



**SOIL VAPOR EXTRACTION (SVE)
PILOT TEST SUMMARY AND
SVE SYSTEM DESIGN REPORT
DELPHI AUTOMOTIVE
NORTHERN PORTION OF BUILDING 10
LOCKPORT COMPLEX
200 UPPER MOUNTAIN ROAD
LOCKPORT, NEW YORK**

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1.0 INTRODUCTION

GZA GeoEnvironmental (GZA) has prepared this Soil Vapor Extraction (SVE) Pilot Test Summary & SVE Design Report (Report) for Delphi Automotive, LLC (Delphi). This report documents the results of the SVE pilot test conducted and provides a SVE system design to be implemented in the northern portion of Building 10 at Lockport Complex located at 200 Upper Mountain Road, Lockport, New York (see Figure 1 – Locus Plan).

2.0 BACKGROUND

In 2006, Delphi conducted a voluntary facility-wide investigation of soil and groundwater conditions at their Lockport facility. (This was done at most of the Delphi manufacturing facilities in the United States.) The first phase of that work was the development of a Current Conditions Summary (CCS), which was done by Environmental Resources Management (ERM). The purpose was to obtain information about potential environmental liabilities because that knowledge was needed by Delphi and potential investors as part of developing the strategy for exiting bankruptcy. The CCS work generally followed the requirements for a CCS in the RCRA Corrective Action Program.

After completion of the CCS, a field investigation was initiated to assess soil and groundwater conditions at each area of interest (AOI), identified by the CCS. A total of 144 soil borings were completed throughout the Lockport Complex, and nine sediment and four surface soil samples were collected. Six monitoring wells were installed, but only five were sampled as one of the wells was dry. Over 400 soil and groundwater samples were analyzed for an extensive list of parameters. The field investigation activities and results were described in the Field Investigation Report (FIR), dated January 2007, followed by the CCS submission in May 2007.

Two AOIs located within the footprint of Building 10 were included in the field investigation. AOI-36 was a former painting operation in the western portion of the building. AOI-37 was an area where soil contamination was encountered during construction of a sump in 1999. Boring 10-106 was installed in AOI-36 and borings 10-107-A and 10-107-B were installed in AOI-37. At each AOI, samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) and metals. No detections above NYSDEC Part 375 Commercial Soil Clean-up Objectives (CSCO) were found at AOI 36. At AOI-37, tetrachloroethylene was found at 270 milligrams/kilogram (mg/kg) in one sample, exceeding the CSCO of 150 mg/kg.

Based on the findings described above, a Focused Environmental Assessment (FEA) was conducted by GZA GeoEnvironmental of New York (GZA). The purpose of this FEA at Building 10 was to assess the potential extent of chlorinated VOC impacts in soil and groundwater in the vicinity of column WK45 within Building 10 and whether



vapor intrusion was a concern within the northern portion of Building 10. The FEA was conducted in general accordance with the GZA work plan dated June 27, 2007.

It was GZA's opinion that the elevated detections of tetrachloroethene (PCE) and trichloroethene (TCE) found in the sub-slab air sample collected at Bldg 10, SS-1, the elevated detections of PCE in the soil samples and the detections of VOCs above groundwater criteria in the groundwater sample from MW-1 indicate that a release in this area occurred and will require remedial action.

Delphi has submitted a draft Brownfield Cleanup Program (BCP) application for the northern portion of Building 10 to the New York State Department of Environmental Conservation (NYSDEC). Delphi plans on submitting a final BCP application for Building 10 by October 31, 2007.

3.0 PURPOSE AND OBJECTIVES

The purpose of this report is to present the results of:

- The additional contaminated soil delineation performed to assess the extent of PCE at concentrations greater than 300 parts per million (ppm)¹;
- The SVE pilot test; and
- The SVE system design to be implemented to address the soil contamination greater than 300 ppm.

The objectives of the SVE pilot test and this report include:

- Collect pertinent data to assist with SVE design process;
- Assess SVE vapor flow rates and VOC vapor concentrations under a range of flow and vacuum conditions; and
- Develop an SVE treatment system design.

The following sections discuss the additional soil delineation, SVE pilot test procedures, results and conclusions of the SVE pilot test, and SVE system design.

¹ 300 ppm is the 6 NYCRR Part 375 6.8(b) Industrial Soil Cleanup Objective (SCO).



4.0 ADDITIONAL SOIL DELINEATION

As part of the Building 10 FEA, twelve (12) soil probe locations, SP-1 through SP-12 (see Figure 2), were completed on July 10, 2007 around the former sump area to assist in delineating potential chlorinated solvent contamination within the subsurface soils (see Figure 2 for approximate locations). Nine (9) additional soil probe locations, SP-13 through SP-21 (see Figure 3) were completed on September 17, 2007 to assess the limits of PCE soil contamination at concentrations greater than 300 ppm (Figure 4).

The soil probes were advanced into overburden soils utilizing direct push technology via a hydraulic hammer mounted on a track mounted rig equipped with 2-inch outer diameter by 48-inch long macrocore sampler. Soil probes were advanced to depths which ranged from approximately 6.1 feet to 9 feet below ground surface (bgs). Bedrock is located at approximately 8 to 9 feet bgs.

A field geologist observed the soil probes and created a field log for each probe (see logs in Appendix A). Soil samples were collected from the soil probes for classification, chemical and geotechnical laboratory analysis and headspace screening with an Organic Vapor Meter (OVM) for the presence of VOC vapors (discussed in the next section). Soil samples were collected at two-foot intervals to the bottom of the probes. Table 1 contains a list of the soil samples selected for chemical and geotechnical analysis.

4.1 HEADSPACE SCREENING

The headspace present in the sample baggies above the soil samples collected from soil probes were screened for total organic vapors using an organic vapor meter (OVM) with a photoionization detector (PID). The OVM, a MiniRae 2000 was calibrated in accordance with manufacturer's recommendations using a gas standard of isobutylene at an equivalent concentration of 100 ppm in air. GZA screened a clean, unused plastic bag prior to the start of the headspace screening to establish background concentrations, which were non-detect.

The OVM probe was placed in to the top of the sealed baggies to screen the headspace. OVM readings from the headspace screening of the soil probe samples ranged from 9 ppm (SP-21, 8 to 9 feet bgs) to >10,000 ppm (SP-20, 2 to 4 and 4 to 6 feet bgs). Headspace results were recorded on the probe logs included in Appendix A.

4.2 SUBSURFACE CONDITIONS

Subsurface soil conditions encountered at the soil probe locations generally consisted of 2 to 3 feet of fill material (sub-base stone beneath the concrete slab-on-grade floor and reworked native soils) overlying native soils which consisted of various amounts of silty clay or clayey silt with lesser and varying amounts of sand and gravel. Bedrock (Lockport Dolostone) underlies the overburden soil at a depth of approximately 8 to 9 feet below the slab-on-grade floor.



Overburden groundwater was not encountered in a suitable quantity that would allow for the collection of groundwater measurements and/or samples at the soil probe locations.

Geotechnical analysis (moisture content and sieve/hydrometer (grain size)) of select soil samples from SP-13, SP-14 and SP-15 (see Table 1) indicated that moisture content of the soil samples ranged from 10.7 % (SP-15, 6 to 8 ft bgs) to 22.9 % (SP-14, 2 to 4 ft bgs). See Appendix B for the geotechnical laboratory results. The average moisture contents were as follows:

- SP-13: 19%
- SP-14: 19%
- SP-15: 17%

Soil samples collected from SP-13 and SP-15 were combined into two composite samples to be tested for sieve/hydrometer to assess grain size and soil classification type. See Appendix B for the geotechnical laboratory results. The following is a breakdown of the grain size analysis.

SP-13, 2 to 8 feet bgs (Composite): Silt and Clay– 81%
Sand – 18%
Gravel – 2%

The soils from SP-13, 2 to 8 feet bgs were classified as CLAY & SILT, little fine to medium Sand and trace Gravel.

SP-15, 2 to 8 ft bgs (Composite): Silt and Clay – 776%
Sand – 16%
Gravel – 7%

The soils from SP-15, 2 to 8 feet bgs were also classified as CLAY & SILT, little fine to medium Sand and trace Gravel.

5.0 SVE PILOT TEST PROCEDURES

This section describes the detailed design of the two (2) extraction wells, eight (8) vacuum monitoring points and procedures for the SVE pilot test.

5.1 EXTRACTION WELL INSTALLATIONS

The two areas shown as on Figure 5 were selected for SVE pilot testing. Previously completed soil probe locations, SP-7 and SP-20, were selected as extraction well locations. EW-1 was installed at SP-20 and EW-2 was installed at SP-7. The areas



were selected based on their spatial locations within the area to be addressed with the SVE system and the concentration of PCE in soil samples. Probe location SP-20 is located in the northern portion of the area to be treated and contained concentrations of PCE greater than 1,000 ppm in multiple soil samples tested (see Table 2). Probe location SP-7 is in the southern portion of the area to be treated and contained concentrations of PCE of 297 ppm, which is at the Part 375 Industrial SCO of 300 ppm.

The two extraction wells were both installed to a depth of 7 feet bgs in a similar manner (see Extraction Well log in Appendix A), with a rotary drill rig utilizing 6¼-inch diameter hollow stem augers (HSA). No spilt spoon samples were collected because the wells were installed at former soil probe locations where sampling had previously been completed. The extraction wells were screened from 2 to 7 feet bgs, which encompasses the full thickness of the vadose zone, using 4-inch diameter PVC 10-slot well screen. A solid PVC riser was installed above the well screen and finished as a stick up approximately 2 feet above the concrete slab. A sand pack, consisting of #2 sand, was placed in the annulus space of the boring from approximately 1.5 to 7 feet bgs. Approximately 6-inches of bentonite was placed above the sand pack and hydrated to seal the extraction well screen from the approximate 6-inch gravel layer located beneath the concrete floor slab. A concrete seal was placed over the bentonite to ground surface.

The extraction wells were not installed to the top of bedrock because previous experience at some of the monitoring wells installed as part of previous investigations at the Delphi Lockport Complex indicate that groundwater is present in the vicinity of the overburden soil and bedrock interface. Groundwater at this overburden/bedrock interface is under pressure due to the low permeability of the clayey overburden soils and water levels measured in some bedrock monitoring wells are at elevations above that of the bedrock. Due to the high vacuums (see Section 6) that were used during the pilot testing, GZA wanted to limit the potential for groundwater upwelling and focus on the SVE pilot testing.

5.2 VACUUM MONITORING POINT INSTALLATIONS

To measure the magnitude and distribution of the vacuum induced through the SVE wells, eight (8) vacuum monitoring points were installed, four (4) around each of the two (2) extraction wells (see Figure 5). The vacuum monitoring points were installed in four directions from the extraction wells (north, south, east and west) at distances of 5, 10, 15 and 20 feet.

A direct push soil probe rig was used to create the hole that the vacuum monitoring points were installed. Two depths were monitored at each vacuum monitoring point, from 1.5 to 3 feet bgs and 3.5 to 7 feet bgs. The eight (8) vacuum monitoring points were typically installed as shown on the log in Appendix A. Polyethylene tubing (¼-inch outer diameter) was installed within a sand pack placed at two monitoring depths (1.5 to 3 feet bgs and 3.5 to 7 feet bgs). Bentonite was used to seal off the two depths

from each other and seal the upper monitoring depth from the gravel layer located beneath the concrete slab.

5.3 PILOT TEST PROCESS EQUIPMENT



The pilot test process equipment for the SVE pilot test was provided by Matrix Environmental Technologies, Inc. (Matrix) and consisted of a trailer mounted SVE system equipped with a positive displacement blower, moisture knock out tank, 55-gallon drum of granular activated carbon (GAC), piping and temporary discharge lines, details of which are summarized below.

5.3.1 Regenerative Blower

The positive displacement blower utilized for the pilot testing at both, EW-1 and EW-2 was a Roots Universal RAI Whispair, which was capable of producing as much as 190 inches of water column (inches w.c.) vacuum and an air flow rate of up to 160 cubic feet per minute (CFM). The regenerative blower was used to achieve wellhead vacuums ranging from 40 to 190 inches w.c. and air flow rates ranging from 13 to 20 SCFM during different step tests at EW-1; and wellhead vacuums ranging from 54 to 175 inches w.c. and air flow rates ranging from 10 to 23 SCFM during different step tests at EW-2. Equipment specifications for the SVE pilot test are presented on Table 3 and shown in schematic format on Figure 6.

5.3.2 Air Pollution Control Equipment

Extracted soil vapor passed through one, 55-gallon drum containing approximately 200-pound (lb) of vapor phase granular activated carbon before being discharged outside the building through an existing roof penetration. The influent (at the wellhead), midpoint (prior to entering the carbon drum) and effluent air (prior to discharge to the atmosphere) were monitored periodically for VOCs with an OVM. A tedlar bag air sample was also collected from the discharge air towards the end of the second and final day of pilot testing (see Table 1). The gas chromatograph screening result of the discharge air sample collected had a total VOC concentration of 11.4 ppm/v, of which PCE was 10 ppm and 1,1-dichloroethelene was 1.4 ppm (see Appendix C for the laboratory report).

Following the completion of the pilot test activities, the vapor phase carbon drum was staged in Building 10 for proper off-Site disposal by Delphi. Additionally, water accumulated within the moisture knockout tanks was removed and placed in the 55-gallon drum containing monitoring well MW-1 development and purged groundwater for proper off-Site disposal by Delphi.

5.3.3. Pilot Test Monitoring Equipment

Vacuum, flow and air quality measurements were collected during the SVE pilot testing. This section describes the equipment used to collect those measurements.



5.3.3.1 Vacuum Monitoring Equipment

Soil vacuum measurements were collected using two types of gauges, Testo 506 digital manometers for vacuum readings ranging from, 0 to 2 in of w.c. and Dwyer dial magnehelic gauges for vacuum readings from 1 to 20 inches of w.c.. The manometers/magnehelic gauges used have an accuracy of 5% of their maximum range. The system vacuum monitoring points and sample ports are shown on Figure 6.

5.3.3.2 Flow Monitoring Equipment

Air flow monitoring was conducted at the extraction wellheads using an in-line EG&G Roton flow meter and Cole-Palmer Tri-Sense Temperature, Humidity and Velocity meter, which was placed downstream of the Rotron flow meter. The details of the flow monitoring equipment are shown on Table 3 and a typical schematic of the system is presented on Figure 6.

5.3.3.3 Volatile Organic Monitoring

Volatile organic compound (VOCs) monitoring was conducted in both the field and laboratory.

- **Field Monitoring**

In the field, total volatile organics monitoring was performed using a HNU PI-101 OVM utilizing a 10.2 eV lamp. The PID was calibrated daily using 100 ppm isobutylene calibration gas. PID readings were collected directly from the SVE piping system at various points within the process system (see Figure 6 for the sampling locations and Table 4 for a summary of the reading collected during the testing).

- **Laboratory Analysis of Soil Vapors**

To provide data for assessment of VOC mass flux rates and correlation with PID measurements, air samples of extracted well vapors were collected using tedlar bags. The air samples collected from the wellhead were extracted from the system using a Thomas 107CAB diaphragm compressor vacuum pump. The tedlar bag

vapor samples were analyzed for VOCs via gas chromatograph screening. Two air samples were collected during the pilot testing at EW-1 and two were collected during the testing at EW-2. The laboratory analytical results are presented in Appendix C.



6.0 SVE PILOT TEST RESULTS

This section of the report provides the results of the SVE pilot testing. Table 4 summarizes the field data collected during the SVE pilot testing.

6.1 RESULTS OF SOIL ANALYSES

Prior to the installation of SVE extraction wells and vacuum monitoring points, additional soil probes were done to collect soil samples for analysis to further delineate the area of soil contamination greater than 300 ppm. The results of the soil sampling are summarized on Table 2 and the laboratory report is provided in Appendix C. The approximate limit of the soil contamination greater than 300 ppm is shown on Figure 4.

6.2 EXTRACTION WELL, EW-1 AREA

The results of SVE pilot tests conducted in and around EW-1, in the northern portion of the PCE contaminated area, are presented below. No liquid condensate was collected in the air/water separator during the testing in this area. However, approximately 0.5 feet of water was measured in the bottom of EW-1, prior to the start of testing.

6.2.1 Test Sequence and Parameters

Step tests were conducted on the SVE extraction well, EW-1 area, beginning at the higher end of the vacuum range proposed for testing. The first step test was initiated at 190 inches w.c. (14 inches of mercury). Over the course of 385 minutes (3 hours 45 minutes), the vacuum at the wellhead stabilized at 184 inches w.c. The flow rate at the beginning of the test was approximately 10 SCFM and eventually stabilized at 20 SCFM. Subsequent steps consisted of extraction under vacuums of 136 inches w.c., 82 inches w.c. and 41 inches w.c., respectively. Flow and subsurface vacuum observations during the 136 inches w.c., the 82 inches w.c. and the 41 inches w.c. steps generally stabilized within approximately 1 hour. The 136 inches w.c. test yielded a flow rate of approximately 17 SCFM, while the 82 inches w.c. test and the 41 inches w.c. test yielded flow rates of approximately 13 SCFM and 8 SCFM, respectively. No liquid condensate was collected in the air/water separator during the EW-1 SVE Pilot Test. The summarized test sequence and parameters are provided in Table 4.



6.2.2 Vacuum Distribution

GZA attempted to monitor vacuum at two depth zones as apart of the pilot study, 1.5 to 3 feet bgs and 3.5 to 7 feet bgs. However, the vacuum monitoring points in the upper zone from 1.5 to 3 feet bgs did not register vacuum readings during the pilot testing. The lack of upper zone vacuum readings may be caused by the reworked native soils that have likely been removed, replaced and/or compacted as part of the construction of Building 10. Therefore, it is possible that the horizontal flow pathways, due to the laminar stratigraphy of the native soils (glacially derived lacustrine soils deposited in a horizontal manner) were removed due to reworking and compaction.

The vacuum measured in the lower vacuum monitoring points from 3.5 to 7 feet bgs was proportional to the applied wellhead vacuum. The observed vacuum distribution in subsurface soils for EW-1 Area for each of the four vacuum steps is shown on Figure 7. The semi-logarithmic relationship between observed vacuum and the distance from SVE extraction well is graphically represented in Figure 8 and yields good correlation ($R^2 > 0.93$) for each step. As expected, the greater the vacuum at the extraction wellhead, the higher observed vacuum measurements at the vacuum monitoring points. However, due to the low permeability of the subsurface soils the measurable vacuum was only observed at a distance of approximately 15 to 20 feet radially from extraction well, EW-1.

6.2.3 Flow-Vacuum Relationship

Air flow rate was measured at the SVE extraction well EW-1 at specific intervals during the wellhead vacuum step tests. The results of flow measurement activities are shown on Table 4. In general, air flow rates increased linearly as the wellhead vacuum was increased. The air flow rate at the lowest applied wellhead vacuum, 42 inches w.c., was 8 SCFM, while the air flow rate at the highest applied wellhead vacuum tested, 190 inches w.c., was 20 SCFM. The air flow rate per vacuum for EW- 1 is graphically shown on Figure 9 and indicates that the air flow rate varied between 1.6 and 4 SCFM per foot of well screen during the four steps performed.

6.2.4 VOC Monitoring Results

The VOC monitoring data collected by the OVM from the SVE extraction wellhead during each of the four steps ranged between approximately 45 ppm and 290 ppm. PID measurements were also collected prior to the vapor entering into the carbon drum and effluent during the course of the steps. The OVM reading prior to entering into the carbon drum ranged from 25 to 75 ppm and the reading from the effluent was less than 1 ppm.

Two tedlar bag samples were taken for laboratory analysis of VOCs by gas chromatogram screening during the initial 190 inches w.c. test. These samples



were identified as EW-1: 1215 and EW-1: 1345. Air sample EW-1: 1215 indicated a total VOC concentration of 820 ppm, of which 800 ppm was PCE. Air sample EW-1: 1345 indicated a total VOC concentration of 432 ppm, of which 420 ppm was PCE. A comparison of the tedlar bag air sample results to collocated PID measurements indicates that at the observed total VOC concentration range, PID measurements were approximately 87 percent lower than the laboratory measurements.

PID results are summarized in Table 4. Laboratory analytical reports are summarized in Table 4 and presented in Appendix C.

6.3 EXTRACTION WELL, EW-2 AREA

The results of SVE pilot tests conducted in around EW-2, in the southern portion of the PCE contaminated area are presented below. Approximately 3-gallons of water collected in the knockout tank during the testing in this area. The extraction well was dry prior to the test of the testing. It is likely that due to the high vacuums used in the pilot test, that water in formation or groundwater near the zone of capillary fringe was drawn into the well. GZA bailed the well dry twice during the testing and recharge was not observed until vacuum was applied to the wellhead.

6.3.1 Test Sequence and Parameters

Step tests were conducted on the SVE extraction well, EW-2 area, beginning at the higher end of the vacuum range proposed for testing, similar to test at EW-1. The first step test was initiated at 177 inches w.c. (13 inches of mercury) and ran for approximately 1.5 hours, until water was drawn up from the extraction well. The vacuum at the wellhead held at 177 inches w.c. during the testing. The flow rate at the beginning of the test was approximately 23 SCFM and eventually stabilized at 19 SCFM, however due to moisture/water in the system, the flow meter could not be used. Subsequent steps consisted of extraction under vacuums of 109 inches w.c., 82 inches w.c. and 54 inches w.c., respectively. Flow and subsurface vacuum observations during the 109 inches w.c., the 82 inches w.c. and the 54 inches w.c. steps generally stabilized within approximately 1 hour. The 109 inches w.c. test yielded a flow rate of approximately 15 SCFM, while the 82 inches w.c. test and the 54 inches w.c. test yielded flow rates of approximately 12 SCFM and 10 SCFM, respectively. Approximately 10-gallons of water collected in the knockout tank during the EW-2 SVE Pilot Test. The summarized test sequence and parameters are provided in Table 5.

6.3.2 Vacuum Distribution

Similar to the EW-1 pilot test area, GZA attempted to monitor vacuum at two depth zones, 1.5 to 3 feet bgs and 3.5 to 7 feet bgs. However, the vacuum monitoring points in the upper zone from 1.5 to 3 feet bgs did not register



vacuum readings during the pilot testing. The lack of upper zone vacuum readings may be caused by the reworked native soils that have likely been removed, replaced and/or compacted as part of the construction of Building 10 and the horizontal flow pathways of the native soils were removed due to reworking and compaction.

The vacuum measured in the lower vacuum monitoring points from 3.5 to 7 feet bgs was proportional to the applied wellhead vacuum. The observed vacuum distribution in subsurface soils for EW-2 Area for each of the four vacuum steps is shown on Figure 10. The semi-logarithmic relationship between observed vacuum and the distance from SVE extraction well is graphically represented in Figure 11. This relationship does not yield good correlation for each step. Vacuum was not observed at the vacuum monitoring point 15 feet from EW-2. This is likely due to the utility line that was present between the extraction well and the vacuum monitoring point.

At vacuum monitoring points that were influenced by the vacuum applied to the SVE well, the greater the vacuum at the extraction wellhead, the higher the observed vacuum measurements. Measurable vacuum was observed at 20 feet from extraction well, EW-2, but it is unknown if the vacuum is due to air flow vacuum or from the water that accumulated in the well being drawn towards the well.

6.3.3 Flow-Vacuum Relationship

Air flow rate was measured at the SVE extraction well EW-2 at specific intervals during the wellhead vacuum step tests. The results of flow measurement activities are shown on Table 5. In general, air flow rates increased linearly as the wellhead vacuum was increased. The air flow rate at the lowest applied wellhead vacuum, 54 inches w.c., was 10 SCFM, while the air flow rate at the highest applied wellhead vacuum tested, 177 inches w.c., was 19 SCFM. This air flow rate for EW-2 is graphically shown on Figure 11.

6.3.4 VOC Monitoring Results

The VOC monitoring data collected by the OVM from the SVE extraction wellhead during each of the four steps ranged between approximately 300 ppm and 110 ppm. PID measurements were collected prior to the vapor entering into the carbon drum and effluent during the course of the steps. The OVM reading prior to entering into the carbon drum were around 145 ppm and the reading from the effluent was less than 1 ppm.

Two tedlar bag samples were taken for laboratory analysis of VOCs by gas chromatogram screening. One was collected during the initial 109 inches w.c. test (identified as EW-2: 1300) and the second was collected during the 82 inches w.c. test (identified as EW-2: 1645). Air sample EW-2: 1300 indicated a



total VOC concentration of 3,870 ppm, of which 3,700 ppm was PCE. Air sample EW-2: 1645 indicated a total VOC concentration of 3550 ppm, of which 3,400 ppm was PCE. A comparison of the tedlar bag air sample results to collocated PID measurements indicates that at the observed total VOC concentration range, PID measurements were approximately 88 percent lower than the laboratory measurements.

PID results are summarized in Table 5. Laboratory analytical reports are summarized in Table 6 and presented in Appendix C.

7.0 SVE SYSTEM DESIGN PARAMETERS

The SVE Pilot Test conducted in support of the proposed vadose zone remedy yielded sufficient information to support the design of these planned activities. The proposed SVE system design is summarized below.

7.1 KEY DESIGN FACTORS

The results of the soil probe programs as well as the SVE pilot test indicate the proposed design of the SVE system should account for the following key design factors:

- Unsaturated zone soils at the Site consist of clays and silts with varying percentages of sand and gravel. Interbedded coarse-grained soils were not observed in the soil probes. Therefore, the anticipated pneumatic permeability of these materials is expected to be relatively uniform and low.
- Anthropogenic features, including coarse grained base coarse installed directly beneath the slab, and unknown utilities and their associated bedding materials, will have a significant affect on SVE flow pathways. These features will likely alter the magnitude and distribution of SVE well flow and vacuum.
- The high vacuum required to induce SVE flow may result in localized upwelling of the groundwater in the area of the SVE wells; therefore, the SVE well points should not extend into or near the anticipated top-of-rock groundwater zone.
- The SVE system will have a sub-slab depressurization (SSD) component designed into the system that will be able to be operated as its own separate system if the SVE system is shut-down.

The proposed SVE design has been developed in consideration of these key design factors as well as the results of the SVE pilot test.



7.2 SVE WELL CONSTRUCTION/GEOMETRY

SVE pilot test results indicate the average vacuum radius of influence for the SVE wells will be approximately 15 to 20 feet. This suggests that approximately 17 SVE wells are to be installed within the proposed treatment area at a spacing of less than 40 feet on center. We expect that the actual location of each of the anticipated 17 SVE wells will vary based on the location of utilities and other building structural components. Figure 13 presents a tentative layout of the SVE wells, with an approximate radius of influence of 18-feet.

GZA's experience is that SVE systems should be designed to extract a minimum of 1 pore volume exchange (PVE) per day. Assuming: (1) the average soil porosity is 0.3, and (2) soil vapor is extracted across the 2 foot to 6 foot depth zone of the SVE well, at an average expected SVE flow rate of 10 SCFM this spacing will result in a PVE rate of approximately 10 PVE/day.

7.3 FLOW AND VACUUM OPERATIONAL PARAMETERS

Based on the results of the SVE pilot test, the average expected SVE flow rate will be approximately 10 SCFM per well at an applied wellhead vacuum of approximately 80 in. w.c.. Assuming 17 wells operating in SVE mode, this translates to a total average SVE system flow rate of 170 SCFM at an applied wellhead vacuum of 80 in. w.c.. After applying a 150% safety factor to these target parameters, GZA suggests the SVE system be capable of extracting approximately 250 SCFM at an applied wellhead vacuum of 120 in. w.c..

7.4 INITIAL VOC MASS FLUX RATE

The laboratory analytical data from SVE extraction well soil vapor indicated total VOC concentrations of up to approximately 420 to 3,900 ppm during the various step tests. Assuming a 250 SCFM total system flow rate, this translates to an initial VOC mass flux rate of approximately 9 to 85 pounds per day. This VOC mass flux rate would be expected to decrease rapidly during system operation.

7.5 SSD COMPONENT OF SVE SYSTEM

To address the indoor air concerns, a SSD component will be included in the SVE design. As shown on Figure 14, three horizontal perforated pipes will be installed beneath the slab-on-grade floor in the trenches used to connect the SVE wells together. The horizontal piping will be tied into the SVE system manifold so that the extraction flow rates can be controlled and that, if the SVE system is taken out of service, a smaller blower can be installed to run the SSD component.

8.0 PROPOSED SVE SYSTEM DESIGN

The proposed SVE system design is summarized below. This design is based on the SVE system design parameters presented in section 6.0.



8.1 SVE WELLS

A total of 17 well will be installed within the proposed SVE treatment area. The average spacing of these wells will be approximately 30 feet on center (See conceptual layout shown on Figure 13).

Similar to the SVE wells installed for the SVE pilot test, wells will be constructed of 4-inch PVC riser and 10 slot well screen. Well screen will be installed from a depth of 2 to 7 feet bgs. No. 2 sand pack will be installed from a depth of 1.5 to 7 feet bgs. The remainder of the riser will be backfilled with hydrated bentonite chips.

To enhance operational flexibility in light of the low soil pneumatic permeability and the presence of potential preferential flow pathways, wells will be constructed to serve as either SVE or air inlet wells. This configuration will allow for the localized modifications of vacuum gradients and, as a result, SVE flow pathways. Valves will be installed at each SVE well; in this manner, the vacuum applied and soil vapor rate extracted from each well can be adjusted.

8.2 SVE SYSTEM PIPING

Wells will be connected to the SVE process equipment via sub-slab piping. The design and routing of this piping will be subject to the results of future utility location and clearance activities. In general, the following guidelines will be followed:

- Piping from individual wells to the manifolds will consist of solid 1.5-inch diameter (min.) schedule 40 PVC pipe.
- Piping for manifolds will be constructed of schedule 40 PVC pipe and will be sized for the expected SVE flow rate within the pipe.
- Piping will be installed approximately 1 foot beneath the existing slab in shallow trenches. Connection to the wells will be made in accessible road boxes.
- In addition to the piping from the individual SVE wells, a 2-inch diameter perforated schedule 40 PVC pipe will be installed in the SVE system trench as part of a SSD component of the system. The perforated piping will be connected to the SVE process equipment via manifolds. The SSD component will be capable of operating via a small blower if the SVE system is taking out of service.



8.3 SVE SYSTEM PROCESS EQUIPMENT

The primary SVE process equipment will be a positive displacement blower capable of extraction 250 SCFM at 120 in w.c. (plus applicable pipe losses). The blower will be equipped with flow control valves, an air make-up valve, and pressure and temperature instruments.

An air/water separator and particulate filter will be installed upstream of the blower to remove entrained water and filterable solids. This equipment will be sized to match the blower operating parameters. Water collected in the air/water separator will be periodically removed and disposed off-site.

Extracted soil vapor will be treated via two vapor phase activated carbon canisters installed in series. Each vessel will contain 500 pounds of activated carbon (min.). Sample ports will be installed in the piping upstream and downstream of the blower to permit the collection of air samples. Once analyses performed on the collected air samples indicate replacement of the activated carbon is warranted, the activated carbon will be removed and replaced and the spent carbon will be shipped off-site for disposal or regeneration.

9.0 SVE SYSTEM PERFORMANCE MONITORING

Monitoring of SVE/SSD System performance will be conducted primarily via vacuum, flow, VOC monitoring and indoor air sampling.

9.1 VACUUM MEASUREMENTS

Vacuum measurements will be collected to assess the distribution of SVE vacuum influence. Vacuum measurements will be obtained at the SVE/air inlet well heads and at various locations throughout the SVE system. The design and location of the vacuum measurement points will be determined during the final SVE design phase.

9.2 FLOW MEASUREMENT

Flow measurement will be performed to assess SVE extraction performance. Flow measurements will be collected at individual wellheads/trunk lines as well as other locations within the SVE system. The design and location of the flow measurement points will be determined during the final SVE design phase.

9.3 VOC MONITORING & INDOOR SAMPLING

Air phase VOC monitoring will be conducted to assess VOC extraction rates, VOC mass reduction in vadose zone soils and air discharge. VOC monitoring will be conducted at individual wellheads/trunk lines and various throughout other locations within the SVE system. The design and location of the flow measurement points will be determined during the final SVE design phase.



In addition to monitoring the SVE system, two indoor air samples will also be collected via New York State Department of Health (NYSDOH) methodologies on an annual basis to monitor the indoor work space. Samples will be collected for an 8-hour period and tested for VOCs, via TO-15, utilizing the 0.25 ug/m³ detection limit for trichloroethene and 1 ug/m³ detection limit for tetrachloroethene.

9.4 PROGRESS REPORTING

SVE operation reports will be submitted annually to the NYSDEC and NYSDOH. The reports will include performance monitoring data, SVE operational information and indoor air sampling results. The progress reports will also present conclusions regarding overall system effectiveness and recommendations for modifications to the SVE program, if appropriate.

TABLES

Table 1
Analytical Testing Program Summary
SVE Pilot Test & Design
Delphi Building 10
Lockport, New York

Location	Date Collected	Depth/ Interval (ft bgs)	VOCs EPA Method 8260 TCL	VOCs GC Screen	Moisture Content	Sieve Hydrometer (Grain Size)
Soil Samples						
SP-13	9/17/2007	0 to 2			X	
SP-13	9/17/2007	2 to 4			X	ft bgs were composited into one sample for this analysis.
SP-13	9/17/2007	4 to 6	X		X	
SP-13	9/17/2007	6 to 8	X		X	
SP-14	9/17/2007	0 to 2			X	
SP-14	9/17/2007	2 to 4	X			
SP-14	9/17/2007	4 to 6			X	
SP-14	9/17/2007	6 to 8	X			
SP-15	9/17/2007	0 to 2			X	ft bgs were composited into one sample for this analysis.
SP-15	9/17/2007	2 to 4			X	
SP-15	9/17/2007	4 to 6			X	
SP-15	9/17/2007	6 to 8	X			
SP-15	9/17/2007	8 to 9	X			
SP-16	9/17/2007	2 to 4	X			
SP-16	9/17/2007	4 to 6	X			
SP-17	9/17/2007	2 to 4	X			
SP-18	9/17/2007	0.5 to 2	X			
SP-18	9/17/2007	8 to 8.5	X			
SP-19	9/17/2007	4 to 6	X			
SP-20	9/17/2007	0.5 to 2	X			
SP-20	9/17/2007	2 to 4	X			
SP-20	9/17/2007	4 to 6	X			
SP-20	9/17/2007	6 to 8	X			
SP-21	9/17/2007	0.5 to 2	X			
SP-21	9/17/2007	6 to 8	X			
Air Samples						
		TIME				
EW-1	10/3/2007	1215		X		
EW-1	10/3/2007	1345		X		
EW-2	10/4/2007	1300		X		
EW-2	10/4/2007	1515		X		
Discharge	10/4/2007	1300		X		
Notes:						
1. ft bgs = feet below ground surface						
2. VOCs = Volatile Organic Compounds						
3. TCL = total compound list.						
4. GC = Gas Chromatogram						

Table 2
Soil Sampling Analytical Testing Results Summary
SVE Pilot Test & Design
Delphi Building 10
Lockport, New York

Parameter	NYSDEC Part 375 Industrial SCO	Bldg 10 SP-13 4 to 6 ft bgs	Bldg 10 SP-14 2 to 4 ft bgs	Bldg 10 SP-14 6 to 8 ft bgs	Bldg 10 SP-15 6 to 8 ft bgs	Bldg 10 SP-15 8 to 9 ft bgs	Bldg 10 SP-16 2 to 4 ft bgs	Bldg 10 SP-16 4 to 6 ft bgs	Bldg 10 SP-17 2 to 4 ft bgs	Bldg 10 SP-18 0.5 to 2 ft bgs	Bldg 10 SP-19 4 to 6 ft bgs	Bldg 10 SP-20 0.5 to 2	Bldg 10 SP-20 2 to 4 ft bgs	Bldg 10 SP-20 4 to 6 ft bgs	Bldg 10 SP-20 6 to 8 ft bgs	Bldg 10 SP-21 0 to 2 ft bgs	Bldg 10 SP-21 6 to 8 ft bgs
VOC - EPA Method 8260 (mg/kg)																	
cis-1,2-Dichloroethene	1,000				0.29	2.3					0.41	0.26					
Trichloroethene	400		0.27	18.9	0.48	3.6					1.7	0.25	1.2	1.1	0.61		
Tetrachloroethene	300	260	105	1,120	4.6	4.3	1.9	5	2.9	3.2	4.6	2.5	1,075	1,090	280	8.9	2.6
Toluene	1,000			1.2													
m,p-Xylene	1,000 *			0.21													
m,p-Xylene	1,000 *			0.84													

Notes:

1. Compounds detected in one or more samples are presented on this table.
Refer to Attachment D for list of all compounds included in analysis.
2. Analytical testing completed by Free-Co Laboratories.
3. Soil cleanup objectives (SCOs) based on the NYSDEC Part 375 Industrial Soil Cleanup objectives
4 mg/kg = part per million (ppm)
5. Blank indicates compound was not detected above detection limits
6. * = 1,000 ppm is the Industrial SCO for total xylene
7. Shading indicates values exceeding guidance criteria.

Table 3
Process & Monitoring Equipment Summary
SVE Pilot Test & Design
Delphi Building 10
Lockport, New York

ITEM	DETAILS
SVE System Trailer Blower	Type: Regenerative Blower Make: Roots Universal RAI Whispair Volumetric Flow: 160 CFM Maximum Vacuum Level: 14 inches Mercury Maximum Motor Type: Baldor 3640M, 7.5 HP RPM: 3,450 maximum 230 volt, 3 Phase
Vapor Phase Carbon	1, 55-gallon drum
Flow Measurements	EG& E Rotron Flow Meter
	Cole Palmer Temperature, Humidity and Velocity Meter
Vacuum Measurements	Digital Manometers: 0 to 2 in wc - Testo 506
	Magnehelic Gauges: 0 to 1 in wc 0 to 5 in wc 0 to 8 in wc 0 to 100 in wc
Photoionization Detector	H-Nu PI-101 - 10.2 eV bulb

TABLE 4
EW-1: SVE Pilot Test Data
SVE Pilot Test Design
Delphi Building 10
Lockport Complex

TIME	FLOW AT WELL HEAD (SCFM)	VACUUM at WELL HEAD (in. of Hg)	VACUUM at BLOWER (in. of Hg)	ORGANIC VAPORS at WELL HEAD (ppm)	VMP 5 FT FROM EXTRACTION WELLS (in. of water)	VMP 10 FT FROM EXTRACTION WELLS (in. of water)	VMP 15 FT FROM EXTRACTION WELLS (in. of water)	VMP 20 FT FROM EXTRACTION WELLS (in. of water)	ORGANIC VAPORS BEFORE CARBON TREATMENT (ppm)	ORGANIC VAPORS AFTER CARBON TREATMENT (ppm)
1045	10	14	13	290	5.0	3.2	1.8	0.021	50	<1
1100	10	13.5	13		4.9	3.1	1.8	0	75	<1
1115	10	13.5	13		4.2	2.9	1.5	0	70	<1
1130	10	13.5	13	120	5.1	3.1	1.7	0	50	<1
1145	20	13.5		95	4.2	3.1	1.6	0		
1200	20	13.5	13		4.7	2.9	1.7	0	50	<1
1215	20	14	14	100 *	4.2	2.6	1.5	0.049		
1230	20	14	14		3.9	2.5	1.4	0.053	50	<1
1245	20	14	14	85	3.6	2.5	1.3	0.030		
1300	20	14	14	65	3.9	2.5	1.4	0.014	50	<1
1315	20	14	14	60	3.8	2.5	1.4	0.007	60	<1
1330	20	14	14	60	3.4	2.3	1.3	0		
1345	20	14	14	55 *	3.6	2.3	1.3	0	50	<1
1400	20	13.5	13.5	65	3.3	2.3	1.3	0		
1430	20	13.5	13	55	3.3	2.3	1.3	0	40	<1
STEP DOWN VACUUM										
1445	17	10	10	105	3.0	2.0	1.1	0	45	<1
1500	18	9.5	10		3.0	2.1	1.1	0		
1515	18	9.5	10	85	3.0	2.0	1.1	0	50	<1
1530	17	10	10	70	2.8	1.8	1.0	0		
1545	17	10	10	65	2.9	2	1.1	0	30	<1
1600	17	9.5	10	60	2.7	1.8	1.0	0		
1615	17	9.5	10	60	2.8	1.8	1.0	0	35	<1
STEP DOWN VACUUM										
1645	13	6	6	95	2.4	1.5	0.8	0	25	<1
1700	13	6	6	85	2.3	1.5	0.8	0		
1715	13	6	6	100	2.4	1.6	0.9	0	25	<1
1730	13	6	6	60	2.6	1.7	0.7	0		
1745	13	6	6	50	2.8	1.8	1.0	0		
1800	13	6	6	45	2.2	1.6	0.8	0	25	<1
STEP DOWN VACUUM										
1815	8	3	3		1.0	0.8	0.4	0		
1830	8	3	3		1.2	0.9	0.5	0		
RETEST IN MORNING										
830	9	3	3		2.5	1.8	0.8	0		
845	8	3	3	60	2.5	1.6	0.9	0	20	<1
900	9	3	3	45	2.2	1.5	0.8	0.017		
915	8	2.5	3	40	2.1	1.5	0.8	0.002	20	<1
930	8	3	3	45	2.0	1.4	0.8	0.018		

Notes
 * = leadlar bag confirmator sample collected

TABLE 5
EW-2 SVE PILOT TEST DATA
SVE Pilot Test Design
DELPHI BUILDING 10
LOCKPORT COMPLEX, LOCKPORT, NEW YORK

TIME	FLOW AT WELL HEAD (SCFM)	VACUUM at WELL HEAD (in. of Hg)	VACUUM at BLOWER (in. of Hg)	ORGANIC VAPORS at WELL HEAD (ppm)	VMP 5 FT FROM EXTRACTION WELLS (in. of water)	VMP 10 FT FROM EXTRACTION WELLS (in. of water)	VMP 15 FT FROM EXTRACTION WELLS (in. of water)	VMP 20 FT FROM EXTRACTION WELLS (in. of water)	ORGANIC VAPORS BEFORE CARBON TREATMENT (ppm)	ORGANIC VAPORS AFTER CARBON TREATMENT (ppm)
1030	23	12.5	13	300	15.0	0	0	4.1		
1045	19	13	13		17	0.5	0	4.6	130	<1
1100	No readings collected due to	13	13	155	18	0.5	0	4.8		
1115	moisture in system	13	13	165	20	4.0	0	5.1	145	<1
1130	interfering with	13	13		18	5.0	0	4.4		
1145	velocity meter	13	13		16	5.0	0	4.3		
1200		13	13		17	3.8	0	4.5		
TEST STOPPED DUE TO WATER BEING DRAWN OUT OF THE EXTRACTION WELL.										
1245	15	8	8		10	2.4	0	2.8		
1300	15	8	8	*	10	2.2	0	2.7		
1315	15	8	8		10	2.2	0	2.7		
1330	15	8	8	150	10	2.2	0	2.7		
TEST STOPPED DUE TO WATER BEING DRAWN OUT OF THE EXTRACTION WELL. WELL BAILED DRY.										
1500	10	4	4	130	4.4	0	0	1.2		<1
1515	10	4	4	150 *	4.4	0	0	1.4		
1530	10	4	4		4.4	0	0	1.4		
1545	10	4	4		4.4	0	0	1.4		
1600	10	4	4	140	4.4	0	0	1.4		
1615	13	6	6	135	6.8	0	0	2.2		<1
1630	13	6	6	125	6.6	0	0	2.1		<1
1645	12	6	6	110	5.8	0	0	1.8		<1
1700	12	6	6	130	4.8	0	0	1.6		<1
1715	11.5	6	6	130	4.8	0	0	1.5		

Notes

* = tedlar bag confirmator sample collected

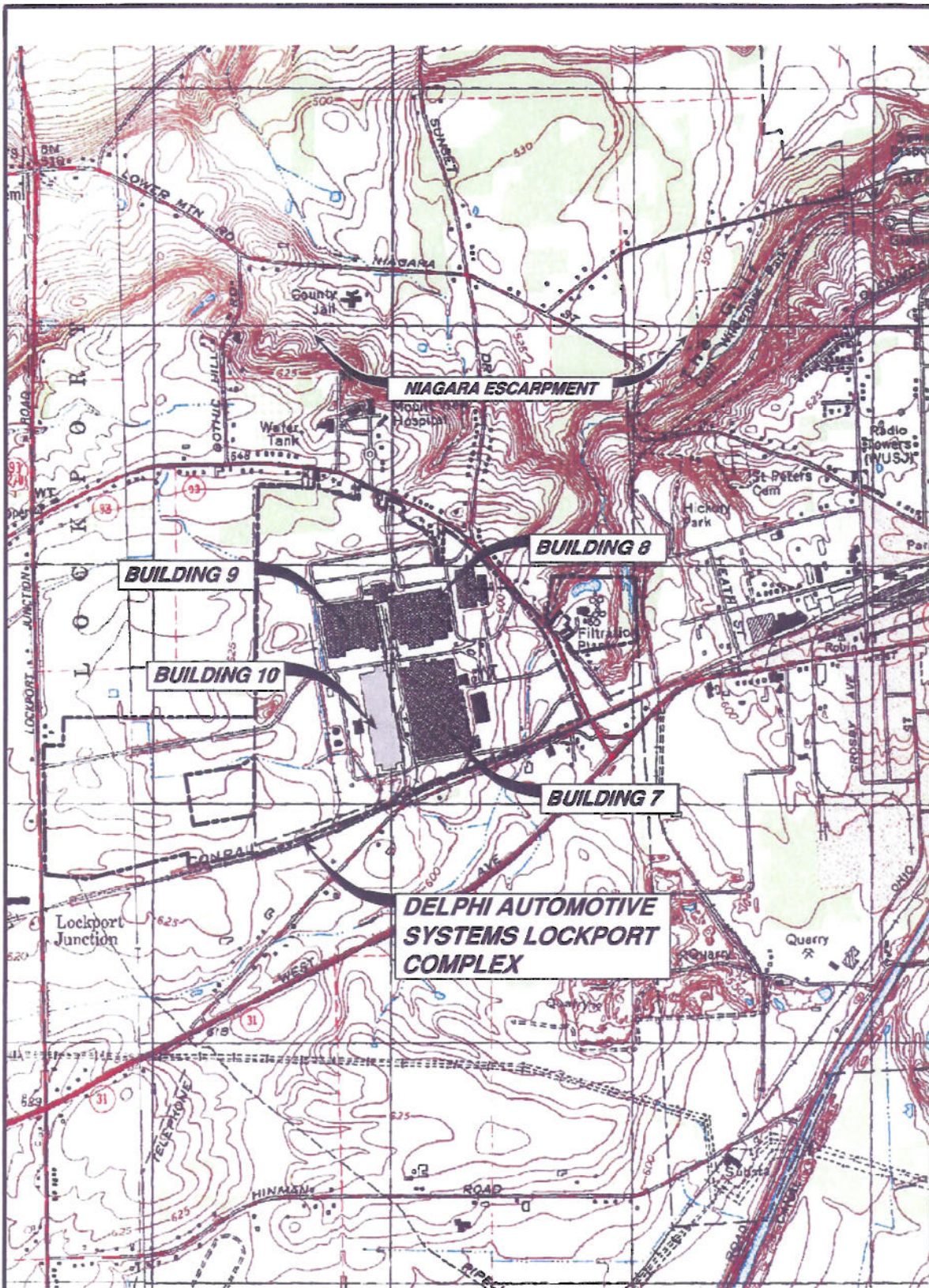
Table 6
Air Sampling Analytical Testing Results Summary
SVE Pilot Testi & Design
Delphi Building 10
Lockport, New York

Sample Location Sample Date	EW-1: 1215 10/3/2007	EW-1: 1345 10/3/2007	EW-2: 1300 10/4/2007	EW-2: 1515 10/4/2007	Discharge: 1300 10/4/2007
VOC - Gas Chromatograph Screen (ppm (v/v))					
1,1-Dichloroethene	5.6	4.5			1.4
Tetrachloroethene	800	420	3,700	3,400	10
Trichloroethene	14	8.3	170	150	

Notes:

1. Compounds detected in the samples are presented on this table.
Refer to Appendix C for list of all compounds included in analysis.
2. Analytical testing completed by GZA Laboratory, in Hopkinton, Massachusetts.
dated October 2006, prepared by New York State Department of Health..
3. ppm/v = parts per milliom per volume.
4. Blank indicates compound was not detected.

FIGURES

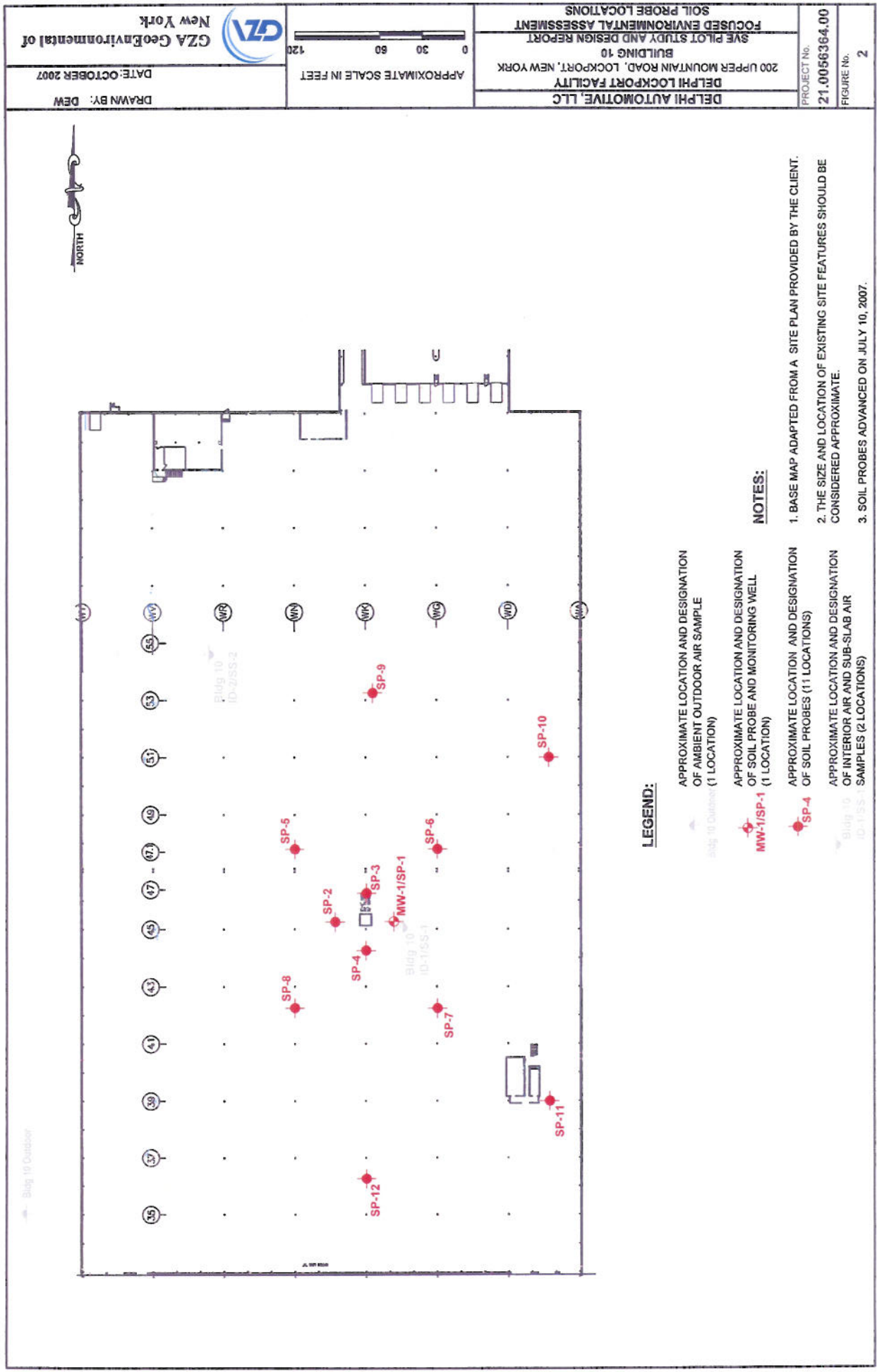


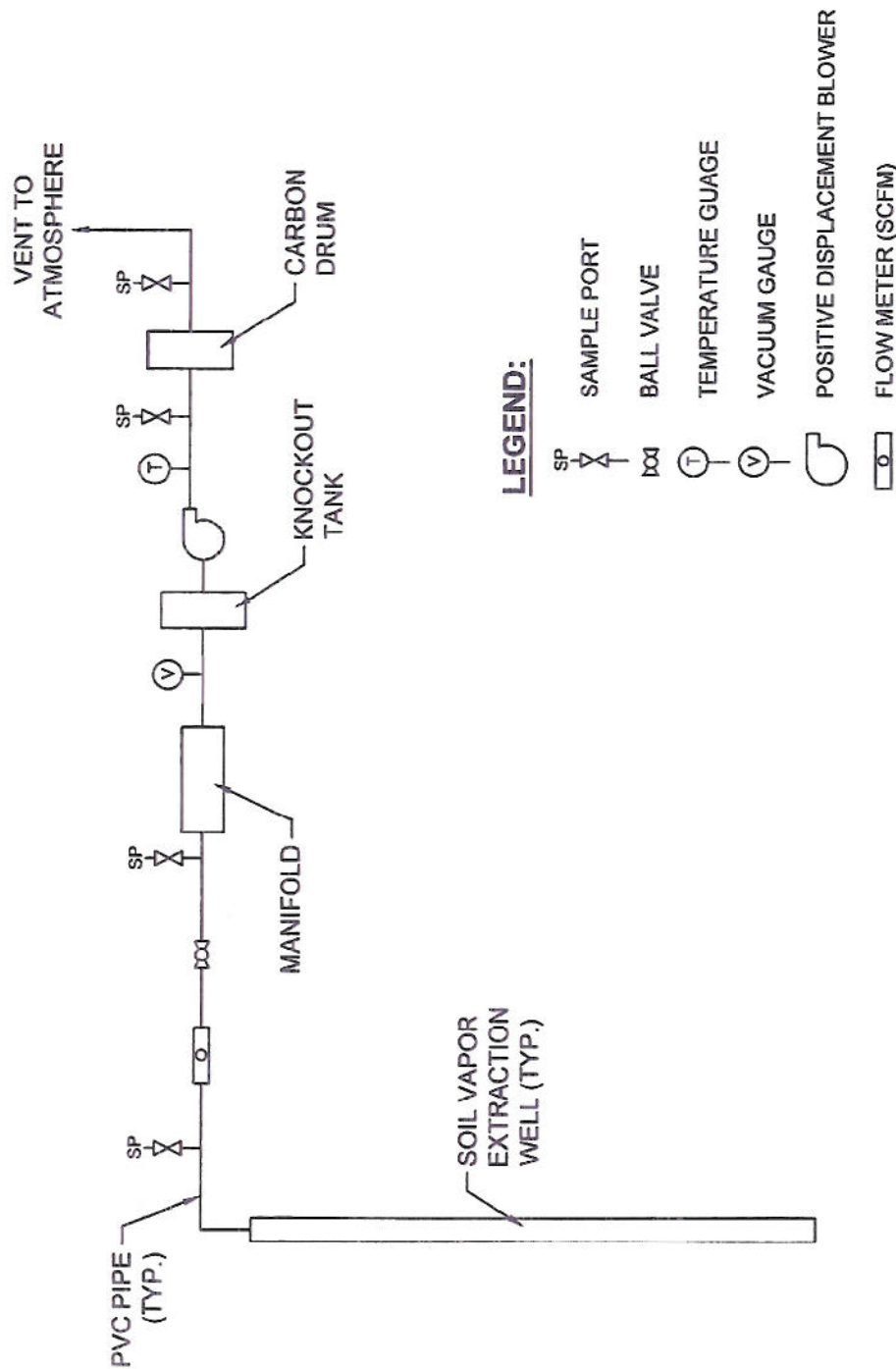
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<p>NOTE:</p> <p>BASE MAP ADAPTED FROM U.S.G.S. TOPOGRAPHIC MAPS DOWNLOADED FROM TERRASERVER.MICROSOFT.COM</p>			




GZA GeoEnvironmental of New York



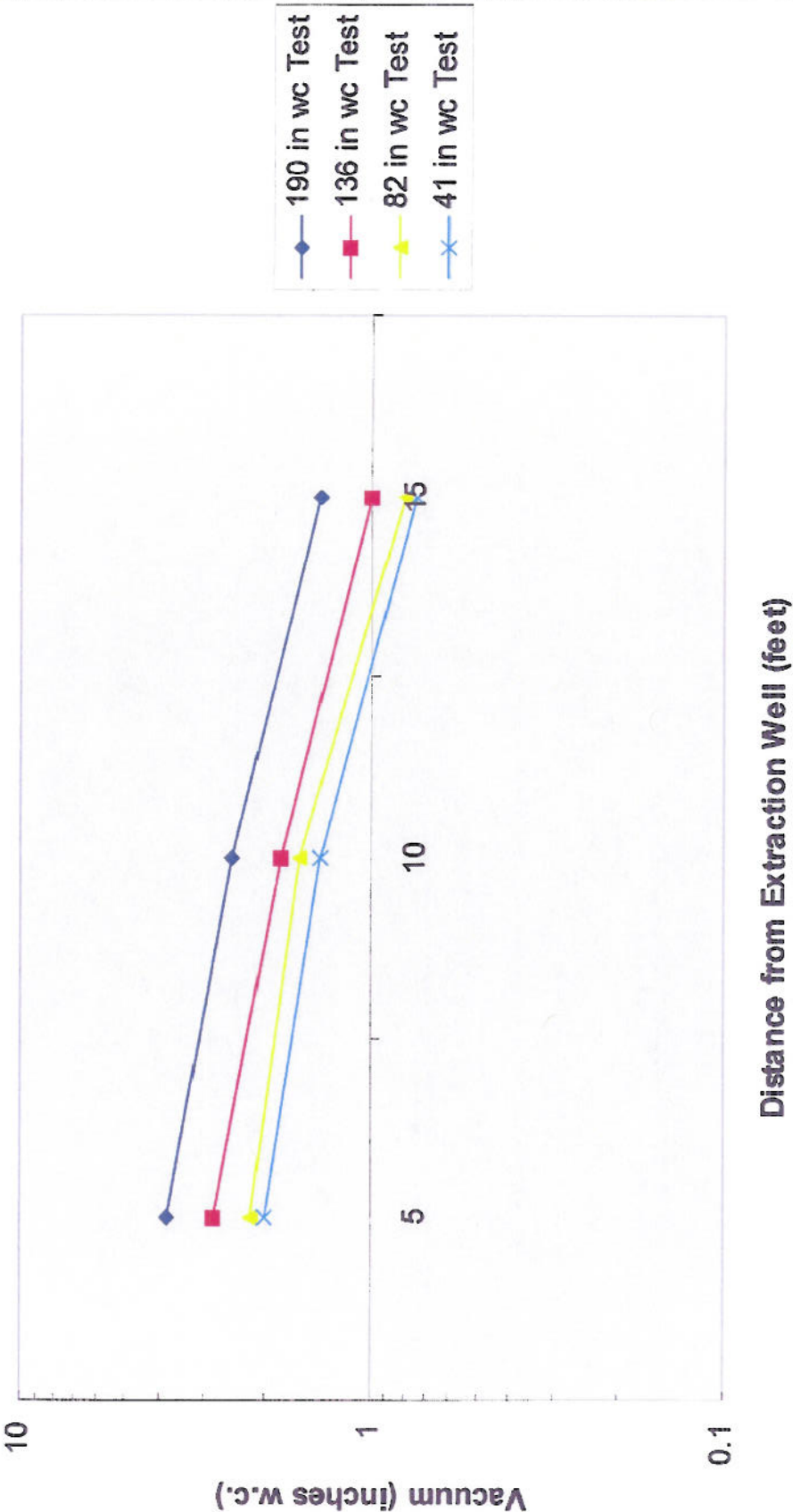




<div>DELPHI AUTOMOTIVE, LLC</div> <div>DELPHI LOCKPORT FACILITY</div> <div>200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK</div> <div>BUILDING 10</div> <div>SVE PILOT STUDY AND DESIGN REPORT</div> <div>TYPICAL SOIL VAPOR EXTRACTION</div> <div>PILOT TEST SCHEMATIC</div>		<div>SCALE IN FEET</div> <div><div>0100020004000</div><div></div></div>	<div>DRAWN BY: DEW</div> <div>DATE: OCTOBER 2007</div>
<div>PROJECT No.</div> <div>21.0056364.00</div>		<div></div> <div>GZA GeoEnvironmental of New York</div>	
<div>FIGURE No.</div> <div>6</div>			

**VACUUM DISTRIBUTION WITH APPLIED WELL HEAD
VACUUM OF 82 INCHES OF WATER COLUMN**

EW-1: Vacuum Response vs Distance from Extraction Well



<div>PROJECT No. 21.0056364.00</div> <div>FIGURE No. 8</div>		<div>DELPHI AUTOMOTIVE, LLC DELPHI LOCKPORT FACILITY 200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK BUILDING 10</div> <div>SVE PILOT STUDY AND DESIGN REPORT GRAPH OF VACUUM RESPONSE vs. DISTANCE FROM EXTRACTION WELL EW-1</div>	<div>SCALE IN FEET</div> <div>0100020004000</div> <div></div>	<div>DRAWN BY: DEW DATE: OCTOBER 2007</div> <div><div>GZA GeoEnvironmental of New York</div></div>
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EW-1: Air Flow vs. Applied Vacuum

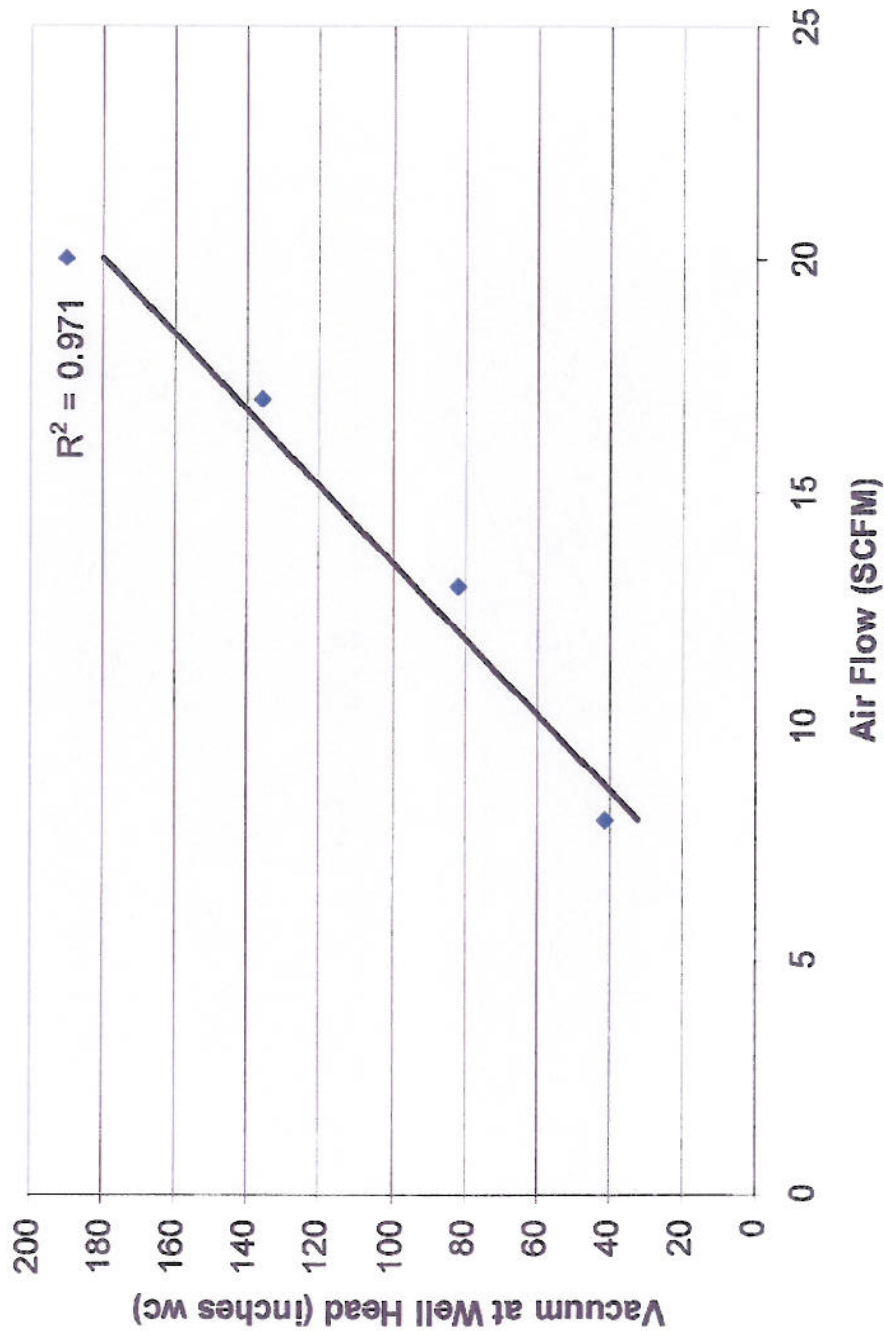


FIGURE No.
9

PROJECT No.
21.0056364.00

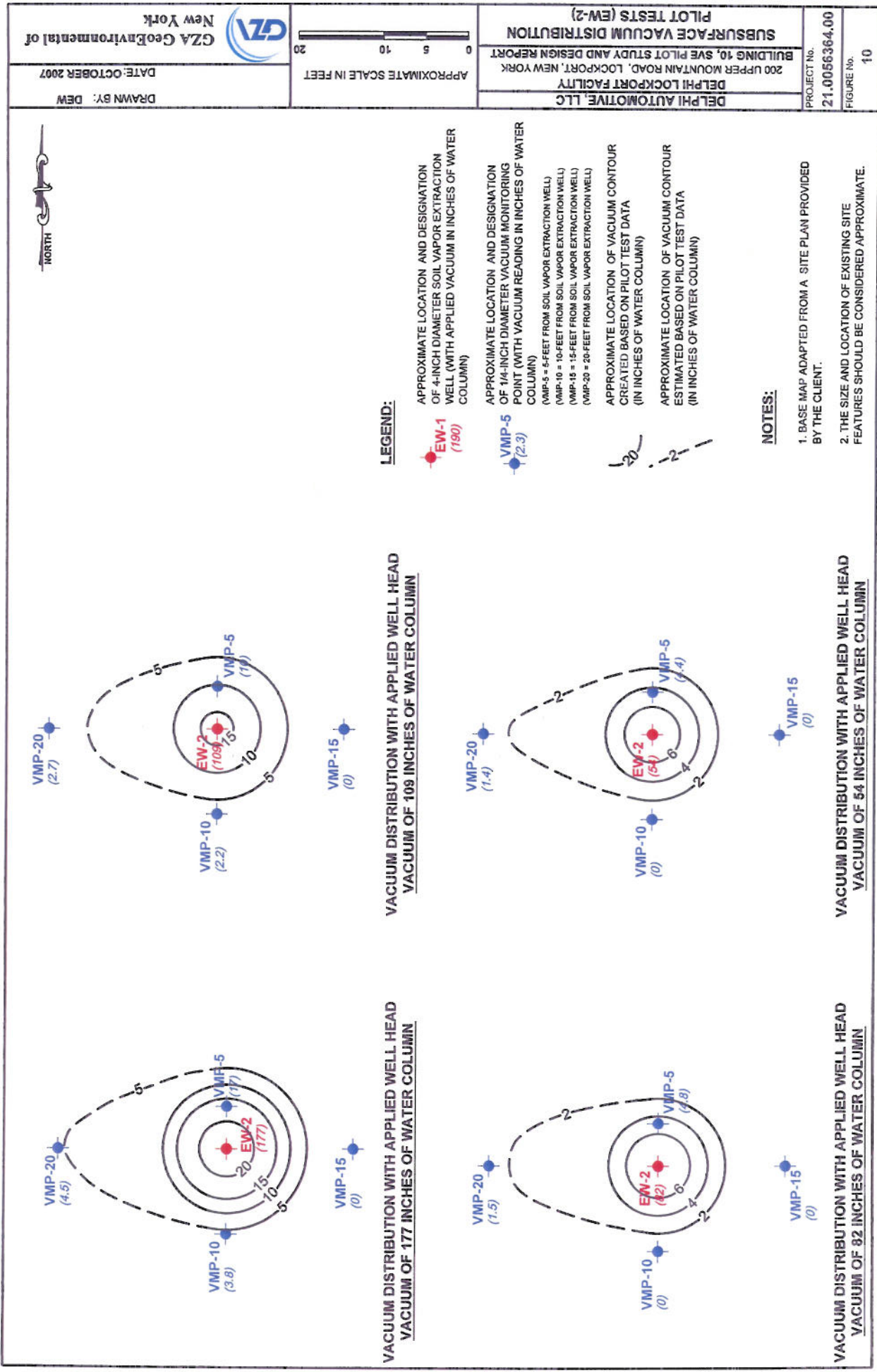
DELPHI AUTOMOTIVE, LLC
DELPHI LOCKPORT FACILITY
 200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK
 BUILDING 10

SVE PILOT STUDY AND DESIGN REPORT
GRAPH OF AIR FLOW vs. APPLIED VACUUM
FOR EXTRACTION WELL EW-1

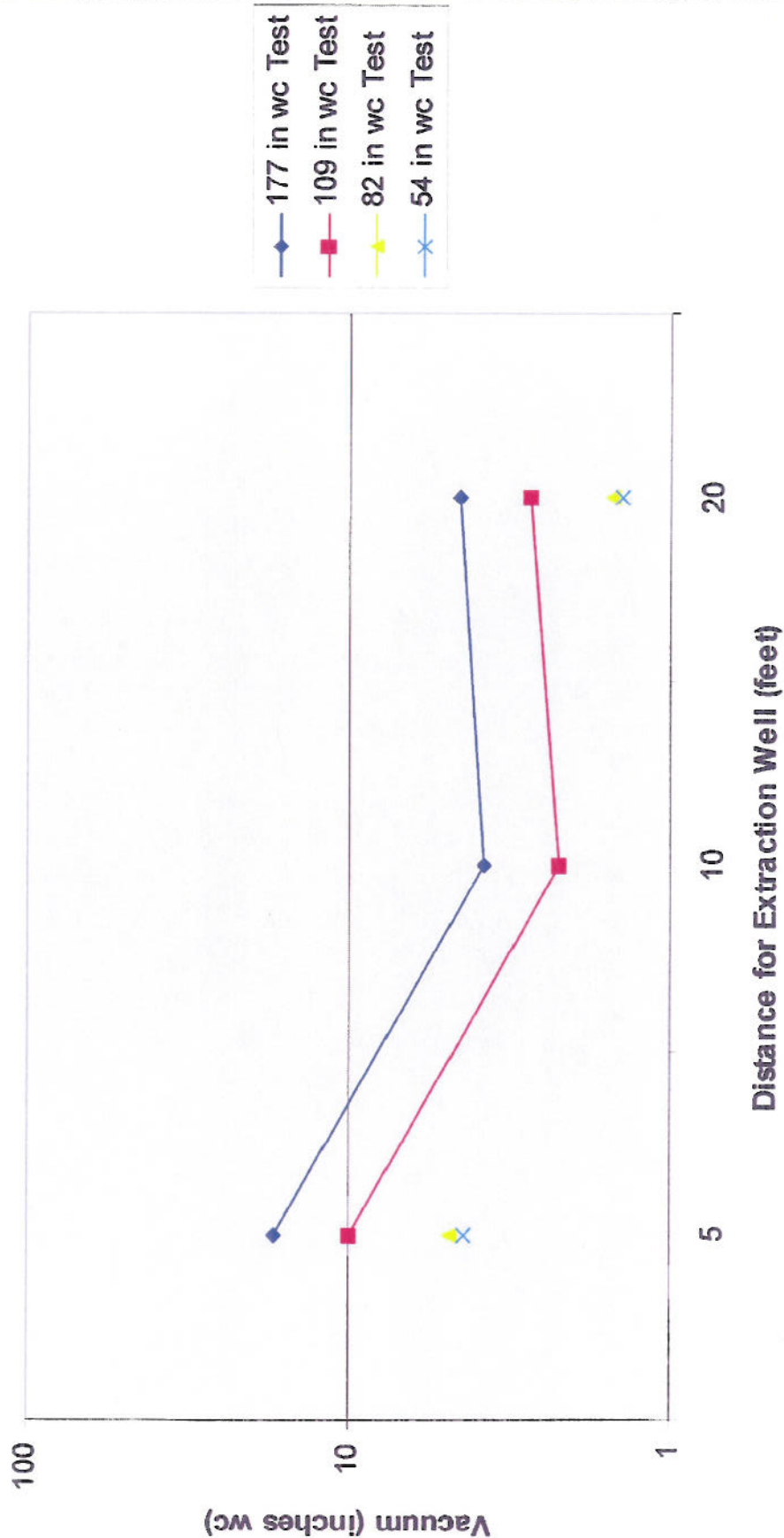


GZA GeoEnvironmental of New York

DRAWN BY: DEW
DATE: OCTOBER 2007



EW-2: Vacuum Response vs Distance



PROJECT No.
21.0056364.00

FIGURE No.
11

DELPHI AUTOMOTIVE, LLC
DELPHI LOCKPORT FACILITY
 200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK
 BUILDING 10
 SVE PILOT STUDY AND DESIGN REPORT
 GRAPH OF VACUUM RESPONSE vs. DISTANCE
 FROM EXTRACTION WELL EW-2



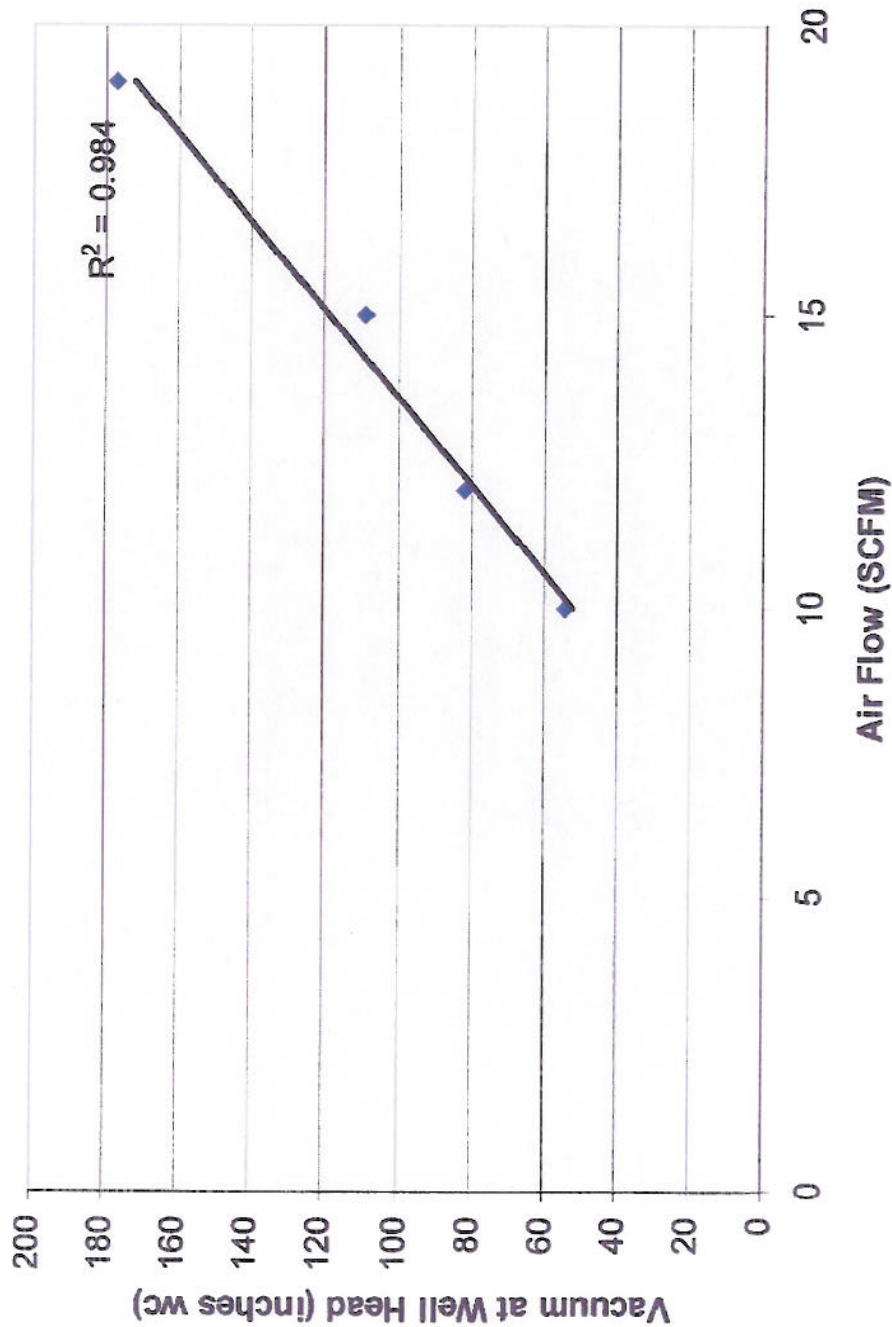
DRAWN BY: DEW

DATE: OCTOBER 2007



**GZA GeoEnvironmental of
New York**

EW-2: Air Flow vs. Applied Vacuum



PROJECT No.

21.0056364.00

FIGURE No.

12

DELPHI AUTOMOTIVE, LLC

DELPHI LOCKPORT FACILITY

200 UPPER MOUNTAIN ROAD, LOCKPORT, NEW YORK

BUILDING 10

SVE PILOT STUDY AND DESIGN REPORT

GRAPH OF AIR FLOW vs. APPLIED VACUUM
FOR EXTRACTION WELL EW-2

SCALE IN FEET



DRAWN BY: DEW

DATE: OCTOBER 2007



GZA GeoEnvironmental of
New York

APPENDIX A
SOIL PROBE LOGS

CONTRACTOR		Matrix Environmental Tech.		BORING LOCATION		See Location Plan	
DRILLER		Mark Janus		GROUND SURFACE ELEVATION		DATUM	
START DATE		9/17/2007		END DATE		9/17/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE				C. Boron			

WATER LEVEL DATA				TYPE OF DRILL RIG				Geoprobe GH 42					
DATE		TIME		WATER		CASING		CASING SIZE AND DIAMETER		2" diameter by 48" long			
								OVERBURDEN SAMPLING METHOD		Direct push			
								ROCK DRILLING METHOD		NA			

DEPTH	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M
	Sample Number	DEPTH (FT)	RECOVERY (%)			
1	S-1	0 - 2	90	Concrete slab cored to ~8" below ground surface (bgs).		387
2				Brown Clayey SILT, trace Sand, trace Gravel, moist. (FILL)		
3		2 - 4	90	Reddish brown SILT & CLAY, trace Sand, moist. (FILL)		1186
4				Reddish brown Clayey SILT, trace Sand, moist. (NATIVE)		
5	S-2	4 - 6	90	Grades to:....SILT & CLAY, w/ intermittent Sand and Silt seams.		3385
6						
7		6 - 8	90	Grades to:....Clayey SILT, trace Sand, trace Gravel, moist to wet.		1115
8						
9	S-3	8 - 8.5	100	Grades to:....SILT, little Sand, little Gravel, wet.		564
10				End of soil probe at 8.5 feet bgs,		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
C - Rock Core Sample	

General	1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.
Notes:	2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

CONTRACTOR		Matrix Environmental Tech.		BORING LOCATION		See Location Plan	
DRILLER		Mark Janus		GROUND SURFACE ELEVATION		DATUM	
START DATE		9/17/2007		END DATE		9/17/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE				C. Boron			

WATER LEVEL DATA				TYPE OF DRILL RIG				Geoprobe GH 42							
DATE		TIME		WATER		CASING		CASING SIZE AND DIAMETER				2" diameter by 48" long			
								OVERBURDEN SAMPLING METHO				Direct push			
								ROCK DRILLING METHOD				NA			

D E P T H	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M
	Sample Number	DEPTH (FT)	RECOVERY (%)			
	S-1	0 - 2	90	Concrete slab cored to ~8" below ground surface (bgs).		66
1				Red brown Silty CLAY, little Sand, little Gravel, moist. (FILL)		
2						
		2 - 4	90	Red brown SILT & CLAY, trace Sand, trace Gravel, moist. (NATIVE)		2209
3						
4						
	S-2	4 - 6	90	Grades to:....Clayey SILT, with intermittant Sand and Silt seams.		1013
5						
6						
		6 - 8	90	Grades to:....little Sand, little Gravel, wet.		5875
7						
8						
				Refusal at 8 ft bgs.		
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample C - Rock Core Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
--	---

General Notes:

- 1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.
- 2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

CONTRACTOR		Matrix Environmental Tech.		BORING LOCATION		See Location Plan	
DRILLER		Mark Janus		GROUND SURFACE ELEVATION		DATUM	
START DATE		9/17/2007		END DATE		9/17/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE				C. Boron			

WATER LEVEL DATA				TYPE OF DRILL RIG				Geoprobe GH 42							
DATE		TIME		WATER		CASING		CASING SIZE AND DIAMETER				2" diameter by 48" long			
								OVERBURDEN SAMPLING METHOD				Direct push			
								ROCK DRILLING METHOD				NA			

DEPTH	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M
	Sample Number	DEPTH (FT)	RECOVERY (%)			
	S-1	0 - 2	90	Concrete slab cored to ~8" below ground surface (bgs).		64
1						
2				Red brown SILT & CLAY, little Sand, little Gravel, moist. (FILL) Grades to:...trace Sand.		
		2 - 4	90	Brown Clayey SILT, little Sand, trace Gravel, moist. (NATIVE)		210
3						
4				Grades to:...intermittent Silt seams.		
	S-2	4 - 6	100			333
5						
6						
		6 - 8	100	Grades to:...little Sand, little Gravel.		350
7						
8						
	S-3	8 - 9	100	Red brown SAND and Silt, wet.		380
9						
				End of soil probe at 9 feet bgs,		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
C - Rock Core Sample	
General 1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.	
Notes: 2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.	

CONTRACTOR		Matrix Environmental Tech.		BORING LOCATION		See Location Plan	
DRILLER		Mark Janus		GROUND SURFACE ELEVATION		DATUM	
START DATE		9/17/2007		END DATE		9/17/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE				C. Boron			

WATER LEVEL DATA				TYPE OF DRILL RIG				Geoprobe GH 42					
DATE		TIME		WATER		CASING		CASING SIZE AND DIAMETER		2" diameter by 48" long			
								OVERBURDEN SAMPLING METHOD		Direct push			
								ROCK DRILLING METHOD		NA			

DEPTH	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M
	Sample Number	DEPTH (FT)	RECOVERY (%)			
1	S-1	0 - 2	90	Concrete slab cored to ~8" below ground surface (bgs). Red brown SILT & CLAY, trace Sand, trace Gravel, moist. (FILL)		53
2						
3		2 - 4	90			
4				Red brown Clayey SILT with intermittent Silt seams, moist. (NATIVE)		105
5	S-2	4 - 6	90			
6				Grades to:.... SILT & CLAY, trace Sand, trace Gravel.		154
7		6 - 8	90			
8						
9				Grades to:.... Clayey SILT, little Sand, little Gravel, moist to wet.		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample C - Rock Core Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
--	---

General	1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.
Notes:	2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

CONTRACTOR <u>Matrix Environmental Tech.</u>		BORING LOCATION <u>See Location Plan</u>	
DRILLER <u>Mark Janus</u>		GROUND SURFACE ELEVATION _____ DATUM _____	
START DATE <u>9/17/2007</u> END DATE <u>9/17/2007</u>		GZA GEOENVIRONMENTAL REPRESENTATIVE <u>C. Boron</u>	

WATER LEVEL DATA				TYPE OF DRILL RIG <u>Geoprobe GH 42</u>	
DATE	TIME	WATER	CASING	CASING SIZE AND DIAMETER	2" diameter by 48" long
				OVERBURDEN SAMPLING METHO	Direct push
				ROCK DRILLING METHOD	NA

D E P T H	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M (ppm)
	Sample Number	DEPTH (FT)	RECOVERY (%)			
1	S-1	0 - 2	95	Concrete slab cored to ~8" below ground surface (bgs).		6
2				Red brown SILT & CLAY, trace Sand, trace Gravel, moist. (FILL)		
3		2 - 4	95	Red brown Clayey SILT, trace Sand, trace Gravel, moist. (NATIVE)		27
4				Grades to:....SILT & CLAY.		
5	S-2	4 - 6	80	Grades to:....intermittent Silt seams.		11
6				Grades to:....Clayey SILT, moist to wet.		
7		6 - 8	80	Grades to:....SILT, little Sand.		6
8						
9				End of soil probe at 8 feet bgs,		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample C - Rock Core Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
--	---

General	1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.
Notes:	2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

CONTRACTOR <u>Matrix Environmental Tech.</u>		BORING LOCATION <u>See Location Plan</u>	
DRILLER <u>Mark Janus</u>		GROUND SURFACE ELEVATION <u> </u> DATUM <u> </u>	
START DATE <u>9/17/2007</u> END DATE <u>9/17/2007</u>		GZA GEOENVIRONMENTAL REPRESENTATIVE <u>C. Boron</u>	

WATER LEVEL DATA				TYPE OF DRILL RIG <u>Geoprobe GH 42</u>	
DATE	TIME	WATER	CASING	CASING SIZE AND DIAMETER	2" diameter by 48" long
				OVERBURDEN SAMPLING METHO	Direct push
				ROCK DRILLING METHOD	NA

DEPTH	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M
	Sample Number	DEPTH (FT)	RECOVERY (%)			
1	S-1	0 - 2	90	Concrete slab cored to ~8" below ground surface (bgs).		38
2				Red brown SILT & CLAY, trace Sand, trace Gravel, moist. (FILL)		
3		2 - 4	90	Red brown Clayey SILT, trace Sand, trace Gravel, moist. (NATIVE)		32
4						
5	S-2	4 - 6	90	Grades to:...little Sand, moist to wet.		38
6						
7		6 - 8	90	Grades to:...trace Sand.		88
8				Grades to:...SILT, little Gravel, moist.		
9	S-3	8 - 8.5	100	Bedrock		270
10				Refusal at 8.5 feet bgs,		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample C - Rock Core Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
--	---

General Notes:

- 1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.
- 2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

CONTRACTOR		Matrix Environmental Tech.		BORING LOCATION		See Location Plan	
DRILLER		Mark Janus		GROUND SURFACE ELEVATION		DATUM	
START DATE		9/17/2007		END DATE		9/17/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE				C. Boron			

WATER LEVEL DATA				TYPE OF DRILL RIG			
DATE	TIME	WATER	CASING	Geoprobe GH 42			
				CASING SIZE AND DIAMETER			
				2" diameter by 48" long			
				OVERBURDEN SAMPLING METHO			
				Direct push			
				ROCK DRILLING METHOD			
				NA			

D E P T H	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M
	Sample Number	DEPTH (FT)	RECOVERY (%)			
	S-1	0 - 2	80	Concrete slab cored to ~8" below ground surface (bgs). Brown SILT & CLAY, trace Sand, trace Gravel, moist. (FILL)		21
1						
				Red brown SILT & CLAY, trace Sand, moist. (NATIVE)		30
2		2 - 4	80			
3						
4						
	S-2	4 - 6	70	Refusal at 6.1 feet bgs.		126
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
C - Rock Core Sample	
General Notes:	
1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.	
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.	

CONTRACTOR		Matrix Environmental Tech.		BORING LOCATION		See Location Plan	
DRILLER		Mark Janus		GROUND SURFACE ELEVATION		DATUM	
START DATE		9/17/2007		END DATE		9/17/2007	
GZA GEOENVIRONMENTAL REPRESENTATIVE		C. Boron					

WATER LEVEL DATA				TYPE OF DRILL RIG				Geoprobe GH 42			
DATE	TIME	WATER	CASING	CASING SIZE AND DIAMETER				2" diameter by 48" long			
				OVERBURDEN SAMPLING METHOD				Direct push			
				ROCK DRILLING METHOD				NA			

D E P T H	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M (ppm)
	Sample Number	DEPTH (FT)	RECOVERY (%)			
1	S-1	0 - 2	75	Concrete slab cored to ~8" below ground surface (bgs). Red brown SILT & CLAY, little Sand, little Gravel, moist. (FILL)		891
2		2 - 4	75	Red brown SILT & CLAY, trace Sand, moist. (NATIVE)		>10000
3						
4	S-2	4 - 6	80	Grades to....Clayey SILT, trace Sand, moist.		>10000
5						
6		6 - 8	80			1540
7				(slight increase in moisture content)		
8				Gray/tan SILT, moist.		
9				Bedrock		
10				End of soil probe at 8 feet bgs,		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample
C - Rock Core Sample

NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples.
Meter was calibrated to the equivalent of 100 ppm benzene in air.

General 1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.
Notes: 2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

CONTRACTOR		Matrix Environmental Tech.		BORING LOCATION		See Location Plan	
DRILLER		Mark Janus		GROUND SURFACE ELEVATION		DATUM	
START DATE		9/17/2007		END DATE		9/17/2007	
				GZA GEOENVIRONMENTAL REPRESENTATIVE		C. Boron	

WATER LEVEL DATA				TYPE OF DRILL RIG				Geoprobe GH 42					
DATE		TIME		WATER		CASING		CASING SIZE AND DIAMETER		2" diameter by 48" long			
								OVERBURDEN SAMPLING METHOD		Direct push			
								ROCK DRILLING METHOD		NA			

D E P T H	SAMPLE INFORMATION			SAMPLE DESCRIPTION	NOTES	O V M (ppm)
	Sample Number	DEPTH (FT)	RECOVERY (%)			
1	S-1	0 - 2	35	Concrete ~8" below ground surface (bgs).		51
2				Dark brown SAND, little Silt, moist. (FILL)		18
3		2 - 4	35			
4						
5	S-2	4 - 6	40			14
6				Grades to:...wet.		
7		6 - 8	40			28
8				Brown Clayey SILT, little Sand, little Gravel, wet. (NATIVE)		
9	S-3	8 - 9	90			9
10				Refusal at 9 feet bgs,		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample
C - Rock Core Sample

NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples.
Meter was calibrated to the equivalent of 100 ppm benzene in air.

General Notes: 1) Stratification lines represent approximate boundary between soil types, transitions may be gradual.
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

DELPHI THERMAL
BUILDING 10 Focused Environmental Assessment
Lockport, New York

BORING No. Bldg 10 MW-1
SHEET 10 OF 11
FILE No. 21.0056340.00
CHECKED BY: CZB

CONTRACTOR DRILLER START DATE: 9/27/07		Nature's Way Dale Gramza END DATE: 9/27/07		BORING LOCATION GROUND SURFACE ELEVATION GZA GEOENVIRONMENTAL REPRESENTATIVE		See Location Plan 615.5 DATUM See Note 1. D. W.																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5">WATER LEVEL DATA</th> </tr> <tr> <th>DATE</th> <th>TIME</th> <th>WATER</th> <th>CASING</th> <th>NOTES</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>		WATER LEVEL DATA					DATE	TIME	WATER	CASING	NOTES																TYPE OF DRILL RIG _____ CASING SIZE AND DIAMETER _____ OVERBURDEN SAMPLING METHOD NA ROCK DRILLING METHOD NA					
		WATER LEVEL DATA																														
		DATE	TIME	WATER	CASING	NOTES																										
D E P T H		SAMPLE			SAMPLE DESCRIPTION	NOTES	MONITORING WELL INSTALLATION																									
		BLOWS (/6")	NO.	DEPTH (FT)				N-VALUE /RQD %	REC. (%)																							
1						Continuously augered through overburden material to 7 feet bgs. See BLDG-10-SP-7 and SP-20 soil probe log for soil description.	Cement/Bentonite → Bentonite Chips → 4-inch diameter PVC riser pipe 4-inch diameter PVC well screen → 10-slot well screen # 2 well sand → Bottom of well at 7 feet bgs.																									
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																
13																																
14																																
15																																
16																																
17																																
18																																
S - Split Spoon Sample C - Rock Core Sample			NOTES: 1) Ground surface elevation data was provided by Delphi Thermal. 2) BGS= below ground surface. 3) NV= no value.																													
General Notes:			1) Stratification lines represent approximate boundary between soil types; transitions may be gradual. 2) Water level readings have been made at times and under conditions stated; fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.																													

CONTRACTOR <u>Matrix Environmental Tech.</u>		BORING LOCATION <u>See Location Plan</u>	
DRILLER <u>Mark Janus</u>		GROUND SURFACE ELEVATION _____ DATUM _____	
START DATE <u>9/17/2007</u> END DATE <u>9/17/2007</u>		GZA GEOENVIRONMENTAL REPRESENTATIVE <u>D. Wulif</u>	

WATER LEVEL DATA				TYPE OF DRILL RIG <u>Geoprobe GH 42</u>	
DATE	TIME	WATER	CASING	CASING SIZE AND DIAMETER	2" diameter by 48" long
				OVERBURDEN SAMPLING METHOD	Direct push
				ROCK DRILLING METHOD	NA

DEPTH	SAMPLE INFORMATION			VACUUM MONITORING POINT DESCRIPTION	NOTES	O V M (ppm)
	Sample Number	DEPTH (FT)	RECOVERY (%)			
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

S - Split Spoon Sample C - Rock Core Sample	NOTES: Hnu PI-101 organic vapor meter was used to field screen and headspace soil samples. Meter was calibrated to the equivalent of 100 ppm benzene in air.
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General Notes:	1) Stratification lines represent approximate boundary between soil types, transitions may be gradual. 2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
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APPENDIX B
GEOTECHNICAL SOIL TESTING DATA

LABORATORY TESTING DATA SHEET

Project Name Delphi Building 10
 Project No. 21.0056364.00
 Project Engineer C. Boron
 Assigned By C. Boron

Project Location Lockport, NY
 Report Date 10/5/2007
 Reviewed By *[Signature]*
 Date Reviewed 10/5/07

Boring/ Test Pit No.	Sample No.	Depth ft.	Lab No.	Identification Tests							Laboratory Log and Soil Description
				Water Content %	LL %	PL %	Sieve -200 %	Hyd -2 μ %	pH	ORG %	
SP-13		0-2	1	20.2							
SP-13		2-4	2	18.0							
SP-13		4-6	3	21.5							
SP-13		6-8	4	14.6							
SP-14		0-2	5	14.1							
SP-14		2-4	6	22.9							
SP-14		4-6	7	18.9							
SP-15		0-2	9	17.6							
SP-15		2-4	10	17.6							
SP-15		4-6	11	20.3							
SP-15		6-8	12	10.7							
SP-13	Composite	0-8	13				81	27			Red-brown CLAY & SILT little f-m Sand, trace Gravel
SP-15	Composite	0-8	14				77	25			Red-brown CLAY & SILT little f-m Sand, trace Gravel



GZA GeoEnvironmental, Inc.
 Engineers and Scientists

Grain size distribution curve showing Percent Finer by Weight versus Grain Size (mm). The curve indicates a soil classification of CLAY.

Grain Size (mm)	Percent Finer by Weight (%)
0.075	100
0.15	95
0.3	85
0.6	75
1.18	65
2.0	55
3.75	45
7.5	35
100	25

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
13	SP-13	Composite	2-8'	Red-brown CLAY & SILT, little f-m Sand, trace Gravel				

Delphi Building 10
Lockport, NY

GZA File # 21.0056364.00

Tested by: PEC Date: 9/27/07

Reviewed by: MBP Date: 10/5/07



Grain Size Distribution Data

Grain Size (mm)	Percent Finer (%)
2.0	100
0.85	100
0.75	98
0.6	95
0.425	90
0.3	85
0.25	82
0.2	78
0.15	75
0.106	72
0.075	68
0.06	65
0.05	62
0.0425	58
0.0375	55
0.03	52
0.025	48
0.02	45
0.015	42
0.0106	38
0.0075	35
0.006	32
0.005	28
0.00425	25
0.00375	22
0.003	18
0.0025	15
0.002	12
0.0015	10
0.00106	8
0.00075	5
0.0006	2
0.0005	0

Soil Classification Summary:

- Gravel:** 7.2% (Grain sizes 2.0 mm to 0.075 mm)
- Sand:** 16.2% (Grain sizes 0.075 mm to 0.0425 mm)
- Fines:** 76.6% (Grain sizes 0.0425 mm to 0.00025 mm)

Soil Type: CLAY (Based on fines content and plasticity)

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
14	SP-15	Composite	2-8'	Red-brown CLAY & Silt little f.m Sand trace Gravel				

GZA File # 21.0056364.00

Tested by: <u>PEC</u>	Date: <u>9/27/07</u>
Reviewed by: <u>MBP</u>	Date: <u>10/5/07</u>



APPENDIX C
CHEMICAL ANALYSIS OF AIR SAMPLES

Note: The "pdf" file provided by the laboratory contains all Quality Control information, and should be considered to supersede all other report formats, including this Excel spreadsheet.



GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

Laboratory Identification Numbers:
MA and ME: MA092 NH: 2028
CT: PH0579 RI: LAO00236
NELAC - NYS DOH: 11063

ANALYTICAL REPORT

GZA GeoEnvironmental of NY
535 Washington Street
11th Floor
Buffalo, NY 14203-1415
Chris Boron

Project No.: 21.0056364.00
Work Order No.: 0710-00060
Date Received: 10/08/2007
Date Reported: 10/09/2007

SAMPLE INFORMATION

Date Sampled	Matrix	Laboratory ID	Sample ID
10/03/2007	Air	0710-00060 001	EW - 1 1215
10/03/2007	Air	0710-00060 002	EW - 1 1345
10/04/2007	Air	0710-00060 003	EW - 2 1300
10/04/2007	Air	0710-00060 004	EW - 2 1515
10/04/2007	Air	0710-00060 005	Discharge, 1300

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GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

Page 2 of 8

ANALYTICAL REPORT

GZA GeoEnvironmental of NY
535 Washington Street
11th Floor
Buffalo, NY 14203-1415
Chris Boron

Project Name.: **Delphi SVE Pilot Study**
Project No.: **21.0056364.00**

Date Received: **10/08/2007**
Date Reported: **10/09/2007**
Work Order No.: **0710-00060**

PROJECT NARRATIVE:

1. Sample Receipt

The samples were received on 10/06/07 via __GZA courier, __x__UPS, __FEDEX, or __hand delivered. The temperature of the __temperature blank/_x__ air, was 22.9 degrees C. The temperature requirement for most analyses is above freezing to 6 degrees C. The samples were received intact for all requested analyses.

The chain of custody indicates that the samples, when required, were chemically preserved in accordance with the method they reference.



GZA GeoEnvironmental, Inc.
106 South Street
Hopkinton, MA 01748
(781) 278-4700

Page 3 of 8

ANALYTICAL REPORT

GZA GeoEnvironmental of NY
535 Washington Street
11th Floor
Buffalo, NY 14203-1415
Chris Boron

Project Name.: **Delphi SVE Pilot Study**
Project No.: **21.0056364.00**

Date Received: **10/08/2007**
Date Reported: **10/09/2007**
Work Order No.: **0710-00060**

Data Authorized By: 

NELAC certification, as indicated by the NELAC Lab ID Number, is per analyte. For a complete list of NELAC validated analytes, please contact the laboratory.

Abbreviations:

% R = % Recovery
DF = Dilution Factor
DFS = Dilution Factor Solids
DO = Diluted Out

Method Key:

Method 8260: The current version of the method is 8260B.
Method 8021: The current version of the method is 8021B.
Method 8270: The current version of the method is 8270C.
Method 6010: The current version of the method is 6010B.

Please note that the laboratory signed copy of the chain of custody record is an integral part of the data report.

The laboratory report shall not be reproduced except in full without the written consent of the laboratory.

Soil data is reported on a dry weight basis unless otherwise specified.

Matrix Spike / Matrix Spike Duplicate sets are performed as per method and are reported at the end of the analytical report if assigned on the Chain of Custody.



ANALYTICAL REPORT

GZA GeoEnvironmental of NY
535 Washington Street
11th Floor
Buffalo, NY 14203-1415
Chris Boron

Project Name.: Delphi SVE Pilot Study
Project No.: 21.0056364.00

Date Received: 10/08/2007
Date Reported: 10/09/2007
Work Order No.: 0710-00060

Sample ID: EW - 1 1215
Sample Date: 10/03/2007

Sample No.: 001

Test Performed	Method	Results	Units	Tech	Analysis Date
VOLATILE ORGANIC COMPOUNDS	GC SCREEN			AJY	10/08/2007
Tetrachloroethene	GC SCREEN	800	PPM (v/v)	AJY	10/08/2007
Trichloroethene	GC SCREEN	14	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethene	GC SCREEN	5.6	PPM (v/v)	AJY	10/08/2007
cis-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
trans-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Vinyl Chloride	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1,1-Trichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,2-Dichloroethane	GC SCREEN	<2.0	PPM (v/v)	AJY	10/08/2007
Chloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Methyl-Tert-Butyl-Ether	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Benzene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Toluene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Ethyl Benzene	GC SCREEN	0.29	PPM (v/v)	AJY	10/08/2007
m,p-Xylene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
o-Xylene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Methane	GC SCREEN	<10	PPM (v/v)	AJY	10/08/2007



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Project No.: **21.0056364.00**

Date Received: **10/08/2007**
Date Reported: **10/09/2007**
Work Order No.: **0710-00060**

Sample ID: **EW - 1 1345**
Sample Date: **10/03/2007**

Sample No.: **002**

Test Performed	Method	Results	Units	Tech	Analysis Date
VOLATILE ORGANIC COMPOUNDS	GC SCREEN			AJY	10/08/2007
Tetrachloroethene	GC SCREEN	420	PPM (v/v)	AJY	10/08/2007
Trichloroethene	GC SCREEN	8.3	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethene	GC SCREEN	4.5	PPM (v/v)	AJY	10/08/2007
cis-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
trans-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Vinyl Chloride	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1,1-Trichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,2-Dichloroethane	GC SCREEN	<2.0	PPM (v/v)	AJY	10/08/2007
Chloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Methyl-Tert-Butyl-Ether	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Benzene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Toluene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Ethyl Benzene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
m,p-Xylene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
o-Xylene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Methane	GC SCREEN	<10	PPM (v/v)	AJY	10/08/2007



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Date Received: **10/08/2007**
Date Reported: **10/09/2007**
Work Order No.: **0710-00060**

Sample ID: **EW - 2 1300**

Sample No.: **003**

Sample Date: **10/04/2007**

Test Performed	Method	Results	Units	Tech	Analysis Date
VOLATILE ORGANIC COMPOUNDS	GC SCREEN			AJY	10/08/2007
Tetrachloroethene	GC SCREEN	3700	PPM (v/v)	AJY	10/08/2007
Trichloroethene	GC SCREEN	170	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
cis-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
trans-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Vinyl Chloride	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1,1-Trichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,2-Dichloroethane	GC SCREEN	<2.0	PPM (v/v)	AJY	10/08/2007
Chloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Methyl-Tert-Butyl-Ether	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Benzene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Toluene	GC SCREEN	16	PPM (v/v)	AJY	10/08/2007
Ethyl Benzene	GC SCREEN	3.3	PPM (v/v)	AJY	10/08/2007
m,p-Xylene	GC SCREEN	1.6	PPM (v/v)	AJY	10/08/2007
o-Xylene	GC SCREEN	0.91	PPM (v/v)	AJY	10/08/2007
Methane	GC SCREEN	<10	PPM (v/v)	AJY	10/08/2007



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Date Received: **10/08/2007**
Date Reported: **10/09/2007**
Work Order No.: **0710-00060**

Sample ID: **EW - 2 1515**
Sample Date: **10/04/2007**

Sample No.: **004**

Test Performed	Method	Results	Units	Tech	Analysis Date
VOLATILE ORGANIC COMPOUNDS	GC SCREEN			AJY	10/08/2007
Tetrachloroethene	GC SCREEN	3400	PPM (v/v)	AJY	10/08/2007
Trichloroethene	GC SCREEN	150	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
cis-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
trans-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Vinyl Chloride	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1,1-Trichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,2-Dichloroethane	GC SCREEN	<2.0	PPM (v/v)	AJY	10/08/2007
Chloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Methyl-Tert-Butyl-Ether	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Benzene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Toluene	GC SCREEN	11	PPM (v/v)	AJY	10/08/2007
Ethyl Benzene	GC SCREEN	2.7	PPM (v/v)	AJY	10/08/2007
m,p-Xylene	GC SCREEN	1.3	PPM (v/v)	AJY	10/08/2007
o-Xylene	GC SCREEN	1.0	PPM (v/v)	AJY	10/08/2007
Methane	GC SCREEN	<10	PPM (v/v)	AJY	10/08/2007



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Project No.: **21.0056364.00**

Date Received: **10/08/2007**
Date Reported: **10/09/2007**
Work Order No.: **0710-00060**

Sample ID: **Discharge, 1300**
Sample Date: **10/04/2007**

Sample No.: **005**

Test Performed	Method	Results	Units	Tech	Analysis Date
VOLATILE ORGANIC COMPOUNDS	GC SCREEN			AJY	10/08/2007
Tetrachloroethene	GC SCREEN	10	PPM (v/v)	AJY	10/08/2007
Trichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethene	GC SCREEN	1.4	PPM (v/v)	AJY	10/08/2007
cis-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
trans-1,2-Dichloroethene	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Vinyl Chloride	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1,1-Trichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,1-Dichloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
1,2-Dichloroethane	GC SCREEN	<2.0	PPM (v/v)	AJY	10/08/2007
Chloroethane	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Methyl-Tert-Butyl-Ether	GC SCREEN	<1.0	PPM (v/v)	AJY	10/08/2007
Benzene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Toluene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Ethyl Benzene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
m,p-Xylene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
o-Xylene	GC SCREEN	<0.25	PPM (v/v)	AJY	10/08/2007
Methane	GC SCREEN	<10	PPM (v/v)	AJY	10/08/2007

W.O. # 0710 - 00060
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