Interim Remedial Measures Design Report
High Vacuum Extraction/Soil Vapor Extraction
136 Fuller Road Site
Brownfield Cleanup Program
NYSDEC BCP Site No. C401055

City of Albany and Town of Guilderland
Albany County, New York

May 2011

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NYS Professional Engineer Certification

I, Daniel Stone, certify that I am currently a NYS registered professional engineer and that this Interim Remedial Measures Design Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

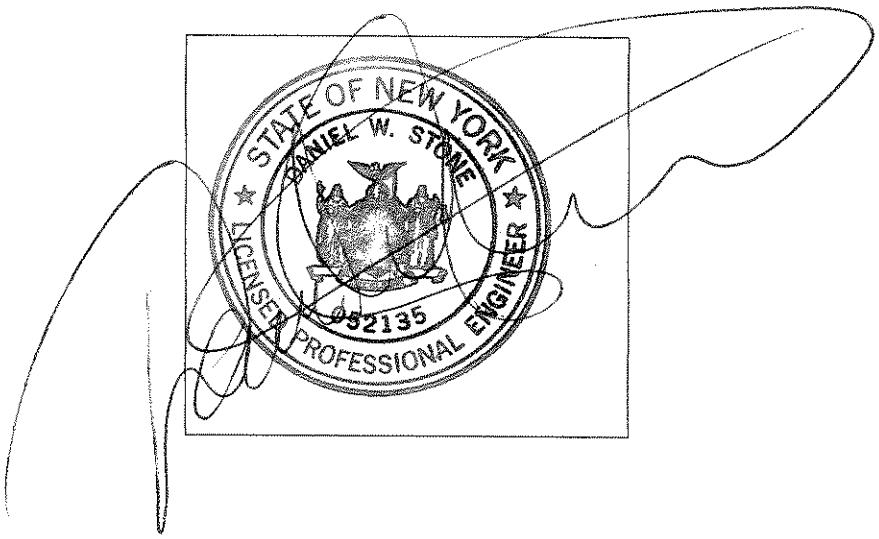


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1.0 INTRODUCTION

The 136 Fuller Road Site (site) is currently part of the State's Brownfield Cleanup Program (BCP Site No. C401055) (Figure 1). The Interim Remedial Measures (IRMs) described in this design report are proposed to reduce gross contamination in the source area and also begin to reduce high concentrations of dissolved constituents in the source area. This IRM approach was initially submitted to NYSDEC as a January 2011 *Interim Remedial Measures Work Plan* that was available for public comment from January 12 through February 26, 2011, and subsequently approved by the Department.

1.1 Proposed Interim Remedial Measures

Remedial investigation testing and analysis of soil and groundwater, performed at the site in 2006 and 2010, revealed the presence of volatile organic compounds (VOCs) including chlorinated solvents and petroleum constituents (Figure 2). The source of soil and groundwater contamination at the site has been determined to be dense non-aqueous phase liquid (DNAPL) solvents and dissolved-phase petroleum organic compounds in the shallow groundwater aquifer. The source area is primarily situated in an unpaved grassy area located along the northern side of the main site building where an historic tank farm was located. The aboveground storage tanks (ASTs) were used to store chemicals supporting the manufacturing processes of the Fuller Brush Manufacturing Plant from the 1950s into the 1970s. The site compounds of concern appear to have been released near the former tank farm and are partially "trapped" atop a lacustrine clay formation that was identified and dimensioned during the 2010 Remedial Investigation. From the source area, chemicals dissolved in the shallow groundwater have been slowly mobilized, via groundwater transport, to down gradient areas of the site beneath and south of the site building (Figure 2).

A vacuum extraction system will be the primary mechanism for reduction of VOCs in the source area. After DNAPL and dissolved-phase VOC concentrations are substantially reduced in the source area, VOCs dissolved within the remainder of the impacted groundwater area will be remediated using alternate technologies. At this time, it is anticipated that dissolved-phase VOCs will undergo in-situ remediation through either direct chemical oxidation or a bioremediation approach that involves the stimulation of naturally occurring bacterial populations to reductively dechlorinate chlorinated VOCs.

This proposed IRM will be conducted in accordance with the NYSDEC-approved Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) prepared for the site's Remedial Investigation Work Plan. These plans are included as Appendixes C and E of the June 2010 NYSDEC/NYSDOH-approved Remedial Investigation & Alternatives Analysis Work Plan.

1.2 Nature and Extent of Contamination

Figure 2 depicts the source area and the impacted groundwater area. A NAPL layer was found perched on top of a shallow lacustrine clay formation in the source area. NAPL was noted

intermittently and in what appeared to be relatively small trapped quantities in source area soil in the 3 to 5 foot depth interval, 4 to 10 foot depth interval, and at one location in the 4 to 13.5 foot interval. The NAPL appeared as dark staining intermittently within the noted layers and regularly at the bottom of the sandy soil layer at the top of the clay surface. NAPL was noted above the top of the clay surface, which varies from 8 to 15 feet below grade. In the source area and in close proximity to the source area, dissolved chlorinated and petroleum compounds (which appeared to be diesel-range organics) are present in an upper sandier formation from the groundwater surface (as shallow as 3 feet below grade in some areas), to depths ranging between 15 and 25 feet below grade.

Down gradient of the source area, dissolved-phase compounds in groundwater are present principally within the top 10 to 12 feet of the sandy aquifer. VOCs were identified near the southern (most down gradient) boundary of the site at very low concentrations, only slightly above regulatory cleanup standards.

1.3 Design Investigation and Selected IRM

The IRM HVE/SVE approach was selected based on soil and groundwater analytical data collected in 2006 and 2010, and geological data gathered during extensive soil boring installation in 2010 (Section 1.2).

To minimize the potential for DNAPL migration via groundwater flow paths through the site, an aggressive IRM was selected to remediate the chemical source area to the extent practicable. The IRM chosen for the source area is groundwater/DNAPL extraction and treatment via high vacuum extraction (HVE) coupled with soil vapor extraction (SVE). HVE and SVE were selected as the most appropriate response actions for recovering DNAPL and treating VOC-impacted soil and dissolved-phase VOCs in groundwater in the sandy soil source area. HVE will be employed to extract DNAPL, impacted groundwater, and soil vapors from the subsurface. HVE is planned to lower the water table to the depth of the shallow clay surface in the source area and expose the impacted soil horizons for the SVE system to remediate. The lowered groundwater level in the source area will also help retain impacted groundwater within the treatment area boundaries and reduce migration outside the source area. SVE will be employed to extract and treat impacted soil vapors from the subsurface. The combination of SVE and HVE technologies will increase the system's overall effectiveness and reduce the size of system components (e.g., pumps) compared to an all-HVE system. This will reduce the up-front capital costs and electrical operating costs of the remedial system.

These source reduction activities will be suspended once DNAPL is reduced to the extent practicable, total VOC concentrations are substantially reduced, and the groundwater concentrations have reached a "steady state condition" under this treatment method. Source reduction will be assessed by evaluating VOC concentration changes over time in groundwater, influent vapor and influent liquid. A steady state condition is expected to be demonstrated when gross contamination has been removed and concentration reductions over time are minimal or significantly reduced.

2.0 IRM DESIGN SCOPE

Following November 2010 discussions between NYSDEC and the project team, it was agreed that the SVE/HVE well system could be installed (but not activated) to avoid delays in system installation due to winter weather. After NYSDEC input is received on this Design Report and any necessary revisions are made, then the system will be modified (if needed) and started. The initial startup will be a pilot test to evaluate and modify the system configuration as needed to maximize efficiency. Therefore, this design report presents the basic system layout and equipment planned for use during pilot testing; however, modifications may be made, if needed, after system startup. All soil drilling and excavation activities were monitored and included logging of subsurface conditions. The CAMP was implemented during system installation activities.

Section 2.1 provides an overview of the HVE/SVE system and subsequent sections provide design specifications for extraction well installation (Section 2.2.1), system piping (Section 2.2.2), area cover and stormwater management (Section 2.2.3), the treatment system enclosure (Section 2.2.4), SVE system (Section 2.2.5), HVE system (Section 2.2.6), off-gas treatment (Section 2.2.7), and remedial wastewater discharge (Section 2.2.8).

2.1 HVE/SVE System for Source Area Remediation

A series of nine wells were installed in the source area that will be connected to a vacuum system used to extract impacted groundwater and DNAPL (via the HVE) and soil vapor (via the SVE) (Figure 3). Once the system is started, a high level vacuum will be applied to the HVE wells seeking to lower the water table to the top of the shallow clay surface (typically ranging between 8 and 15 feet deep in the treatment area). The system will extract grossly contaminated groundwater and DNAPL from the sandy aquifer horizon and expose saturated source area soils allowing the SVE system to extract VOCs that are currently trapped in the saturated soil.

As the HVE system is designed to actively lower the groundwater level beneath the unpaved area, the design also included installation of a synthetic impermeable liner with perforated pipe to limit infiltration of stormwater into the source area and enhance conditions for vacuum extraction by creating a ”cover” over the moderately permeable soil area (Figure 4).

Piping from the wells will be connected to SVE and HVE influent manifolds in a remediation trailer that has been brought to the site to house the SVE and HVE equipment (Figure 4).

Vapor extracted from the subsurface through the SVE wells will be directed through a phase separator that will remove liquid from the vapor stream (Figures 5 and 6). The extracted vapor phase (soil gas/air) will initially be treated via catalytic oxidation (CatOx) with and then discharged to the atmosphere, until concentrations are low enough that this CatOx treatment is no longer necessary. Liquid will be transferred to the HVE system.

Liquid and vapor removed via the HVE well network will be directed through a phase separator that is designed to remove liquid from the vapor stream (Figures 5 and 6). Vapor will be directed to the CatOx unit before discharging to the atmosphere. Liquid separated from both the SVE and HVE systems will then go through a product oil/water separator where the liquid DNAPL and suspended sludge or solids will be separated from the water. The water will then be transferred through bag filters and at least one 900-pound liquid-phase granular activated carbon (GAC) vessel to substantially reduce concentrations of dissolved-phase VOCs. If further reduction of VOCs is necessary based on effluent system testing, the filtered water will be passed through a second 900 pound liquid-phase GAC vessel. Lastly, treated water will be discharged to the sanitary sewer system through the existing wastewater treatment process operated and maintained by UltrePET in accordance with conditions listed on their sewer discharge permit.

Routine monitoring of both the vapor and liquid influent and effluent streams produced by the proposed extraction systems will be used to evaluate system performance and effluent conditions, and determine when the source compounds of concern have been reduced to the extent practicable at this site by way of these proposed technologies.

Beginning on the day of initial system start-up, the system will be closely monitored and adjusted based on initial flow rates and system response. Therefore, this design report presents the planned equipment that will be used; system flows will be determined, recorded and adjusted once the system is operating and a pilot test phase of operation is performed during the first month of operation.

2.2 Design Specifications

Prior to installing the HVE/SVE wells, approximately one foot of soil cover was temporarily removed from the unpaved source area (Figure 1). Surface soil samples collected from this area during the 2010 remedial investigation, did not contain elevated concentrations of VOCs, semi-volatile organic compounds, pesticides, polychlorinated biphenyls, or metals. Section 2.2.3 discusses temporary removal of this top soil layer and its replacement with the installation of an underlying synthetic liner.

2.2.1 Extraction Well Installation

The locations of the installed HVE and SVE wells are shown on Figure 4. A schematic diagram of typical HVE and SVE well construction is shown on Figure 3. Soil boring and well construction logs for the site HVE/SVE wells showing the actual depths of the well installations and the geologic conditions encountered in each soil boring are included as Appendix A. The well locations were selected based on the site limitations to provide the best coverage of the source area and to avoid existing surface and subsurface obstacles. Well screens were installed at depths above the lacustrine clay layer where DNAPL and high concentrations of dissolved-phase VOCs were identified.

The HVE/SVE wells were installed using a hollow-stem auger (HSA) drilling rig and were screened above the top of the lacustrine clay surface. This well screen installation approach concentrates removal of impacts from the shallow saturated zone perched atop the clay unit where DNAPL and the highest concentrations of dissolved-phase VOCs were found. Exterior wells were constructed with the top of screens starting at 4 feet below ground surface and extending the screened interval down to the top of the clay layer. Exterior wells R-4 through R-9 have well screen lengths ranging from 4 to 7 feet below grade. Interior wells were installed deeper as the top of the clay layer was determined to be present at greater depths. The typical length of HVE well screen associated with interior borings is 15 feet.

Each well was constructed using 4-inch diameter, threaded, flush-joint, schedule 40 polyvinyl chloride (PVC) solid casing and 0.01-inch (10 slot) slotted screen. The annular space around each extraction well screen was packed with #2 Morie well sand from the base of the well screen to one foot above the top of the well screen. One foot of hydrated granular bentonite clay was placed on top of the sandpack to seal the borehole. The remaining annular space above the bentonite clay seal was packed with suitable native material. The wells were capped with 4-inch diameter water-tight expansion plugs and enclosed in 8-inch diameter pre-cast steel road boxes with bolted steel covers that were secured at the surface with concrete collars.

All of the wells were installed in such a way to allow them to be used for either HVE or SVE points. In the HVE configuration, a 1-inch diameter, schedule 40 PVC inner well pipe (referred to as a drop pipe) will be attached to a pitless adapter to extract water from the bottom of each HVE well. The pitless adapters for the exterior wells were installed as shown on Figure 3. For the two interior wells (trenchless), the adapter for the drop tube is at the floor surface. During the initial start-up, three wells will be configured for HVE activities to dewater the source area down to the lacustrine clay surface, and the remainder of the wells will be configured to extract vapors via SVE.

2.2.2 System Piping Configuration and Installation

Figure 4 illustrates the layout of extraction well piping. Piping for each HVE/SVE well installed outside the site building was connected individually to a manifold via 2-inch diameter, schedule 40 PVC piping running below grade at a minimum depth of 3 feet below grade. Trenches were installed two feet wide using the minimum number of trenches necessary to plumb piping back to the northern side of the building. Soil was temporarily staged adjacent to the trenches and then replaced as backfill. Trench backfill was compacted with excavating equipment after piping joints were sealed.

Steel piping was used inside the building to protect HVE/SVE well piping. Piping for these wells was connected individually to the manifold via 2-inch diameter steel piping running along the concrete floor surface and fastened every 10 feet. The steel piping was transitioned to PVC immediately prior to exiting the northern wall of the building. For additional protection, a

protective steel box was installed around the steel pipe closest to active facility work, to protect both pipes from being damaged.

To connect the nine SVE/HVE wells to the treatment trailer, piping was extended to the northern side of the building, between the electrical equipment and cooling tower. From this location, flexible hoses were connected to the pipes and extend up into the treatment trailer where the hoses are connected to either the SVE or HVE manifold. This system can be reconfigured by switching which manifold inlet a subject well is connected to, along with the removal or addition of the drop pipe at the well head. Piping/hose connections are secured within an insulated wooden pipe chase to prevent freezing during winter operations.

2.2.3 SVE/HVE Area Cover and Stormwater Management

Following the installation of the HVE/SVE wells, a 60-mil thick synthetic impermeable liner was installed over the unpaved area before the top one foot of surface soil was replaced. This liner serves two purposes: 1) to reduce the potential for the SVE system to short circuit vertically back to the atmosphere, and 2) to redirect surface water collecting on top of the unpaved treatment area to an existing site stormwater drain, substantially reducing storm water infiltration into the source area. A four-inch diameter horizontal perforated drain pipe, embedded in crushed stone, was installed around the perimeter of the unpaved area, on top of the impermeable synthetic liner, and then the top one-foot of soil was replaced. Figure 4 illustrates the location of the liner and perforated pipe.

Stormwater that falls on, flows onto, or melts within the unpaved treatment area is directed to the buried perforated pipe and then flows to an existing three-foot deep, sealed, concrete basin in the southwestern corner of the treatment area (Figure 4). This concrete basin has a single outlet connected to the facility's stormwater management system. Water within the basin is discharged to the facility's stormwater system without coming in contact with the contaminated subsurface media.

2.2.4 Treatment System Trailer

The extraction system components are housed in a treatment system trailer. The basic SVE and HVE system components contained within the enclosure include the items depicted on Figures 5 and 6: two liquid phase separators, a vacuum blower, a CatOx unit, a liquid ring pump, flow meters, a product oil/water separator with product recovery tank, transfer pumps, two bag filters, and up to two 900-pound liquid-phase GAC vessels. Sample ports pressure gauges, temperature gauges, ball valves, and check valves are also part of the systems. The remedial control panel contains all necessary electrical controls for treatment equipment placed inside the trailer.

2.2.5 SVE System

A vacuum blower will be used to extract VOC vapors from the subsurface via the SVE well network. The sizing of the blower and positioning of the extraction wells for this site was approximated for initial system design based on the site's geologic conditions. Additional information will be obtained when the system is started and will include airflow rates and radius of influence (ROI), which can be measured using nearby monitoring wells during the pilot test phase.

Based on observed site geology and past experience at similar sites, an airflow rate of 30 cubic feet per minute (CFM) per extraction well at a wellhead vacuum of 20 to 30 inches of water column (inWC) is anticipated. A 5 horse power (HP), rotary lobe vacuum blower (or equivalent) capable of 250 CFM will be used. The layout of remedial equipment installed in the treatment trailer is shown on Figure 4. Effluent discharge is discussed in Section 2.2.7.

Due to the relatively short SVE piping lengths and shallow well depths, minimal frictional line loss is anticipated for each SVE zone. Line loss is generated by pipe fittings (i.e., T, wyes, elbows, restrictions, manifolds). Other potential points generating minor frictional losses could occur at air-stream filtration components such as within the phase separator or CatOx units. Vacuum and airflow gauges will be used on each SVE zone to monitor system pressures.

2.2.6 HVE System

The HVE system will be operated to lower the water table by use of a liquid ring pump (a rotating positive displacement pump) to extract DNAPL, soil vapor and impacted groundwater. A lowered water table in the source area will limit migration of impacted groundwater from the treatment area. The sizing of the pump for this site has been approximated based on spacing of the installed wells and site soil conditions, and is a 10 HP unit capable of 130 CFM at 270 inWC. The locations of the extraction wells are shown on Figure 4. Initially, three of the existing nine wells (wells R-2, R-5 and R-8) will be used to test the viability of liquid/vapor extraction and source area dewatering via the proposed HVE technology. This configuration may be adjusted to use different or additional wells depending on the initial performance of the system using these three wells. The most important goal of the HVE system is to lower the water table to the clay surface and recover DNAPL. Phreatic zone soils will be dewatered exposing soils containing high levels of adsorbed VOCs to SVE vacuum extraction efforts. The initial HVE liquid recovery flow is anticipated to be up to 10 gallons per minute and then modified as necessary to maintain adequate dewatering in the source area.

Following start-up of the system, the groundwater influent and effluent will be tested at an analytical laboratory for VOC concentrations using EPA Method 8260. Groundwater will be subjected to strong vacuum conditions within the system which may separate vapor-phase VOCs from the water stream; therefore, vapors will be directed to the air discharge portion of the SVE system. Groundwater will be pumped through a combined DNAPL/LNAPL oil/water separator. DNAPL will be manually decanted from the oil/water separator's internal collection

sump. Then the groundwater will be pumped through two bag filters and one GAC treatment tank prior to discharge. If additional treatment is necessary for the effluent, then a second GAC treatment tank will be added for final polishing of the process water prior to discharge to the facility's sanitary sewer.

Periodic system monitoring (see Section 3.3) will occur to determine the effluent concentrations and to determine if/when the carbon units need to be replaced.

2.2.7 Off-Gas Treatment

Soil vapors will be recovered from the extraction wells using a vacuum blower and directed through a water separator, which will remove liquid from the influent vapor prior to treatment of the vapors. Soil vapors extracted by the HVE system will be similarly directed through the same effluent treatment and discharge as SVE vapor.

A Falmouth Products Falco Model 300 Catalytic Oxidizer (CatOx) unit will be used to oxidize residual vapor-phase VOCs to carbon dioxide and water vapor. VOC combustion within the unit occurs in the temperature range between 300 and 600 degrees Celsius (°C). Heat is transferred from the hot exhaust stream to the incoming contaminated air, heating it to catalytic oxidation temperature in the oxidization chamber to destroy VOCs. VOC-stripped exhaust is then discharged to the atmosphere. For the destruction of hydrocarbon vapors, oxidizers use metal catalysts. The precious metals (platinum and palladium) are deposited on a wash coat of high surface area alumina that is adhered to a support structure. The resulting catalyst has an extremely large surface area covered with reactive sites that serve as an oxidative bonding area for reduction of hydrocarbon vapors.

Vapor directed to the CatOx unit will be periodically evaluated to determine when the CatOx unit treatment can be discontinued (see Section 3.2). Once the pre-CatOx concentrations confirm that the system is discharging total VOCs at a rate of 0.5 pounds per hour or less, CatOx treatment will be discontinued and replaced by a single discharge stack that extends to above the building roofline. This discharge will be monitored weekly with a PID to ensure that effluent concentrations do not increase exceed the 0.5 pounds per hour limit. Section 3.2 discusses off-gas treatment monitoring in more detail.

2.2.8 Remedial Wastewater Discharge

Groundwater that is collected and treated through the extraction system will be discharged to a sanitary sewer pipe connection for the UltrePET facility. The effluent from the extraction system will be monitored monthly to determine discharge concentrations by collecting a sample from a sample port after the GAC treatment. The monthly samples will be collected and submitted to an analytical laboratory for VOC analysis via EPA Method 8260. UltrePET will evaluate discharge concentrations relative to their facility's discharge water quality goal and discharges to ensure compliance with their permit. If monitoring results from

the extraction system indicate an unacceptable VOC concentration in the treated process water, then the system will be maintained by either back-flushing the carbon to increase efficiency of fouled carbon or the carbon will be replaced when its efficiency is substantially diminished. Should any type of system reconfiguration be warranted due to unanticipated changes in the influent, the NYSDEC project manager will be informed of the change.

The groundwater effluent flow rate is initially estimated to be about 4 gallons per minute (GPM) and may be modified slightly as necessary by adjusting intake manifold valve settings to maintain dewatering in the treatment area. Based on preliminary estimates, the average treatment system flow is not expected to exceed 5 GPM.

2.2.9 Effluent Thresholds and NYSDEC Notification

The air effluent threshold is 0.5 pounds per hour total VOCs. The water effluent threshold is 5 part per million total VOCs. If air or water effluent from the extraction system exceeds predetermined discharge limits, Chazen will take corrective maintenance actions to reduce concentrations and will notify the NYSDEC Project Manager via a phone call or email within two working days.

3.0 OPERATION, MONITORING AND MAINTENANCE PLAN

3.1 System Start-up and Monitoring

The extraction system was started for pilot testing following NYSDEC's approval of the IRM Work Plan. After the treatment system pilot test and NYSDEC review/approval of this design report system, operational information will be provided to NYSDEC with a detailed monitoring plan. The treatment system will be monitored on a weekly basis. Weekly measurements will include monitoring system vapor concentrations from influent and effluent pipes with a PID and recording vacuum readings, airflow rates, average groundwater flow rates and the number of gallons of groundwater extracted and treated.

3.2 Off-Gas Treatment Monitoring

Influent and effluent air stream samples will be collected from sampling ports in the vapor treatment system piping and screened for VOCs using a PID. PID monitoring will be conducted during the weekly monitoring events at: each SVE well sample port; each of the pre-CatOx vapor sample ports for the SVE influent, HVE influent and combined SVE/HVE influent; and at the CatOx effluent sample port. Airflow rates will also be measured weekly using an air flow gauge. Air samples will be collected periodically from the influent and effluent of the air treatment system and submitted to an ELAP-certified environmental testing laboratory for analysis of total VOCs by Method TO-15. The laboratory data will be used to confirm the results of field screening, to demonstrate changes in the removal rates, and ultimately to determine

when the system has sufficiently reduced VOC concentrations in the source area (to the extent practicable) and can be discontinued.

The results of system monitoring and sampling will also be evaluated to optimize the performance of the extraction system and make decisions whether to reconfigure wells to balance conditions in the treatment area. Reconfiguration of the HVE and SVE well locations and flow rates may change periodically based on observed performance and will be noted in progress reports.

3.3 Groundwater Monitoring

Productive monitoring wells in the treatment area will be gauged quarterly and samples will be collected and submitted to an analytical laboratory for VOC analysis via EPA Method 8260. Results will be used to determine when the area is considered substantially remediated. Groundwater monitoring will document the progress of the treatment and ultimately to determine when the system is no longer beneficial for gross removal of contaminants in the source area. Monitoring frequency may be modified, if approved by the NYSDEC.

When groundwater monitoring results indicate that the source area has been substantially remediated, Chazen will contact the Department to discuss the cessation of this IRM and evaluate the next phase to treat dissolved phase groundwater plume contamination in-situ.

4.0 PERMITS OR OTHER AUTHORIZATIONS

4.1 Required Permits

Treated HVE groundwater effluent will be directed to the industrial sanitary sewer discharge maintained in the site building by UltrePET as a portion of their daily sewer discharge and will be discharged in accordance with conditions listed on the permit they maintain with the City of Albany. The system's initial rate of treatment is estimated at 5 GPM or less, but will be adjusted as necessary to maintain dewatering in the treatment area.

4.2 Permit Exemptions

The air discharge from the HVE/SVE system will initially be treated with the use of an in-line catalytic oxidizer and the VOC-stripped exhaust is then discharged to the atmosphere above the roofline of the building. If the concentrations of VOCs in the vapor stream become low enough (less than 0.5 pounds per hour of VOCs as determined by air sampling and laboratory analysis) that this CatOx treatment is no longer necessary, the CatOx system will be removed and replaced with a standard emissions stack which will discharge the low VOC concentration vapor phase effluent through an alternate stack above the building's roof elevation. As such, no air discharge permits will be required for this temporary discharge because no regulatory air permit thresholds will be exceeded.

5.0 IRM DELIVERABLES

After system startup, initial system data will be used to refine the system's monitoring plan, which will be submitted for NYSDEC approval. IRM-specific operational reports will be provided to the NYSDEC, NYSDOH and the Albany County Health Department on a quarterly basis.

Following completion of IRM activities, an IRM Construction Completion Report (CCR) will be submitted to the NYSDEC.

Prior to any in-situ treatment of dissolved-phase groundwater contaminants, appropriate pilot studies will be performed to select and design an appropriate technology and a groundwater treatment design report will be submitted for agency review and approval.

6.0 SCHEDULE

Schedule for the completion of this IRM is as follows.

1. NYSDEC has approved the IRM Work Plan and initiation of the pilot test for this IRM.
2. The final design for the proposed HVE/SVE system is planned for May – June of 2011 following receipt of final NYSDEC comments on the draft design report.
3. Following the system's pilot testing, a supplemental operation, monitoring and maintenance plan will be prepared and submitted to NYSDEC, this will constitute the completion of the design report for NYSDEC approval. The system is expected to operate for six months to one year.
4. The design of an in-situ groundwater treatment program will follow the implementation of the source area HVE/SVE IRM phase, should the client wish to perform the plume treatment as an IRM action.

FIGURES



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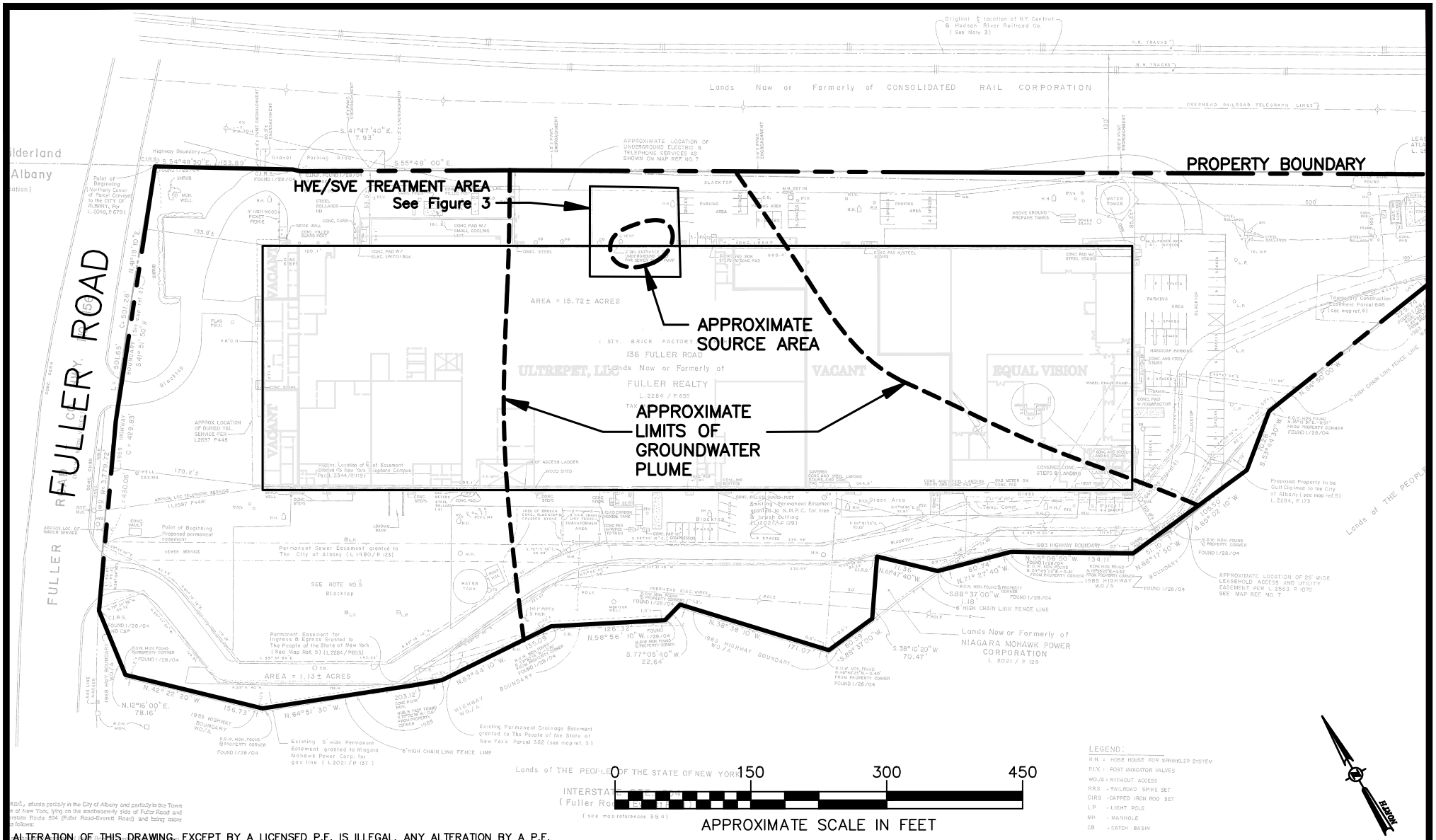
FIGURE 1 - SITE LOCATION MAP

Fuller Partners, LLC Site

136 Fuller Road
City of Albany, Albany County, New York

Base orthoimagery from Google Earth, 2010.

Date:	2010
Scale:	N.T.S
Project #:	90618.00



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FULLER PARTNERS, LLC SITE

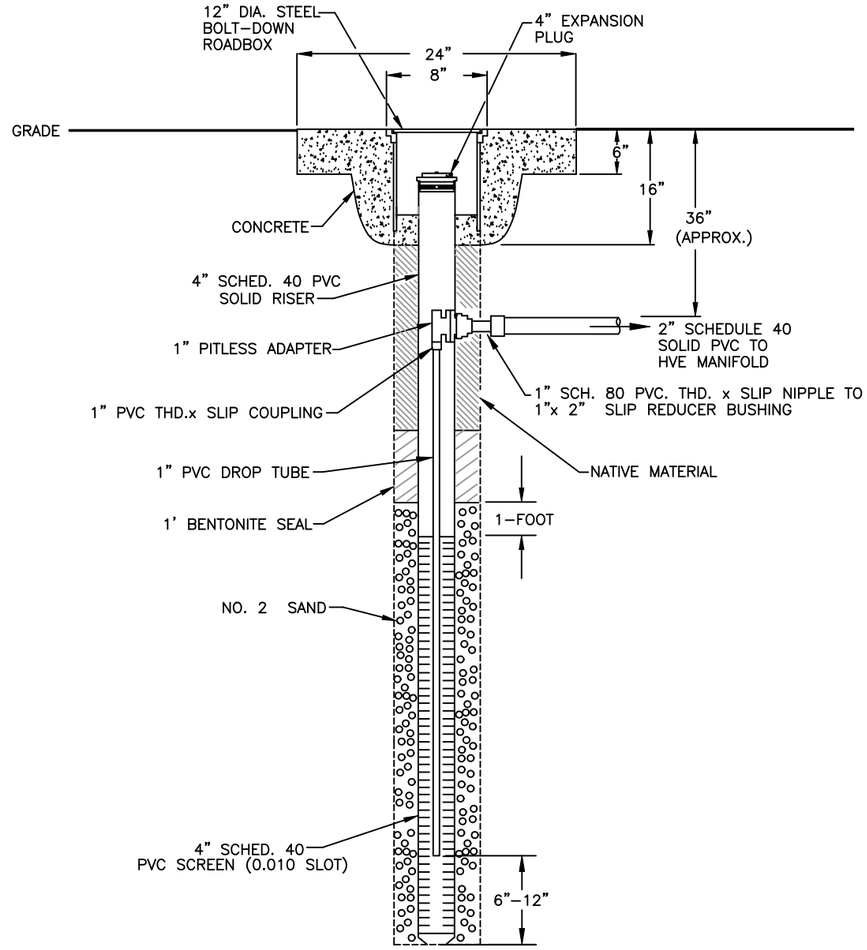
SOURCE AREA AND GROUNDWATER PLUME

136 FULLER ROAD
CITY OF ALBANY, ALBANY CO., NEW YORK

drawn	checked
CSD	DS
date 12/9/10	scale 1"=150'
project no. 90618.00	
sheet no. 2	

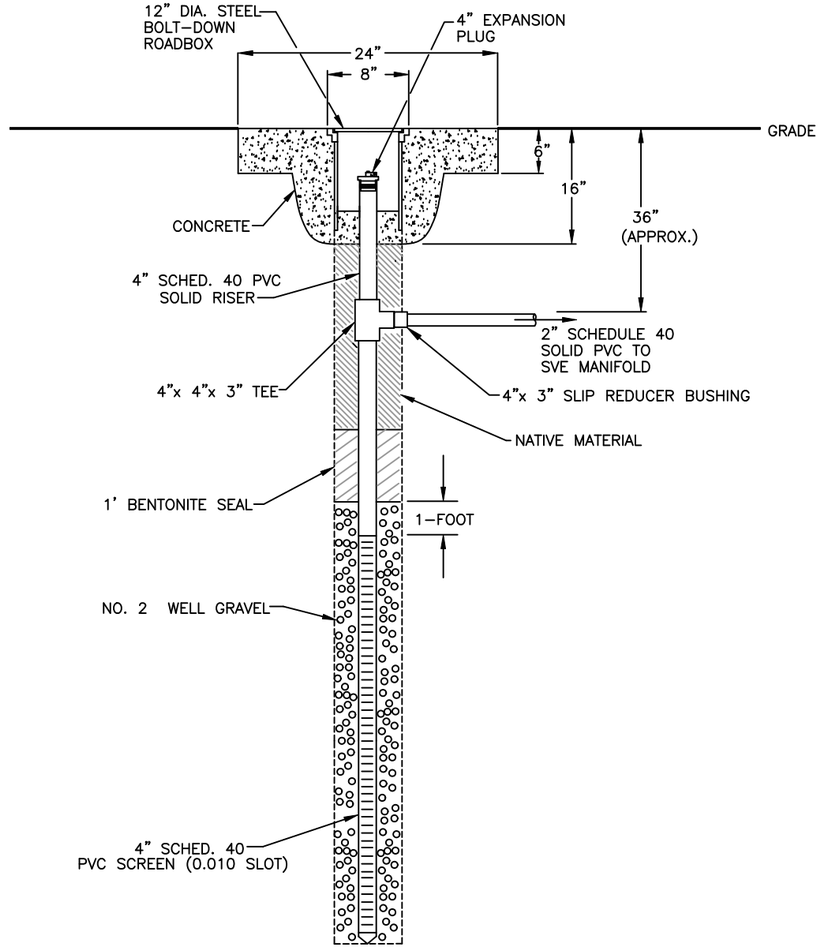
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Drawing Name: S:\9\90600-90699\90618_00\ENG\DWG\FIGURES_90618-00.DWG Date Printed: Dec 23, 2010, 3:28pm



HVE WELL CONSTRUCTION DETAIL

NOT TO SCALE



SVE WELL CONSTRUCTION DETAIL

NOT TO SCALE

CORPORATE ENVIRONMENTAL ADVISORS, INC.
Assessments – Remedition – Emergency Response
127 HARTWELL ST. W.BOYLSTON, MA.

SCALE: AS SHOWN		DR. BY: K. HAZEL
DATE: 3/3/11	APP. BY: KLB	JOB NO.: NY-0001-10

HVE / SVE WELL CONSTRUCTION DETAILS

FULLER PARTNERS, LLP
SITE NO. C401055
136 FULLER ROAD ALBANY, NY

FIGURE-3

PAVED SITE LOOP ROAD

E E E E E E E E E E E

W W W W W W W

R–8

PERFORATED PVC DRAIN PIPE

PERIMETER OF UNPAVED AREA

EXTERIOR SOURCE AREA

TREATMENT SYSTEM TRAILER

R–7

MW–25

R–9

MW–27

MW–29

R–5

MANIFOLDS

Treated water effluent to UltrePET sanitary sewer

CATOX AIR DISCHARGE

FLEXIBLE HOSE

SANITARY SEWER SUMP

R–6

R–4

UltrePET Cooling Tower

UltrePET Electrical Equipment

s

CATCH BASIN

BUILDING EXTERIOR WALL

ULTREPET COMPRESSED AIR AND COOLING EQUIPMENT AREA

INTERIOR HVE/SVE WELLS

R–1

R–10 (Unused)

R–2

MW–30

R–3

S S S S S

0 10 20 30

ORIGINAL SCALE IN FEET

LEGEND

R–1	HVE/SVE System Well and Piping
	HVE/SVE System Inflow and Outflow Lines
MW–25	Shallow Groundwater Monitoring Well
MW–1	Deep Groundwater Monitoring Well
s	Underground Storm Sewer Pipe
E	Underground Electrical Lines
W	Underground Water Pipe

THE Chazen COMPANIES®
Engineers/Surveyors
Planners
Environmental Scientists
Landscape Architects

Dutchess County Office:
21 Fox Street Poughkeepsie, NY 12601
Phone: (845) 454–3980

Capital District Office:
547 River Street Troy, NY 12180
Phone: (518) 273–0055

North Country Office:
100 Glen Street Glens Falls, NY 12801
Phone: (518) 812–0513

FULLER PARTNERS, LLC SITE

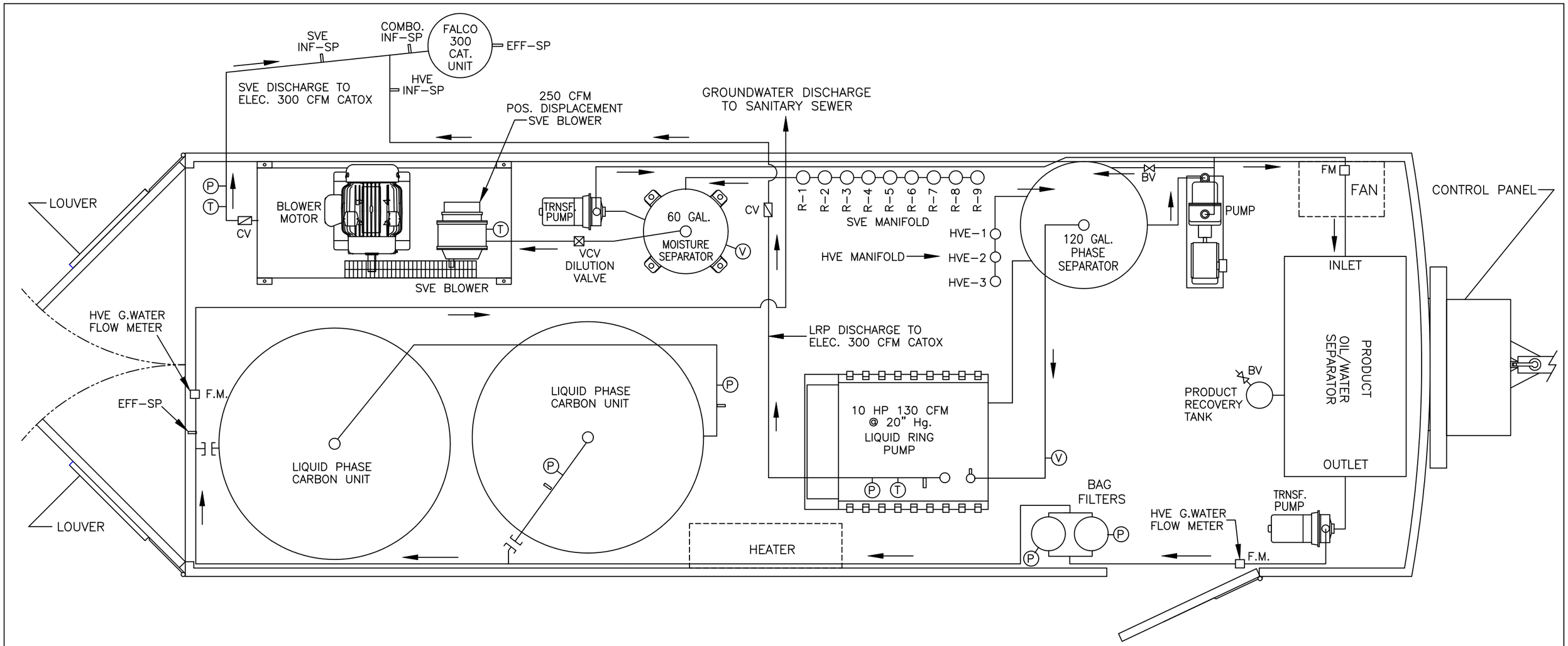
HVE/SVE SYSTEM COMPONENT MAP

136 FULLER ROAD
ALBANY, ALBANY CO., NEW YORK

drawn CSD	checked ASM
date 2/25/11	scale 1"=10'
project no. 90618.00	
sheet no. 4	

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Drawing Name: S:\9\90600–90699\90618_00\ENG\DWG\IRM FIGURES_90618–00(SD).dwg Date Printed: Mar 01, 2011, 8:33am



HVE MANIFOLD				SVE MANIFOLD									CATOX	
WELL	HVE–1	HVE–2	HVE–3	R–1	R–2	R–3	R–4	R–5	R–6	R–7	R–8	R–9	INF.	EFF.
VAC														
PPM														
LEL														
O2														
CO														
FPM														
SVE MANIFOLD VALVE POSITION (IN %) →														

SVE BLOWER

VAC _____

TEMP _____

PRES. _____

CATOX TEMP.

T1 _____

T2 _____

T3 _____

COMMENTS:

LEGEND

- (P) PRESSURE GAUGE
- (T) TEMP. GAUGE
- (V) VACUUM GAUGE
- SP ▭ SAMPLE PORT
- FM ▭ FLOW METER
- BV ⋈ BALL VALVE
- CV ▨ CHECK VALVE
- → FLOW DIRECTION

TECHNICIAN:

DATE:

CORPORATE ENVIRONMENTAL ADVISORS, INC.

Assessments – Remediation – Emergency Response

127 HARTWELL ST. W.BOYLSTON, MA.

SCALE: NOT TO SCALE		DR. BY: K. HAZEL
DATE: 1/27/11	APP. BY: KLB	JOB NO.: NY–0001–10

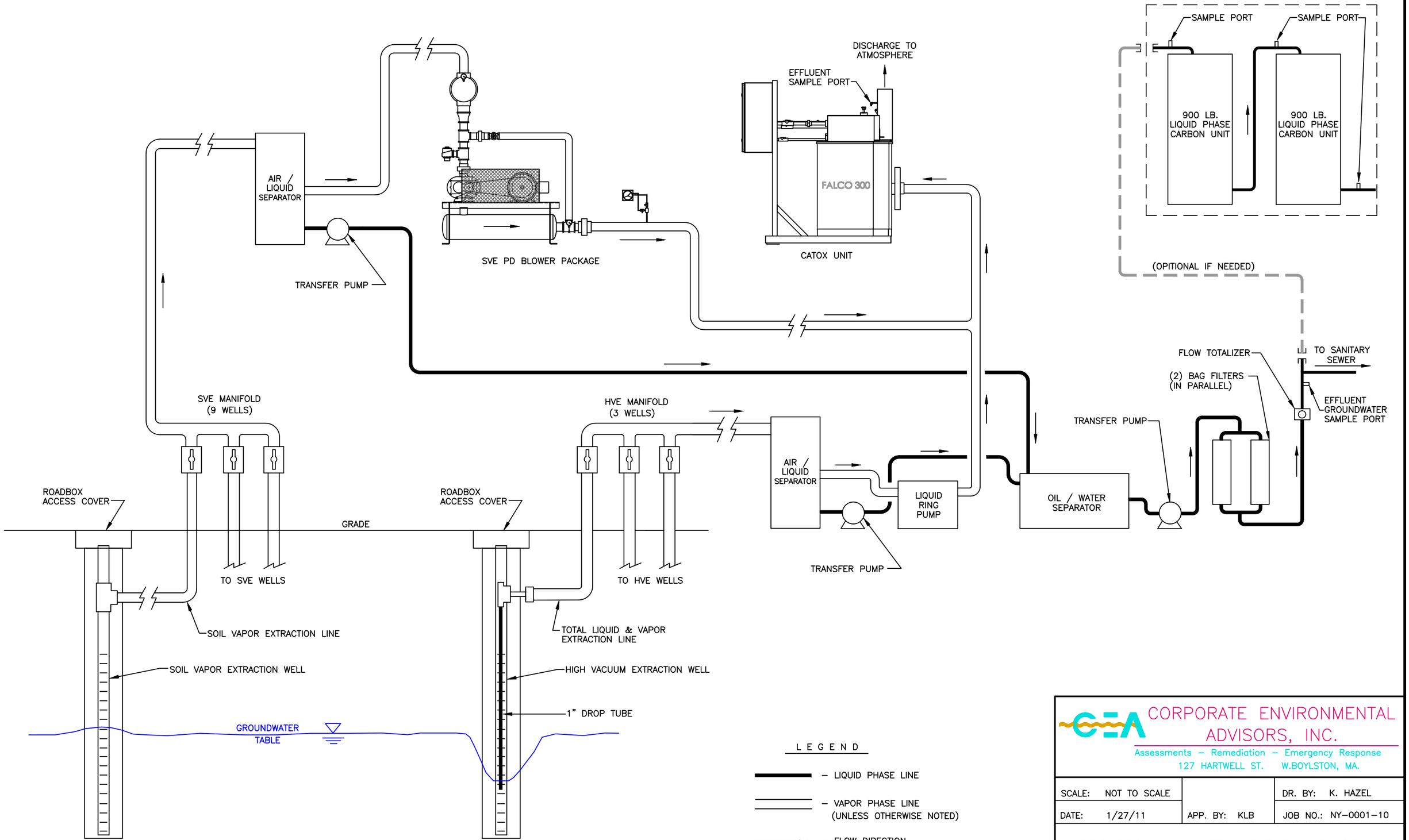
REMEDIAL SYSTEM TRAILER LAYOUT

FULLER PARTNERS, LLP

SITE NO. C401055

136 FULLER ROAD ALBANY, NY

FIGURE 5



CORPORATE ENVIRONMENTAL ADVISORS, INC.

Assessments – Remediation – Emergency Response

127 HARTWELL ST. W.BOYLSTON, MA.

SCALE: NOT TO SCALE		DR. BY: K. HAZEL
DATE: 1/27/11	APP. BY: KLB	JOB NO.: NY-0001-10

PROCESS AND INSTRUMENTATION DIAGRAM

FULLER PARTNERS, LLC

SITE NO. C401055

136 FULLER ROAD ALBANY, NY

FIGURE 6

APPENDIX A

HVE/SVE Well Construction Logs

TEST BORING AND WELL LOG

THE Chazen COMPANIES

547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

Test Boring No.: **R-1**
Total Depth: 20 ft.

Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

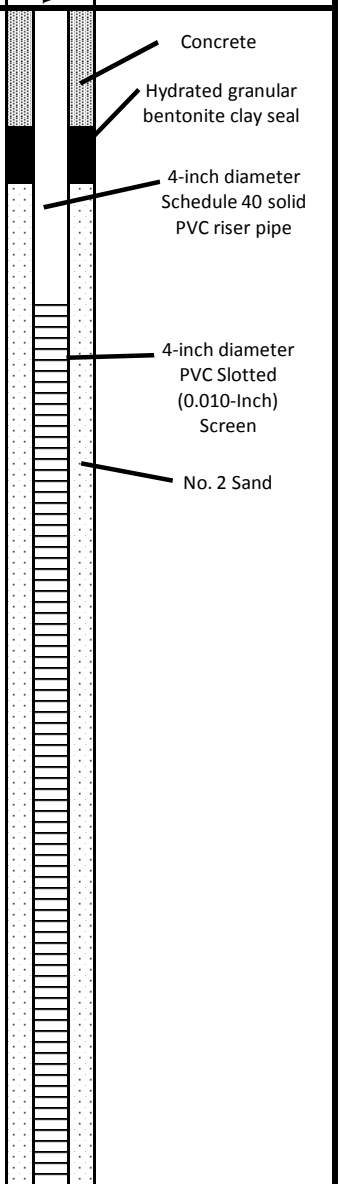
Start Date: 11/15/2010
Finish Date: 11/15/2010
El. Datum: NAVD
G.S. Elevation: 252

Northing: --
Easting: --
Longitude: --
Latitude: --

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 20 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	251							
								0 - 9 Ft. Not sampled
2	250							
3	249							
4	248							
5	247							
6	246							
7	245							
8	244							
9	243							
			1					Brown, fine to medium SAND, wet
10	242							
11	241							
			2					SAA
12	240							
13	239							
			3					SAA
14	238						SP	
15	237							
			4					SAA
16	236							
17	235							
			5					SAA
18	234							
19	233							
20	232							Exploration terminated at 20 ft. bgs

Well Diagram



Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

Test Boring No.: **R-2**
Total Depth: 20 ft.

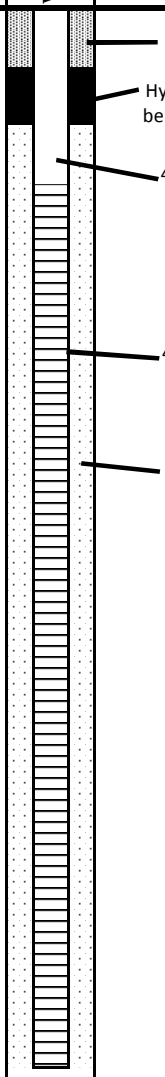
Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

Start Date:	11/15/2010	**Northing:**	--
Finish Date:	11/15/2010	**Easting:**	--
El. Datum:	NAVD	**Longitude:**	--
G.S. Elevation:	252	**Latitude:**	--

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 18 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	251							*Soil description from MW-30:*
							SP	Brown SAND to 3.5 ft.
2	250							
3	249							
4	248						CL	Brown CLAY to 6 ft.
5	247							
6	246						SP	Brown, silty SAND, wet
7	245							Gray fm SAND
8	244							
9	243							
10	242							
11	241							
12	240						SP	
13	239							
14	238							Start of split spoon sampling
			1					Gray fm SAND
15	237							
16	236							
			2					SAA
17	235							
18	234							Gray CLAY
19	233						CL	
20	232							Exploration terminated at 20 ft. bgs

Well Diagram



Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

Test Boring No.: **R-3**
Total Depth: 18 ft.

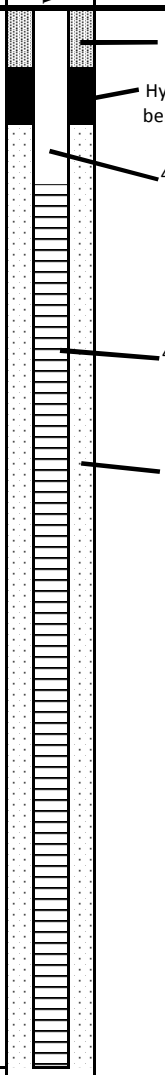
Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

Start Date:	**11/15/2010**	**Northing:**	--
Finish Date:	**11/15/2010**	**Easting:**	--
El. Datum:	**NAVD**	**Longitude:**	--
G.S. Elevation:	**252**	**Latitude:**	--

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 18 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	251							
								0 - 9 Ft. Not sampled
2	250							
3	249							
4	248							
5	247							
6	246							
7	245							
8	244							
9	243							
			1					Gray, fine to medium SAND, wet
10	242							
11	241							
			2					SAA
12	240							
13	239							
			3					SAA
14	238						SP	
15	237							
			4					SAA
16	236							
17	235							
18	234							
								Exploration terminated at 18 ft. bgs
19	233							
20	232							

Well Diagram



Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

Test Boring No.: **R-4**
Total Depth: 10 ft.

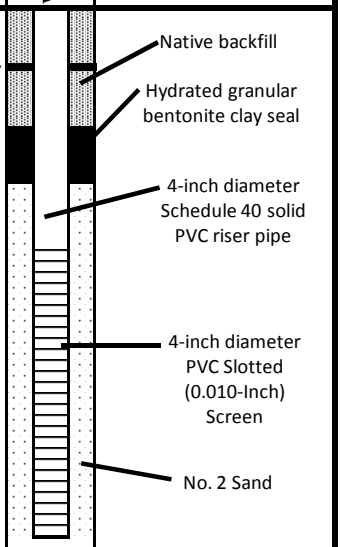
Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

Start Date:	**11/15/2010**	**Northing:**	--
Finish Date:	**11/15/2010**	**Easting:**	--
El. Datum:	**NAVD**	**Longitude:**	--
G.S. Elevation:	**249**	**Latitude:**	--

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 9 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	248							0 - 1 Ft. Soil excavated from the surface prior to drilling
								1 - 6 Ft. Not sampled
2	247							
3	246							
4	245							
5	244							
6	243							
7	242		1				SP	Gray-brown, fine to medium SAND, wet
8	241							
9	240		2					SAA
10	239						CL	Gray CLAY, medium stiff, moist
11	238							Exploration terminated at 10 ft. bgs
12	237							
13	236							
14	235							
15	234							
16	233							
17	232							
18	231							
19	230							
20	229							

Well Diagram



Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES
547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

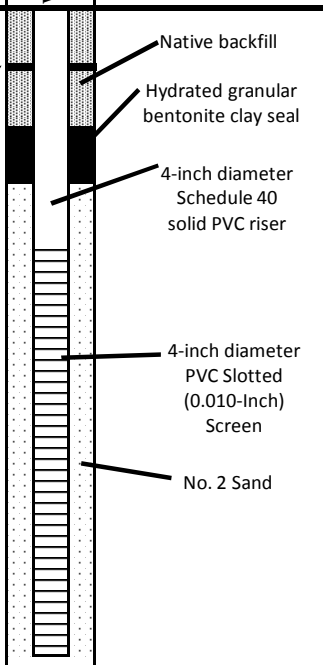
Test Boring No.: R-5
Total Depth: 12 ft.

Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

Start Date: 11/15/2010
Finish Date: 11/15/2010
El. Datum: NAVD
G.S. Elevation: 249
Northing: --
Easting: --
Longitude: --
Latitude: --

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 11 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	248							0 - 1 Ft. Soil excavated from the surface prior to drilling
								1 - 6 Ft. Not sampled
2	247							
3	246							
4	245							
5	244							
6	243							
			1					Brown, fine to medium SAND, wet, strong odor
7	242							
8	241							
			2				SP	SAA
9	240							
10	239							
			3					SAA
11	238							Gray CLAY, medium stiff, moist
							CL	
12	237							
								Exploration terminated at 12 ft. bgs
13	236							
14	235							
15	234							
16	233							
17	232							
18	231							
19	230							
20	229							



Well Diagram

Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

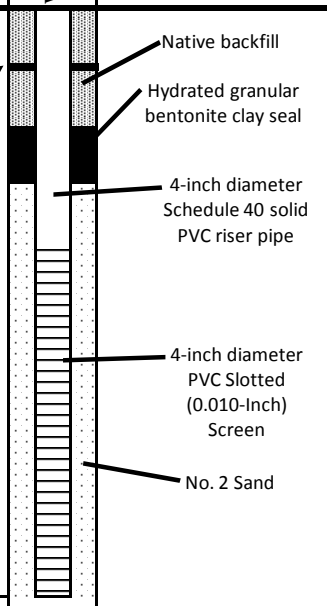
Test Boring No.: **R-6**
Total Depth: 9 ft.

Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

Start Date:	**11/15/2010**	**Northing:**	--
Finish Date:	**11/15/2010**	**Easting:**	--
El. Datum:	**NAVD**	**Longitude:**	--
G.S. Elevation:	**249**	**Latitude:**	--

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 9 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	248							0 - 1 Ft. Soil excavated from the surface prior to drilling
								1 - 6 Ft. Not sampled
2	247							
3	246							
4	245							
5	244							
6	243							
			1					Brown, fine to medium SAND, wet, strong odor
7	242							
8	241						SP	
			2					SAA
9	240							
10	239						CL	Gray CLAY, medium stiff, moist
								Exploration terminated at 10 ft. bgs
11	238							
12	237							
13	236							
14	235							
15	234							
16	233							
17	232							
18	231							
19	230							
20	229							



Well Diagram

Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION

Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES
547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

Test Boring No.: R-7
Total Depth: 9 ft.

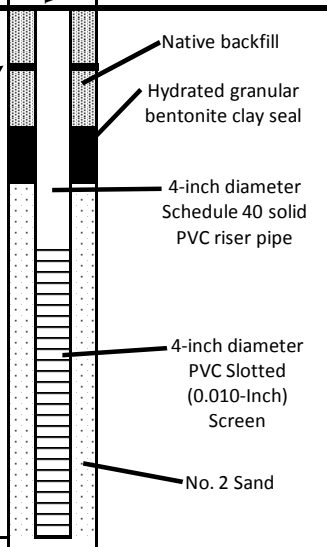
Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

Start Date:	11/15/2010	**Northing:**	--
Finish Date:	11/15/2010	**Easting:**	--
El. Datum:	NAVD	**Longitude:**	--
G.S. Elevation:	249	**Latitude:**	--

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 9 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	248							0 - 1 Ft. Soil excavated from the surface prior to drilling
2	247							1 - 6 Ft. Not sampled
3	246							
4	245							
5	244							
6	243							
7	242		1				SP	Brown, fine to medium SAND, wet
8	241						CL	Gray CLAY, medium stiff, moist
9	240							Not sampled
10	239							Exploration terminated at 9 ft. bgs
11	238							
12	237							
13	236							
14	235							
15	234							
16	233							
17	232							
18	231							
19	230							
20	229							

Well Diagram



Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES
547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

Test Boring No.: R-8
Total Depth: 10 ft.

Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

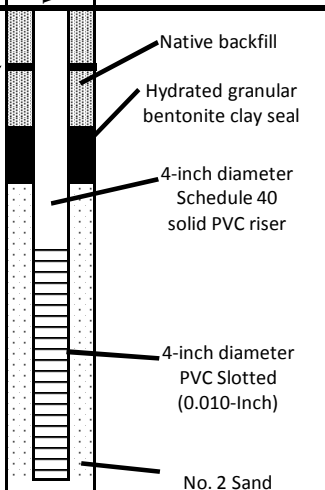
Start Date: 11/15/2010
Finish Date: 11/15/2010
El. Datum: NAVD
G.S. Elevation: 249

Northing: --
Easting: --
Longitude: --
Latitude: --

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 8 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	248							0 - 1 Ft. Soil excavated from the surface prior to drilling
								1 - 6 Ft. Not sampled
2	247							
3	246							
4	245							
5	244							
6	243							
7	242		1				SP	Brown, fine to medium SAND, wet
8	241							Gray CLAY, medium stiff, moist
9	240		2				CL	SAA
10	239							
								Exploration terminated at 10 ft. bgs
11	238							
12	237							
13	236							
14	235							
15	234							
16	233							
17	232							
18	231							
19	230							
20	229							

Well Diagram



Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

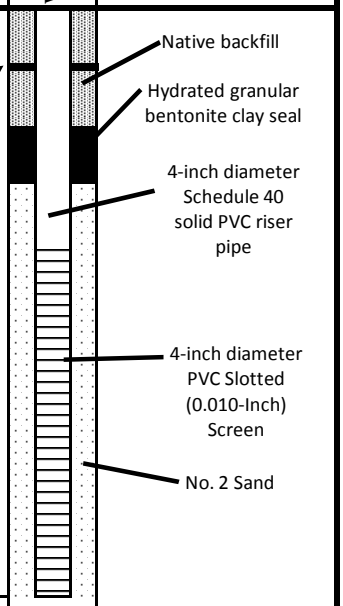
Test Boring No.: **R-9**
Total Depth: 9 ft.

Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad Jackson
Inspector: Scott Dietzel

Start Date:	**11/15/2010**	**Northing:**	--
Finish Date:	**11/15/2010**	**Easting:**	--
El. Datum:	**NAVD**	**Longitude:**	--
G.S. Elevation:	**249**	**Latitude:**	--

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 9 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	248							0 - 1 Ft. Soil excavated from the surface prior to drilling
								1 - 6 Ft. Not sampled
2	247							
3	246							
4	245							
5	244							
6	243							
			1					Brown, fine to medium SAND, wet, strong odor
7	242							
8	241						SP	
			2					SAA
9	240							
10	239						CL	Gray CLAY (at 9.75 ft), medium stiff, moist
								Exploration terminated at 10 ft. bgs
11	238							
12	237							
13	236							
14	235							
15	234							
16	233							
17	232							
18	231							
19	230							
20	229							



Well Diagram

Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

TEST BORING AND WELL LOG

THE Chazen COMPANIES

547 River Street
Troy, New York
12180

PROJECT: 136 Fuller Road Site
LOCATION: Albany, New York
CLIENT: Fuller Partners, LLC
PROJECT NO.: 90618.00

Test Boring No.: **R-10**
Total Depth: 20 ft.

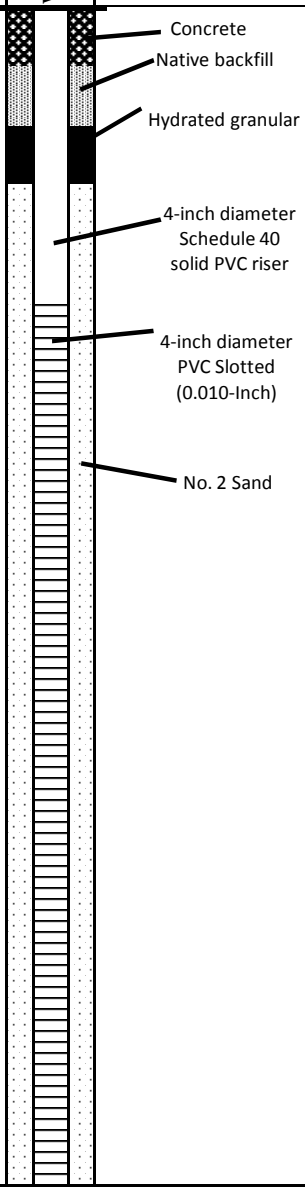
Contractor: Drilex
Drill Rig: CME - Track Mounted
Driller: Brad
Inspector: Scott Dietzel

Start Date:	**11/15/2010**	**Northing:**	--
Finish Date:	**11/15/2010**	**Easting:**	--
El. Datum:	**NAVD**	**Longitude:**	--
G.S. Elevation:	**252**	**Latitude:**	--

Borehole Dia.: 8 in.
Depth to Water: ft.
Depth to Rock: N/A ft.
Depth of Well: 20 ft.

Depth (Feet)	Elevation (Feet)	Casing Data	Sample No.	Sample Data	Recovery (Inches)	PID (ppm)	Group Symbol	Stratum and Field Descriptions:
1	251							
								0 - 9 Ft. Not sampled
2	250							
3	249							
4	248							
5	247							
6	246							
7	245							
								Brown clay in drill cuttings
8	244							
9	243							
			1					Gray CLAY, mod. Stiff
10	242							
11	241							
			2					SAA
12	240							
13	239							
			3					SAA, soft
14	238						CL	
15	237							
			4					Gray CLAY, soft, trace silt
16	236							
17	235							
			5					SAA
18	234							
19	233							
20	232							Exploration terminated at 20 ft. bgs

Well Diagram



Field Notes, Well Notes, Comments:

STANDARD NOTES:

1. Samples classified in accordance with ASTM D-2488 unless otherwise noted.
2. Test Boring Log Page 1: 0 - 20 feet Each subsequent page: Additional 25 feet.

ADDITIONAL NOTES:

DRILLING INFORMATION
Method: Hollow Stem Auger

	Casing	Sample	Core
Type:			
Diam.:			
Weight:			
Fall:			

APPENDIX B

HVE/SVE Equipment Information

Liquid Ring Pump System

- Nash Elmo 2BL1 Liquid Ring Pump
- Asco EF8210G54 Dilution Air Solenoid Valve

Soil Vapor Extraction System

- Roots 36 URAI-J Positive Displacement Blower
- Marathon U613 Motor
- Belt & Sheave
- Falco Catalytic Oxidizer Dilution

Phase Separator Tanks

- LRP Phase Separator
- SVE Moisture Separator

Oil Water Separator

- Model AGS-1SS-30V

Bag Filter System

- U.F. Strainrite SRS-2 Bag Filter Vessel

Transfer Pumps

- Moyno 34401 LRP Phase Separator Transfer Pump
- Gould's NPE Oil Water Separator & SVE Moisture Separator Transfer Pump

Carbon Systems

- Barnebey Sutcliffe TW-36 Liquid Phase Carbon Adsorber

Instrumentation

- Water Flowmeter Turbine Housing
- SVE Low Vacuum Switch
- LRP Level Switch
- Product Tank High Level Switch
- LRP Phase Separator, SVE Moisture Separator & Oil Water Separator Float Switch

Control Panel

- Warrick Series 27 Intrinsically Safe Relay
- Warrick Series 67 Intrinsically Safe Relay

Haulmark Trailer