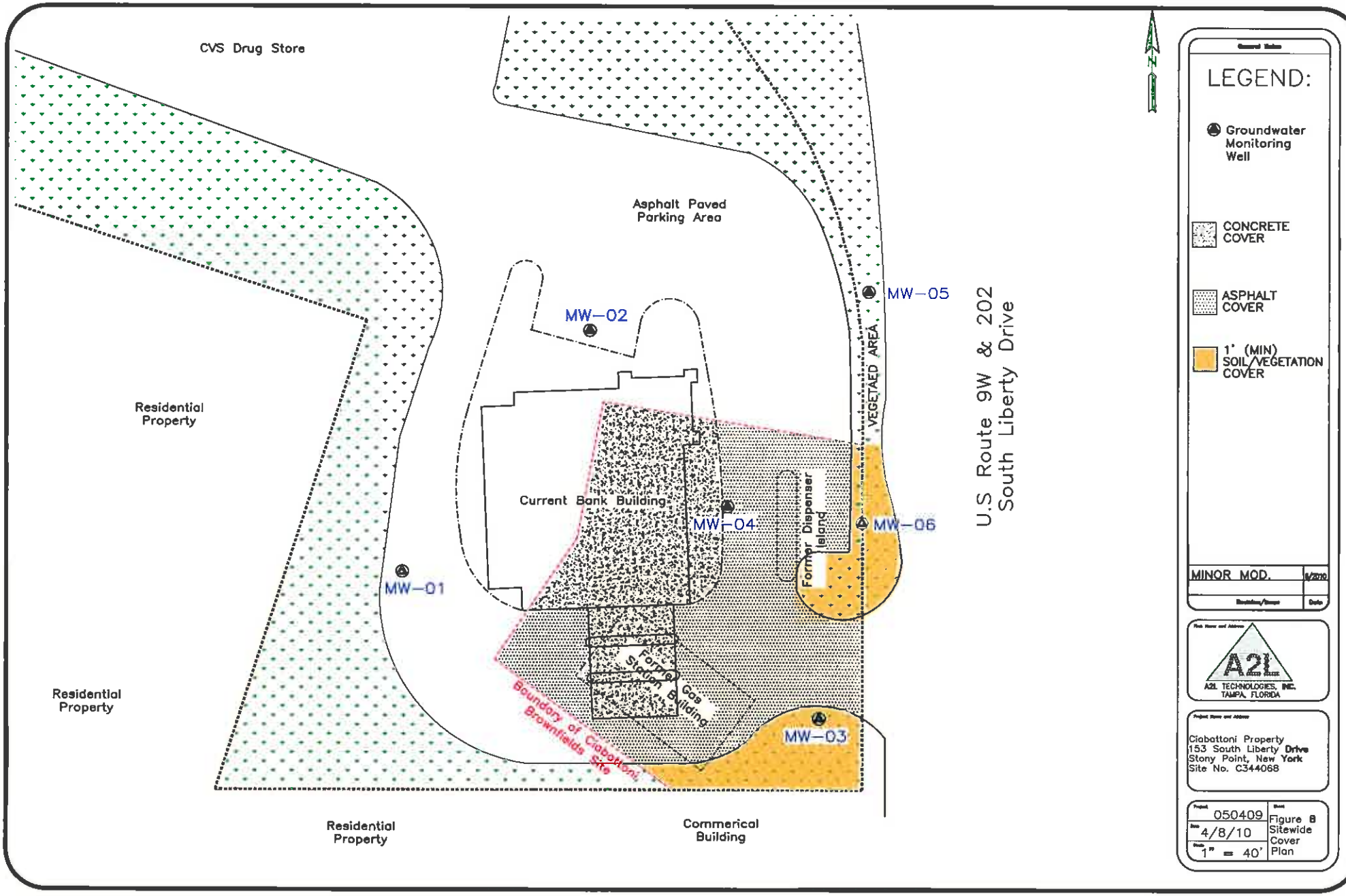
LEGEND:

A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA

CIABATTONI PROPERTY
153 South Liberty Drive
Stony Point, New York
Site No. C344068

Project: 050409	Sheet: Figure 7
Date: 8/28/09	Vicinity Map
Scale: 1" = 40'	

FNAME
RPRIVATE
USER


CVS Drug Store
Asphalt Paved Parking Area
MW-02
MW-05
VEGETAED AREA
Residential Property
Current Bank Building
MW-04
MW-06
Former Dispenser Island
MW-01
Former Station Building
Gas
Boundary of Ciabattoni Brownfields Site
MW-03
Residential Property
Residential Property
Commerical Building
U.S Route 9W & 202
South Liberty Drive
N
LEGEND:
Groundwater Monitoring Well
CONCRETE COVER
ASPHALT COVER
1' (MIN) SOIL/VEGETATION COVER
MINOR MOD.
A2L TECHNOLOGIES, INC.
TAMPA, FLORIDA
Ciabattoni Property
153 South Liberty Drive
Stony Point, New York
Site No. C344068
050409
Figure 8
Sitewide Cover Plan
4/8/10
1" = 40'
FNAME
REVDATE
USER