US ENVIRONMENTAL PROTECTION AGENCY - REGION II

Stanton Cleaners Area Groundwater Contamination Site

Soil Vapor Extraction and Groundwater Extraction Treatment System

Operations and Maintenance Manual

Soil Vapor Extraction and Groundwater Extraction Treatment System Operations and Maintenance Manual

Site:
Stanton Cleaners Area Groundwater Contamination
Great Neck, Nassau County, New York

Supplied to:
US EPA Region II – ERRD
Removal Action Branch
2890 Woodbridge Avenue
Edison, New Jersey 08837

US EPA Region II – ERRD
New York Remediation Branch
290 Broadway
New York, New York 10007

Prepared by:
Environmental Chemical Corporation
110 Fieldcrest Avenue
Edison, New Jersey

September 2012

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ACRONYMS AND ABBREVIATIONS

1,2-DCE	1, 2-dichloroethene
ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
EPA	United States Environmental Protection Agency
ERRS	Emergency Rapid Response Service
GAC	granular activated carbon
GWT	groundwater treatment
GWTS	groundwater treatment system
HASP	Health and Safety Plan
LTRA	Long-Term Remedial Action
MCL	Maximum Contaminant Levels
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NYSDEC	New York State Department of Environmental Conservation
NYSPDES	New York State Pollution Discharge Elimination System
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Act
P&ID	Process and Instrumentation Diagram
PCE	tetrachloroethylene
PLC	programmable logic control
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SCACG	Stanton Cleaners Area Community Group
SCP	Stanton Cleaners Property
SVE	soil vapor extraction
TAG	Technical Assistance Grant
TCE	trichloroethene
TSS	Total Suspended Solids
UFP QAPP	Uniform Federal Policy Quality Assurance Project Plan
VOC	volatile organic compound
WAGNN	Water Authority of Great Neck North

EXECUTIVE SUMMARY

Earth Tech, Inc., under contract from the United States Environmental Protection Agency (EPA) Region II Removal Action Branch, has prepared this Operations and Maintenance (O&M) Manual for the Stanton Cleaners Area Groundwater Contamination Site Soil Vapor Extraction and Groundwater Extraction and Treatment System. This partially fulfills the March 1999 EPA-issued Record of Decision (ROD).

This Manual has been revised in September 2012 by ECC, as contracted by the United States Army Corps of Engineers (USACE) Long Term Response Action (LTRA) to reflect modifications implemented to the system since 2005, and to provide additional operational information to facilitate transition of O&M of the system to another Contractor.

The purpose of the O&M Manual is to insure that when properly implemented, the Site will be in compliance with the substantial technical requirements of CERCLA Part 300, Subpart F, RCRA Regulations Part 264 and 265. The O&M Manual specifies

1) basic periodic maintenance,
2) general operational standards,
3) monitoring requirements for all affected media, and
4) identifies remedial procedures necessary if operating parameters are exceeded.

The O&M Manual accomplishes its goals through the following specific items:

- **Familiarization and Preparation**
  - To familiarize the operator with the groundwater treatment (GWT) system, the soil vapor extraction (SVE) system, contaminants of concern, and waste characteristics associated with both treatment systems.
  - To provide a general description and background information on previous Site response actions that were completed under the EPA's removal and remedial authority.
  - To establish specific safety guidelines.
  - To provide a detailed description of all Site and plant support systems, including all programmable logic control (PLC) systems, so the operator may better understand detailed operating instructions.
- **Operation**
  - To specify detailed instructions regarding the operation of the GWT system and the SVE system equipment.
- **Maintenance**
  - To specify detailed instructions regarding maintenance of appropriate components of the GWT system, SVE system, and PLC monitoring/controlling systems.
- **Testing and Records**
  - To specify all operator responsibilities regarding monitoring, testing, reporting and record keeping.

1.0 INTRODUCTION

1.1 Site Background

The Stanton Cleaners Area Groundwater Contamination site (Site) includes an active dry-cleaning business, located at 110 Cutter Mill Road in the Town of Great Neck, Nassau County, New York (Figure 1 Site Location). The Stanton Cleaners Property (SCP) is approximately 1/4-acre in size and includes a one-story building in which the dry-cleaning business operates and an adjacent one-story boiler/storage building. Most of the SCP has been paved with asphalt except for a strip between the boiler/storage building and the treatment building. This strip was paved in 2005. Adjoining, but separate, properties include a synagogue/day care and school facility, a pre-school across Cutter Mill road, a condominium complex, and a service station (Figure 2 Site Layout). The indoor tennis facility was dismantled in the fall of 2004. The community surrounding the Site is zoned commercial and residential and is serviced by public sewer and water. The Water Authority of Great Neck North (WAGNN) supplies the public water. Three public water supply wells are located approximately 1000 feet downgradient of the SCP.

Improper handling and disposal of spent dry-cleaning solvents, including tetrachloroethylene (PCE), resulted in the release of hazardous substances at the Site. PCE migrated from the Site's subsurface soils into the indoor air environments of the above-referenced affected buildings and into the groundwater beneath the Site, resulting in a significant threat to human health. Levels of PCE were found above Federal and State drinking water standards in the WAGNN public water supply wells. The WAGNN public water supply wells have implemented treatment systems and are routinely monitored to ensure that the drinking water supply is in compliance with Federal and State drinking water standards.

1.2 Site Response Actions

In 1983, approximately 20 cubic yards of PCE-contaminated soil was removed from behind the Stanton Cleaners property.

In 1989, the original Site operator installed a groundwater extraction and treatment system, to treat groundwater contamination, which resulted from improper disposal of spent PCE behind the SCP building. This system is not currently operational.

In 1998, the New York State Department of Environmental Conservation (NYSDEC) funded the construction of a new air stripper treatment system for the WAGNN water supply wells, which are impacted by contamination from the Site. This treatment system is currently in operation.

In September 1998, as an immediate response action, the EPA, through its Emergency Rapid Response Service (ERRS) contractor, Earth Tech, Inc., installed a temporary soil vapor interceptor system, adjacent to the tennis club, to mitigate impacts from PCE vapors to the indoor air of this facility.

EPA, through its ERRS contractor, Earth Tech, Inc., completed the construction and installation of a soil vapor extraction (SVE) system and a ground water treatment (GWT) system on the SCP. Both the SVE and GWT systems are housed in the treatment building that was constructed on the SCP. The SVE was installed to remediate the VOC-contaminated soils, thus reducing the indoor air contamination to safe levels in the potentially impacted surrounding structures. The GWT system (GWTS) was installed to remediate the VOC-contaminated groundwater. Both systems are currently operating at the Site.

1.3 Regulatory History

In March 1999, EPA issued a Record of Decision (ROD) identifying a selected remedy for Operable Unit One, which included:

1) an upgrade of the existing groundwater air stripper on the SCP,
2) construction of a groundwater extraction and treatment system for the Site,
3) continued operation of the SVE system,
4) indoor air monitoring of the affected buildings adjacent to the SCP,
5) long term groundwater monitoring, and
6) groundwater use restrictions.

1.4 Site Operations

The SVE system addresses surface and subsurface soil contamination through a series of SVE wells located throughout the SCP, where significant concentrations of PCE have been detected. Soil vapors containing VOCs are being extracted from the soils by an above ground vacuum system. The contaminated vapors are being treated by a vapor-phase granular-activated carbon (GAC) system. A low permeability gunnite cover was placed over the affected soils to enhance the system's efficiency by controlling short-circuiting with atmospheric air.

The GWT system addresses the VOC contamination in the Site groundwater through a pump and treat system, which includes the subsequent recovery of extracted product. The GWT system includes up to four groundwater recovery or extraction wells. At the present time, there is one active recovery wells in the triangle area, which extracts approximately 65 GPM. The contaminated groundwater from the recovery well is pumped is pumped to and treated with a single 3000-lb aqueous GAC system. The final treated groundwater is then discharged into a local storm sewer system.
In February 2004, USEPA Region II Removal Sampling Team (RST) installed a six-inch diameter, combination SVE/recovery well (EPA-SVE-04R) in the parking lot in front of the active dry cleaners. However, problems encountered during well installation rendered the recovery portion of the well inoperable for groundwater recovery. EPA-SVE-04R is being utilized as a soil vapor extraction well. A six-inch diameter replacement groundwater recovery well (EPA-EXT-04R) was installed between February 21 and 22, 2005, approximately 5-feet from EPA-SVE-04R. Once the well was developed, a submersible pump was placed in the well and the well placed into operation in March 2005. This well was taken off-line in 2007 due to diminishing PCE recovery.

Through the implementation of these soil and groundwater remediation technologies, the concentrations of PCE have been dramatically reduced in the indoor air of adjacent buildings and in the Site soils and groundwater. In addition, the SVE system reduces the mass of VOC contaminants in the soils, thereby reducing any cross media contamination impacts to the groundwater. The performance of the SVE system is being monitored and has extracted over 1,700 pounds of PCE from September 2003 through September 2012. The performance of the GWT system is being monitored and has treated over 278 million gallons of contaminated groundwater as of September 2012..

On January 11, 2005, Earth Tech installed three sub-slab vapor recovery systems. Two of these systems were installed at the boiler building; one on the north end and one on the south end. The other sub-slab system was installed on the south end of the dry cleaner’s building adjacent to the Getty Gas Station building.

The sub-slab systems were installed by excavating soil on the outside of the walls to below the floors of the buildings, installing a 2-inch polyvinyl chloride (PVC) extraction pipeline underneath the floor, backfilling the soil, and extending the pipelines to the SVE extraction manifold. There is no small vacuum air blower installed on these three lines, which is typical of sub-slab vapor-recovery systems. The SVE vacuum pump pulls vapors from underneath the floors.

The exhaust from the SVE system was extended to outside the building to prevent VOC vapors from entering the building. The vapor-phase GAC units were also relocated outdoors.

In 2010 and 2012, two air sparge systems were installed, which is intended to enhance PCE recovery in the groundwater and SVE systems.

1.5 Monitoring Well/Recovery Well Information

Table 3 shows the Master Well List, which identifies the ID number, the northing and easting, aquifer unit, top of PVC casing, ground surface elevation, depth to top of screen, depth to bottom of screen, elevation of top of screen, and elevation of bottom of the screen. The physical location of all the wells is shown in Figure 3 - Monitoring Well Network Map.

2.0 COMMUNITY INVOLVEMENT

2.1 Public Meetings

The Fact Sheets for the Stanton Cleaners Area Groundwater Contamination Site are included in Volume I – Appendix A.

2.2 Stanton Cleaners Area Community Group

Stanton Cleaners Area Community Group (SCACG) is a group formed and incorporated for the purpose of applying and managing the EPA Superfund Technical Assistance Grant (TAG); informing the public about past, present, and potential hazardous waste sites; and working with a technical advisor to produce the best remediation possible for the Stanton Area Cleaners Superfund Site.

2.3 Access and Property Issues

The access agreements for the Stanton Cleaners Area Groundwater Contamination Site are included in Volume I – Appendix A.

3.0 PERMIT STANDARDS

Federal Applicable or Relevant and Appropriate Requirements (ARARs), determined to be practicable for the SCP Site include the following:

- Clean Water Act Water Quality Criteria,
- Safe Drinking Water Act (National Primary Drinking Water Regulations, Maximum Contaminant Levels (40 CFR 141.11 – 141.6),
- Toxic Substances Control Act,
- Resource Conservation and Recovery Act (RCRA),
- Clean Air Act (National Ambient Air Quality Standards),
- National Emission Standards for Hazardous Air Pollutants (NESHAPs),
- Occupational Safety and Health Act (OSHA), and
- Hazardous Materials Transportation Act.

New York State ARARs determined to be practicable for the SCP Site include the following:

- New York State Pollution Discharge Elimination System (NYSPDES) Regulation,
- New York Drinking Water Standard,
- New York Groundwater Quality Standards,
- New York Surface Water Quality Standards, and
- New York Air Emission Standards for Volatile Organics.

The contaminants of concern at the SCP were identified based on information collected during the remedial investigation (see Hydrogeologic Investigation - Operable Unit 1 - Stanton Cleaners Area Groundwater Contamination Site, February 2003.). The contaminants of concern (COCs) at SCP are primarily tetrachloroethylene (PCE); with minor concentrations of cis-1,2-dichloroethene (1,2-DCE); trichloroethene (TCE); manganese; and iron. The historical analytical data for the COCs of the influent water of the GWTS at the Stanton Cleaners Site is summarized in Table 4.

For the COCs, both federal and state standards and guidance values were identified. Federal drinking water standards and removal action levels for site remediation are provided at the website http://www.epa.gov/safewater/. This web site displays the Maximum Contaminant Levels (MCLs), which represent levels of water quality that the Federal Government believes are attainable using the best, generally available treatment technologies. The effluent requirements for the GWTS of the Stanton Cleaners Site are shown in Table 1.

The New York State Air Discharge Limits for the SCP are shown in Table 2.

Water quality standard and guidance values have been developed by the NYSDEC to protect New York State waters for their best-classified usage. Both New York State ambient water quality standards and guidance values are listed for the contaminants of concern. These values are provided at the website at http://www.dec.state.ny.us/website/regs/703.htm.

Among the federal standards and New York State standards, the most stringent were selected and used as final remedial objectives for remediation at the SCP site. The final operation and discharge standards are discussed and provided in Table 1 and Table 2.

3.1 Permits

The New York State Department of Environmental Conservation (NYSDEC) SPDES Permit Equivalent Application to discharge into the water of New York for the SCP facility is presented in Volume I - Appendix A.

The NYSDEC SPDES Permit Equivalent Application Tables are presented in Volume I - Appendix A.

3.2 Approvals

Since the Site is a Superfund Site, approvals for all permits are not required. All discharges will meet the established federal, state, and local discharge requirements.

4.0 SYSTEM INFORMATION

The purpose of the Site GWT system and the SVE system is to contain the off-site migration of VOC-contaminated groundwater. The GWT system's primary purpose is the pumping and treatment of ground water and the subsequent recovery of extracted product. The SVE system's purpose is the treatment of high VOC source areas, the containment of off-site migration of contaminated soil vapors, and the extraction and disposal of the product contained in the soil vapors. The location map of the EPA's GWT system and the SVE system building is shown in Figure 2 Site Layout Map.

4.1 Treatment Plant Components

Groundwater Treatment System:

- PLC based control panels (also controls SVE system);
- Three submersible recovery well pumps and motors;
- Three modulating flow control valves that control the flow rate of each recovery well;
- One low profile three-stage air stripper;
- Two 400 lb. aqueous-phase carbon absorber vessels; and,
- One 3,000 lb. vapor-phase carbon absorber vessel (located inside the treatment building).

Soil Vapor Extraction (SVE) System:

- PLC based control panel (also controls GWT system);
- Six soil vapor extraction wells;
- One skid mounted 250-CFM SVE unit with an 80-gallon knock-out tank and transfer pump;
- One 1,000-gallon holding tank and pump,
- Three sub-slab vapor recovery wells (two in the boiler building and one in the Dry Cleaner's building),
- One 2,500-lb. vapor phase carbon vessel (located outside the treatment building), and
- One newly installed SVE recovery line attached to the new 6-inch SVE well (EPA-SVE-04R) that is located in front of the Dry Cleaner's building

Air Sparge (AS) System:

- Two AS wells;
- One Air compressor;
- One well packer assembly (equipped in EPA-AS-01 only)

The PLC control panel system and its associated electronics are located in the treatment building's second floor control room. The part of the building that has been set aside for the treatment facility is approximately 32 feet long by 36 feet wide and is maintained at ambient temperature with a forced air heater and two exhaust fans. A smaller exhaust fan with motor was installed in the GWTS building to reduce the amount of outside air being drawn into the building. The previous fan was so large that it was removing the heat from the offices. The expected life of the entire treatment system and its control components is 20 years.

All system components are to be integrated through the PLC system for system automation, control, and off-site monitoring.

The treatment system components are operated by the PLC, but some specific components (treatment room heater, exhaust fans, HVAC, and ceiling fans) are operated via their own controls. The equipment motors are powered by 240 VAC, 3-phase electrical service. The treatment system monitoring instrumentation devices such as the level switches, probes, sensors, and transmitters have a 24 VDC input, with the transmitters having a 4-20 mA output. The system Process and Instrumentation Diagram (P&ID), Figure 4, shows all system components and utilizes the naming conventions, which are incorporated in the labeled PLC control panel and associated electrical drawings.

The two air sparge wells were added to the remediation system to promote subsurface volatilization of VOC contaminants and to enhance the recovery of contaminant mass from the groundwater. One sparge system was installed in well EPA-AS-01 (directly in front of the Stanton Cleaners Building) in June 2010. This system uses air from the groundwater treatment system's air compressor to sparge within the screened interval. The sparge system uses an isolation packer to seal the well from atmospheric pressure, so the sparge air exits the well screen and enters the aquifer.

The second sparge system was installed in well MW-24, adjacent to EPA-EXT-02 in the "triangle" portion of the site (Figure 2) in April 2012. This system also uses air from the treatment system's air compressor, but no packer is installed.

4.2 Detailed Equipment Description

Table 4 provides the Equipment List, Government Property Tracking Numbers and Maintenance Requirements.

4.3 Startup/Shutdown/Data Downloading Procedures

4.3.1 Start-Up Procedures

1. Make sure **all** of the Hand-Off-Auto (HOA) switches on the front door of the control panel are in the "Off" position (see preceding diagram of HOA switch locations).
2. If the circuit breaker marked "Control Panel" in the large circuit breaker panel downstairs by the overhead door is turned off, turn the circuit breaker on.
3. If the main panel disconnect (Power Disconnect) on the top right of the control panel is in the "Off" position, turn the power on to the control panel by turning the Power Disconnect switch to the "On" position.
4. If the monitoring program is not showing on the screen, start the program by double-clicking on the Stanton HMI icon on the panel display desktop.
5. Check the control panel display screen to assure all water levels are correct. (All floor sumps are dry, no high-high levels in any tanks, etc.)
6. Turn the SVE Blower HOA switch to the "Auto" position and the SVE blower should start. Green should show on the display screen and read over 400 CFM. If the air stripper blower doesn't start in "Auto", try pushing the yellow reset button on the front of the control panel.

7. Turn the HOAs for the 1) Discharge Valve, 2) SVE Transfer Pump and 3) EQ Tank Transfer Pump to the "Auto" position. Check the display screen to make sure the correct valve is open (usually the discharge valve). Also, check the treatment room to assure the correct valve is open (handle on valve is vertical for open and horizontal for closed).
8. Once correct operation is verified, the correct valve is open and all the transfer pumps are in "Auto", adjust the recovery well pump control valves, if necessary. This is done through the display screen by clicking on the percentage that you want to change and entering in the new percentage on the corresponding valve.
9. Once the initial correct control valve percentage open is verified, turn the associated recovery well pump (Recovery Well 1, Recovery Well 2, Recovery Well 3) HOA to the "Auto" position and verify the correct GPM on the display screen.
10. Wait for the EQ Tank to fill up at least once, as shown on the display screen, and pump down correctly to make sure all the flows are balanced.

4.3.2 Shutdown Procedures

1. Turn Hand-Off-Auto (HOA) switches for Recovery Well 1, Recovery Well 2, Recovery Well 3, and SVE Blower to the "Off" position, if not already off.
2. Check the water level in the Equalization Tank on the graphical display screen and, if necessary, turn the EQ Tank Pump HOA switch to "Hand" to pump out the water manually, being sure to turn the pump off when the water level goes below the low level, as shown on the screen. If the power needs to be turned off to the control panel, please continue to steps 3 and 4.

Other Electrical Power Shutdown Procedures

3. If the power needs to be turned off to the control panel, close the monitoring program on the display screen first, then turn the main disconnect switch (Power Disconnect) on the top right of the control panel to the "Off" position. (The handle will be horizontal).
4. If power coming into the control panel needs to be turned off, turn off the circuit breaker marked "Control Panel" in the large circuit breaker panel in the treatment room by the overhead garage door.

4.3.3 Emergency Shutdown

1. Turn the main disconnect switch (Power Disconnect) on the top right of the control panel to the "Off" position. (The handle will be horizontal) OR
2. Turn off the circuit breaker marked "Control Panel" in the large circuit breaker panel in the treatment room by the overhead garage door.

4.3.4 Data Downloading Procedures

Data logging for the Stanton Cleaners GWT and SVE systems is automatic and the data is saved to the panel mounted computer in C:\Program Files\National Instruments\Lookout. The files are sorted by year and month and can be saved to compact disk or downloaded through the Stanton LAN by going to

\\CONTROLPANEL\c drive\Program Files\National Instruments\Lookout. The files are in csv format, which can be opened and edited, if necessary, with Microsoft Excel or other spreadsheet programs.

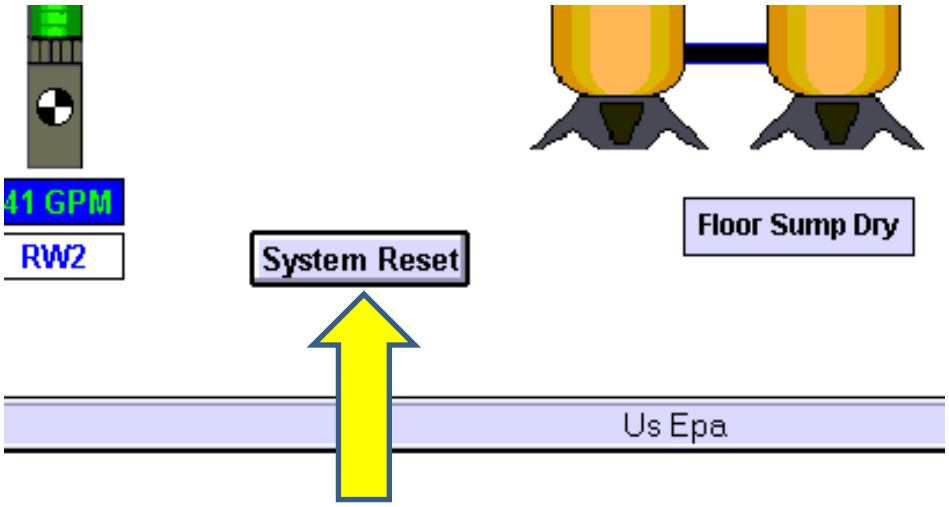
The Startup/Shutdown/Data Downloading Procedures also are provided in Appendix A.

4.4 Alarms, Causes, and Solutions Table and Alarm Reset Procedures

The Stanton Cleaners Alarms, Causes, and Solutions Table provided in Appendix A and is presented at the end of this section. Alarm reset procedures are presented below.

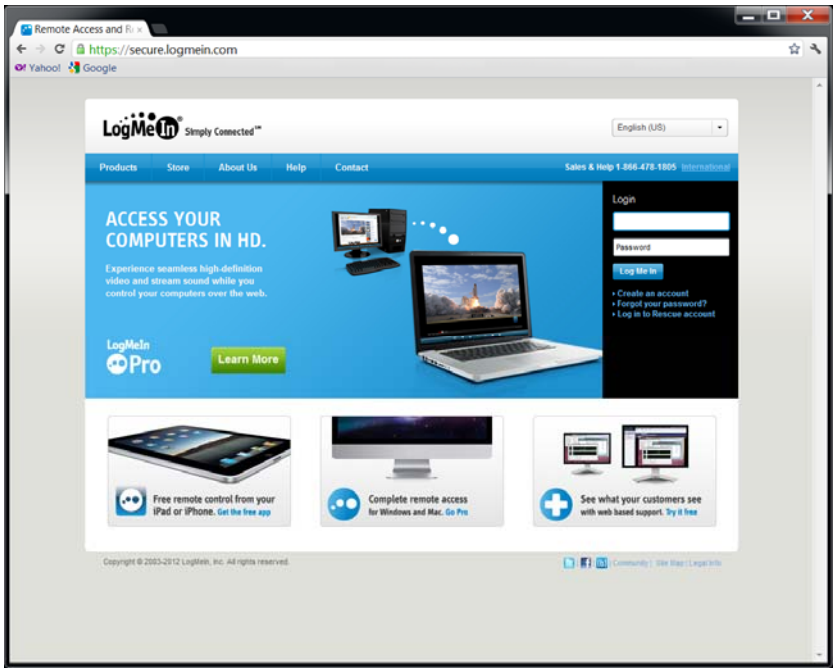
Alarm Reset Procedures

Pressing the SYSTEM RESET button on the HMI will reset any system alarms.

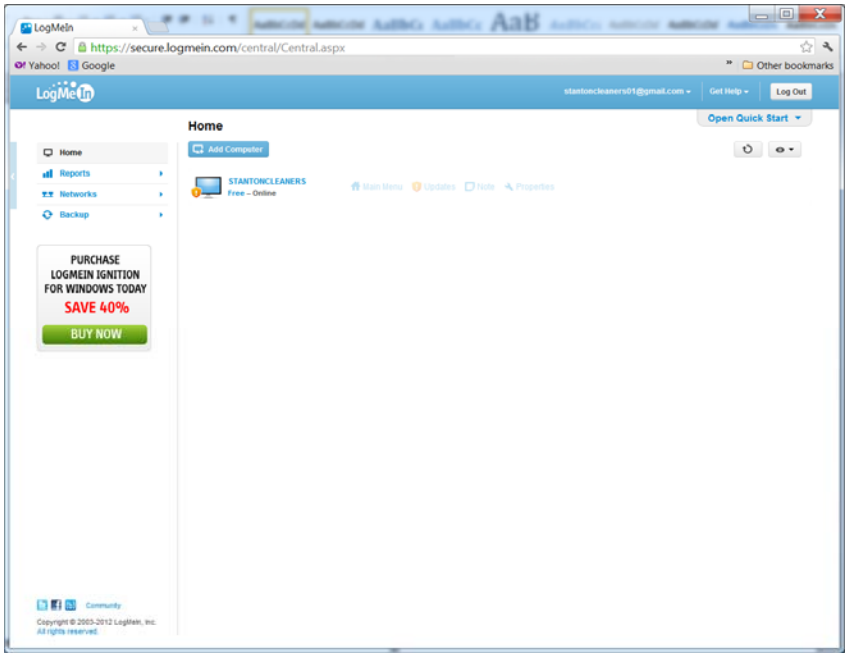


4.5 Remote Connection Procedures

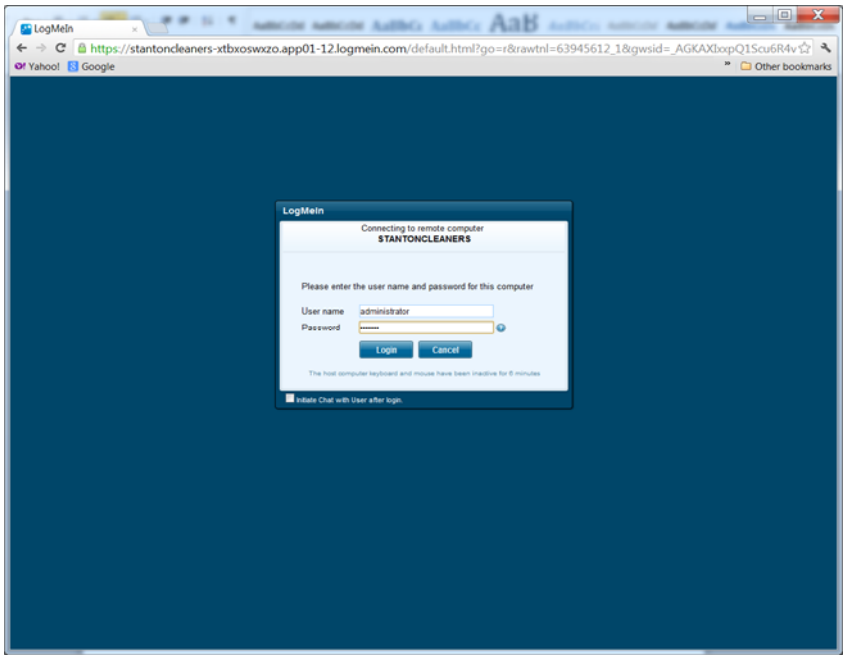
1. Open an internet browser and go to www.logmein.com
2. Login – stantoncleaners01@gmail.com
3. Password: **110cuttermill**



4. Click on STANTONCLEANERS.



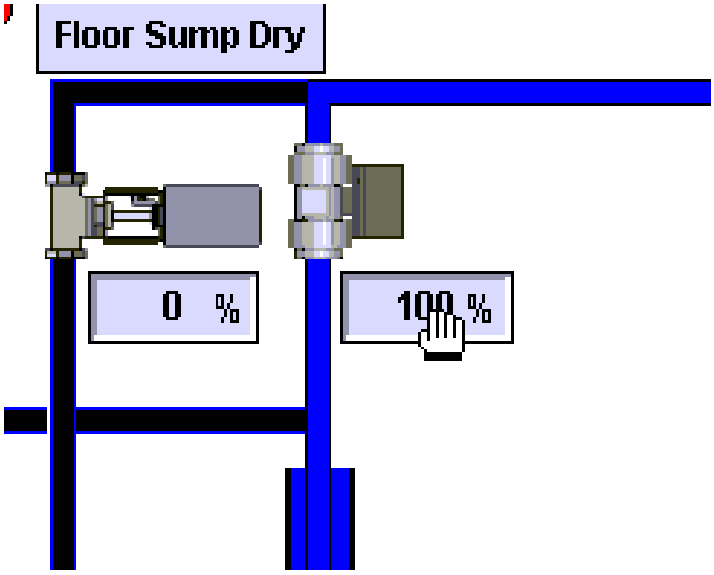
5. Login in with
   User name: **administrator**
   Password: **stanton**



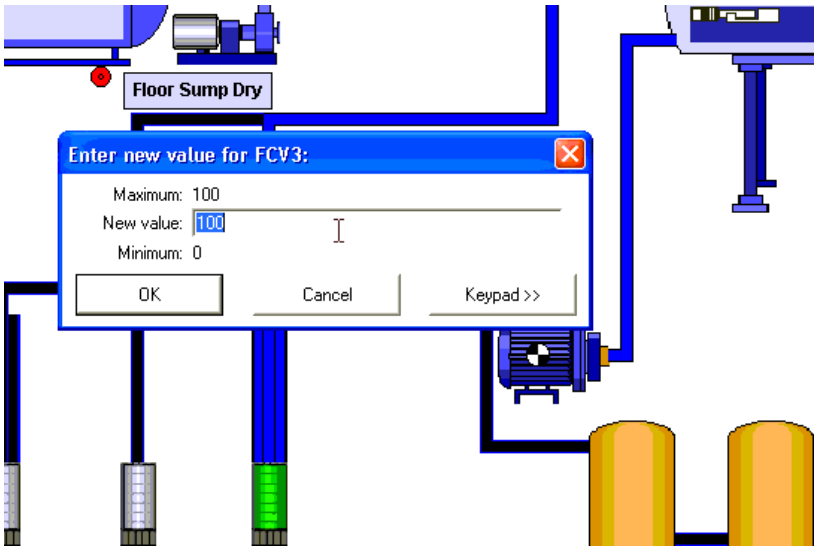
6. The desktop on the site PC will be accessible.

4.6 Procedures to Change System Settings

1. The only user adjustable setting for the treatment system is the incoming recovery well flow control valve percent open.
2. To change the setting, move the computer cursor over the numeric display box until the hand cursor is visible.



3. Click the left mouse button and a numeric entry screen will allow the operator to change the value.



4. Click OK when finished.

5.0 MONITORING, TESTING, AND REPORTS

The objective of the sampling event is to evaluate the various treatment processes that will produce a significant reduction in the organic concentration of the subsurface soils and groundwater. This data must be generated from the analysis of samples, which are representative of the media sampled and obtained to accurately characterize the influent and effluent waste stream. Samples will be submitted to an analytical laboratory to determine the presence of constituents in the treated water in the influent and effluent discharges from the treatment system.

A Uniform Federal Policy (UFP)-Quality Assurance Project Plan (QAPP) was prepared by ECC in 2010, and details the current sampling protocol for O&M performance evaluation, discharge criteria compliance, annual groundwater monitoring, and indoor air quality sampling. The sampling protocol detailed in the UFP-QAPP includes the sampling strategy, sampling locations, collection procedures, equipment to be used, sample preservation, chain-of-custody procedures, and reporting requirements.

The UFP-QAPP addresses the following:

- Data use objectives. The objectives of the sampling events are to provide data that are accurate and precise. The data will be used to compare the results with previous results to determine if they organic constituents in the subsurface soil and/or groundwater are being reduced. As long as the organic constituents continue to be reduced, the cleanup strategies will continue. Eventually, EPA's goals are to prove the site has reached health based cleanup levels so a Closure Report can be issued for the site.
- Quality assurance objectives. The quality assurance objectives are to provide data that can stand up in court. The data must be validated within certain standard criteria. The data must also indicate the surrogate spiked samples have been recovered to within acceptable limits. Matrix spikes and matrix spike duplicates must also meet certain criteria.
- Sampling program. The sampling program will comply with the EPA protocols for sampling groundwater from monitoring wells, and for sampling subsurface soils. The sampling program will be outlined in the Site Specific Sampling and Analysis Plan that will be submitted for EPA approval prior to commencing the sampling events.
- Sample designation. The designated contractor will comply with the designations of monitoring wells and subsurface soil locations that have been stated in the Site Specific Sampling and Analysis Plan. If for any reason the sampling designations change, the new designations will be stated in the appropriate Trip Report.
- Analytical program. The Analytical Program will be reviewed by the designated contractor's Quality Assurance Program Manager to ensure it meets the EPA requirements.
- Evaluation of monitoring results. The designated contractor and EPA will evaluate the data to determine if the data meet the data objectives and quality assurance objectives. The data will be compared to previous data to determine if the organic constituents are decreasing, remaining the same, or increasing.
- Records. The data will be presented in tables and in a manner that has been approved by the EPA. The sampling activities will be documented in the appropriate Trip Reports or other Reports. The reports required for the site are described later in Section 5.

- Quality Assurance Project Plan. The Uniform Federal Policy (UFP)-Quality Assurance Project Plan (QAPP) was produced by ECC and submitted to USACE and USEPA for approval. As procedures change, the QAPP will be amended and submitted for EPA approval.

Monitoring well sampling procedures. The monitor well sampling procedures are outlined in the EPA approved Site Specific Sampling and Analysis Plan. The Site Specific Sampling and Analysis Plan indicates the monitoring well water sampling method (low-stress sampling procedures), the types of bottles to be used for the sample, the holding times allowed, the preservative used for the various samples, the analytical method to be used, the chain-of-custody procedures to follow, and the sample packaging and shipment requirements. A copy of EPA approved groundwater monitoring well sampling guidelines is provided at the website http://www.epa.gov/ahaazvuc/download/issue/lwflw2a.pdf and in the Stanton Cleaners Area Groundwater Contamination Site Sampling Quality Assurance Project Plan dated August 22, 2000.

Groundwater plume capture zone analysis. The designated contractor's Hydrogeologist will periodically review the groundwater level data, the pumping rates, etc. to determine if the groundwater plume capture zone is still adequate to ensure the contaminated groundwater is not leaving the current boundaries.

Indoor air sampling procedures and sampling locations. The indoor air sampling locations, sampling procedures, and analytical procedures are documented in the Site Specific Sampling and Analysis Plan. The air monitoring data will be compared with previous data to ensure the SVE system is preventing organic contaminants from migrating into the surrounding structures. Air sampling will be performed according to EPA approved air sampling procedures, provided at the website http://www.epa.gov/ttn/amtic/ord/00322.wpd.

5.1 Discharge Equivalency Permit

The discharge equivalency permit application is included in Appendix A.

5.2 Reports

5.2.1 Daily Reports

The following report is completed daily by the designated contractor's employees when there are personnel at the site:

Daily Quality Control Report. The purpose of this report is to provide detailed information on the site conditions, work/activities performed as well as personnel and equipment used to do the work, and projected work/activities for the next site visit. This template can be found in Volume I – Appendix B.

5.2.2 Weekly Reports

The designated contractor's employees complete the following report on a weekly basis when they are at the Site for system operation and maintenance purposes:

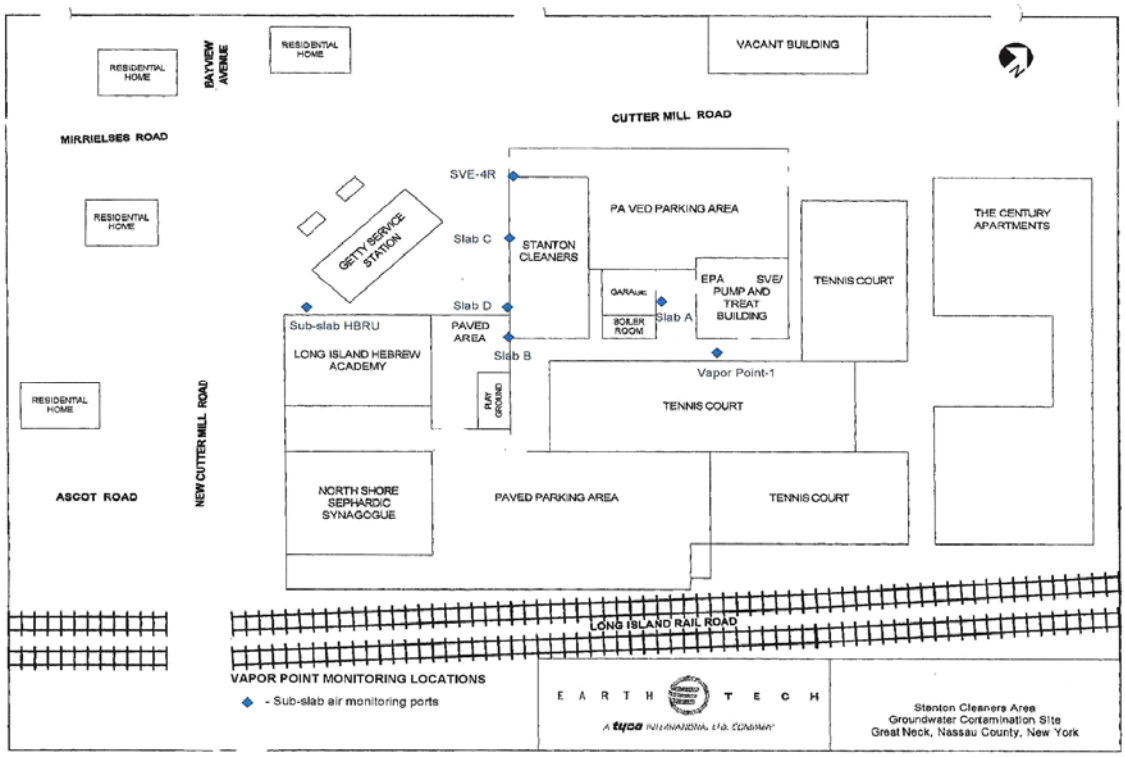
Weekly Operations and Maintenance System Inspection Checklist. This report/checklist logs the readings of all components/instruments visually inspected on a weekly basis by the designated LTRA contractor's GWTS operator. It is also a step-by-step weekly system component checklist that the operator will follow in order to ensure optimum system operation. The Weekly System Inspection Checklist can be found in Volume 1 – Appendix B.

5.2.3 Bi-Weekly Reports

The following report is to be completed every two weeks by the designated LTRA contractor's employees:

Bi-Weekly Air Monitoring Log. All the air monitoring data collected will be recorded in this log. The field monitoring equipment used will yield VOC concentration, hydrogen sulfide concentration, carbon monoxide concentration, percent oxygen, lower explosive limit, temperature, vacuum pressure, dew point, relative humidity, and air flow. This data will be collected from the following sample ports; Slab A, Slab B, Slab C, EPA-SVE-04R, Vapor Point-1, sample ports in the SVE system influent line, post-air stripper line, post-carbon vessel air discharge line(GWP&T and SVE systems), the radon unit (located at western exterior of the Long Island Hebrew Academy) and background. In addition, the Air Monitoring Log keeps a record of the total gallons pumped to that date by the GWTS, the pumping flow rate, and personnel performing the calibration of the field monitoring equipment. This log template can be found in Volume I – Appendix B. Figure 5.1 shows the locations of the air monitoring ports.

Figure 5.1 Vapor Monitoring Location at the Stanton Cleaners Property



5.2.4 Monthly Reports

The contract operator will complete the following reports monthly:

Monthly Water Level Data Summary Log. This log sheet is completed by the designated contractor's Environmental Scientist to record water level measurements of selected Site groundwater monitoring wells, pumping rate of the Water Authority of Great Neck North public water supply wells (#2A and #9), and comments regarding groundwater monitoring wells condition/integrity. This data will be used to

ensure that the GWTS is capturing the plume. A copy of the Monthly Water Level Data Summary Log is included in Volume 1 – Appendix B.

Monthly Water Quality Parameters Log. The designated contractor's Environmental Scientist measures water quality parameters on a monthly basis. A Horiba U-22 model or equivalent will be used to obtain pH, oxidation/reduction potential (ORP), conductivity, turbidity, dissolved oxygen, temperature, and salinity information of the GTWS raw water (influent line) and treated water (discharge line). Water samples for these readings are collected from the GWTS sample ports labeled "combined influent" and "discharge." A copy of the Monthly Water Quality Parameters Log is included in Volume 1 – Appendix B.

Monthly Action List Summary. The designated contractor's Environmental Scientist and/or Senior/Electrical Engineer completes the Monthly Action List Summary. It itemizes all corrective actions that have been performed and/or are outstanding at the Site and which are described in detail in the Daily Quality Control Reports. A copy of the Monthly Action List Summary is included in Volume 1 – Appendix B.

Monthly Operations and Monitoring Report. The Monthly Operations and Monitoring Report summarizes all Site activities for the month and includes a copy of the Daily Quality Control Report, Weekly Operations and Maintenance System Inspection Checklist, Bi-Weekly Air Monitoring Log, Monthly Water Level Data Summary, Monthly Water Quality Parameters Log, Monthly Action List, and Monthly/Quarterly Trip Reports. This report is prepared by the designated contractor's Environmental Scientist and submitted on the first week of the following month. A copy of a Monthly Operations and Monitoring Report is included in Volume 1 – Appendix B.

Monthly Trip Reports. The Monthly Trip Reports are completed for monthly GWT system influent/effluent sampling. The Trip Report is due by the 20th of the month following the sampling event. A copy of a Monthly Trip Report is included in Volume 1 – Appendix B.

The following locations are sampled and sent for laboratory analysis monthly:

Combined influent/raw water of the GWTS.
Treated effluent/discharge water of the GWTS.
Additional samples (i.e. individual extraction wells) may be collected at the discretion of the OSC.

The monthly influent/effluent water samples are analyzed for the following parameters, including their respective analytical method and holding times:

Parameter	Analytical Method	Holding times
Target Compound List Volatiles	EPA 8260B	14 days

5.2.5 Quarterly Reports

The designated LTRA contractor's employees for the quarterly groundwater monitoring well sampling and indoor air sampling events complete the Quarterly Trip Reports. A copy of a Quarterly Trip Report is included in Volume 1 – Appendix B.

Groundwater Sampling

Up to twenty-nine (29) groundwater monitoring wells have been sampled and sent for laboratory analysis on a quarterly or semi-annual basis. As of September, 2012, the number of wells and frequency has been reduced based on an established trend of historical data, and the need to only monitor key monitoring wells. Please refer to the UFP-QAPP for the current requirements, and the 2012 Annual Groundwater Monitoring Report for recent results, and a report of the most recent sampling activities, including potential deviations from the UFP-QAPP. Future monitoring requirements should be routinely evaluated and revised as warranted by data needs.

The quarterly sampling event will be performed following the USEPA approved Low-Flow (Minimal Drawdown) Groundwater Sampling Procedure referenced in EPA/540/S-95/504. A copy of EPA approved groundwater monitoring well sampling guidelines is provided at the website http://www.epa.gov/ahaazvuc/download/issue/lwflw2a.pdf and in the Stanton Cleaners Area Groundwater Contamination Site Sampling Quality Assurance Project Plan dated August 22, 2000.

The groundwater samples are analyzed for the following parameters, including their respective analytical method and holding times:

Parameter	Analytical Method	Holding times
Target Compound List Volatiles	EPA 8260B	14 days from collection

Indoor Air Sampling

The following buildings and locations have been designated for quarterly sampling of indoor air:

- Long Island Hebrew Academy (ground-floor, roof, and 1st floor lobby).
- Century Condominium Complex (lowest parking garage).
- USEPA Groundwater Treatment Building (USEPA 1st floor office and 2nd floor control panel room).
- Ambient sample.

The quarterly indoor air samples are analyzed for the following parameters, including their respective analytical method and holding times:

Parameter	Analytical Method	Holding times
Target Compound List Volatiles	EPA T0-15	14 days from collection

Please refer to the UFP-QAPP for the current requirements, and the 2012 Indoor Air Quality Report for recent results, and a report of the most recent sampling activities, including potential deviations from the UFP-QAPP. Future monitoring requirements should be routinely evaluated and revised as warranted by data needs.

5.2.6 Annual Reports

Annual Reports are available from USEPA and the "ftp site" established by the USACE contractor, ECC. Electronic files (on CD or DVD) of all documents available on the "ftp site" will be made available upon request.

5.3 Reporting Submittal

The designated LTRA contractor will submit all the analytical data to the USACE and EPA. The format and delivery templates are included in Volume I – Appendix B.

6.0 MAINTENANCE

6.1 Equipment Record System

The equipment record system is based upon the government property tracking number inventory system. The list of equipment along with its government property tracking number is included as Table 4 Equipment List, Government Property Tracking Numbers and Maintenance Requirements.

6.2 Equipment Replacement Instructions

There are no spare pieces of equipment. If a piece of equipment breaks down, it will be replaced as quickly as possible. Much of the equipment is in stock and available on short notice from vendors and/or suppliers. The cut sheets presented in the attached appendices contain the model and serial numbers of the equipment. All equipment replacements will meet the requirements specified in the cut sheets.

6.3 Planning and Scheduling

Stanton Cleaners Site GWTS and SVE system preventive maintenance program includes oil changes, lube, belt replacement, and filter changes.

6.4 Warranty Provisions

Many of the large components of the SVE system and water treatment systems were obtained from inventory of the USEPA Region II Removal Action Branch. Therefore, this equipment doesn't have valid warranties. This equipment includes the SVE knockout tank, holding tank transfer pump and motor, air stripper transfer pump and motor, flow-control valves, pH sensors and transmitters, liquid level switches, and air flow, pressure, and temperature transducers.

Due to the extensive operation and run time of the Stanton Cleaners Site GWTS, warranties may no longer apply. This equipment includes: the vapor-phase carbon vessels, flow meters, air stripper blower pump and motor, conductivity sensors and transmitters, electric actuators, SVE silencer, SVE blower, SVE blower motor, air stripper motor and blower, PLC, holding tank, and flow meter. The building components include the heaters, the garage door and door opener, lights, exhaust fans, and overhead recirculation fans.

The individual new equipment warranty information is available in the equipment cut sheets included in the attached appendices.

6.5 Contract Maintenance

The contract maintenance requirements are to be provided on a case-by-case basis. Since this is a Government Contract, the designated LTRA contractor must comply with the Federal Acquisitions Regulations (FARs). The FARs require all service contracts to be competitively bid. Therefore, all maintenance work that can't be completed by the designated LTRA contractor's personnel will be competitively bid.

6.6 Monitoring of Instruments and Controls

The monitoring equipment (field monitoring devices) and monitoring devices will be calibrated at least once a year. Much of the equipment has been internally calibrated. The cut sheets in Volume 1 – Appendix F Sections 1, 2, and 3 contain calibration procedures.

6.7 Maintenance Schedule

There are no set replacement schedules for any of the operating equipment. The equipment will be maintained on a semi-annual basis or more frequently if required. The equipment will be replaced on an as-needed basis. Appendices in Volume 1 and Volume 2 contain a list of all equipment along with general statements on equipment requirements and maintenance frequency.

7.0 SEQUENCE OF OPERATION

The treatment building is located next to the Stanton Cleaners boiler/storage building in its own two-story, 1,500-square-foot facility. The treatment building contains a separate treatment system\equipment room. The treatment room is accessed from outside through the overhead garage door in the front of the building, or inside through the single door at the bottom of the stairs. In the treatment building there are also two ground level office areas and an upstairs office area that has the treatment system control panel used to monitor and control system operation. The two ground level office areas are accessed from the two single doors on the side of the building nearest to the boiler/storage building.

7.1 Groundwater Extraction and Treatment System

The GWTS is used to pump the groundwater from the recovery wells into the system where it is pumped through the liquid-phase carbon vessel, and discharged to the storm sewer located in the Synagogue parking lot. There are two control floats in the recovery wells that control the pump operation. The control floats themselves are attached to the submersible pump piping in the wells and are wired back into the building through the underground conduit and terminated in the control panel. The control floats are normally open, liquid level reed switches. A high level wet condition in the recovery well will allow the recovery pumps to run. The pumps will turn off when either the water level drops below the low level switch or there is an alarm condition that requires the system to turn the pumps off.

The recovery well pump flow rate is controlled via flow control valves that are installed inside the building. The individual recovery pump flow rates are displayed on the control panel and can be adjusted by changing the percentage that the corresponding flow control valves are open. After the individual well flow control valves, flow meters, and transmitters, all four of the well's discharge lines combine into one manifold pipe. The pH and conductivity of the influent recovery well water is measured via sensors and their transmitters. The sensors are mounted in the line after the individual well lines combine into one and before the combined line flows into the liquid-phase carbon vessel.

The discharge water is monitored for pH and conductivity by sensors and transmitters that are mounted in the discharge line on the platform in the treatment room. There is a discharge flow meter and totalizer that is mounted in the discharge line prior to discharge from the building.

7.2 Soil Vapor Extraction System

The SVE system consists of a skid mounted blower and motor, knockout tank with transfer pump and liquid level switches, a holding tank with transfer pump and liquid level switches, a 2,500 lb. vapor phase carbon unit (located outside the treatment building), and a vacuum transmitter. The SVE draws air from six vapor extraction wells located at various locations around the site property, three sub-slab vapor recovery pipes (one beneath the boiler building, one adjacent to the site treatment building, one in the Dry Cleaner's building), and one newly installed 6-inch recovery well (EPA-SVE-04R). The individual vapor extraction wells, sub-slab pipes, and recovery well combine in the building and are piped into the knockout tank.

The excess water from the wells is dropped out in the knockout tank. The water is pumped out via the SVE transfer pump into the holding tank mounted above the SVE. The holding tank transfer pump moves the water through the aqueous phase carbon, and then to discharge. The vapor effluent from the SVE system is treated via a 2,500 lb. vapor phase carbon unit located outside the treatment building.

8.0 PERSONNEL

A Project Organization Diagram is included in Appendix A and includes contact information. Detailed contact information is presented in Section 10.4 - Emergency Contacts.

8.1 Staffing Requirements

Task Manager – This person has overall responsibility for the entire Operations and Maintenance (O&M) of the Stanton Cleaners Area Groundwater Contamination site.

Location of Work: The Task Manager usually works from the office. He/she will rarely visit the site, but will on an occasional basis. The responsibilities of the Task Manager include:

- Providing adequate and proper staffing for all positions required for the completion of the objectives outlined in the contract.
- Maintaining the O&M treatment system building and the SVE and groundwater treatment systems.
- Ensuring the O&M is completed within the budget.
- Ensuring that the proper reporting requirements have been completed.
- Ensuring there are adequate health and safety procedures in effect to protect the health and safety of site workers and visitors.
- Ensuring that all utilities have been paid.
- Ensuring the weekly, biweekly, monthly, quarterly, and annual sampling and analyses events occur.

Field Contract Administrator (FCA) – This person has responsibility for all costs and accounting of field and office expenditures for the Stanton Cleaners Area Groundwater Contamination site.

Location of Work: The FCA usually works from a remote office location. He/she will visit the site in a case-by-case basis. The responsibilities of the RCA include:

- Tracking all expenditures for supplies, materials, labor, travel, expense, per diem, etc.
- Ensuring all expenditures are entered in the Oracle Cost Tracking software.
- Writing Purchase Requisitions.
- Issuing Purchase Orders.
- Ensuring all personnel have been paid.
- Ensuring all personnel are paid travel and meal expenses.
- Ensuring the invoice is processed monthly.
- Tracking all site sign-in and sign-out forms.

Environmental Scientists – Responsible for coordinating and completing the periodic sampling events and ensuring all reports are submitted on time.

Location of Work: Approximately 20 percent of the environmental scientists' time is completed off site at a remote office. This time is used to complete the periodic reports. Approximately 80 percent of the time is completed in the field collecting samples and monitoring system performance. The responsibilities of the environmental scientists include:

- Coordinating and completing the biweekly air monitoring of the SVE system.
- Coordinating and completing the monthly sampling of the GWTS influent and effluent water.

- Coordinating and completing the quarterly groundwater monitoring well sampling events and indoor air sampling events.
- Completing the monthly and quarterly trip reports.
- Completing the annual reports.
- Reviewing and submitting analytical data to ECC.
- Determining when to change out the vapor-phase or aqueous-phase granular activated carbon.

Senior Engineer – This person completes inspections of the systems, provides technical assistance in the O&M of the systems, and revises any plans as needed.

Location of Work: This person works most of the time at a remote office. The responsibilities of the Senior Engineer include:

- Conducting safety audits.
- Conducting inspections of the systems.
- Revises the O&M manual as required.
- Provides technical assistance to the RM and Environmental Scientist.

Field Technicians – There are two field technicians that work on the Stanton Site. They are responsible for completing the daily systems inspections, the O&M, and assisting in the periodic sampling events.

Location of Work: These personnel work exclusively in the field at the site. The responsibilities of the field technicians include:

- Support weekly inspections of the treatment systems.
- Complete any O&M required on the systems.
- Assist the Environmental Scientist during the monthly system sampling events.
- Assist the Environmental Scientist during the quarterly groundwater monitoring well and indoor air sampling events.
- Assist in all system requirements.
- Instrumentation calibration and maintenance.

Electrical/Controls Engineer – This person provides technical assistance in the programming of the PLC and the remote operations of the systems.

Location of Work: This person works mainly from a remote office. The responsibilities of the Electrical/Controls Engineer include:

- Remotely monitoring the SVE system and recovery wells performance.
- Providing assistance in the reprogramming or adjusting of the Programmable Logic Controller (PLC).
- Provides technical assistance on the electrical requirements for all motors.

Health and Safety Officer – Provides technical assistance concerning health and safety issues, ensures all personnel are qualified to work on the site, and ensures all employees have up to date medical monitoring.

Location of Work: Most of the work completed by this individual will be completed at an off-site remote location. The responsibilities of the Health and Safety Officer include:

- Provide technical assistance on health and safety issues in and around the site.
- Ensures all personnel have completed their 8 hour annual OSHA refresher training.
- Ensures all personnel have a yearly physical.
- Provides updates on new health and safety alerts, which are provided to the employees during morning health and safety discussions.
- Revises the HASP accordingly.

QA/QC Technician – This person provides technical assistance on quality assurance and quality control issues concerning sampling activities and reviewing the analytical results.

Location of Work: This person works from a remote office. The responsibilities of the QA/QC Technician include:

- Provide technical assistance on quality assurance and quality control issues concerning sampling requirements.
- Reviews data to ensure it is valid.
- Ensures sampling protocols are followed.
- Completes and edits Sampling and Analysis Plans.

Geologist/Hydrogeologist – This person provides technical assistance concerning the installation of soil borings and monitoring wells and assists in monitoring well sampling activities.

Location of Work: This person works approximately 25 percent of the time at a remote office. Approximately 75 percent of the time is on site during the installation of recovery wells, monitoring wells, soil borings, groundwater sampling, etc. The responsibilities of the Geologist/Hydrogeologist include:

- Overseeing the installation of soil borings, monitoring wells, extraction wells, etc.
- Logging the lithology during soil boring activities.
- Completing pump tests or slug tests to determine groundwater characteristics.
- Performance of monitoring well groundwater sampling events.
- Providing technical assistance in completing RFP for geological work.

8.2 Maintenance Service Personnel

All maintenance will be performed after completing a competitive bid process. Since this is a Government Contract, the Federal Acquisition Regulations (FARs) apply to all work completed on the site.

9.0 HEALTH AND SAFETY PLAN

This section describes the health and safety guidelines developed for the operation and maintenance of the treatment system, to protect on site personnel (the prime contractors and the subcontractors), visitors, and the public from physical harm and exposure to hazardous materials or wastes. The procedures and guidelines contained herein are based upon the best available information. Specific requirements will be revised when new information is received or conditions change and a safety plan modification is necessary to ensure the safety of workers or the public. A written amendment will document all changes made to this plan.

A Health and Safety Plan (HASP) that meets the USACE EM 385-1-1 guidelines has been prepared for the Stanton Cleaners Area Groundwater Contamination Site. Please refer to the Stanton Cleaners Area Groundwater Contamination Site Long Term Response Action (LTRA) Health and Safety Plan dated April 2004 for any health and safety concerns.

10.0 EMERGENCY PROCEDURES

10.1 System Shutdown Procedure

It is essential that site personnel be prepared in the event of an emergency. During an emergency, pressing the emergency disconnect switch located on the front of the PLC panel door can immediately stop the treatment system.

The following steps are to be taken in order to properly and safely shut down the treatment system:

1. If not already in the off position, turn Recovery Well 1, Recovery Well 2, and Recovery Well 3 Hand-Off-Auto (HOA) switches to the "off" position. (Refer to Start-up/Shutdown/Data Downloading Procedures diagram included in Volume 1 - Appendix A to see a picture of the front of the control panel for the location of the HOA switches).
2. Wait at least fifteen minutes for the air stripper to finish treating the remaining water, then turn the HOA switches for the SVE Blower to the off position.
3. Check the water level in the air stripper on the graphical display screen, and if necessary turn the Air Stripper Pump HOA switch to hand, to pump out the water manually, being sure to turn the pump off when the water level goes below the low level as shown on the screen. If the power needs to be turned off to the control panel, please continue to steps 4 & 5 below.

Other electrical power shutdown procedures for Stanton Cleaners

4. If the power needs to be turned off to the control panel, close the monitoring program on the display screen first by closing the window, then turn the main disconnect switch on the top right of the control panel to the off position. (Handle will be horizontal).
5. If power needs to be turned off coming into the control panel, turn off the circuit breaker marked "Control Panel" in the large circuit breaker panel in the treatment room by the overhead garage door.

The following is a list of potential emergencies and the immediate response to them. Emergencies can take many forms such as:

Illness or injuries. Determine the extent of the illness or injuries and call 911 for an ambulance or take the injured to the hospital.

Chemical exposure. If possible without putting the employee in danger, prevent further release of chemicals. Determine if any personnel is exposed to the chemicals. If they are, check with the Material Safety Data Sheets (MSDS) located in the HASP to determine the proper medical treatment, then take the person to the hospital. Once any injured personnel are treated, then take measures to clean up the chemical spill.

Fires. Call the Fire Department at 911. If possible, uses a fire extinguisher to put out the fire. If not, remove all personnel to a safe location.

Explosions. Determine if there are injuries. If so, treat the injured personnel and call 911 for an ambulance. Keep all personnel away from the area.

Spills. Determine the location of the spills. Equip personnel with the appropriate PPE to protect them from exposure. Turn off the treatment system or the component where the spill occurred. Complete repairs as needed. Start up the treatment system.

Leaks. Determine the location of the leaks. Equip personnel with the appropriate PPE to protect them from exposure. If possible, tighten up the appropriate piece of equipment. If it is not possible to stop the leak, turn off the treatment system or the component of the system that is leaking. Complete repairs as needed. Start up the treatment system.

Releases of harmful contaminants. Determine the location of the release of harmful contaminants. Equip personnel with the appropriate PPE to protect them from exposure. Turn off the treatment system. If possible, stop the release. Ensure all contaminants have been cleaned up. Complete repairs as needed. Start up the treatment system.

In the event of an emergency, the designated LTRA contractor's field technician or other personnel who notices the emergency will notify the Earth Tech Task Manager. The Task Manager will contact the appropriate personnel at EPA, ECC, and ACOE. Refer to the organizational/flow chart in Section 5.

The Stanton Cleaners Area Groundwater Contamination Site Long Term Response Action (LTRA) Health and Safety Plan (HASP) provides detailed procedures for incidents, which might require emergency measures. Telephone numbers for emergency contact are included in the HASP.

10.2 Spill Prevention, Control, and Countermeasure Plan

The spill prevention, control, and countermeasure (SPCC) plan includes the following:

1. Water level sensor are strategically located throughout the treatment system. In the event that these sensors detect dangerous high/low levels of water, they will automatically send and alarm signal to trigger a system shutdown.
2. There are water sensors placed throughout the floor of the GTWS building to detect and shutdown the system in the event of a spill.
3. Follow the aforementioned emergency procedures when possible.
4. Follow the Standard Operating Procedures listed in the HASP.

10.3 Emergency Equipment Inventory

There is a fire extinguisher and first aid kit located in the treatment room. The EPA treatment building is also equipped with a sprinkler system and emergency exit signs. Volume 2 – Appendix L Section 3 contains cut sheets for the fire extinguisher, emergency exit signs, and sprinkler system.

10.4 Emergency Contacts

Emergency Service	Company	Phone
Police Department	Nassau County Police (Sixth District)	911 516-573-6600
Fire Department	Vigilant Hook & Ladder	911 516-482-5000
Hospital	North Shore University Hospital	516-829-9666

Other emergency contacts are:

EPA contacts:

Louis DiGuardia
On-Scene Coordinator
U.S. EPA Region II
Removal Action Branch
2890 Woodbridge Avenue (MS-211)
Edison, NJ 08837
(732) 906-6927

Damian Duda
Remedial Project Manager
U.S. EPA Region II
New York Remediation Branch
290 Broadway
New York, NY 10007-1866
(212) 637-4269

11.0 CONTINGENCY PLAN

Contingencies may arise at the site that will require corrective action. In most instances (such as power failure, malfunction of instruments, monitors etc.), the following step-by-step process shall be followed. Major incidents such as water tank overflow, malfunction of recovery and transfer pumps, and malfunction of the PLC system will require steps to be taken immediately to prevent further complications before any appropriate corrective action can be implemented.

11.1 Corrective Action Process

1. Identify/verify the problem – If possible, make a preliminary assessment of its severity. Take immediate steps to contain the problem if it is deemed necessary. If possible, the field technician will correct the problem. If this is not possible, the next corrective action step will be followed.
2. Notify the proper authorities depending on the severity of the problem and notify the Response Manager. The Task Manager will provide the assistance necessary to obtain the necessary maintenance personnel (i.e., electrician, etc.), and will assist in ordering new equipment.
3. The Task Manager will make recommendations for the corrective action and to develop a schedule for implementation. If necessary, a more detailed assessment of the problem will be made, and an evaluation of alternatives for corrective actions may be undertaken subject to approval of the Task Manager.
4. Authorization by the Task Manager will be required to implement any major corrective action.
5. The operator/subcontractor will implement a proper, safe, and effective corrective action at the direction of the Task Manager and/or Health and Safety Officer.

11.2 Tank Overflow

The holding tanks may overflow if, for example, a liquid level switch that is used to control the associated pump fails or the transfer pump fails. The following initial steps may be taken in response to the holding tank overfilling:

1. Cease operation of recovery pumps by turning off the respective HOA switches on the control panel to the off position.
2. The floor sump switches, when wet, will send an alarm signal to shut down the system.
3. Turn off the holding tank transfer pump by turning the HOA switch on the control panel to the off position.
4. Assess the extent of the holding tank overflow.
5. Determine if any water flowed from the building. If so, clean up the water.
6. Contact the designated LTRA contractor's Task Manager to inform him of the problem. See the Organization Chart in Appendix 5.1.
7. Call a maintenance contractor or electrician to determine if the transfer pump failed, or whether the high level and/or high-high level switches failed.
8. If the pump or motor failed, determine the cause and repair and/or replace the pump or motor. If a spare pump and/or motor are not available, then purchase a new pump and/or motor.
9. If the pump and motor and operating properly, then change out the level switches with new ones.
10. Restart the treatment system according to the procedures in Appendix 4.3.

In the event that there is a tank overflow (tank water level switches failed) while no personnel is on-site, the floor water sensors will send an alarm signal that will shutdown the treatment system.

11.3 Malfunction of the Recovery and Transfer Pumps

If the recovery pumps fail to operate properly, complete the following procedures:

1. Turn the HOA switch for the appropriate recovery pump to the off position.
2. Pull the pump, motor, controls, and discharge hose from the well.
3. Add a replacement pump and/or motor, or wait until a spare pump and/or motor is ordered and delivered.
4. Lower the pump, motor, controls, and discharge hose back into the well.
5. Turn the HOA switch to the "A" position.
6. Ensure that the new or replacement recovery pump and/or motor are operating properly.

If the transfer pumps fail to operate properly, complete the following procedures:

1. Turn the HOA switch for the transfer pump to the off position.
2. Remove the pump, and/or motor.
3. Add a replacement pump and/or motor or wait until a spare pump and/or motor is ordered and delivered.
4. Replace the pump and/or motor.
5. Turn the HOA switch to the "A" position.
6. Ensure that the new or replacement transfer pump and/or motor are operating properly.

11.4 PLC System Malfunction

The treatment system is normally controlled automatically by the PLC. However, if there is a problem with the automated controls, the following steps should be taken:

1. Initiate the five-step corrective action process.
2. Shutdown the PLC and operate the treatment system(s) manually.
3. Contact a Programming Engineer or an Electrical Engineer to inspect the PLC to determine the problem.
4. Repair the PLC and restart the system(s) and operate with the automated controls.

12.0 SUBMERSIBLE RECOVERY WELL PUMPS AND MOTORS

12.1 Description of Pumps and Motors

There are five submersible recovery well pumps/motors that are part of the groundwater treatment system. The purpose of the recovery well pumps is to pump the groundwater to the building for treatment. The five recovery wells are designated EPA-EXT-02 (Triangle), IW-01 (Synagogue Parking Lot), EPA-EXT-03 (Stanton Parking Lot) EPA-MW-24 (Triangle, originally a monitoring well but later converted into an extraction well), and EPA-EXT-04R (adjacent to Cutter Mill Road, in front of the New Stanton Cleaners). Only EPA-EXT-02 is currently on-line. The description of the other wells remain in this manual to describe the original design, and provide a description of these wells should a future operator wish to consider re-configuration of the system.

EPA-EXT-04R was installed on February 21 and 22, 2005, by RST. EPA-EXT-04R is a 6-inch recovery well adjacent to the previous well installed by RST (EPA-SVE-04R). The well was piped to the treatment building and tied into the manifold within the GWT system building.

EPA-EXT-02 is in a 6-inch stainless steel well casing, and IW-01, EPA-EXT-03, and EPA-MW-24 are 4-inch PVC well casings. EPA-EXT-04R is a 6-inch PVC well casing. All five pumps have attached motors that range in size from 1 ½ to 5 horsepower (Hp). The depths of the pumps range from 80 to 120 feet below ground level. The expected flow rates in gallons per minute (GPM) ranges from 15 to 80 GPM.

The following table summarizes groundwater extraction well specifications.

Pump Number	Well Casing (in.)	Elevation Head (ft.)	Total Dynamic Head (ft.)	Flow Rate (GPM)
EPA-EXT-02	6 in. SS	110 ft.	160 ft.	60-80 gpm
IW-01	4 in. PVC	110 ft.	160 ft.	15 gpm
EPA-MW-24	4 in. PVC	110 ft.	130 ft	15 gpm
EPA-EXT-03	4 in. PVC	110 ft.	130 ft.	15 gpm
EPA-EXT-04R	6-in. PVC	120 ft.	100 ft	40 gpm

Note: Only EPA-EXT-02 remains online as of September 2012.

12.2 Manufacturer's Specifications

The five submersible pumps/motors are required to meet the following specifications.

Pump must be rated for continuous service.
Pump motor electrical requirements – 230VAC, 60 Hz and 1 phase
Pump and motor housing have to be stainless steel
Mechanical seal and other wetted parts must be compatible with a solvent concentration of a 1% mixture of PCE, TCE, and DCE.

The pumps also needed to meet the elevation head, total dynamic head, and flow rate specifications in the above table.

The submersible pumps are Teel Submersible Pumps. The following table summarizes the groundwater extraction well pumps and motors specifications.

Pump Number	Teel Model Number	Hp Motor Required	Total Dynamic Head (ft.)	Flow Rate (GPM)
EPA-EXT-02	2PC12	5 Hp	100 ft.	50 gpm
IW-01	2PC08	3 Hp	100 ft.	31 gpm
EPA-MW-24	2PC08	3 Hp	100 ft.	31 gpm
EPA-EXT-03	2PC08	3 Hp	100 ft.	31 gpm
EPA-EXT-04R	2PC11	3 Hp	100 ft.	43 gpm

12.3 Operations Procedures

The individual submersible pump motors are sized according to manufacturer's specifications for the required performance. The motor operations are controlled through the treatment system control panel. Each pump has an associated Hand-Off-Auto (HOA) switch, manual motor starter, and motor contactor in the control panel. Additionally, each motor has a corresponding electrical starter box that is required for single-phase operation.

The manufacturer's manual for the submersible pump and submersible pump motors is included in Volume 1 - Appendix C.

12.4 Maintenance Requirements

The manufacturer's manual for the submersible pump and submersible pump motors is included in Volume 1 - Appendix C.

12.5 Troubleshooting

The manufacturer's manual for the submersible pump and submersible pump motors is included in Volume 1 - Appendix C.

12.6 Recovery Well Liquid Level Switches

The manufacturer's information for the recovery well liquid level switches is included in Volume 1 - Appendix C.

13.0 FLOW CONTROL VALVES

13.1 Description of Valves

There are three actuated flow control valves (FCV) that are part of the groundwater treatment system. The purpose of the flow control valves is to control the flow rate from the five recovery wells into the building. The three flow control valves are designated FCV-EPA-EXT-02, FCV-IW-01, and FCV-EPA-EXT-03. FCV-EPA-EXT-02 controls both EPA-EXT-02 and EPA-MW-24. FCV-IW-01 controls both EPA-IW-01 and EPA-EXT-04R. FCV-EPA-EXT-03 which controls EPA-EXT-03 is currently inactive.

There are two different styles of actuated valve (as shown in Figures 13.1 and 13.2), but they are both controlled the same way and perform the same function. The two Jordan Controls MV-1100 control valves are used for FCV-IW-01/EPA-EXT-04R (currently only EPA-EXT-04R is active) and FCV-EPA-EXT-03. The Asahi-America Quarter Master Series 94 control valve is used for EPA-EXT-02/EPA-MW-24. All three flow control valves (FCVs) are powered by 110VAC from the control panel and are actuated by a 4-20mA signal also from the control panel. The Jordan MV-1100 FCV has a brass valve that is attached to the actuator. The Ashai Quarter Master FCV has an Ashai-America Type 21 ball valve attached to the actuator. The following table shows the specifics for each flow control valve.

Figure 13.1 Jordan Control MV-1100

Figure 13.2 Asahi America Quarter Master Series 94

The following table summarizes the flow control actuator and valve specifications.

FCV Number	Actuator Manufacturer	Actuator Part Number	Valve Piping Size
FCV-EPA-EXT-02	Asahi-America	Series 94	2 in.
FCV-IW-01	Jordan Controls	MV-1100	1 in.
FCV-EPA-EXT-03	Asahi-America	Series 94	1 in.

13.2 Manufacturer's Specifications

The three flow control valves are electrically actuated flow control valves that are made up of two components. There is an electrical actuator that is powered by an 110VAC circuit and is adjustable from fully open to fully close by an external 4-20mA signal. There is also a valve coupled to each of the actuators.

13.3 Operations Procedures

The manufacturer's manuals for both the Asahi-America and Jordan Controls actuators and valves (Figure 13.3 and Figure 13.4 respectively) are included in Volume 1 - Appendix D.

Figure 13.3 Asahi-America Flow Control Valve

Figure 13.4 Jordan Control Valves and Sediment Strainers

13.4 Maintenance Requirements

The manufacturer's manuals for the flow control valves are included Volume 1 - Appendix D.

13.5 Troubleshooting

The manufacturer's manuals for the flow control valve are included in Volume 1 - Appendix D.

13.6 Recovery Well Sediment Strainers

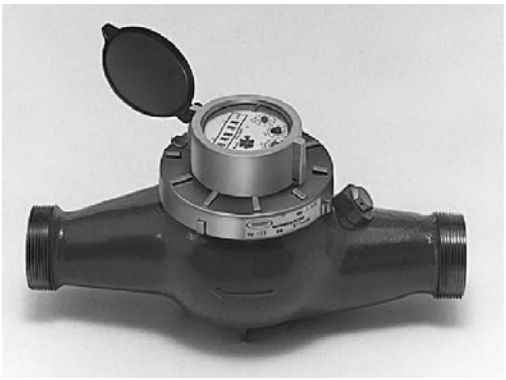
There are Asahi sediment strainers (Figure 13.5) installed in each of the recovery well water lines. There are cut sheets for the sediment strainers included in Volume 1 - Appendix D.

Figure 13.5 Asahi Sediment Strainers

14.0 RECOVERY WELL FLOW METERS, TRANSMITTERS, AND CONVERTERS

14.1 Description of Flow Meters, Transmitters and Converters

Figure 14.1 Niagara Series MTX Turbine Flow Meter with Totalizer



There are three recovery well water flow meters/transmitters (WFT) that are part of the groundwater treatment system. Each recovery well flow meter/transmitter consists of an impeller style flow meter with a totalizer, an infrared sensor transmitter, and a pulse to DC converter. The three flow meters are designated WFT-EPA-EXT-02,WFT-IW-01 and WFT-EPA-EXT-03. WFT-EPA-EXT-02 reads flow for both EPA-EXT-02 and EPA-MW-24 extraction wells. WFT-IW-01 reads flow for both EPA-IW-01 and EPA-EXT-04R extraction wells.

The Niagara series MTX flow meter with totalizer (Figure 14.1) contains an impeller that is driven by the liquid, which in turn increments the internal totalizer and also turns a rotating wheel inside the flow meter that activates a phototransistor in the infrared sensor transmitter (Figure 14.2). The transmitter converts the infrared signals to an electrical pulse signal. The pulse signal is then converted through the pulse to DC converter (Figure 14.3) into a 4-20mA electrical signal that is wired to the control panel.

Figure 14.2 Niagara Model 860 Infrared Transmitter

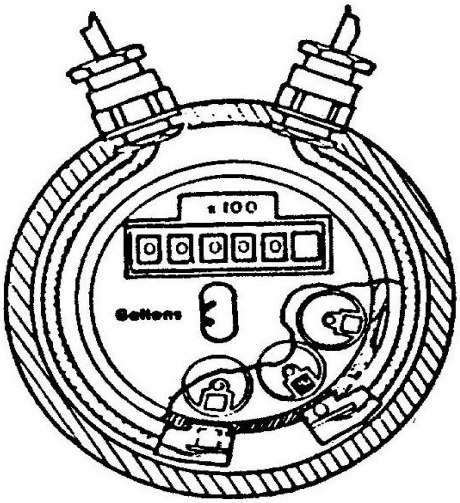
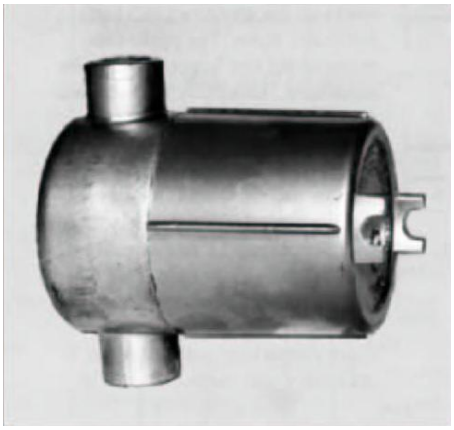


Figure 14.3 Niagara Model 1005 Pulse to DC Converter



The following table summarizes the specifications of each groundwater extraction well flow meter, infrared transmitter, and pulse DC converter.

WFT Number	Flow Meter Model Number	Transmitter Part Number	Converter Part Number
WFT-EPA-EXT-02	MTX	Niagara 860	Niagara Model 1005
WFT-IW-01	MTX	Niagara 860	Niagara Model 1005
WFT-EPA-EXT-03	MTX	Niagara 860	Niagara Model 1005

14.2 Manufacturer's Specifications

The three recovery well flow meters are impeller style, mechanical flow meters with mechanical totalizers. The infrared transmitters are built into the flow meter and are wired to the converter. The converter is wired into the control panel and the flow rate in gallons per minute (GPM) is displayed on the control panel.

Figure 14.4 Niagara Series MTX Recovery Well Flow Meters

14.3 Operation Procedures

The manufacturer's manuals for the Niagara Series MTX flow meter, the Niagara Model 860 Infrared Sensor, and the Niagara Model 1005 Pulse to DC Converter are included in Volume 1 - Appendix E.

14.4 Maintenance Requirements

The manufacturer's manuals for the flow control valves, infrared sensors, and pulse to DC converters are included in Volume 1 - Appendix E.

14.5 Troubleshooting

The manufacturer's manuals for the flow control valves, infrared sensors, and pulse to DC converters are included in Volume 1 - Appendix E.

15.0 INFLUENT PH AND CONDUCTIVITY SENSORS AND TRANSMITTERS

15.1 Description of System

Figure 15.1 TBI Bailey Two-Wire pH Transmitter

Figure 15.2 TBI Bailey Two-Wire Conductivity

There are multiple pH and conductivity sensors included in the GWTS to monitor the influent and effluent water properties. There are three pH sensors and transmitters in the system and two conductivity sensors and transmitters. There is a pH sensor located in the combined influent water line before the air stripper (INFPH – Fig 15.3), there is a pH sensor in the sump of the air stripper (ASPH – Fig 15.3) and there is a pH sensor in the effluent water line prior to discharge (DISCHPH – covered in Section 19.0). There is a conductivity sensor located in the combined influent water line before the air stripper (INFCOND – Fig 15.4) and there is a conductivity sensor located in the effluent water line prior to discharge (EFFCOND – covered in Section 19.0). The purpose of the pH sensors is to measure the pH of the water prior to and after the air stripper to determine if there is any need to adjust the pH of the water during the air stripping process. The discharge pH sensor is used to monitor the pH prior to discharge to maintain discharge requirements. The conductivity sensors are used to monitor the change in the conductivity of the water from influent to effluent and to maintain discharge conductivity requirements. The following tables show the specifics on each of the pH and conductivity transmitters (Figures 15.1 and 15.2, respectively) and sensors used.

The following table summarizes the pH sensor and pH transmitter manufacturer's part number, and pH sensor operating range.

pH Sensor Number	pH Sensor Manufacturer Number	pH Transmitter Manufacturer Part Number	pH Sensor Operating Range
INFPH	TBI-Bailey/ABB Model TB4	TBI-Bailey/ABB Model TB515	0-14 pH
ASPH	TBI-Bailey/ABB Model TB4	TBI-Bailey/ABB Model TB515	0-14 pH

The following table summarizes the conductivity sensor and transmitter manufacturer's part number, and conductivity sensor operating range.

Cond. Sensor Number	Cond. Sensor Manufacturer Part Number	Cond. Transmitter Manufacturer Part Number	Cond. Sensor Operating Range
INFCOND	TBI-Bailey/ABB Model TB4	TBI-Bailey /ABB Model 417	Variable 0-1,000,000 uS/cm

15.2 Manufacturer's Specifications

The TBI Bailey/ABB Model TB515 two-wire pH transmitters (Figure 15.1) are designed to convert an electrode signal from the associated pH sensor to an isolated 4-20 mA output.

Figure 15.3 TBI Bailey/ABB pH Sensor

Figure 15.4 TBI Bailey/ABB Conductivity Sensor

There is an LCD readout on each of the pH transmitters, which allows for local monitoring of pH levels as well as aiding in calibration of the transmitter. There are front panel controls on the transmitter for zero and span adjustments if necessary. The pH sensor is an insertion type sensor that is installed in a twist lock fitting in the water lines for ease in removal and service, if necessary.

The TBI Bailey/ABB Model TB417 two-wire conductivity transmitters (Figure 15.2) are designed to convert an on-stream conductivity sensor signal to an isolated 4-20 mA output. There is an LCD readout on each of the conductivity transmitters, which allows for local monitoring of conductivity levels as well

as aiding in calibration of the transmitter. There are front panel controls on the transmitter for zero and span adjustments, if necessary. There is also a front panel range switch, which allows for transmitter range factors from 0.01 to 100.0, which extend the measurement range of the conductivity sensor. The conductivity sensor is an insertion type sensor that is installed in a twist lock fitting in the water lines for ease in removal and service, if necessary.

15.3 Operation Procedures

The manufacturer's manuals for the pH and conductivity transmitters are included in Volume 1 - Section 1 of Appendix F.

The manufacturer's manuals for the pH and conductivity sensors are included in Volume 1 - Section 2 of Appendix F.

Figure 15.5 pH and Conductivity Meters Installed in Influent Water Line

15.4 Maintenance Requirements

The manufacturer's manuals for the pH and conductivity transmitters are included in Volume 1 - Section 1 of Appendix F.

The manufacturer's manuals for the pH and conductivity sensors are included in Volume 1 - Section 2 of Appendix F.

15.5 Troubleshooting

The manufacturer's manuals for the pH and conductivity transmitters are included in Volume 1 - Section 1 of Appendix F.

The manufacturer's manuals for the pH and conductivity sensors are included in Volume 1 - Section 2 of Appendix F.

16.0 VAPOR-PHASE CARBON

16.1 Description of the System

Figure 16.1 Envirotrol VPM 3000/Envirotrol VPM 2500 Vapor Phase Carbon Adsorbers

The discharge air from the SVE system goes through treatment in an Envirotrol Model VPM-2500 vapor-phase carbon absorber vessel before discharge into the atmosphere. The Envirotrol Model VPM-2500 is located outside the treatment building. The absorber is a prefabricated steel vessel that contains approximately 2,500 lbs. of vapor phase activated carbon. The air that needs to be treated is piped into the vessel through a 12" flange opening on the bottom of the vessel. The treated air comes out of the top of the vessel and is discharged to the atmosphere.

There are air flow meters both before and after the vapor phase carbon to allow monitoring of the airflow through the vessel to assure there are no blockages in the carbon. There is also a pressure transducer before the vessel to monitor when the backpressure generated from the carbon increases, which is a sign that the carbon is beginning to become saturated.

16.2 Manufacturer's Specifications

The vapor phase carbon adsorber vessel for the GWP&T system is an Envirotrol Model VPM-3000. The vapor phase carbon adsorber for the SVE system is an Envirotrol Model VPM-2500. The adsorbers will hold approximately 3,000 lbs. and 2,500 lbs. of vapor phase carbon, respectively. The manufacturer rates the VPM-3000 at a maximum airflow of 1,200 CFM and the VPM-2500 at a maximum flow rate of 1,000 CFM. They are constructed of carbon steel with an internal coating of an epoxy resin and an external coating of industrial enamel.

16.3 Operations Procedures

The manufacturer's manual for the vapor-phase carbon absorber vessels and vapor-phase carbon are included in Volume 1 - Section 1 of Appendix G.

16.4 Maintenance Requirements

The manufacturer's manual for the vapor-phase carbon absorber vessels and vapor-phase carbon are included in Volume 1 - Section 1 of Appendix G.

16.5 Troubleshooting

The manufacturer's manual for the vapor-phase carbon absorber vessels and vapor-phase carbon are included in Volume 1 - Section 1 of Appendix G.

17.0 AQUEOUS-PHASE CARBON

17.1 Description of System

The discharge water from the recovery wells goes through a single 3000-lb liquid-phase carbon absorber vessel. The absorber is a steel vessel that contains approximately 3000 lbs. of aqueous-phase carbon. The vessel is piped so the water travels from the recovery wells, into the top of the vessel, out the bottom to discharge.

There is one water flow meter before the carbon vessel, and there is one water flow meter and transmitter after the carbon vessel prior to discharge

17.2 Manufacturer's Specifications and Operations Procedures

The manufacturer's manual for the aqueous-phase carbon absorber vessel and aqueous-phase carbon are included in Volume 1 - Section 2 of Appendix G.

17.3 Maintenance Requirements

The manufacturer's manual for the aqueous-phase carbon absorber vessel and aqueous-phase carbon are included in Volume 1 - Section 2 of Appendix G.

17.4 Troubleshooting

The manufacturer's manual for the aqueous-phase carbon absorber vessel and aqueous-phase carbon are included in Volume 1 - Section 2 of Appendix G.

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18.0 EFFLUENT pH AND CONDUCTIVITY SENSORS AND TRANSMITTERS

18.1 DESCRIPTION OF SYSTEM

Figure 18.1 TBI Bailey TB82 pH Transmitter

There is a pH meter and a conductivity meter included in the GWTS to monitor the effluent water properties. There is a pH transmitter (Figure 18.1) and sensor (Figure 18.3) located in the effluent water line after the aqueous-phase carbon vessels prior to discharge (DISCHPH). There is also a conductivity transmitter (Figure 18.2) and sensor (Figure 18.4) located in the effluent water line after the aqueous-phase carbon vessels prior to discharge (EFFCOND). The discharge pH meter is used to monitor the pH prior to discharge to maintain the discharge requirements. The conductivity sensor is used to monitor the effluent water conductivity to maintain the discharge conductivity requirements.

Figure 18.2 TBI Bailey Two-wire Conductivity Transmitter

Figure 18.3 TBI Bailey/ABB pH Sensor

Figure 18.4 TBI Bailey/ABB Conductivity Sensor

The following table summarizes pH sensor manufacturer part number and operating range, and pH transmitter manufacturer part number.

pH Sensor Number	pH Sensor Manufacturer Number	pH Transmitter Manufacturer Part Number	pH Sensor Operating Range
DISCHPH	TBI-Bailey/ABB Model TB4	TBI-Bailey/ABB Model TB82	0-14 pH

The following tables summarize conductivity sensor manufacturer part number and operating range, and conductivity transmitter manufacturer part number.

Cond. Sensor Number	Cond. Sensor Manufacturer Part Number	Cond. Transmitter Manufacturer Part Number	Cond. Sensor Operating Range
EFFCOND	TBI-Bailey/ABB Model TB4	TBI-Bailey /ABB Model 417	Variable 0 - 1,000,000 uS/cm

18.2 Manufacturer's Specifications

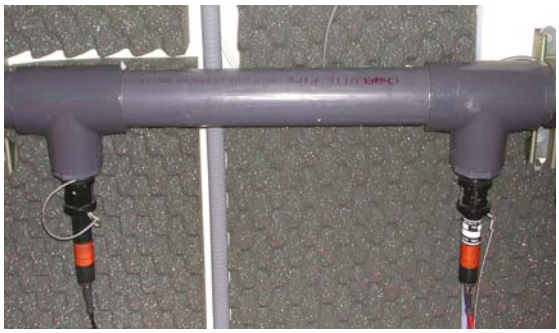
The TBI Bailey/ABB Model TB82 pH transmitter (Figure 18.5) is a microprocessor-based instrument that is designed to convert an electrode signal from the associated pH sensor to an isolated 4-20 mA output. There is an operator interface on the transmitter that allows for user configuration and calibration. The pH sensor is an insertion type sensor that is installed in a twist lock fitting in the water lines for ease in removal and service, if necessary.

Figure 18.5 Discharge pH and Conductivity Transmitter

The TBI Bailey/ABB Model 417 two- wire conductivity transmitters (Figure 18.5) are designed to convert an on-stream conductivity sensor signal to an isolated 4-20 mA output. There is an LCD readout on each of the conductivity transmitters, which allows for local monitoring of conductivity levels as well as aiding in calibration of the transmitter. There are front panel controls on the transmitter for zero and span adjustments, if necessary. There is also a front panel range switch, which allows for transmitter range factors from 0.01 to 100.0, which extend the measurement range of the conductivity sensor. The conductivity sensor is an insertion type sensor that is installed in a twist lock fitting in the water lines for ease in removal and service, if necessary.

18.3 Operation Procedures

Figure 18.6 Discharge pH and Conductivity Sensors



The manufacturer's manuals for the pH transmitter (Figure 18.6) and conductivity transmitter (Figure18.6) are included in Volume 1 - Section 1 of Appendix F.

The manufacturer's manuals for the conductivity transmitter and pH sensor are included in Volume 1 - Section 2 of Appendix F.

18.4 Maintenance Requirements

The manufacturer's manuals for the pH transmitter and conductivity transmitter are included in Volume 1 - Section 1 of Appendix F.

The manufacturer's manuals for the conductivity transmitter and pH sensor are included in Volume 1 - Section 2 of Appendix F.

18.5 Troubleshooting

The manufacturer's manuals for the pH transmitter and conductivity transmitter are included in Volume 1 - Section 1 of Appendix F.

The manufacturer's manuals for the conductivity transmitter and pH sensor are included in Volume 1 - Section 2 of Appendix F.

19.0 EFFLUENT WATER FLOW METERS AND VALVES

19.1 Description of System

Figure 19.1 Discharge Valve and Water Flow Meter

After the air stripper treated water goes through the final "polishing" phase in the aqueous carbon vessels; it will normally be discharged to the storm sewer. There is an effluent water flow meter (Figure 20.1) that totalizes the gallons pumped to the storm sewer, as well as sending an instantaneous flow rate to the control panel, which is displayed on the user interface screen. There are valves however, to re-circulate the water into the holding tank (Section 21.0) if desired. Currently this re-circulation loop is not an automatic system function, and, therefore, must be manually started. The recirculation process involves closing the discharge valve and opening the recirculation valve, which allows the treated water to go into the holding tank. This is done through HOA switches on the control panel. The holding tank will pump into the air stripper and the water will continue to re-circulate through the system until the valves are changed and the water can be discharged. The discharge flow meter is identical to the recovery well flow meters, just larger to accommodate a higher GPM. The discharge and re-circulation valves are similar to the Asahi-America recovery well flow control valves, without the 4-20 mA input. They are only open or close valves.

19.2 Manufacturer's Specifications

The discharge flow meter is an impeller style, mechanical flow meter with a mechanical totalizer. The infrared transmitter is built into the flow meter and is wired to the converter. The converter is wired into the control panel, and the flow rate in gallons per minute (GPM) is displayed on the control panel.

The discharge and re-circulation valves (Figure 19.2) are electrically actuated flow control valves that are made up of two components. There is an electrical actuator that is changeable from open to close by separate 110 VAC signals. There is also a valve coupled to each of the actuators.

19.3 Operation Procedures

The manufacturer's manuals for the Niagara Series MTX flow meter, the Niagara Model 860 Infrared Sensor, and the Niagara Model 1005 Pulse to DC Converter are included in Volume 1 - Appendix E. The manufacturer's manuals for the discharge and re-circulation actuators and valves are included in Volume 1 - Appendix D.

Figure 19.2 Recirculation Valve

19.4 Maintenance Requirements

The manufacturer's manuals for the Niagara Series MTX flow meter, the Niagara Model 860 Infrared Sensor, and the Niagara Model 1005 Pulse to DC Converter are included in Volume 1 - Appendix E.

The manufacturer's manuals for the discharge and re-circulation actuators and valves are included in Volume 1 - Appendix D.

19.5 Troubleshooting

The manufacturer's manuals for the Niagara Series MTX flow meter, the Niagara Model 860 Infrared Sensor, and the Niagara Model 1005 Pulse to DC Converter are included in Volume 1 - Appendix E.

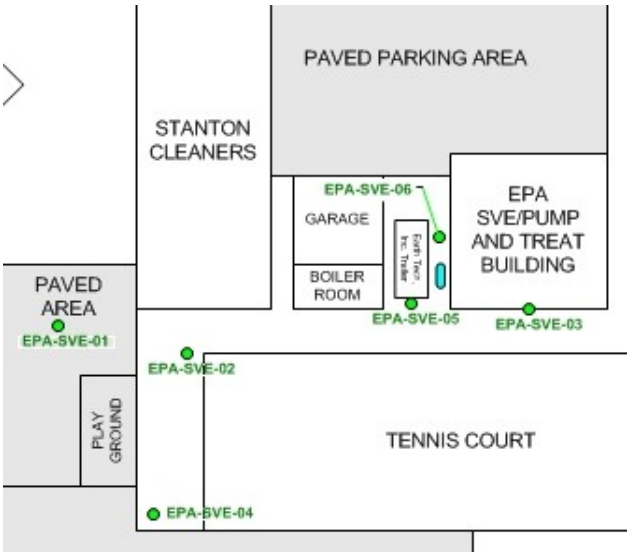
The manufacturer's manuals for the discharge and re-circulation actuators and valves are included in Volume 1 - Appendix D.

20.0 SOIL VAPOR EXTRACTION

20.1 Description of System

The soil vapor extraction (SVE) system is used to extract and treat before discharge into the atmosphere, sub-surface vapors from the surrounding SCP area. The SVE system consists of six-vapor extraction wells located around the SCP (Figure 20.1A). The extraction wells are piped to the treatment building and into the SVE knockout tank. The knockout tank is used to capture any excess moisture and water that may be present before the vapors are treated in the Envirotrol VPM 2500 vapor-phase carbon vessel (Section 16.0). The water that is accumulated in the knockout tank is automatically pumped into the holding tank and from there, pumped into the air stripper for treatment and eventual discharge to the storm sewer.

Figure 20.1A Vapor Monitoring Locations at the Stanton Cleaners Property



In addition, several sub-slab SVE wells have been added to the SVE system. The locations of the sub-slab monitoring/extraction points connected to the influent of the SVE system (EPA-SVE-4R, Slab-A, Slab-B, Slab-C, and Slab-D) are included in Figure 20.1B. In addition, Sub-Slab HBRU (located at the Long Island Hebrew Academy) and Vapor Point-1 are monitored bi-weekly. The Sub-Slab HBRU is connected to a radon unit and the effluent is released to the atmosphere. Sub-Slab HBRU is not connected to the SVE system.

The SVE system is a skid mounted unit with a knockout tank, positive displacement blower and motor, silencer, filter, three liquid level switches, transfer pump and motor, air flow meter, vacuum transducer, butterfly valve, and two manual vacuum gauges (Figure 20.2).

The SVE knockout tank is a 120-gallon tank mounted horizontally on a base with wheels. There are three liquid level switches mounted on one end of the tank that are used to control the operation of the transfer pump. The blower and motor are mounted on top of the tank. There is steel piping that allows for proper air travel from the extraction wells, into the knockout tank, through the inline filter, through a vacuum relief valve, into the blower, and out through the silencer. There is a vacuum transducer on the inlet side

of the knockout tank to measure vacuum in inches of water column (w.c.) from the extraction wells. There is an air flow meter after the system to measure airflow from the SVE unit.

Figure 20.1B Vapor Monitoring Locations at the Stanton Cleaners Property

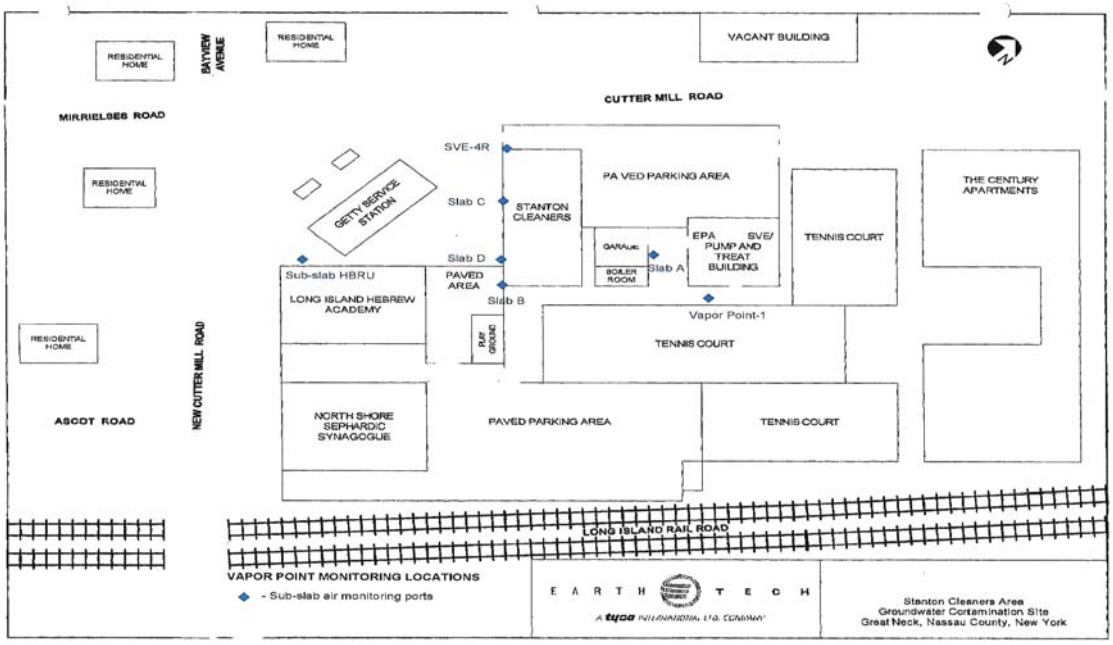


Figure 20.2 Soil Vapor Extraction System

20.2 Manufacturer's Specifications

The following table summarizes the specifics of each of the components used in and in conjunction with the soil vapor extraction system.

Component Name	Manufacturer	Model or Part Number	Details
SVEKOTANK	Brunner	120 gallons	120-gallon
SVBLR	Sutorbilt	4MP	----------
SVBLRMOTOR	Baldor	M3714T	10 HP, 3-phase
SVSILENCER	Stoddard	Series D33H	----------
SVFILTER	Stoddard	F75-2 1/2	----------
SVHHL, SVHL, SVLL	McMaster-Carr	Side mount liquid level switches	----------
SVPMP	Price	CD100	CD100-350-6A212-75-36-IT6
SVPMPMOTOR	Leeson	M2394T	15 HP, 3-phase
SVVAC	Dwyer	Series 621	In. Hg
SVVACGAUGE	Noshok	316 SS Tube & Socket	In. Hg
SVVALVE	Spears/Mastergear	98 Series	8 inches
SVFLOW	ERDCO	3600 series w/ signal output	0-500 CFM
SVGAC	Envirotrol	VPM 2500	15 PSIG, 2,500 lbs capacity, 1,000 CFM

20.3 Operation Procedures

The manufacturer's manuals for the components associated with the SVE including the Dwyer pressure indicator, the knockout tank, the Sutorbilt vacuum blower, vacuum blower motor, knockout tank transfer pump, knockout transfer pump motor, silencer, and silencer filters are included in Sections 1 through 3 of Volume 1 - Appendix I. The Spears butterfly valves and liquid level switches cut sheets are included in Section 5 of Volume 1 – Appendix G.

20.4 Maintenance Requirements

The manufacturer's manuals for the components associated with the SVE including the Dwyer pressure indicator, the knockout tank, the Sutorbilt vacuum blower, vacuum blower motor, knockout tank transfer pump, knockout transfer pump motor, silencer, and silencer filters are included in Sections 1 through 3 of Volume 1 - Appendix I. The Spears butterfly valves and liquid level switches cut sheets are included in Section 5 of Volume 1 – Appendix G.

20.5 Troubleshooting

The manufacturer's manuals for the components associated with the SVE including the Dwyer pressure indicator, the knockout tank, the Sutorbilt vacuum blower, vacuum blower motor, knockout tank transfer pump, knockout transfer pump motor, silencer, and silencer filters are included in Sections 1 through 3 of Volume 1 - Appendix I. The Spears butterfly valves and liquid level switches cut sheets are included in Section 5 of Volume 1 – Appendix G.

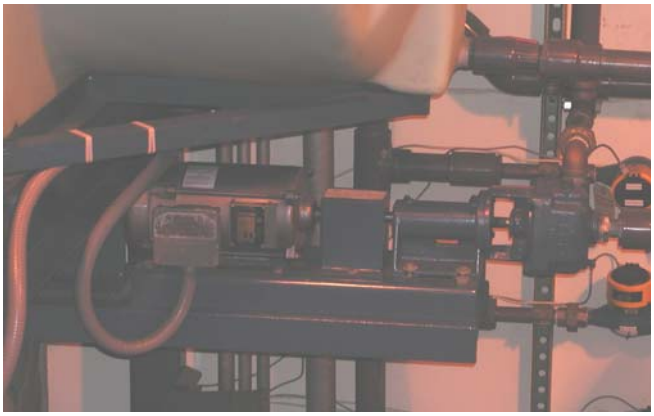
21.0 HOLDING TANK AND TRANSFER PUMP

21.1 Description of System

There is a 1,025 gallon Chem-tainer tank (Figure 21.1) included in the groundwater treatment system that serves as a holding tank for the groundwater, the water transferred out of the SVE knockout tank, and for any water that needs to be re-circulated through the treatment system. The tank is mounted on top of a platform stand above the SVE unit. There are three liquid level switches mounted in the side of the tank that operate the holding tank transfer pump. The transfer pump (Figure 21.2) will pump the holding tank water into the air stripper for treatment.

Figure 21.1 Holding Tank

Figure 21.2 Holding Tank Transfer Pump



21.2 Manufacturer's Specifications

The holding tank is manufactured from linear polyethylene in a one-piece seamless construction. The tank has a 16" covered opening in the top for clean out access or water observation, if necessary.

The transfer pump is mounted on the stand holding the tank and is piped into the influent water line going into the air stripper.

The following table summarizes specifics of each of the components used in and in conjunction with the holding tank and transfer pump.

Component Name	Manufacturer	Model or Part Number	Details
HOLDTANK	Chem-tainer	TN1025LC	1,025 gallon
HOLDHHL, HOLDHL, HOLDLL	McMaster-Carr	Side mount liquid level switches	----------
HOLDPMP	Burks	ES Series	X3104ES9MV
HOLDPMPMOTOR	Baldor	M7014T	3/4 HP, 3 phase
SVPMPMOTOR	Leeson	M2394T	15 HP, 3-phase

21.3 Operation Procedures

The manufacturer's manuals for the holding tank, transfer pump, and transfer pump motor are included in Sections 1 and 2 of Volume 1 - Appendix J.

21.4 Maintenance Requirements

The manufacturer's manuals for the holding tank, transfer pump, and transfer pump motor are included in Sections 1 and 2 of Volume 1 - Appendix J.

21.5 Troubleshooting

The manufacturer's manuals for the holding tank, transfer pump, and transfer pump motor are included in Sections 1 and 2 of Volume 1 - Appendix J.

22.0 CONTROL PANEL

22.1 Description of System

Figure 22.1 Treatment System Control Panel - Exterior

The treatment system control panel (Figures 22.1 and 22.2) contains the electrical components, which automate the operation of both the GWTS and the SVE systems. The control panel contains all of the motor controls which provide power to the pumps, blowers, valves etc. that are used in the treatment system, as well as providing short circuit and overload protection for all of the motors. There are HOA switches for all of the major components, so that all of the pumps and blowers can either be operated manually or be automatically controlled by the control panel. The PLC unit, located in the control panel, controls all of the system automation functions, including turning pumps and blowers on and off, opening and closing valves, and monitoring all of the system sensors and transmitters. The user interface screen is mounted in the panel and in conjunction with the panel mounted PC, provides a graphical representation of the operation of all of the components of the system. The graphics screen allows the user to change user adjustable settings (flow control valve open percentage and alarm set points) as well as monitor system variables (pH and conductivity levels, pressure, vacuum, flow rates, and flow totals). The control panel has the field connection terminals, which are the termination places for all of the wiring coming from the equipment in the treatment system.

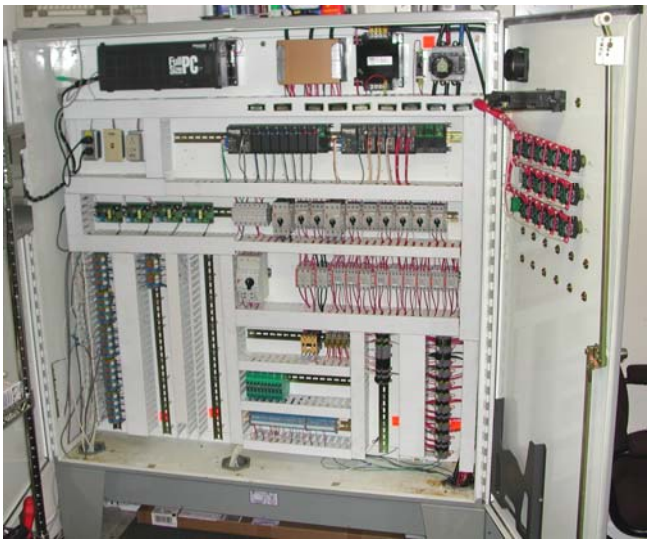
22.2 Manufacturer's Specifications

The control panel is capable of controlling up to 200A worth of equipment (motors, valves, power supplies, PLC hardware, etc.). There are currently motor starters in the control panel with the ability of controlling up to 11 motors of varying horsepower. The PLC unit in the control panel is currently capable of 40 analog inputs, 4 analog outputs, 32 low voltage (24 VDC) inputs, 16 high voltage (110 VAC) inputs, and 24 relay outputs. The panel mounted PC is capable of monitoring and controlling up to 500 I/O from the PLC hardware.

22.3 Operation Procedures

The manufacturer's manuals for all of the components associated with the control panel including Hoffman paint, disconnect switches, power distribution blocks, fuse terminal blocks, motor circuit controllers, contactors, feed through terminal blocks, ground terminal blocks, DIN rail, PLC enclosure, central processing unit (CPU), analog current input modules, analog current output modules, CD input modules, AC input modules, relay output modules, serial remote I/O master/slave modules, open board power supply, PLC, monitor and touch monitor, pilot devices, the Direct32 package software, and switching devices are included in Sections 1 through 12 of Volume 2 - Appendix K.

Figure 22.2 Treatment System Control Panel - Interior



22.4 Maintenance Requirements

The manufacturer's manuals for all of the components associated with the control panel including Hoffman paint, disconnect switches, power distribution blocks, fuse terminal blocks, motor circuit controllers, contactors, feed through terminal blocks, ground terminal blocks, DIN rail, PLC enclosure, central processing unit (CPU), analog current input modules, analog current output modules, CD input modules, AC input modules, relay output modules, serial remote I/O master/slave modules, open board power supply, PLC, monitor and touch monitor, pilot devices, the Direct32 package software, and switching devices are included in Sections 1 through 12 of Volume 2 - Appendix K.

22.5 Troubleshooting

The manufacturer's manuals for all of the components associated with the control panel including Hoffman paint, disconnect switches, power distribution blocks, fuse terminal blocks, motor circuit controllers, contactors, feed through terminal blocks, ground terminal blocks, DIN rail, PLC enclosure, central processing unit (CPU), analog current input modules, analog current output modules, CD input modules, AC input modules, relay output modules, serial remote I/O master/slave modules, open board power supply, PLC, monitor and touch monitor, pilot devices, the Direct32 package software, and switching devices are included in Sections 1 through 12 of Volume 2 - Appendix K.

22.6 Control Panel Drawings

Figure 4 includes control panel wiring diagrams.

22.7 Ladder Control

The PLC Ladder Logic diagrams are included as Figure 5. The ladder logic diagrams are for information purposes only. The Plant Operator should not try to adjust or change the ladder logic. If the treatment system requires a change in the logic then a Process Control Engineer or an Electrical Engineer will be required to change the logic.

23.0 TREATMENT BUILDING

23.1 Description of Building

The water treatment building is a 30'X40'X24' structure consisting of a wood frame anchored to a concrete pad with a sheet metal roof and sheet metal siding. The building is supplied with 400 A, 240 VAC electrical power from Long Island Power Association (LIPA). The building contains two offices downstairs with a combination office and electrical control room in the upstairs. The control room contains the control panel, which operates the components for the automated EPA groundwater/soil vapor extraction systems.

23.1.1 Ceiling Fans

Two commercial ceiling fans are installed in the water treatment building treatment system area to provide general air circulation. By minimizing temperature stratification in the winter, they reduce heating costs in high ceiling buildings.

System Maintenance
All bearings are permanently lubricated and do not require further lubrication. The fan blades may be wiped off with a damp cloth. Do not allow the motor to get wet and do not use solvents or harsh detergents.

System Repairs
Refer to Section 1 of Volume 2 - Appendix L for the manufacturer's manuals for the commercial ceiling fan operation.

23.1.2 Exhaust Fans

There are two ventilation exhaust fans (Figure 23.1) installed in the side of the building opposite the offices. Variable speed fan controls are located next to the overhead garage door opener in the treatment room. The exhaust fans can be operated when necessary to promote air circulation through the treatment room. A new smaller exhaust fan and motor was installed in the GWTS building. This new fan removes less total airflow, and maintains enough air transfer to remove any VOCs that may enter the building space from the treatment system components. The smaller fan doesn't exhaust too much air to where the heat is removed from the offices.

Figure 23.1 Treatment Room Exhaust Fan

System Maintenance
Periodically inspect all the electrical and mechanical parts.

System Repairs
Repair the exhaust fans according to the manufacturer's manual.

Exhaust Fan Variable Speed Switch
Refer to Section 1 of Volume 2 - Appendix L for the manufacturer's manual for the Dayton electric motor speed controls.

23.1.3 Overhead Garage Door

There is an overhead garage door located on the side of the building facing the dry cleaner's parking lot. The door allows access to the treatment building and to the treatment system equipment. The door is operated by either of two garage door opener switches. One is located outside the garage door in a separate electrical box with a padlock on it and one is directly inside the door, mounted on the wall.

System Maintenance
Periodically inspect all the electrical and mechanical parts.

System Repairs
Repair the garage door according to the manufacturer's manuals.

Overhead Garage Door Opener
Refer to Section 2 of Volume 2 - Appendix L for the manufacturer's manual for the overhead garage door opener.

Overhead Garage Door Opener Switch
Repair the garage door opener switch according to the manufacturer's manual.

23.1.4 Treatment Room Heater

Figure 23.2 Treatment Room Heater

There is a Dayton fan forced heater (Figure 23.2) installed to heat the treatment system room, if necessary. The unit is mounted above the electrical panels directly next to the overhead garage door. There is a thermostat for the heater located below the heater, mounted on the wall. Turn the thermostat to the desired temperature, if necessary.

System Maintenance
Periodically inspect all the electrical and mechanical parts.

System Repairs
Refer to Section 1 of Volume 2 - Appendix L for the manufacturer's manual for the treatment room heater.

23.2 Emergency/Safety Equipment

Exit Signs/ Emergency Lights
Refer to Section 3 of Volume 2 - Appendix L for the manufacturer's manual for the exit signs/emergency lights.

Smoke Alarms
Installed by ECC in June 2005. A total of four were installed, two on the first floor, and two on the second floor of the offices section of the EPA groundwater treatment building.

Fire Suppression
There is a sprinkler system installed throughout the EPA groundwater treatment building. This sprinkler system will activate itself in the event of a fire. Sprinkler system specifications are included in Section 3 of Volume 2 - Appendix L.

There is a fire extinguisher located next to the overhead garage door. The fire extinguisher is tagged with the most recent inspection. The manufacturer's manual for the fire extinguisher is included in Section 3 of Volume 2 - Appendix L.

23.3 Miscellaneous Equipment

Treatment Room Light Fixtures
Refer to Section 6 of Volume 2 - Appendix L for the manufacturer's manual for the treatment room light fixtures.

Wireless Answering Machine
Refer to Section 4 of Volume 2 - Appendix L for the manufacturer's manual for the wireless answering machine.

24.0 OFFICE AREAS

Included in the treatment building are three office areas. There are two office spaces (Figure 24.1) on the first floor of the treatment building. Each office has its own outside door and there is an inside door connecting the two offices. Both of the downstairs offices are approximately 13'X10', with one of the offices having a storage closet for filing cabinets, storage etc. Both offices have individual baseboard heaters with their own thermostats. The front office has a window, which opens up to the parking lot in front of the treatment building.

Figure 24.1 EPA Office Located in the First Floor of the EPA Groundwater Treatment Building

The upstairs office area is approximately 19'X10'. The treatment system control panel is located in the upstairs office area. Attached to the upstairs office is a 7'X10' copy/coffee/water area. The upstairs offices have two windows, which open up to the side of the building facing the garage next door. The upstairs office area also has baseboard heaters, which are controlled by their own thermostat. A separate thermostat for the building air handler/air conditioning is located in the upstairs office area. The air handler itself is in the attic, which is accessed via a fold down staircase, located in the upstairs office.

Office Area Air Handler
Refer to Section 5 of Volume 2 - Appendix L for the manufacturer's manual for the office area air handler.

Office Area Light Fixtures
Refer Section 6 of Volume 2 - Appendix L for the manufacturer's manual for the office area light fixtures.

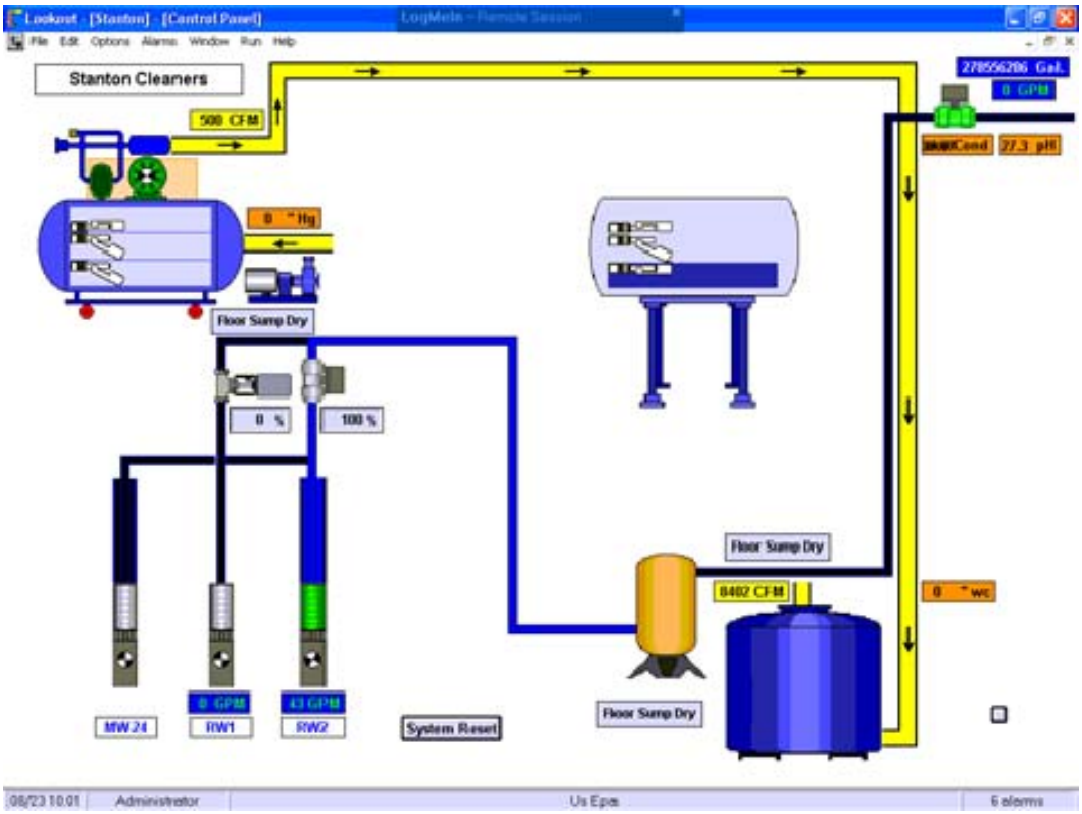
Baseboard Heaters
Refer to Section 6 of Volume 2 - Appendix L for the manufacturer's manual for the baseboard heaters.

Attic Fan
There is a 120V exhaust fan in the attic for ventilation in the summer. A thermostat located next to the fan controls it.

25.0 TREATMENT SYSTEM AUTOMATION

The treatment system is controlled via an electrical control panel that is located in the upstairs offices. The control panel contains a programmable logic controller (PLC) that controls all automated system functions. The PLC is used to control the system logic including pump and blower on and off logic, monitoring of system alarms, and monitoring of system instruments (level switches, flow meters, pH, and conductivity meters etc.). Also in the control panel is a panel mounted personal computer (PC) that performs all of the system monitoring data logging, allows for alarm notification and logging, and runs the graphical user interface program for the system shown below (Figure 25.1).

Figure 25.1 PLC Program Window Display as Seen in the Mounted Control Panel Computer Screen



Treatment System Startup/Shutdown
Refer to Appendix A for the treatment system startup/shutdown procedures.

Treatment System Data Downloading
Refer to Appendix A for the treatment system data downloading procedures.

26.0 REFERENCES

Record of Decision (ROD)

U.S. EPA Region II, Record of Decision (ROD) for the Stanton Cleaners Area Groundwater Contamination Site, March 31, 1999. (See Reference 4 below).

EPA 540-F-01-004

EPA Document EPA 540-F-01-004 is included in Volume I - Appendix 13.1.

Other References

Remedial Investigation and Feasibility Study, Stanton Cleaners Site, Great Neck, NY, dated 1998, prepared by Dvirka and Bartilucci for the NYSDEC.

Proposed Remedial Action Plan for the Stanton Cleaners Area Groundwater Contamination Site, Operable Unit 1, dated 1999, prepared by Dvirka and Bartilucci for the NYSDEC.

Focused Feasibility Study and Interim Remedial Measure/Presumptive Remedy Selection, dated January 1999, Stanton Cleaners Area Groundwater Contamination Site, Operable Unit 1, prepared by Dvirka and Bartilucci for the NYSDEC.

U.S. EPA Region II, Record of Decision (ROD) for the Stanton Cleaners Area Groundwater Contamination Site. March 31, 1999.

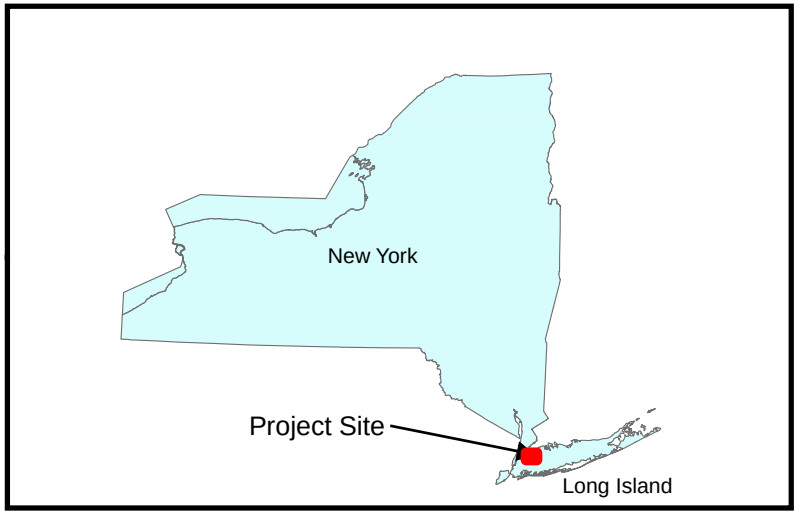
U.S. EPA Region II, Action Memorandum: Authorization to Initiate Remedial Design Activities Related to the Groundwater Extraction and Treatment System at the Stanton Cleaners Area Groundwater Contamination Site, Town of North Hempstead, Nassau County, New York. August 20, 1999.

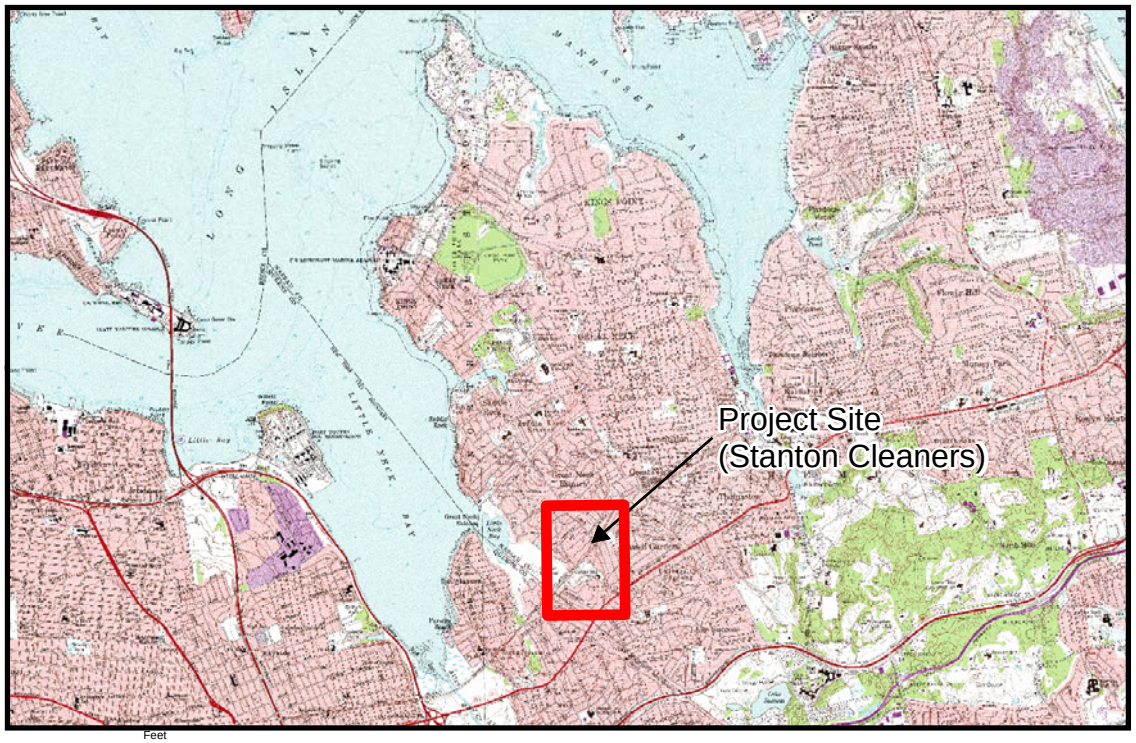
U.S. EPA Region II, Action Memorandum: Authorization to a CERCLA Removal Action at the Stanton Cleaners Site, Great Neck, Nassau County, New York. September 14, 1998.

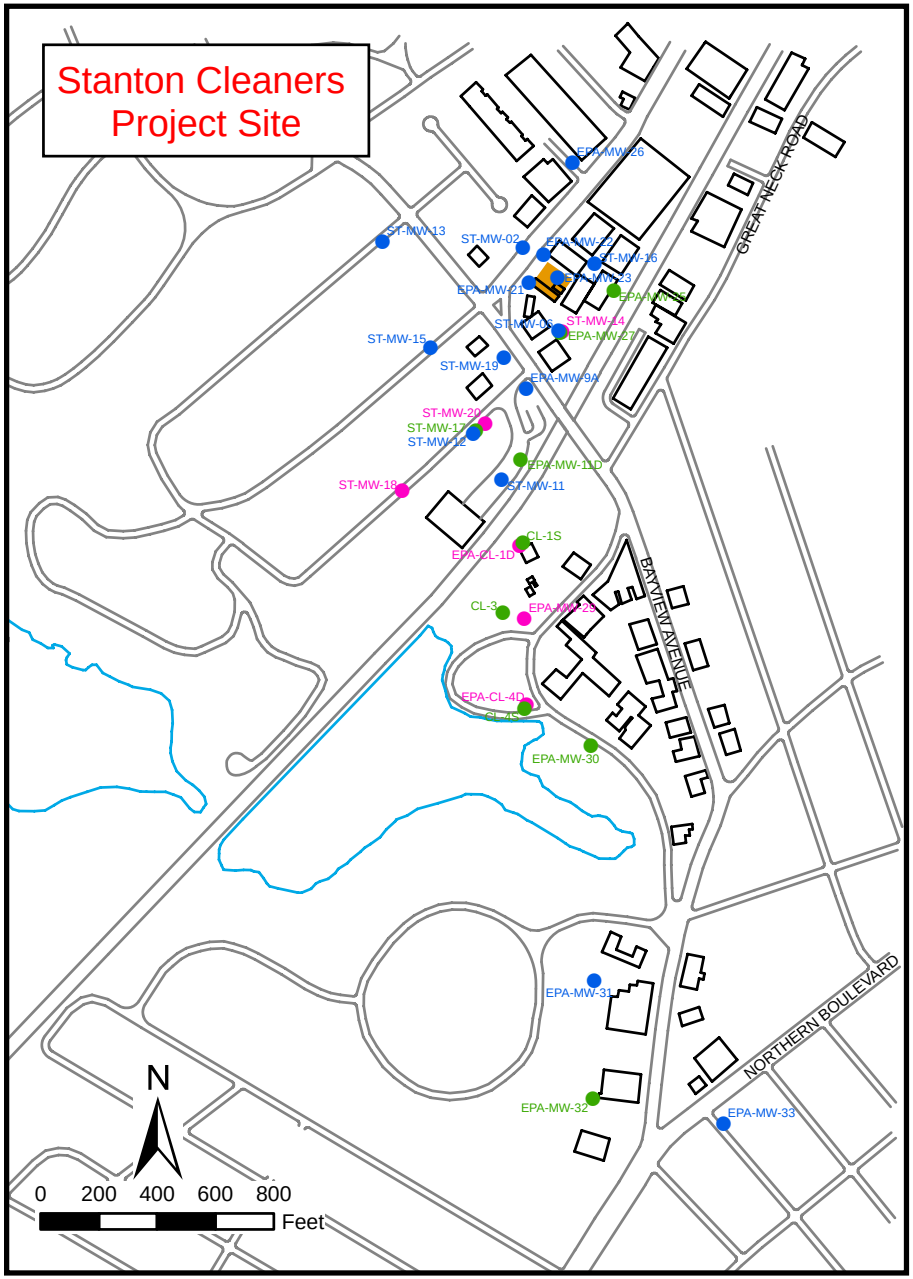
U.S. EPA Region II, Action Memorandum: Authorization to request and document approval of a Change in Scope of Response, Ceiling Increase and 12-Month Exemption for the Removal Action at the Stanton Cleaners Area Groundwater Contamination (a.k.a. Stanton French Cleaners) Site (Site), Great Neck, Nassau County, New York. August 5, 1999.

Technical Guidance: Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites, OSWER 9283.1-12. October 1996.

FIGURES







Legend

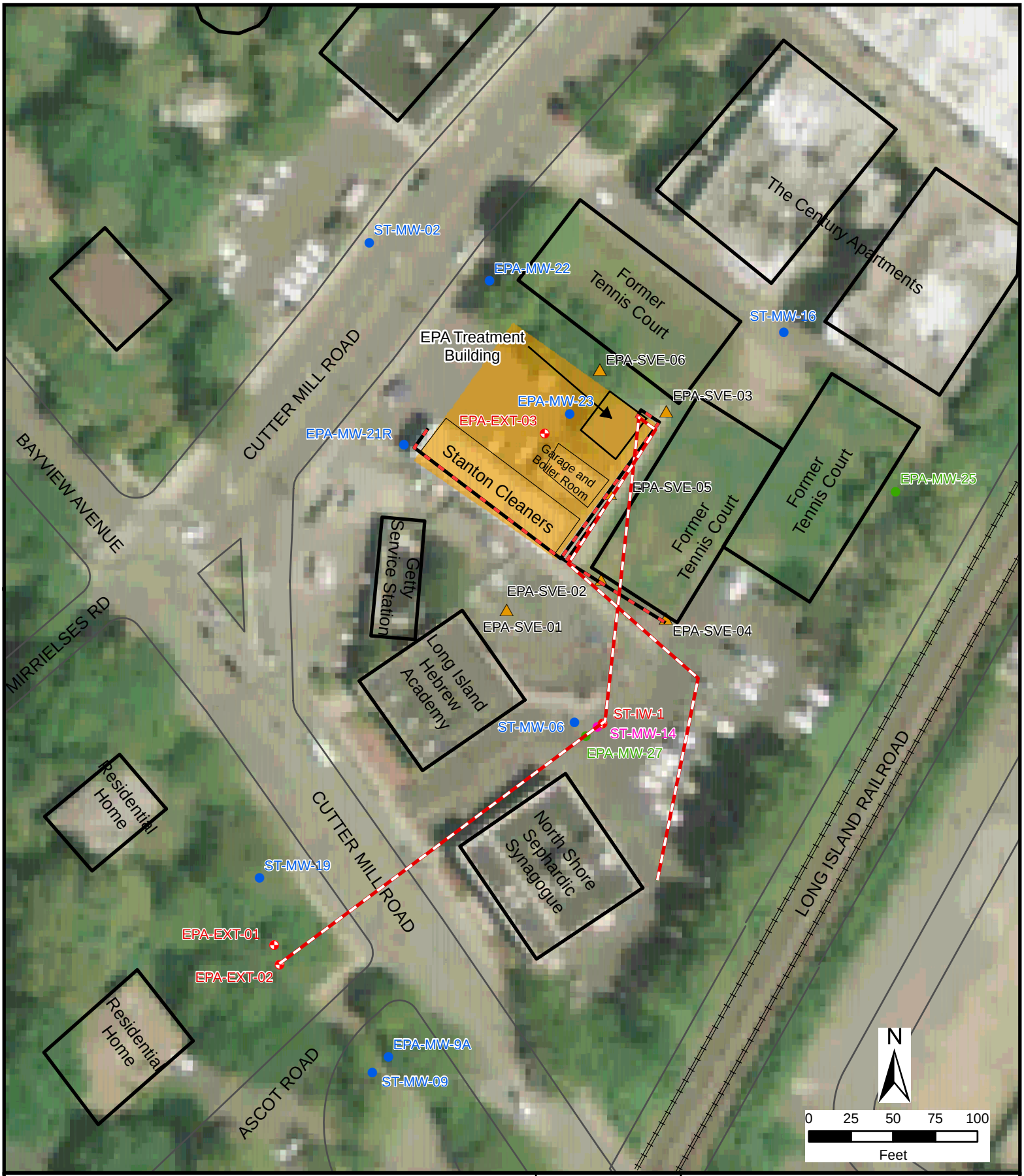
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Water
- Roads
- Buildings
- Stanton Cleaners Property

ECC
1125 Route 22 West
Bridgewater, NJ 08807

STANTON CLEANERS, GREAT NECK, NEW YORK

FIGURE 1
SITE LOCATION MAP

Drawn by: M Johanson	Reviewed by:	Projection: North American Datum 1983 State Plane New York Long Island, FIPS 3104 Units: Feet
Date: 8/30/2012	Date:	
Version:	Revision Date / Initials:	



Legend

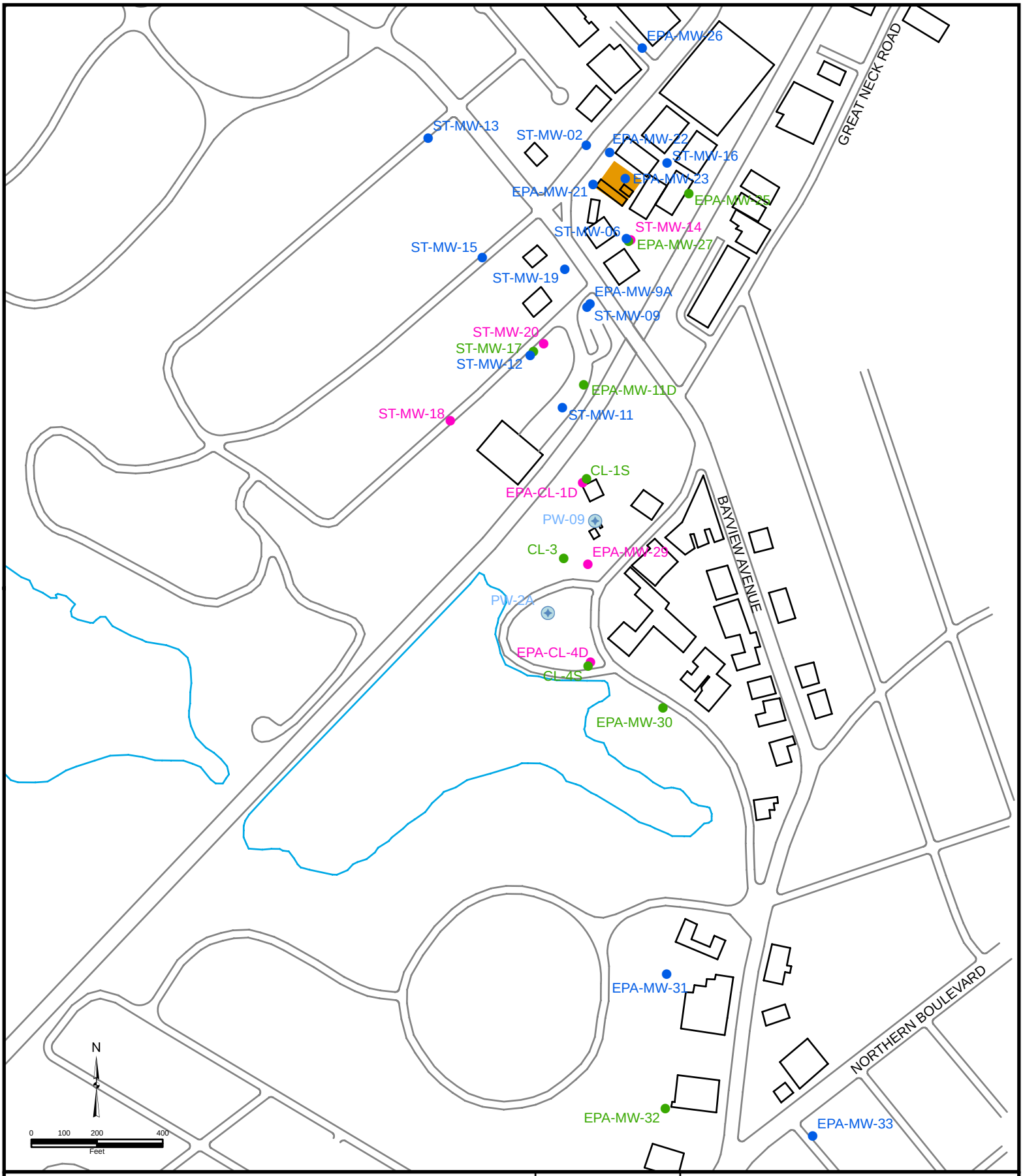
- Buildings
- Stanton Cleaners Property
- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- SVE Extraction Wells
- EPA Extraction Wells
- SVE System Suction Line
- Groundwater Treatment System Influent Line

ECC
1125 Route 22 West
Bridgewater, NJ 08807

STANTON CLEANERS, GREAT NECK, NEW YORK

FIGURE 2
SITE LAYOUT

Drawn by: M Johanson	Reviewed by: D Miller	Projection: North American Datum 1983 State Plane New York Long Island, FIPS 3104 Units: Feet
Date: 9/3/2012	Date: 9/18/2012	
Version:	Revision Date / Initials: 9/19/2012 MGJ	



Legend

- Shallow Monitoring Well
- Intermediate Monitoring Well
- Deep Monitoring Well
- Public Supply Well
- Water
- Roads
- Buildings
- Stanton Cleaners Property

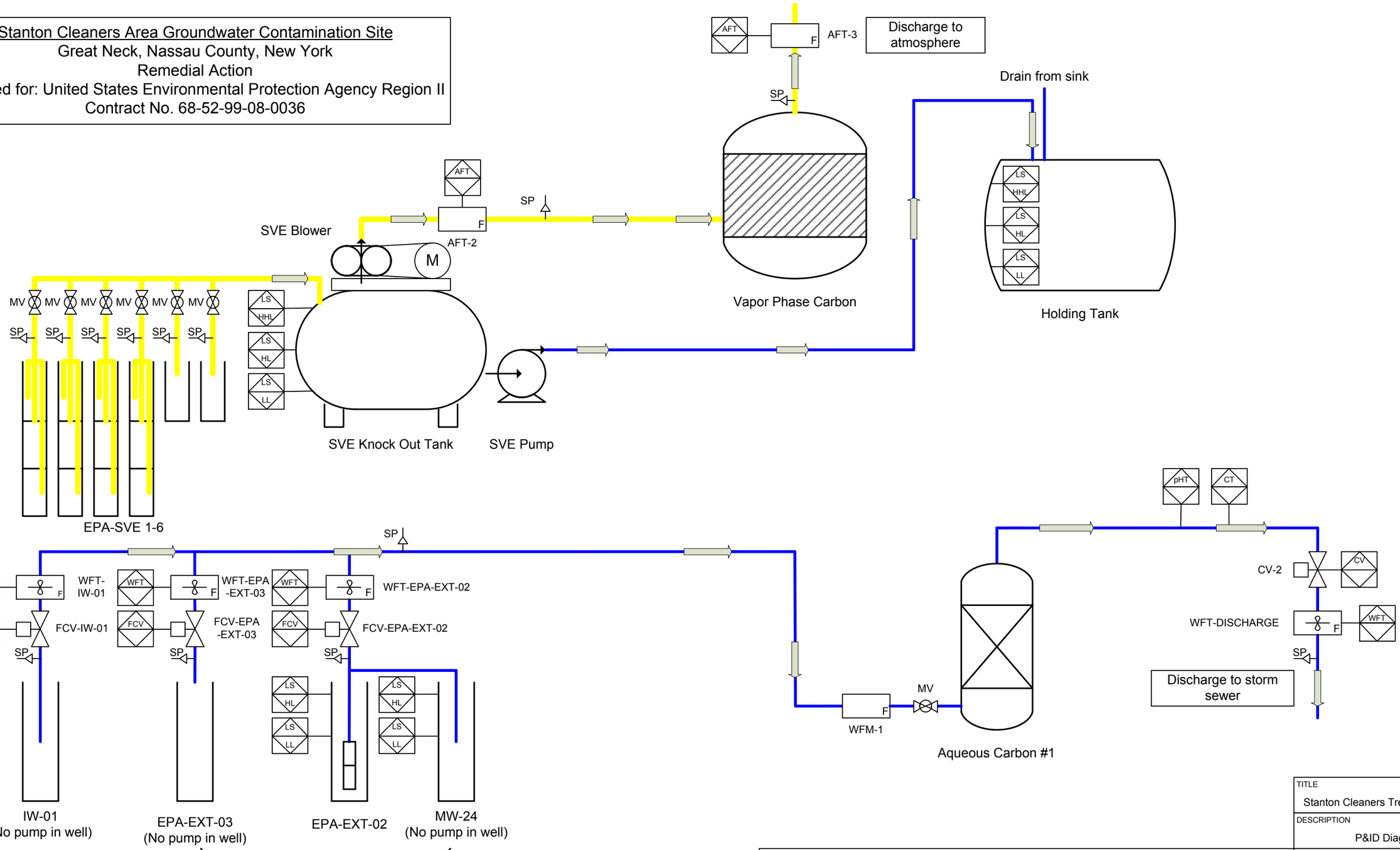
ECC
1125 Route 22 West
Bridgewater, NJ 08807

STANTON CLEANERS, GREAT NECK, NEW YORK

FIGURE 3
SITE LAYOUT WITH MONITORING WELL NETWORK

Drawn by: M Johanson	Reviewed by:	Projection: North American Datum 1983 State Plane New York Long Island, FIPS 3104 Units: Feet
Date: 7/28/2011	Date:	
Version:	Revision Date / Initials:	

Stanton Cleaners Area Groundwater Contamination Site
Great Neck, Nassau County, New York
Remedial Action
Prepared for: United States Environmental Protection Agency Region II
Contract No. 68-52-99-08-0036



WFT – Water Flow Transmitter
FCV – Flow Control Valve
LS – Level Switch
HHL – High High Level
HL – High Level
LL – Low Level
TT – Temperature Transmitter
pHT – pH Transmitter
CT – Conductivity Transmitter
AFT – Air Flow Transmitter
CV – Control Valve
WFM – Water Flow Meter
SP – Sample Port
SVE – Soil Vapor Extraction
F – Flow Meter
IW – Injection Well
MW – Monitoring Well
MV – Manual Valve
Water Piping
Air Piping

Submersible Groundwater Pump
Sample Port
Inline Flow Meter
Insertion Flow Meter
Powered Valve
Ball Valve
Liquid Transfer Pump
Centrifugal Blower
Rotary Lobe Blower
PLC Input
Flow Direction
Motor

TITLE	Stanton Cleaners Treatment System
DESCRIPTION	P&ID Diagram
DRAWN BY	Environmental Remediation
DATE	1/22/2003
REVISED	7/07/2012

FIGURE 4

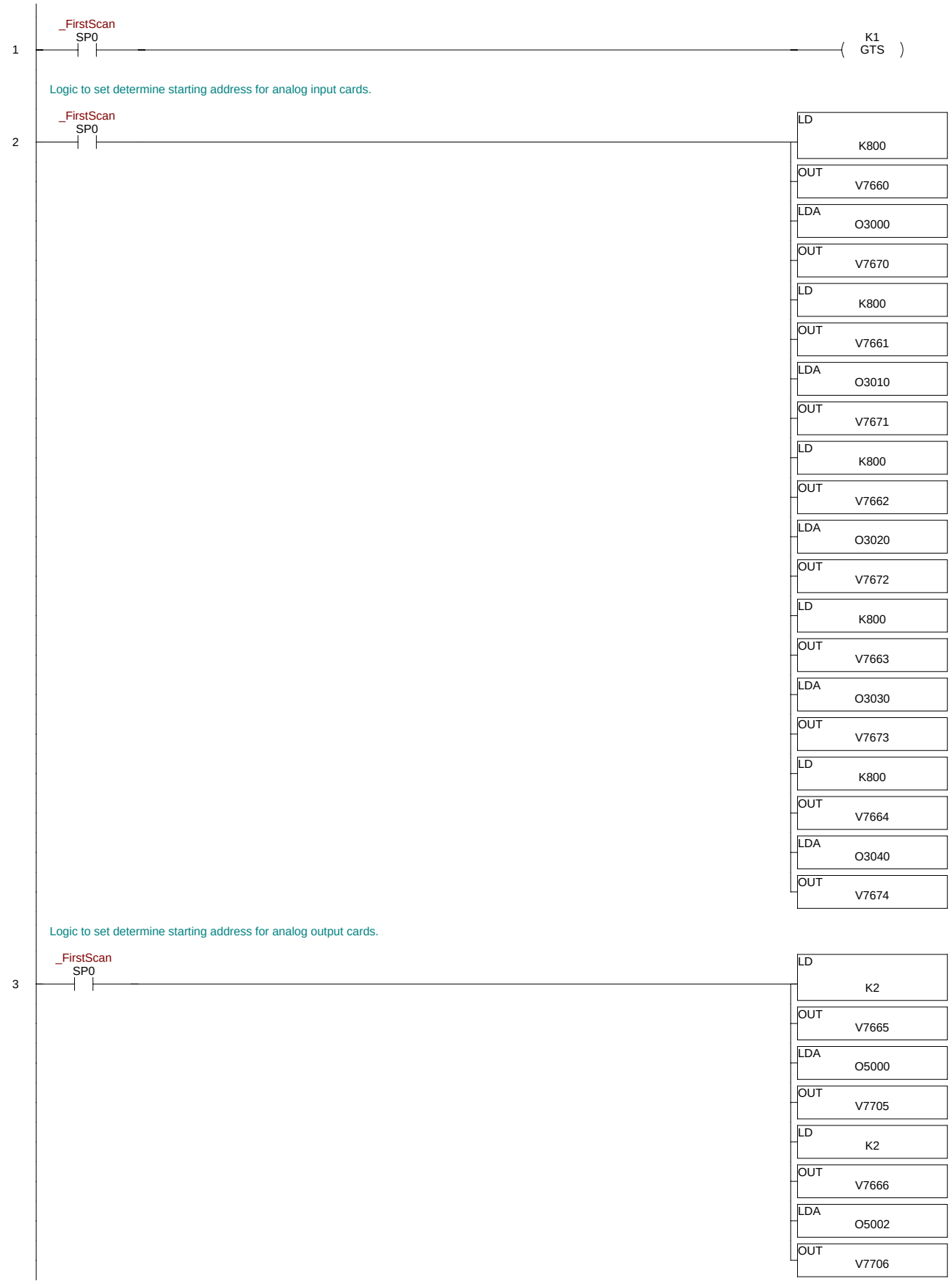


FIGURE 5 Ladder Logic Diagram

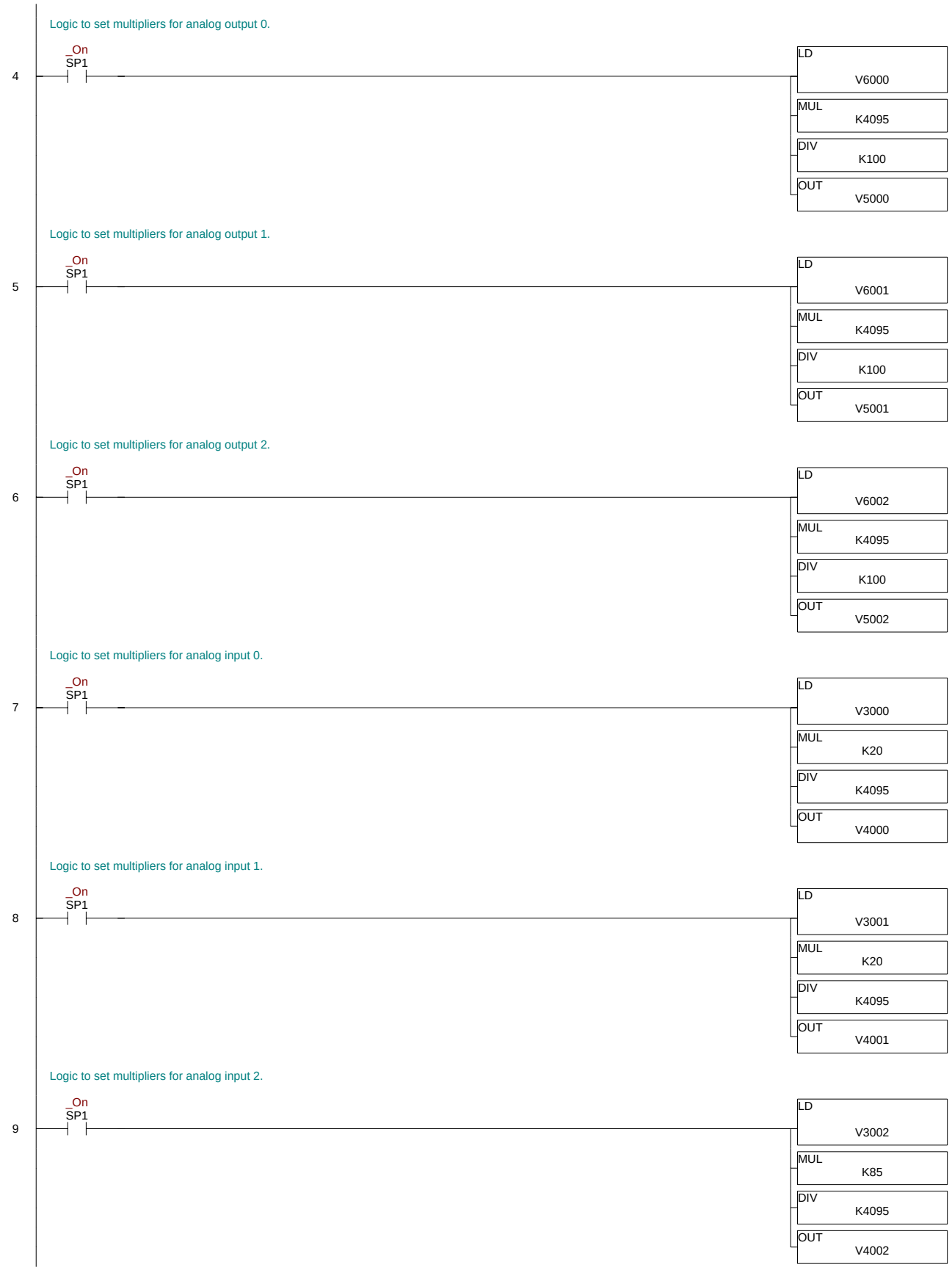


FIGURE 5 Ladder Logic View

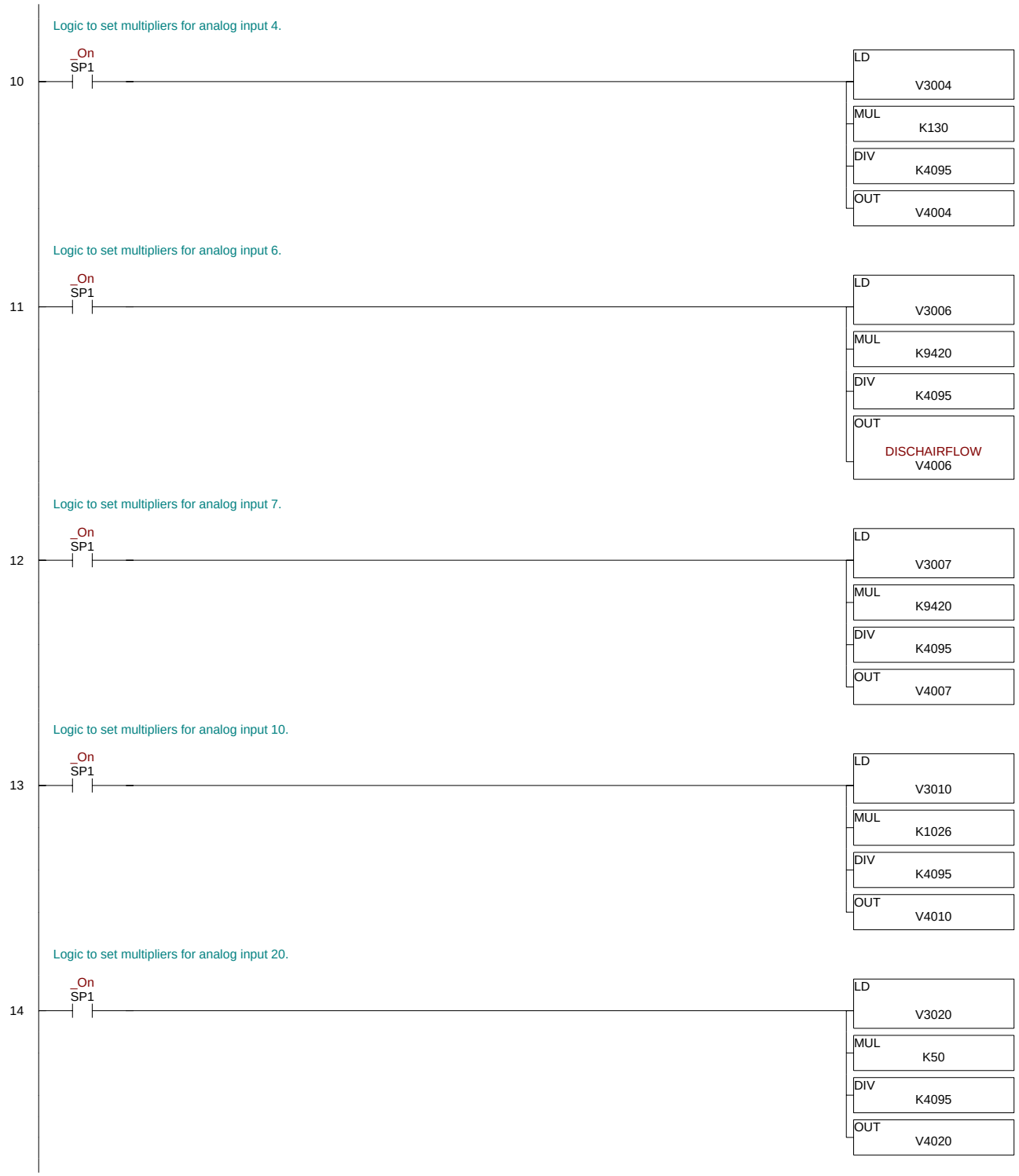


FIGURE 5 Ladder Logic View

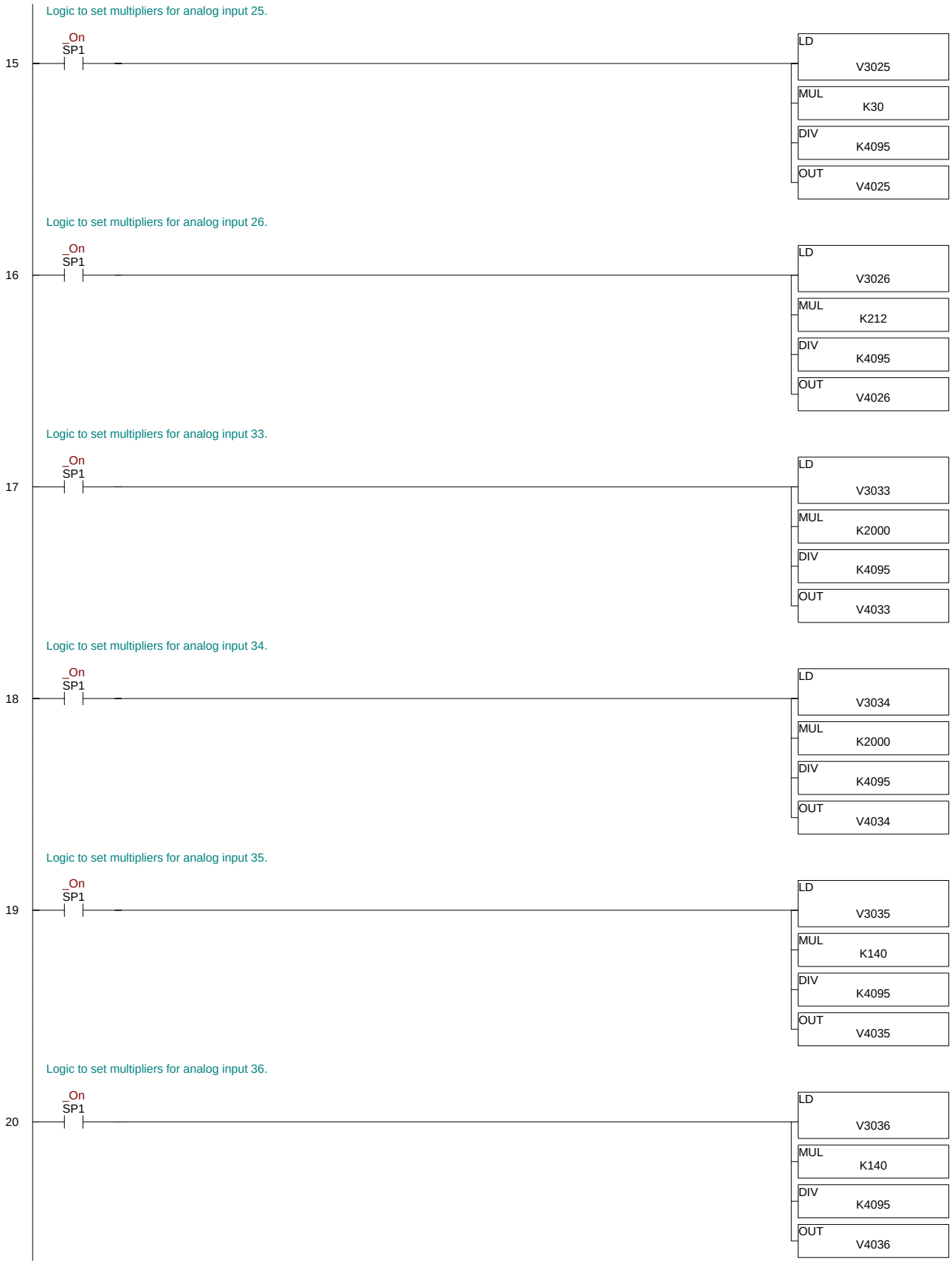


FIGURE 5 Ladder Logic View

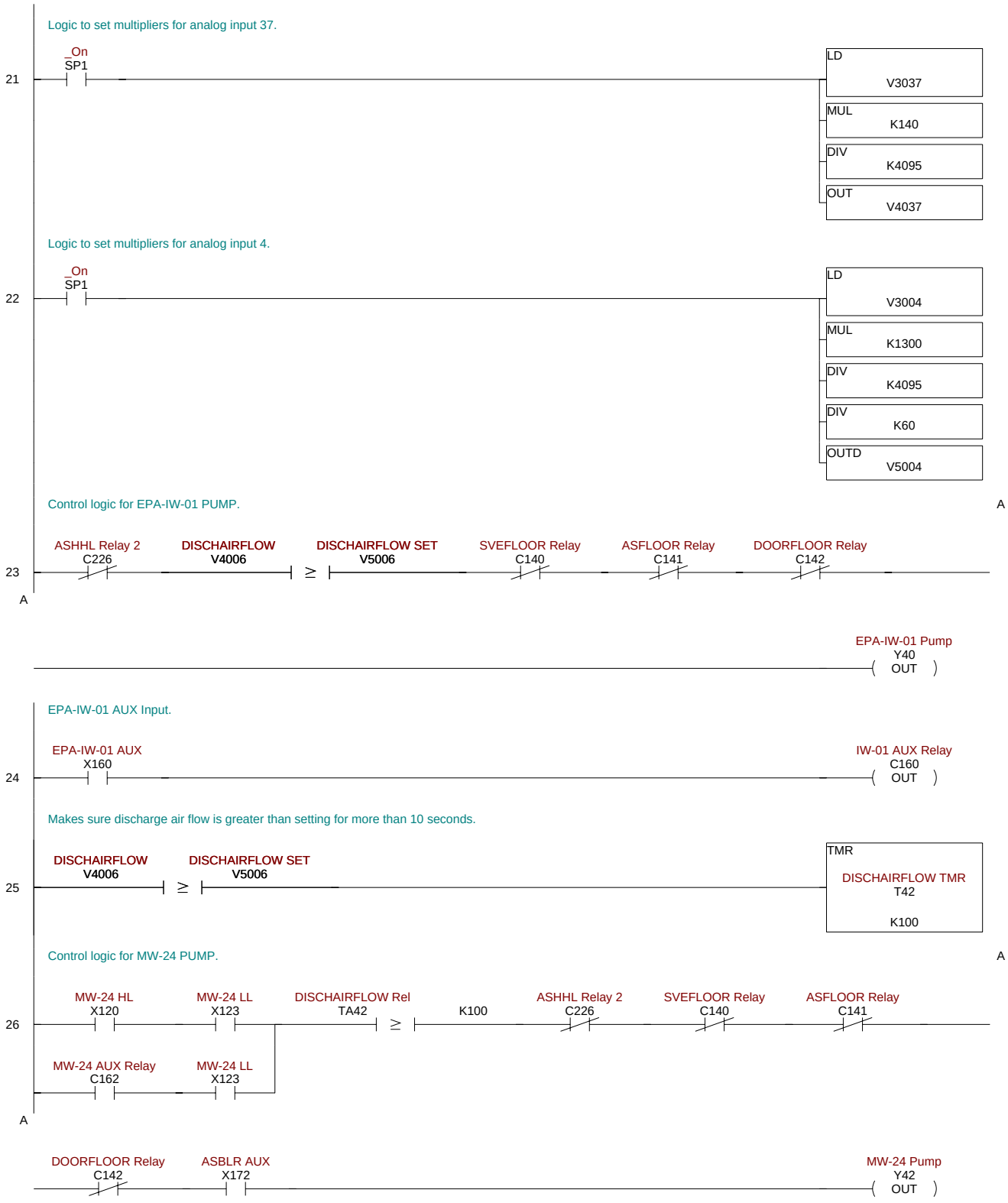


FIGURE 5 Ladder Logic View

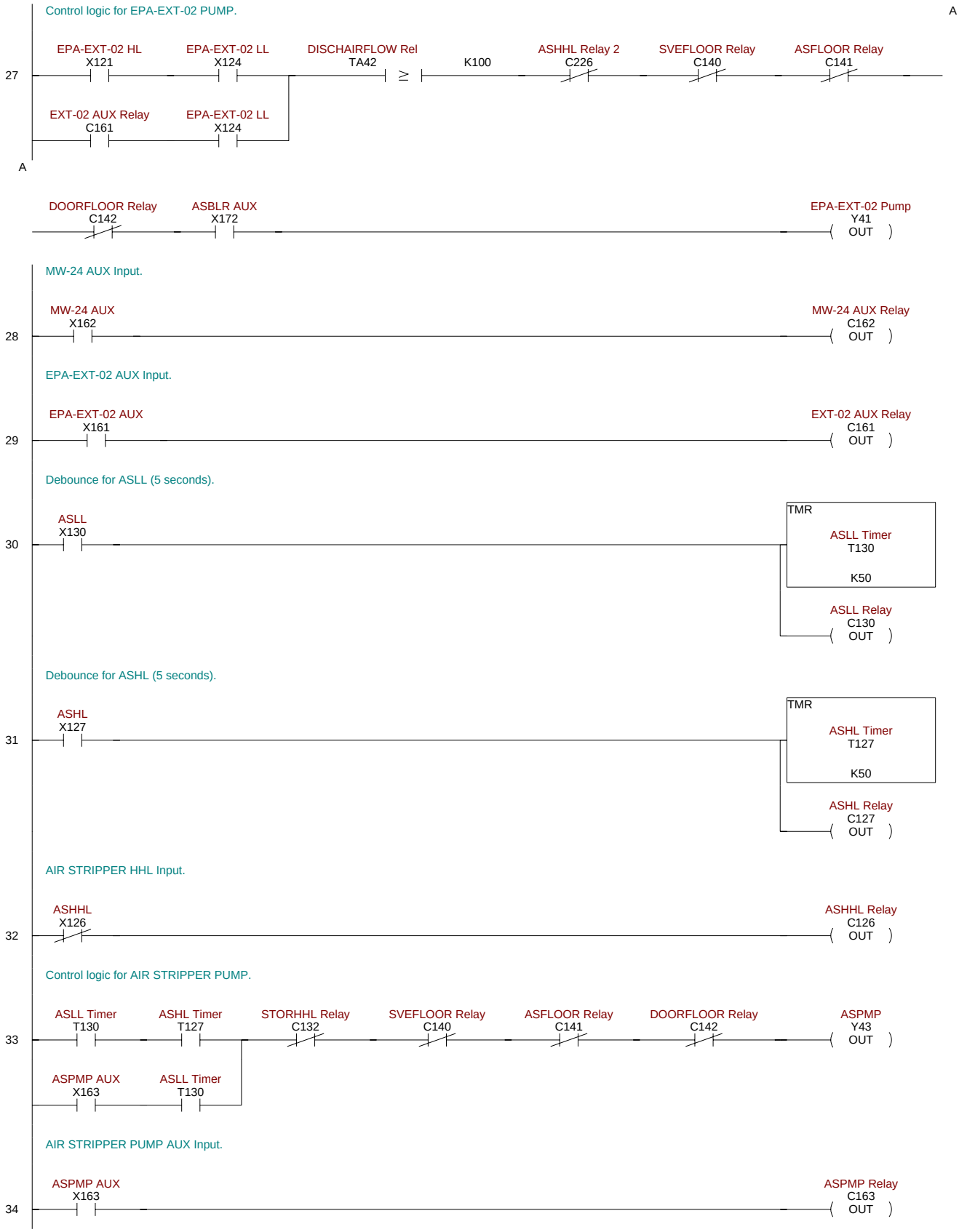


FIGURE 5 Ladder Logic View

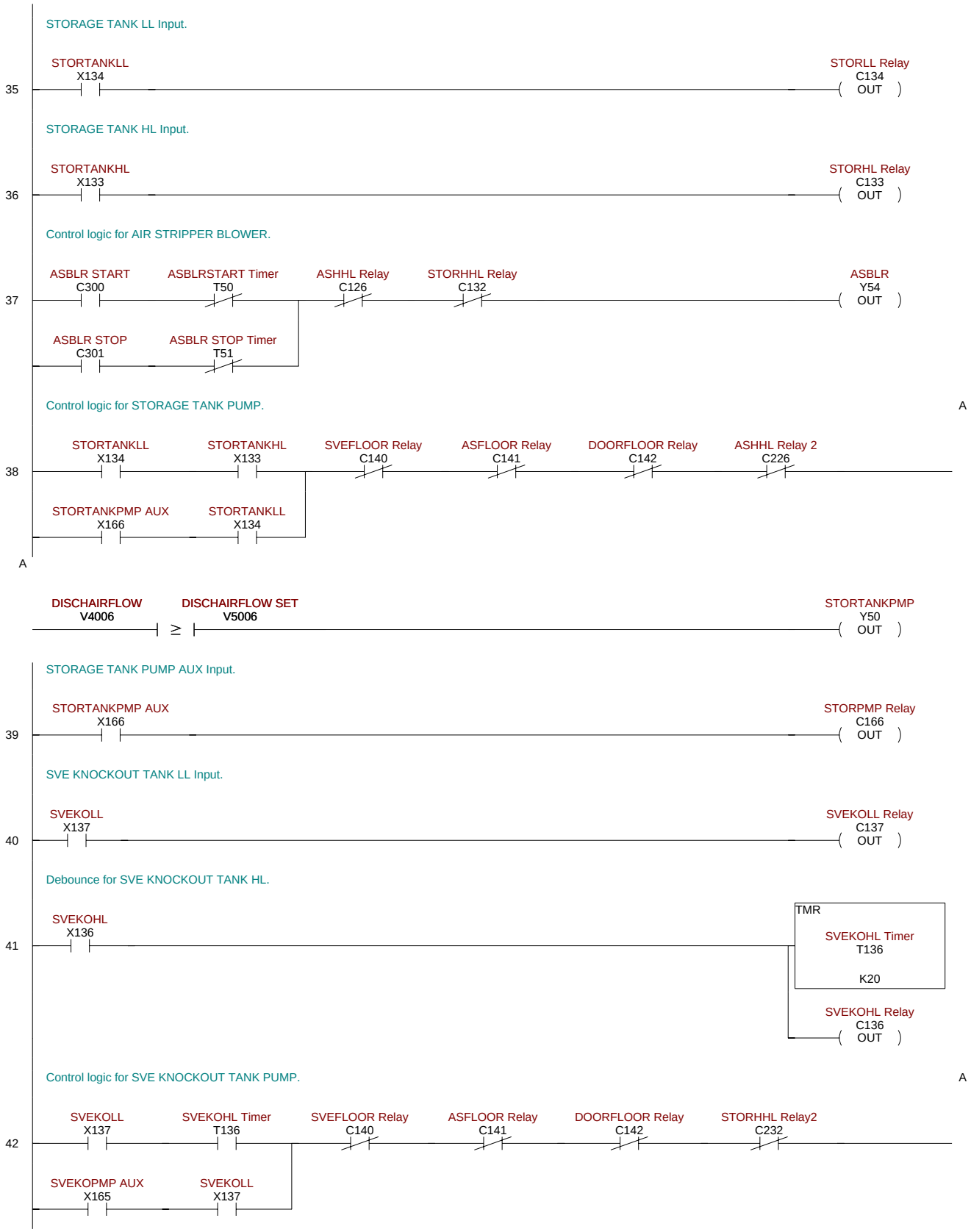


FIGURE 5 Ladder Logic View

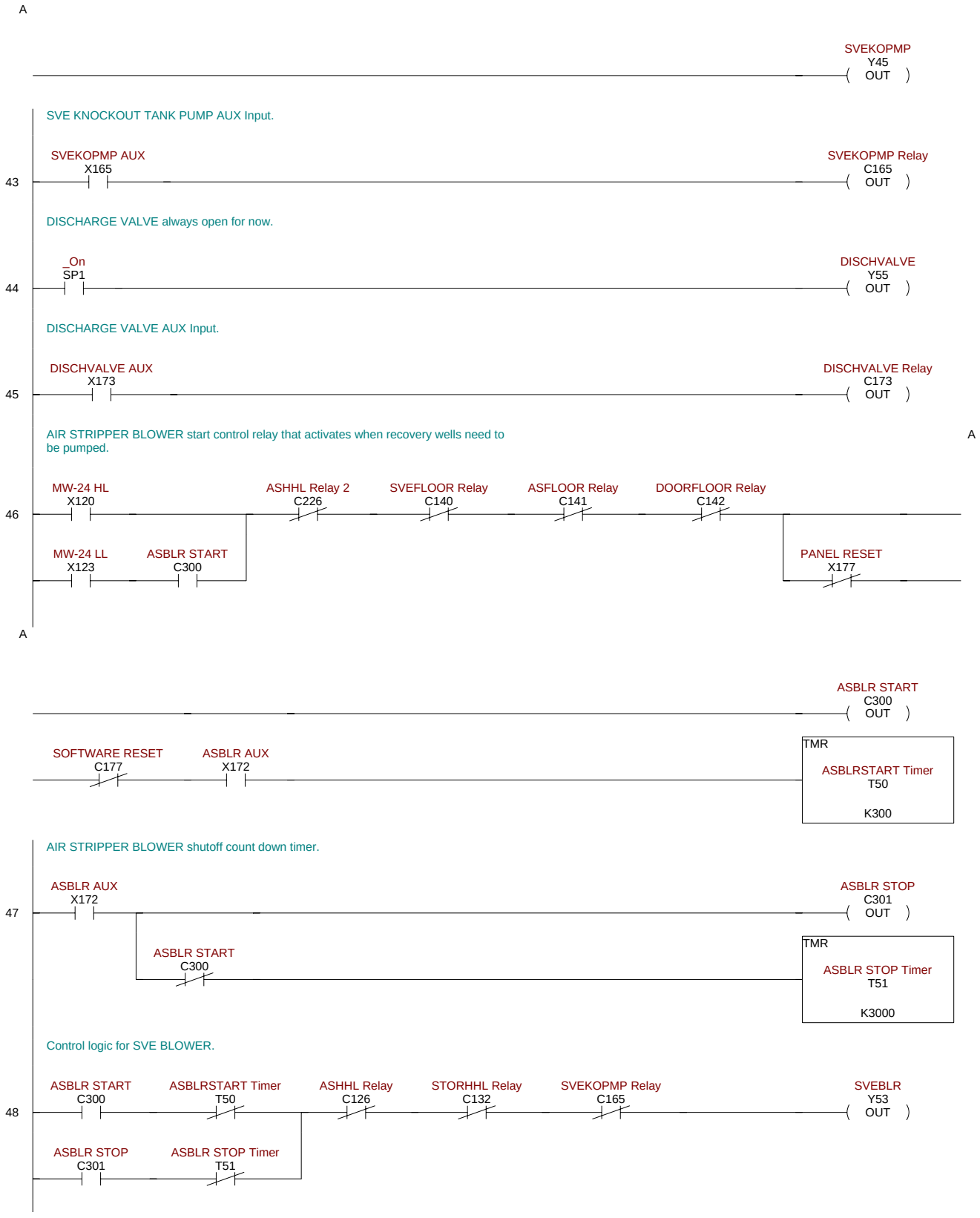


FIGURE 5 Ladder Logic View

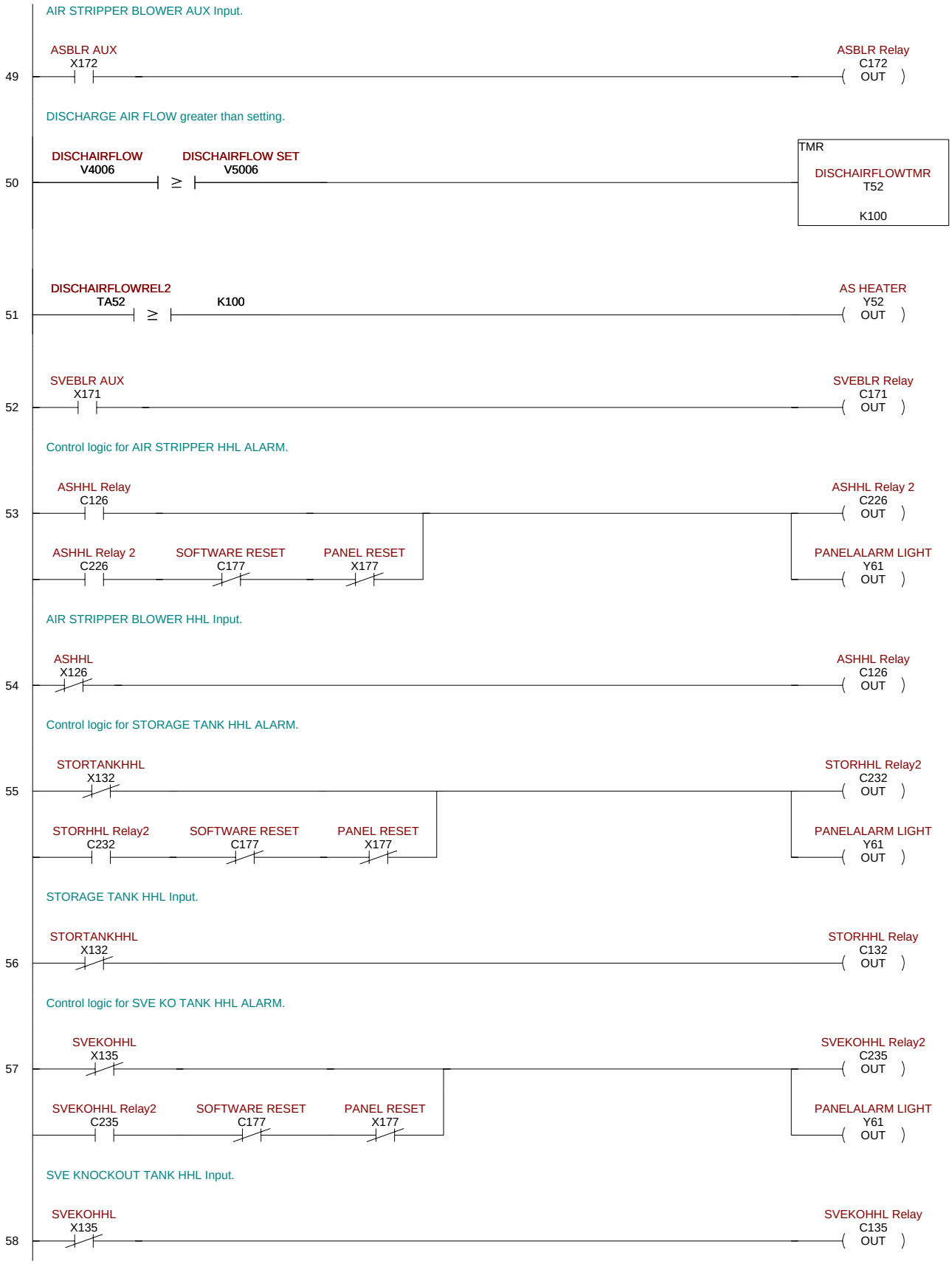


FIGURE 5 Ladder Logic View

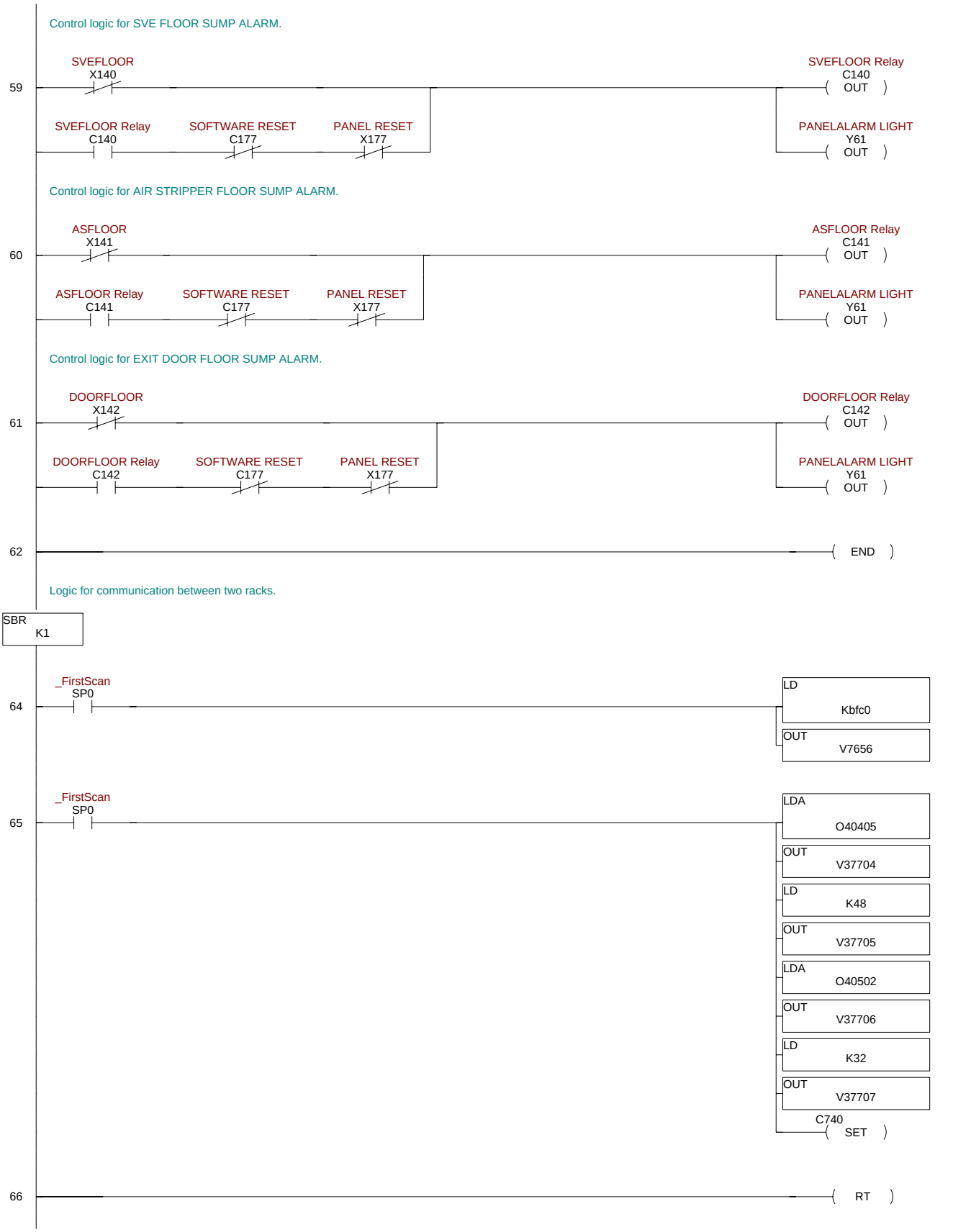


FIGURE 5 Ladder Logic View

FIGURE 5 Ladder Logic View

TABLES

Table 1
Stanton Cleaners Area Groundwater Contamination Site
Groundwater Extraction and Treatment System Discharge Requirements

Parameter	Daily Average	Daily Maximum	Units	Minimum Monitoring	
				Frequency	Sample Type
Flow	Monitor	115,000	GPD	Continuous	Meter
pH (range)*	6.5 - 8.5		SU	Continuous	Meter
Conductivity*				Continuous	Meter
Total Suspended Solids	Monitor	20	mg/L	Monthly	Grab
Tetrachloroethene	Monitor	5	ppb	Monthly	Grab
Trichloroethene	Monitor	5	ppb	Monthly	Grab
cis-1,2-dichloroethene	Monitor	5	ppb	Monthly	Grab
Benzene	Monitor	5	ppb	Monthly	Grab
Toluene	Monitor	5	ppb	Monthly	Grab
Chloroform	Monitor	5	ppb	Monthly	Grab
Methylene Chloride	Monitor	5	ppb	Monthly	Grab
Acetone	Monitor	5	ppb	Monthly	Grab

*These parameters are monitored continuously and during the groundwater extraction and treatment system monthly sampling.
GPD - gallons per day
SU - standard units
mg/L - milligrams per liter
ppb - parts per billion

Table 2
Stanton Cleaners Area Groundwater Contamination Site
New York State Air Discharge Limits

Contaminant	Concentration
Tetrachloroethene	TBD
Trichloroethene	TBD
cis-1,2-dichloroethene	TBD
Total VOCs	0.5 lbs per hour

VOCs - Volatile Organic Compounds
TBD - To be determined
lbs - pounds

Table 3
Stanton Cleaners Area Groundwater Contamination Site
Master Well List

Well ID	Date Installed	Installed By	Northing	Easting	Aquifer Unit	Top of PVC Elevation (ft msl)	Ground Surface Elevation (ft msl)	Depth to Top of Screen (ft BGS)	Depth to Bottom of Screen (ft BGS)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)
CL-1D	5/3/1999	USEPA ERTC	223566.2200	1057923.2500	Deep Upper Glacial	DNA	27.87	135	145	-107.13	-117.13
CL-1S	5/3/1999	USEPA ERTC	223569.2200	1057931.2500	Intermediate Upper Glacial	DNA	27.87	75	85	-47.15	-57.15
CL-2	5/11/1999	USEPA ERTC	223347.0680	1057818.6350	Intermediate Upper Glacial	DNA	33.98	80	90	-46.02	-56.02
CL-3	5/11/1999	USEPA ERTC	223290.2200	1057927.5800	Intermediate Upper Glacial	DNA	25.37	75	85	-49.63	-59.63
CL-4D	5/11/1999	USEPA ERTC	223023.2330	1057954.8480	Deep Upper Glacial	DNA	21.08	135	145	-113.92	-123.92
CL-4S	5/11/1999	USEPA ERTC	223012.9020	1057942.6480	Intermediate Upper Glacial	DNA	21.08	75	85	-54.45	-64.45
CW-01	DNA	DNA	222094.5160	1058180.5470	Shallow Upper Glacial	DNA	DNA	DNA	90.7 [1]	DNA	DNA
CW-02	DNA	DNA	221982.4570	1058189.8440	Shallow Upper Glacial	DNA	DNA	DNA	100.49 [1]	DNA	DNA
EPA-EXT-01	3/25/1999	USEPA ERTC/Aquifer Drilling and Testing	224174.9360	1057867.3400	Shallow Upper Glacial	82.76	82.84	DNA	DNA	DNA	DNA
EPA-EXT-02 [3]	11/11/2000	Earth Tech/Miller Drilling	224163.007	1057871.959	Shallow Upper Glacial	81.39	81.94	83	103	-1.06	-21.06
EPA-EXT-03 [3]	11/9/2000	Earth Tech/Miller Drilling	224477.833	1058030.380	Shallow Upper Glacial	83.30	93.44	90	110	3.44	-16.56
EPA-MW-11D	5/20/1999	USEPA ERTC	223863.3720	1057923.2630	Intermediate Upper Glacial	74.63	75.04	125	135	-49.96	-59.96
EPA-MW-21	2/14/2000	Earth Tech/Boart Longyear	224471.8820	1057950.7130	Shallow Upper Glacial	84.13	84.64	85.43	95.52	-0.79	-10.88
EPA-MW-22	2/15/2000	Earth Tech/Boart Longyear	224567.4650	1058002.1100	Shallow Upper Glacial	82.20	82.58	85.8	95.75	-3.22	-13.17
EPA-MW-23	2/16/2000	Earth Tech/Boart Longyear	224490.1040	1058049.3270	Shallow Upper Glacial	82.83	83.33	85.74	95.72	-2.41	-12.39
EPA-MW-24 [2]	2/17/2000	Earth Tech/Boart Longyear	224193.5790	1057881.0360	Shallow Upper Glacial	81.98	82.64	75	95.4	7.64	-12.76
EPA-MW-25	2/18/2000	Earth Tech/Boart Longyear	224443.6880	1058242.5070	Intermediate Upper Glacial	73.24	73.71	133.07	143.47	-59.36	-69.76
EPA-MW-26	2/19/2000	Earth Tech/Boart Longyear	224885.9940	1058101.0450	Shallow Upper Glacial	78.37	78.90	85.83	95.88	-6.93	-16.98
EPA-MW-27	2/20/2000	Roy F. Weston/Boart Longyear	224303.8510	1058065.5980	Intermediate Upper Glacial	69.32	69.83	115.33	125.93	-45.50	-56.10
EPA-MW-28	2/21/2000	Roy F. Weston/Boart Longyear	224821.9790	1057786.0360	Shallow Upper Glacial	90.31	90.73	90.74	100.71	-0.01	-9.98
EPA-MW-29	11/29/2000	Earth Tech/Miller Drilling	223319.906	1057868.337	Deep Upper Glacial	31.06	31.43	145	155	-113.57	-123.57
EPA-MW-30	12/1/2000	Earth Tech/Miller Drilling	222894.327	1058132.321	Intermediate Upper Glacial	25.45	25.93	94	104	-68.07	-78.07
EPA-MW-31	11/14/2000	Earth Tech/Miller Drilling	222071.991	1058175.165	Shallow Upper Glacial	51.46	51.9	55	65	-3.10	-13.10
EPA-MW-32	11/28/2000	Earth Tech/Miller Drilling	221651.880	1058152.508	Intermediate Upper Glacial	53.39	53.84	110	120	-56.16	-66.16
EPA-MW-33	12/4/2000	Earth Tech/Miller Drilling	221579.159	1058613.643	Shallow Upper Glacial	68.75	69.11	75	85	-5.89	-15.89
EPA-MW-9A	3/16/1999	USEPA ERTC/Aquifer Drilling and Testing	224110.0020	1057941.3420	Shallow Upper Glacial	80.24	80.40	83	103	-2.60	-22.60
EPA-SVE/Sparge-01 [4]	11/21/1998	USEPA ERTC	224058.9320	1057603.2660	Shallow Upper Glacial	DNA	76.25	80 [4]	90 [4]	DNA	DNA
EPA-SVE/Sparge-02 [4]	11/21/1998	USEPA ERTC	224069.1984	1057649.4150	Shallow Upper Glacial	80.57	77.98	80 [4]	90 [4]	DNA	DNA
EPA-SVE/Sparge-03 [4]	12/4/1998	USEPA ERTC	DNA	DNA	Shallow Upper Glacial	DNA	DNA	80 [4]	90 [4]	DNA	DNA
EPA-SVE/Sparge-04 [4]	12/4/1998	USEPA ERTC	DNA	DNA	Shallow Upper Glacial	DNA	DNA	80 [4]	90 [4]	DNA	DNA
EPA-SVE-05 [5]	1/30/2002	USEPA ERTC	DNA	DNA	Shallow Upper Glacial	DNA	DNA	DNA	DNA	DNA	DNA
EPA-SVE-06[6]	1/30/2002	USEPA ERTC	DNA	DNA	Shallow Upper Glacial	DNA	DNA	DNA	DNA	DNA	DNA
FN-3	DNA	DNA	222086.8710	1058175.0130	Shallow Upper Glacial	51.76	52.39	DNA	41.5 [1]	DNA	DNA
PW-09	12/1/1953	Citizen's Water Supply Co.	223451.4170	1057957.5150	Deep Upper Glacial	DNA	19.46	128	143	-108.54	-123.54
PW-2A	5/21/2027	Citizen's Water Supply Co.	223161.2350	1057779.9670	Deep Upper Glacial	DNA	16.30	125	145	-108.70	-128.70
ST-AM-03	DNA	DNA	223611.5510	1058043.4180	Deep Upper Glacial	31.31	31.53	135	145	-103.47	-113.47
ST-AM-04	DNA	DNA	223642.1965	1057985.9873	Shallow Upper Glacial	28.20	28.44	9.9	19.9	18.54	8.54
ST-GP-01	DNA	DNA	224417.4625	1057925.9387	Shallow Upper Glacial	84.20	84.98	63	73	21.98	11.98
ST-GP-02	DNA	DNA	224437.7452	1057964.6631	Shallow Upper Glacial	84.25	85.07	65.9	75.9	19.17	9.17
ST-GP-03	DNA	DNA	224467.4164	1057927.5209	Shallow Upper Glacial	84.27	84.58	64.11	74.11	20.47	10.47
ST-IW-01	DNA	DNA	224310.3730	1058054.3490	Shallow Upper Glacial	70.13	70.38	63	73	7.38	-2.62
ST-MW-01	DNA	DNA	224570.7427	1058004.0615	Shallow Upper Glacial	82.15	82.41	62.5	72.5	19.91	9.91
ST-MW-02	DNA	DNA	224590.9150	1057928.7280	Shallow Upper Glacial	82.03	82.60	90	100	-7.40	-17.40
ST-MW-06	DNA	DNA	224308.4973	1058048.6244	Shallow Upper Glacial	69.83	70.49	44.3	54.3	26.19	16.19
ST-MW-09	DNA	DNA	224087.3813	1057929.7679	Shallow Upper Glacial	78.13	78.13	71.35	81.35	6.78	-3.22
ST-MW-11	10/24/1997	Dvirka and Bartalucci/Unitech	223795.5710	1057857.5180	Shallow Upper Glacial	75.25	75.79	73	83	2.79	-7.21
ST-MW-12	10/25/1997	Dvirka and Bartalucci/Unitech	223955.2270	1057759.9720	Shallow Upper Glacial	87.20	87.62	71	86	16.62	1.62
ST-MW-13	10/29/1997	Dvirka and Bartalucci/Unitech	224612.6300	1057451.5020	Shallow Upper Glacial	103.94	104.52	87	102	17.52	2.52
ST-MW-14	11/24/1997	Dvirka and Bartalucci/Unitech	224299.5390	1058058.1540	Deep Upper Glacial	69.73	70.03	185	200	-114.97	-129.97
ST-MW-15	11/4/1997	Dvirka and Bartalucci/Unitech	224250.1560	1057615.3870	Shallow Upper Glacial	90.13	90.70	85	95	5.70	-4.30
ST-MW-16	11/11/1997	Dvirka and Bartalucci/Unitech	224538.5610	1058175.4850	Shallow Upper Glacial	75.78	76.15	54.5	69.5	21.65	6.65
ST-MW-17	12/4/1997	Dvirka and Bartalucci/Unitech	223965.5190	1057770.5790	Intermediate Upper Glacial	86.53	87.00	120	140	-33.00	-53.00
ST-MW-18	12/15/1997	Dvirka and Bartalucci/Unitech	223759.1250	1057526.3620	Deep Upper Glacial	84.40	84.71	183	203	-98.29	-118.29
ST-MW-19	1/6/1998	Dvirka and Bartalucci/Unitech	224203.6650	1057869.3590	Shallow Upper Glacial	82.50	83.18	74	89	9.18	-5.82
ST-MW-20	1/7/1998	Dvirka and Bartalucci/Unitech	223989.1920	1057801.1820	Deep Upper Glacial	84.53	84.95	200	215	-115.05	-130.05
ST-WA-01	DNA	DNA	223611.5886	1058042.9076	DNA	25.89	26.95	DNA	DNA	DNA	DNA
ST-WA-02	DNA	DNA	223434.0042	1057898.9199	DNA	24.71	26.36	DNA	DNA	DNA	DNA

Notes:

ft msl - feet mean sea level

ft BGS - feet below ground surface

DNA - Data Not Available; Construction data from previous investigations could not be located.

Highlighted wells are sampled on a quarterly basis under the LTRA.

Wells in **bold** were installed as part of this investigation as directed by U.S. EPA ERTC.

1. Well construction data was not available. Total well depth as recorded on Well Data Sheet from October 2001 groundwater sampling event.
2. C-Sparge/Recirculation well
3. Both New Extraction Wells EPA-EXT-02 and -03 have a five foot sump below the screen.
4. EPA-SVE/Sparge-01 through -04 are well cluster with SVE/sparge wells. SVE wells are screened at 35 ft BGS and sparge wells from 80 to 90 ft BGS.
5. Installed during the UST removal action. Horizontal well at ~3.5 ft BGS and covering an area of ~15 ft by ~75 ft.

TABLE 4

STANTON CLEANERS AREA GROUNDWATER CONTAMINATION SITE
EQUIPMENT LIST

EQUIPMENT DESCRIPTION	EQUIPMENT LABEL	MANUFACTURER	MODEL NUMBER	DETAILS	MAINTENANCE REQUIREMENTS	MAINTENANCE FREQUENCY
Recovery Well Pump Motors		Franklin			No routine maintenance requirements.	
Recovery Well Pumps	RWPMP	Teel			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Recovery Well Motor Start Boxes		Franklin			No routine maintenance requirements.	
Recovery Well Liquid Level Switches	RWHL, RWLL	McMaster-Carr			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Recovery Well Sediment Strainers		Asahi-America			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Flow Control Valve - Actuators	FCV	Asahi-America			No routine maintenance requirements.	
Flow Control Valve - Valves		Asahi-America			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Water Flow Meters	WFT	Niagara			No routine maintenance requirements.	
Water Flow Meter Infrared Sensors		Niagara			No routine maintenance requirements.	
Water Flow Meter Pulse to DC Converters		Niagara			No routine maintenance requirements.	
Influent pH Sensors	INFPH	ABB			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Influent pH Transmitters	INFPH	TBI Bailey - ABB			No routine maintenance requirements.	
Influent Conductivity Sensors	INFCOND	ABB			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Influent Conductivity Transmitters	INFCOND	TBI Bailey - ABB			No routine maintenance requirements.	
Air Stripper pH Sensor	ASPH	ABB			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Air Stripper pH Transmitter	ASPH	TBI Bailey - ABB			No routine maintenance requirements.	
Vapor Phase Carbon Adsorber Vessel		Envirotrol			No routine maintenance requirements.	
Vapor Phase Carbon		Envirotrol			Carbon replacement when exhausted.	As indicated by analytical results.
Aqueous Phase Carbon Adsorber Vessel					No routine maintenance requirements.	
Aqueous Phase Carbon					Carbon replacement when exhausted.	As indicated by analytical results.
Discharge Valve - Actuator	DISCHVALVE	Asahi-America			No routine maintenance requirements.	
Discharge Valve - Valve		Asahi-America			No routine maintenance requirements.	
Recirculation Valve - Actuator	RECIRCVALVE	Asahi-America			No routine maintenance requirements.	
Recirculation Valve - Valve		Asahi-America			No routine maintenance requirements.	
Discharge Water Flow Meter	DISCHFLOW	Niagara			No routine maintenance requirements.	
Discharge Flow Meter Infrared Sensor		Niagara			No routine maintenance requirements.	
Dishcharge Flow Meter Pulse to DC Converter		Niagara			No routine maintenance requirements.	
Holding Tank	HOLDTANK	Chem-tainer			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Holding Tank Liquid Level Switches	HOLDHHL, HOLDHL, HOLDLL	McMaster-Carr			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
Holding Tank Transfer Pump Motor					No routine maintenance requirements.	
Holding Tank Transfer Pump	HOLDPMP				No routine maintenance requirements.	
SVE Knockout Tank		Air Components			No routine maintenance requirements.	
SVE Blower Motor					No routine maintenance requirements.	
SVE Blower	SVBLR	Sutorbilt			No routine maintenance requirements.	
Silencer					No routine maintenance requirements.	
Filter					Routine replacements.	As needed based on visual observations.
Liquid Level Switches	SVHHL, SVHL, SVLL	McMaster-Carr/			Routine cleaning to remove build-up/debris	As needed to maintain proper operation.
SVE Transfer Pump Motor					No routine maintenance requirements.	
SVE Transfer Pump	SVPMP				No routine maintenance requirements.	
Vacuum Transducer	SVVAC	Dwyer			No routine maintenance requirements.	
Vacuum Gauge		Noshol			No routine maintenance requirements.	
Butterfly Valve		Spears			No routine maintenance requirements.	
Air Flow Transducer	SVBLRFLOW	Dwyer			No routine maintenance requirements.	

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Control Panel Enclosure		Hoffman			No routine maintenance requirements.	
Three Phase Disconnect		Sprecher&Schuh			No routine maintenance requirements.	
Three Phase Disconnect Handle		Sprecher&Schuh			No routine maintenance requirements.	
Transformer		Cutler-Hammer			No routine maintenance requirements.	
Fuse Blocks		Automationdirect			No routine maintenance requirements.	
Fuses					No routine maintenance requirements.	
Manual Motor Starters		Sprecher&Schuh			No routine maintenance requirements.	
Motor Contactors		Sprecher&Schuh			No routine maintenance requirements.	
Terminals		Automationdirect			No routine maintenance requirements.	
Ground Terminals		Automationdirect			No routine maintenance requirements.	
Din Rail		Automationdirect			No routine maintenance requirements.	
PLC Rack		Automationdirect			No routine maintenance requirements.	
PLC Processor		Automationdirect			No routine maintenance requirements.	
PLC Analog Input Card		Automationdirect			No routine maintenance requirements.	
PLC Analog Output Card		Automationdirect			No routine maintenance requirements.	
PLC Low Voltage Input Card		Automationdirect			No routine maintenance requirements.	
PLC High Voltage Input Card		Automationdirect			No routine maintenance requirements.	
PLC Relay Output Card		Automationdirect			No routine maintenance requirements.	
PLC Remote I/O Card		Automationdirect			No routine maintenance requirements.	
Intrinsic Barriers		Pepperl&Fuchs			No routine maintenance requirements.	
24VDC Power Supplies		Automationdirect			No routine maintenance requirements.	
Panel Mount PC		Automationdirect			No routine maintenance requirements.	
Panel Mount PC Monitor		Automationdirect			No routine maintenance requirements.	
Three Position Selector Switch		Sprecher&Schuh			No routine maintenance requirements.	
Push Button Switch		Sprecher&Schuh			No routine maintenance requirements.	
Indicator Light		Sprecher&Schuh			No routine maintenance requirements.	
Motor Disconnect		Cutler-Hammer			No routine maintenance requirements.	
Floor Wet Switches		McMaster-Carr			No routine maintenance requirements.	
Ceiling Fans					No routine maintenance requirements.	
Exhuast Fan Motors					No routine maintenance requirements.	
Exhaust Fans					No routine maintenance requirements.	
Garage Door					No routine maintenance requirements.	
Garage Door Opener					No routine maintenance requirements.	
Garage Door Opener Switch					No routine maintenance requirements.	
Treatment Room Heater					No routine maintenance requirements.	
Air Handler					Clean or replace system air filter.	As needed based on visual observations.
Treatment Room Light Fixtures					No routine maintenance requirements.	
Office Light Fixtures					No routine maintenance requirements.	
Office Baseboard Heaters					No routine maintenance requirements.	
Office Phone/Fax					No routine maintenance requirements.	
Air Conditioner					No routine maintenance requirements.	
Emergency Lights					Replace batteries.	As needed.
Smoke Alarms					Replace batteries.	As needed.
Fire Sprinklers					No routine maintenance requirements.	
Attic Fan					No routine maintenance requirements.	
Three Phase Disconnect Panel					No routine maintenance requirements.	
Electrical Distribution Panels					No routine maintenance requirements.	