Work Plan - Final
Soil Gas and Indoor Air Monitoring Survey
Davis Howland Oil Company Site
NYSDEC Site #8-28-088

1.0 Purpose

As a result of volatile organic compounds (VOCs) detected in the 2004 Groundwater Study for the Davis Howland Oil Company Site, 200 Anderson Avenue, Rochester, New York, an active soil gas survey and property ambient air monitoring program off the property and downgradient of the site will be conducted. The general site location map is provided as Figure 1. The site-specific location map is provided as Figure 2. The purpose of this soil gas survey is to determine the current location and concentrations of subsurface volatile organic compound contamination that may impact the downgradient properties and receptors. The purpose of ambient air monitoring is to determine and evaluate the concentrations of volatile organic compound contamination within possible buildings and facilities surrounding the site as a result of the onsite contamination. The information developed from the survey and analysis is expected to be utilized for future planning efforts and possible mitigation purposes.

2.0 Introduction

To be proactive and follow-up with New York State Department of Environmental Conservation (NYSDEC) and Department of Health (NYSDOH) requirements to perform these services, an active soil gas survey and indoor ambient air monitoring and analysis will be performed on properties on the South side of the Davis Howland Oil Company site, 200 Anderson Avenue, Rochester, New York.

The active soil gas sampling will be conducted for volatile organic compound (VOC) analysis in the upper overburden aquifer layer (6-12 feet below ground surface) surrounding buildings, facilities, or vacant properties at exterior locations on a grid with an approximate 55-foot station and line spacing (see Sheet 1 of 1). The active soil gas sampling will be conducted at fifty exterior locations including 5 duplicates. The general spacing grid will allow for coverage of the area downgradient of the site to confirm the presence or absence of VOCs in the soil. A utility stakeout will be performed prior to driving the Geoprobe® points.

As part of the ongoing remedial program at the Davis Howland Oil Company site and in response to the revised NYSDOH criteria for indoor air quality, ten residences or facilities downgradient of the site will be selected for indoor air quality sampling. The ten residences or facilities will be selected based the results of the active soil gas survey and on accessibility. One sub-slab basement and two ambient air samples (basement and first floor samples) will be collected from each residence/facility. In addition, one outdoor ambient air sample will be collected each day that sampling is conducted within the residences/facilities. Also, as part of the study, samples will be taken from the six-soil vapor extraction (SVE) points installed under the remedial project inside the 200 Anderson Avenue facility.

Samples will be analyzed by Ecology & Environment Engineering P.C.'s (EEEPC) Analytical Services Center (ASC), for the select chlorinated VOCs via United States Environmental Protection Agency (USEPA) Compendium method TO-14A, using selective ion monitoring (SIM). A detection limit of 1 ug/m^3 must be obtained. A 3-day turnaround time will be provided for all air sample analyses.

The survey will be performed using the equipment and procedures described below.

3.0 Equipment

Outdoor

- Direct-Push Geoprobe® unit with vacuum pump;
- 1.25-inch diameter steel probe rods (decontaminated between sample points);
- Post Run Tubing (PRT) System sampling tools including point holders, adapters, and Teflon-lined polyethylene tubing (Attachment A);
- SUMMA® canisters (provided by E & E) & vacuum control gauge;
- PID (with a 10.6 eV lamp)/FID for Health and Safety screening during all field activities

Indoor

- Concrete coring machine;
- Drill bits: 1-inch diameter x 12-inch long (usable length) and 3/8-inch x 12-inch;
- Tapered, laboratory-grade, silicone rubber plugs with 3/8" hole;
- Particulate filters;
- Teflon-lined, polyethylene tubing (3/8-inch O.D. x 1/4 -inch I.D.);
- PID (with a 10.6 eV lamp)/FID;
- SUMMA® canisters (provided by E & E) with vacuum gauge; and
- Digital camera.

4.0 Active Soil Gas Sampling Procedures

4.1 Outdoor

A vehicle-mounted Geoprobe® unit will be used to collect the subsurface soil gas samples using the following procedures:

- A clean drive point adaptor and new expendable point will be driven to the appropriate depth. The expendable drive point will be sacrificed at each soil gas sampling location.

- After the drive point has reached the desired depth, the probe rod will be retracted approximately 3-4" to create a void which will allow the migration of soil vapor sample into the bottom of the drive point adaptor.

- A clean, unused piece of ¼" Teflon-lined polyethylene tubing (or size as needed to connect) will then be attached to the stainless steel adaptor. The tubing is inserted into the probe rod and extended to the bottom of the probe rod. Using a counter-clockwise circular motion, the tubing is threaded to the drive point adaptor and tightened to compress the "O" ring seal.

- To ensure the integrity of the PRT and tubing connections, a vacuum check will performed on the system prior to purging and collecting the sample.

- After connecting the tubing to the "down-hole" drive point adaptor, the line is purged by drawing a measured volume (one tubing volume) of soil gas/vapor through the tubing using the vacuum/volume system mounted in Geoprobe® unit. A tubing pinch valve will be utilized to seal the end of the tube while the connection to the canister is made and to re-seal the tubing after sampling is completed

- The tubing connected to the drive point adaptor is then disconnected from the vacuum system and attached to a SUMMA® canister.

For preparation of the SUMMA® canister and collection of the sample, the following procedure is to be followed:

- Soil gas samples must be collected in SUMMA® canisters for lab analysis. Each cleaned SUMMA® canister will have a certification check performed with the flow controller in place. If a canister is determined to be contaminated, then it will be re-cleaned and re-certified. The SUMMA® canisters will be provided by the ASC.

- The sample is to be collected over a one-hour period to ensure a flow rate of <0.1 liters per minute. The sampling rate of the canister will be controlled by the use of a calibrated orifice within the flow controller. The calibrated orifice of each flow controller will be preset at the laboratory. The controllers will be attached to the canisters prior to the GC/MS certification check to ensure that the flow controllers are also included in the QA/QC procedures.

- The cycle time of the canisters shall not exceed thirty days. The cycle time is defined as the time from shipment from the laboratory, through the return shipping and analysis at the laboratory.

- A canister with less than 25 inches of Hg showing on the vacuum gauge prior to sampling will not be used. The check will be performed in the field and noted by the lab prior to canister shipment.

- The canister and control valve assembly will be kept out of direct sunlight during sampling by using a cloth or plastic drape or an enclosure. This is to prevent undue heating of the flow controller.

- A slight vacuum will be left in the canister at the end of sampling. The laboratory must check the vacuum in order to document that the canister did not leak during transit.

  Note:
  During sampling no activities will be permitted in the immediate area that involve using materials containing VOCs. The area will be inspected prior to sampling and any containers of oil, gasoline and any other hydrocarbons are to be removed from the area. Sampling personnel will use caution and avoid activities that can influence the sample results, such as pumping gas prior to sampling, using marking pens with the sampling devices, or wearing freshly dry-cleaned clothing while sampling. The sampling point will be monitored during sample collection to insure that the gas implant, the tubing and valves, and the canister remain intact and undisturbed.

- Complete the sample collection log with the appropriate information and log each sample on the chain-of-custody form.

- All canisters will be returned to EEEPC's ASC by the EEEPC field staff. No work or shipment of samples will be expected on weekends or holidays.

- All probe holes (approximately 1½-inch in diameter) will be backfilled with bentonite hole plug. If drilling through surface pavement is required, the pavement will be repaired with either ready mix concrete or cold patch asphalt (depending on existing pavement).

- All sampling tools will be decontaminated with Alconox and water between probe holes and all tubing will be discarded after use.

4.2 Indoor

4.2.1 Existing Buildings and Facilities

For substructure soil gas sampling, the following sampling preparation procedure is to be followed:

- Drill a 1-inch diameter hole about 1 inch into the concrete using an electric hammer drill or concrete coring machine.

- Insert a laboratory grade 1–inch silicone rubber plug with a 6-7 inch stainless steel tube through the plug. Connect the Teflon-line polyethylene tubing to the rubber plug in the floor and the SUMMA® canister.

- Seal the annular space between the 1-inch hole and the 3/8-inch tubing by seating a tapered laboratory-grade silicone rubber plug perforated with a 3/8-inch hole into the hole and capping the stopper with a beeswax seal, if necessary.

For preparation of the SUMMA® canister and collection of the sample, the following procedure is to be followed:

- Place SUMMA® canister adjacent to subsurface probe.
- Record SUMMA® canister serial number on the chain of custody (COC).
- Assign sample identification on canister I.D. tag and record on COC.
- Remove brass plug from canister fitting.
- Install pressure gauge/metering valve on canister valve fitting.
- Open and close canister valve.
- Record gauge pressure, gauge pressure must read > 25 inches of Hg.
- Remove brass plug from gauge and install particulate filter onto metering valve input.
- Connect subsurface probe to end of in-line particulate filter.
- Open canister valve to initiate sample collection.
- Take digital photograph of canister setup and surrounding area.
- Record local time on COC.

Procedure for termination of sample collection:

- Record local time on COC.
- Close canister valve.
- Disconnect Teflon-lined polyethylene tubing and remove particulate filter and pressure gauge from canister.
- Install brass plug on canister.
- Remove temporary subsurface probe and properly seal hole in the slab.
- Place the sample container in the original box.
- Complete the sample collection log with the appropriate information and log each sample on the chain-of-custody form.
- Fill hole with bentonite and patch top with concrete or asphalt, as appropriate.
- All canisters will be returned to EEEPC's ASC by the EEEPC field staff. No work or shipment of samples will be expected on weekends or holidays.

4.2.2 Air Sampling Interior SVE Points - Davis Howland Site

For interior SVE point sampling, the following sampling preparation procedure is to be followed:

- Isolate each interior SVE point by turning off the vacuum pressure to each. Shutoff valves and sampling ports are available to isolate each individual point and sample for below floor soil gas.
- Place SUMMA® canister adjacent to test port.
- Record SUMMA® canister serial number on the chain of custody (COC).
- Assign sample identification on canister I.D. tag and record on COC.
- Remove brass plug from canister fitting.
- Install pressure gauge/metering valve on canister valve fitting.
- Open and close canister valve.
- Record gauge pressure, gauge pressure must read > 25 inches of Hg.
- Remove brass plug from gauge and install particulate filter onto metering valve input.
- Connect the Teflon-lined polyethylene tubing from the test port to the canister.
- Open canister valve to initiate sample collection.
- Take digital photograph of canister setup and surrounding area.
- Record local time on COC.

Procedure for termination of sample collection:

- At end of one hour sample collection period, record gauge pressure.
- Record local time on COC.
- Close canister valve.
- Disconnect Teflon-lined polyethylene tubing and remove particulate filter and pressure gauge from canister.
- Install brass plug on canister.
- Remove temporary subsurface probe and properly seal hole in the slab.

- Place the sample container in the original box.

- Complete the sample collection log with the appropriate information and log each sample on the chain-of-custody form.

- Re-open the SVE point valve to return the return the remedial treatment system back to normal operation.

- All canisters will be returned to EEEPC's ASC by the EEEPC field staff. No work or shipment of samples will be expected on weekends or holidays.

5.0 Reporting

EEEPC will produce a brief letter report that summarizes the soil gas survey and the validated analytical results for further work (if necessary) based on the data generated and consultation with the NYSDEC/NYSDOH. Analytical results for two primary contaminants of interest and total volatile organic compounds (VOCs) will be presented as color concentration contour maps. In addition, a Daily Observation Report summarizing each day's field activities will be performed by EEEPC's subcontractor and provided to the NYSDEC's representative.

6.0 Budget and Schedule

The estimated cost for performing this work is $110,782 (see Table 1). Weather permitting, EEEPC will perform the soil gas survey within two weeks of notice to proceed by NYSDEC, or as soon as a Geoprobe® subcontractor can be obtained. The sample analysis turn around time for this sampling program is 3 days. EEEPC will provide a letter report with sampling results within six weeks of completing the field program.

Figures:

1. Davis Howland - General Location Map
2. Davis Howland – Site Specific Location Map

Drawing:

Sheet 1 of 1 - Soil Gas Survey Sampling Location Map

Tables:

1. Estimated Conceptual Cost for Scoped Work

Attachments:

A. Geoprobe® PRT System Schematic.

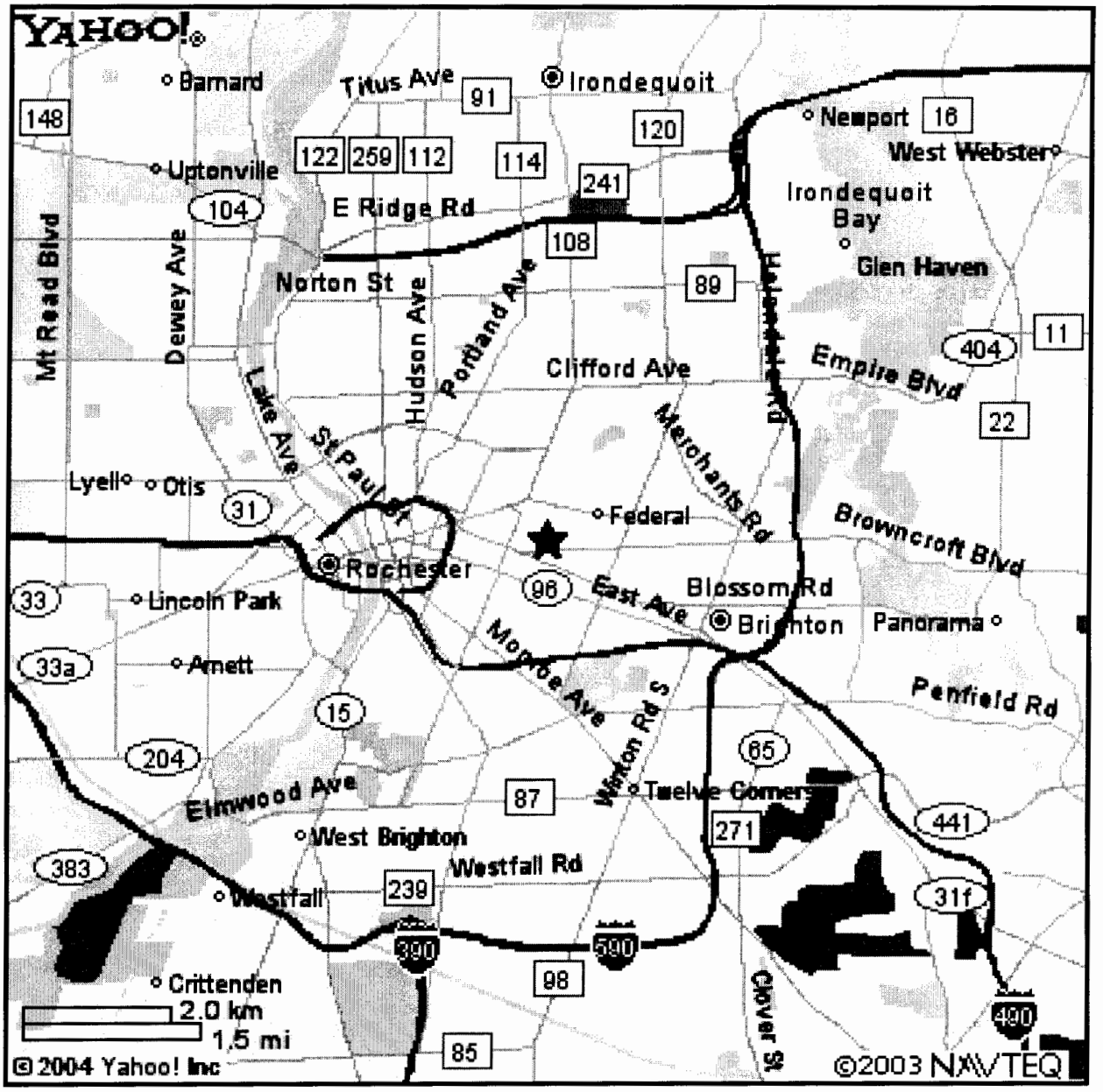

Figure 1
General Location Map
Davis Howland Oil Company Site, 200 Anderson Avenue, Rochester, New York

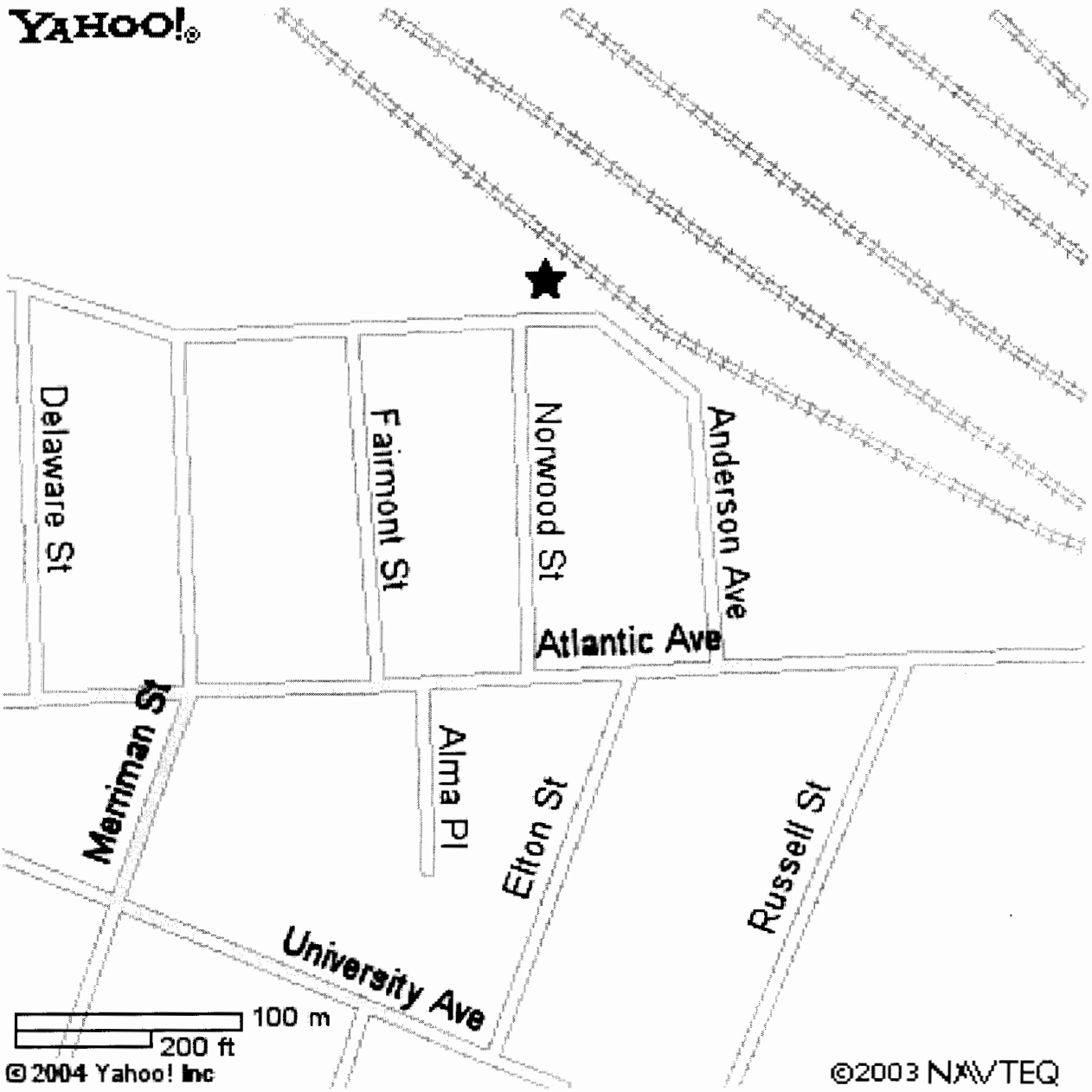

Figure 2
Site Specific Location Map
Davis Howland Oil Company Site, 200 Anderson Avenue, Rochester, New York

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ECOLOGY AND ENVIRONMENT ENGINEERING P.C. Active Soil Gas/Indoor Air Survey
COST ESTIMATE
New York State DEC
State Superfund Standby Contract #D003493 {Place title of Task 4 here}
Work Assignment #: D003493- {Place title of Task 5 here}
Project Name: Davis Howland Soil Gas and Air Monitoring Program - 000699-BU-49

Rates for Year Ending January 31, 2003 (2/1/02 - 1/31/03)

Rate/Hr	Labor Category	Totals	1	2	3	4	5
$73.88	IX	0	0	0	0	0	0
$54.21	VIII	0	0	0	0	0	0
$46.87	VII - (Miller, Siener)	16	16	0	0	0	0
$39.85	VI (Watt)	34	34	0	0	0	0
$34.15	V - (Steffan, Meyers)	240	240	0	0	0	0
$28.14	IV - (Mayer, Cervi)	108	108	0	0	0	0
$25.12	III - Editor	32	32	0	0	0	0
$22.40	II - WP	40	40	0	0	0	0
$17.49	I - Sect.	12	12	0	0	0	0
	TOTAL HOURS	482	482	0	0	0	0

1)	Total Labor Cost		$15,250	$15,250	$0	$0	$0	$0
2)	Overhead	185%	28,213	28,213	0	0	0	0
3)	Total Labor and Overhead		43,463	43,463	0	0	0	0
4)	Travel		1,246	1,246	0	0	0	0
5)	Other Direct Costs		3,883	3,883	0	0	0	0
6)	E&E Analytical Services		32,175	32,175	0	0	0	0
7)	**Subtotal**		80,767	80,767	0	0	0	0
8)	Subcontractors		26,755	26,755	0	0	0	0
9)	**Subtotal**		107,522	107,522	0	0	0	0
11)	Fixed Fee (on Line 3)	7.5%	3,260	3,260	0	0	0	0
12)	**Subtotal Project Price**		$110,782	$110,782	$0	$0	$0	$0
13)	Subcontract Fee *	4.0%	0	0	0	0	0	0
14)	**TOTAL PRICE**		$110,782	$110,782	$0	$0	$0	$0

DATA ENTRY AREA : TASK 6

Task 6: Soil Gas and IAQ Review

LABOR DETAIL

NSPE	Travel Hours	Field Work People	Days	H/Day	M-Day	Field Hours	In-House Hours	Pubs	Total
IX					0				
VIII					0				
VII- Siener/Miller					0		16		16
VI -Watt					0		34		34
V - Steffan/Meyers		1	8	12	8	96	144		240
IV - Mayer		1	4	12	4	48	60		108
III -					0			32	32
II - WP					0		8	32	40
I - Sect.					0		4	8	12
TOTAL					12	144	266.0	72	482.0

E&E ANALYTICAL SERVICES

			Total
Air	90	$337.50	$ 30,375
TO-14A with 3 day - TAT with Summa Cans			
Waters			
40 CFR 136 - Method 601 - Purgeable Halocarbons	10	$90	$ 900
40 CFR 136 - Method 602 - Purgeable Aromatics	10	$90	$ 900
TOTAL E&E ANALYTICAL SERVICES			$ 32,175

TRAVEL DETAIL

	Unit	# Units	$/Unit	Total
Airfare: Buffalo/Albany	RT		$ 504.00	
Per Diem: Albany	Day		$ 34.00	
Per Diem: Rochester	Day		$ 34.00	
Lodging: Albany	Night		$ 70.00	
Auto Rental	Day		$ 50.00	
Mini Van Rental	Day	11	$70.00	$ 770
Local Mileage	Mile	341	$0.330	$ 113
Parking	Day			
Gasoline/Tolls	RT	11	$33.00	$ 363
TOTAL TRAVEL COSTS				$ 1,246

E&E Equipment

Period	# Periods	# Units	$/Unit	Total
All equipment must be rented from an outside vendor or purchased for use				
TOTAL E&E EQUIPMENT COSTS				

OTHER DIRECT COST DETAIL

	Unit	# Units	$/Unit	Total
Communication Costs	Call	10	$5.00	$ 50
Copies Included in computer time				
Blueprinting	Page	12	$1.75	$ 21
Computer T Reimbursed on reasonable operation	Hour	482	$3.00	$ 1,446
Protective Clothing: Level D	Day	12	$15.00	$ 180
Protective Clothing: Level C	Day		$50.00	
Protective Clothing: Level B	Day		$70.00	
Shipping: Lab Samples	lbs.		$65.00	
Shipping: Equipment	lbs.			
Shipping: Other Fedex Priority	5 lbs.		$22.00	
Postage (FED-EX PRIORITY)	2 lbs.	8	$17.00	$ 136
Purchased Items - Incidentals	Lump Sum			
Outside Equipment Rental PID - PPB reac week	3	1	$550.00	$ 1,650
Miscellaneous Field Supplies/ODCs	Lump Sum			$400
TOTAL OTHER DIRECT COSTS				$ 3,883

SUBCONTRACTORS

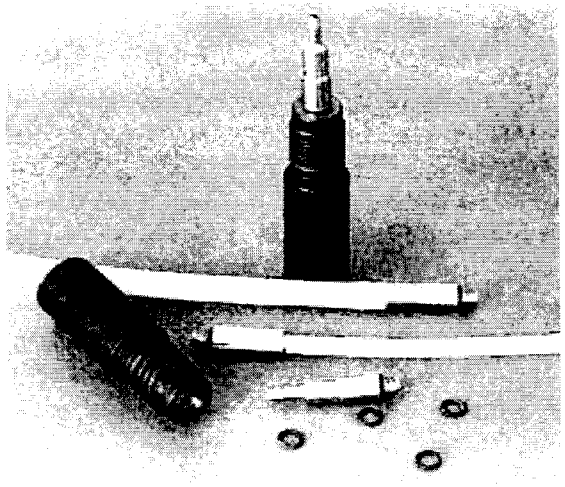
Services to be Performed	Cost Plus or Unit price	Subcontract Price
Joseph C. Lu Engineering and Land Surveying, P.C.		
Addendum Review		
Additional J. Lu Work Addendum #3		
Lu Engineers - Soil Gas and Indoor Air Sampling		$ 25,155
LU Engineers - Report Review		$ 1,600

UNIT PRICE SUBCONTRACTORS (Quotes > $10,000)

TOTAL SUBCONTRACTOR COSTS $ 26,755

► Main Info
Here's How It Works...

PRT Active Sampling



The Post Run Tubing System (PRT) is an ideal tool for locating and delineating contaminated areas when used properly. It allows the user to collect soil vapor samples quickly and easily at the desired sampling depth WITHOUT the time-consuming complications associated with rod leakage and contamination. O-ring connections enable the PRT system to deliver a vacuum-tight seal that prevents sample contamination from UP hole, and assures that the sample is taken from the desired depth at the BOTTOM of the hole. The sample is drawn through the point holder, through the adapter, and into the sample tubing. The tubing can be replaced after each sample, thus eliminating sample carryover problems and the need to decontaminate the probe rods. The resulting time-savings translates into a higher productivity rate for you and your client.

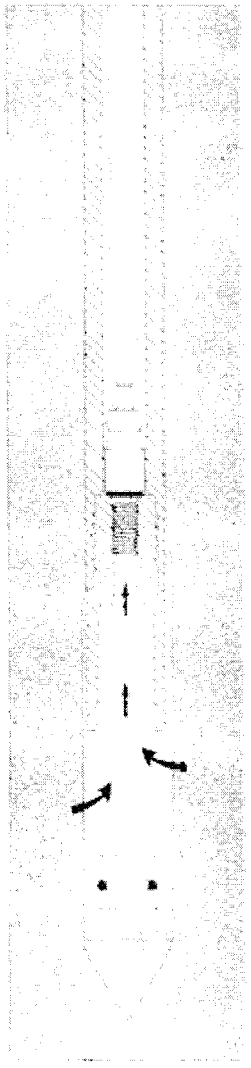
The PRT is inserted AFTER the probe rods are driven to depth.
Advantages include...

- Increases speed and accuracy of soil gas sampling.
- Eliminates problems associated with rod leakage and sample carryover.
- Utilizes simple design for ease of use and vacuum-tight probing.
- Sampling train and all connections can be checked to verify leak-free status.

- Requires no management of inner tubing during probing.

PRT Applications:

- Rapidly define the extent of VOC contamination in the subsurface, under appropriate conditions.
- Rapidly define potential source areas of VOC contamination over large or small areas.
- Determine the types of VOC contamination present in the subsurface at a facility.
- Rapidly define the potential extent of groundwater contamination and down gradient migration of VOC's under appropriate conditions.
- Determine presence, extent, concentration, and types of landfill gasses (methane, carbon dioxide, et.) present in the subsurface at active and abandoned landfills.
- Locate potential sources and delineate plumes of perchloroethylene (PCE) associated with active or abandoned dry cleaning facilities.
- Locate potential source and delineate plumes of carbon tetrachloride (CCl4) associated with active or abandoned grain storage facilities.
- Locate potential sources and delineate plumes of benzene, toluene, ethyl benzene, and xylenes (BTEX) associated with active or abandoned gasoline storage facilities [both underground storage tanks (UST) and aboveground storage tanks (AST)].
- Locate potential sources and delineate plumes of chlorinated solvents, including compounds such as trichloroethane, trichloroethylene, dichloroethane, and dichloroethylene, associated with active or abandoned facilities where degreasing or metal plastic parts cleaning operations were conducted.



A cross section of the PRT System showing how soil gas (arrows) is drawn through the inner tubing system.