
**Work Plan for
Remedial Investigations and
Feasibility Studies at the
Luzerne Road Site,
Queensbury, New York**

Work Assignment No.: D003493-16

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Prepared for:

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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List of Acronyms

ARARs	applicable or relevant and appropriate requirements
ASC	Analytical Services Center
ASP	Analytical Services Protocol
BGS	below ground surface
CAD	computer-aided design
CLP	Contract Laboratory Program
DOT	United States Department of Transportation
DPT	direct push technology
DPW	Department of Public Works
E & E	Ecology and Environment Engineering, P.C.
FWIA	Fish and Wildlife Impact Assessment
GC	gas chromatograph
gpm	gallons per minute
HASP	Health and Safety Plan
HOS	halogenated organic compound scan
ID	inside diameter
IDW	investigation-derived waste
MBE/WBE	Minority Business Enterprise/Women-owned Business Enterprise
MCLs	maximum contaminant levels
mL	milliliter
msl	mean sea level
NTUs	nephelometric turbidity units
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	operation and maintenance

List of Acronyms (Cont.)

OD	outside diameter
oz	ounce
PCB	polychlorinated biphenyls
POC	point of contact
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PRAP/ROD	proposed remedial action plan/record of decision
PVC	polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RI/FS	remedial investigation/feasibility study
SOW	Scope of Work
SSL	Soil Screening Level
TAGM	New York State Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TBC	to be considered
TCL	Target Compound List
TSP	trisodium phosphate
USGS	United States Geological Survey
VOC	volatile organic compound

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Introduction

E & E
Ecology and Environment
Engineering, P.C.

NYSDEC
New York State
Department of
Environmental
Conservation

RI/FS
remedial investigation/
feasibility study

MBE/WBE
Minority Business
Enterprise/Women-owned
Business Enterprise

Pursuant to Work Assignment No. D003493-16 received February 4, 1999, Ecology and Environment Engineering, P.C. (E & E) is submitting this work plan to the New York State Department of Environmental Conservation (NYSDEC), Division of Environmental Remediation, for remedial investigation/feasibility study (RI/FS) services at the Luzerne Road Site (No. 6-22-017) in Glens Falls, New York.

Section 2 of this work plan presents background information on the site; Section 3 details the major tasks to be performed; Section 4 contains a project schedule; Section 5 presents a staffing plan; Section 6 presents subcontracting requirements for this work assignment; Section 7 provides a detailed budget prepared in accordance with contractual reporting requirements, including a separate direct administrative labor hours estimate (Form 2.11 (b-1)); and Section 8 presents the Minority Business Enterprise/Women-owned Business Enterprise (MBE/WBE) utilization plan.

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Background Information

2.1 Site Location and Description

The Luzerne Road Site is comprised of three contiguous properties located at 53 and 55 Luzerne Road and an adjacent New York State-owned property in the Town of Queensbury, County of Warren, New York (see Figure 2-1 for site location). The site is identified as Class 2 in the New York State Registry of Inactive Hazardous Waste Sites, indicating that the site poses a significant threat to public health or the environment. Confirmed hazardous waste disposal at the site includes polychlorinated biphenyls (PCBs) which have been found in site soils and groundwater.

PCB
polychlorinated biphenyl

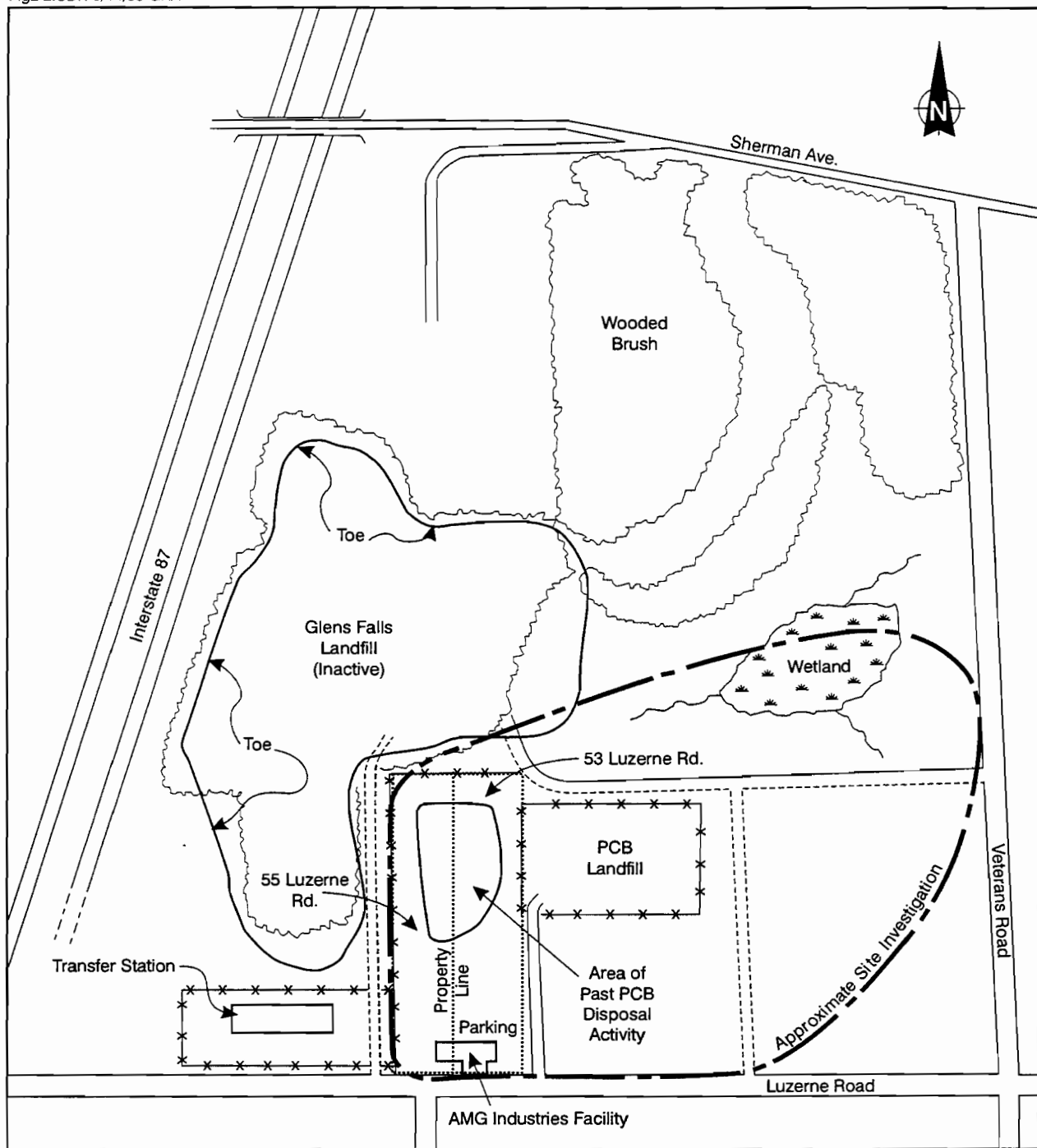
Reportedly, the site was used as a junkyard by a previous owner, and it is believed that PCB contamination has resulted at the site from electrical capacitor salvaging activities. Similar salvaging activities are reported to have occurred at local residences. During a removal action conducted in 1979, NYSDEC used the adjacent State-owned property to construct a secure, temporary PCB storage cell (see Figure 2-2). Excavated soils from the 53 and 55 Luzerne Road properties and the private residences were placed in the secure cell and the cell was capped. The scope of this remedial investigation includes additional investigation at and around the Luzerne Road properties and at the private residences.

The Luzerne Road Site is located in the southeastern portion of Warren County, approximately one-half mile west of the City of Glens Falls city limits. The area includes a mix of residential and vacant land. The Hudson River is located approximately one-half mile to the south of the site. The site is bounded to the north and west by the Glens Falls Landfill Site, which also is a Class 2 Inactive Hazardous Waste Site. The Glens Falls Landfill Site reportedly received primarily municipal waste as well as an unknown quantity of PCB-containing capacitors and approximately 5 tons of ink sludge. Located to the east of the Luzerne Road Site is a vacant field, and to the south is Luzerne Road, beyond which are private residences. The private residences where previous removal actions occurred are located south and west of the site.



SOURCE: Base map USGS 7.5 Minute Series (Topographic) Quadrangle: Glens Falls, NY, 1966.

Figure 2-1 SITE LOCATION MAP, LUZERNE ROAD SITE, GLENS FALLS, NY



SOURCE: RCRA Environmental 1986

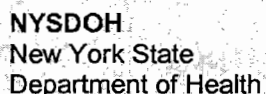
**Figure 2-2 SITE MAP, LUZERNE ROAD SITE,
GLENS FALLS, NEW YORK**

2. Background Information

The 55 Luzerne Road property includes approximately 2 acres. The southern portion of the property is occupied by the AMG Industries (the current property owner) facility. The northern portion is a mixture of vacant field and wooded areas. The property is bounded to the west by the former haul road for the Glens Falls Landfill. The property is generally flat. Drainage from the property flows to the west along an excavated swale.

The 53 Luzerne Road property includes approximately 4 acres. The southern half of the property is occupied by a portion of the AMG Industries (the current property owner) facility and a gravel parking area. The northern half is a vacant field. This property is reportedly where the majority of the site's salvaging operation took place and, as a result, is believed to be the most heavily contaminated. The property is generally flat. Drainage from the property flows either to the west to the 55 Luzerne Road property, to the north to a drainage ditch, or to the south to Luzerne Road.

The secure PCB storage cell located on the State-owned land to the east of the site is approximately 2.7 acres in size. The cell is grass-covered and fenced. The area adjacent to the north of the cell is used by the Town of Queensbury for storage of snow. To the north of the snow storage area is a topographic depression, which is assumed to be the former borrow pit for daily cover material when the Glens Falls Landfill was in operation. To the east and south of the cell lies cleared vacant land and wooded land, respectively. To the southeast, private residences are located along the north side of Luzerne Road.

 NYSDOH
New York State
Department of Health

Based on New York State Department of Health (NYSDOH) field notes recorded during the 1979 residential soil removal, contaminated soils were removed from seven properties, including the following:

- One residence on Luzerne Road;
- One residence on Indiana Avenue;
- Three residences on Rhode Island Avenue;
- One residence on 4th Street Extension; and
- One residence at an unidentified location.



2. Background Information

Additional records indicate two other residences were possibly contaminated with PCBs also, although their locations were not specified.

2.2 Site History

PCB contamination at the site was first discovered in Spring 1979. Sampling completed in April and June 1979 identified three private residences and the 53/55 Luzerne Road property (then known as the Alkes property) as being contaminated. An article in the Saratogan (undated, but assumed to be shortly thereafter) indicated that 15 shallow water supply wells and 45 homes were within a 500-foot radius of the three contaminated residential properties. In August 1979, Dr. Davis Axelrod, Commissioner of NYSDOH, declared a public health emergency regarding the PCB-contaminated properties.

On September 9, 1979, NYSDEC, NYSDOH, the County of Warren, the Town of Queensbury, and the City of Glens Falls entered an agreement to construct the secure PCB cell to dispose of contaminated soils. A letter from EPA dated October 23, 1979, approved the cell construction, outlined waivers for certain construction requirements, and outlined requirements from construction and maintenance of the cell.

Excavation and disposal of soil in the secure cell occurred in late October and early November 1979. While field notes are detailed it appears that the extent of contamination was based on olfactory evidence alone without confirmatory soil testing. On October 31, 1979, three workers were overcome by fumes while excavating on the 53 Luzerne Road property. After that incident, workers were required to wear full-faced respirators with supplied air while excavating at the site.

Following conclusion of the excavation, questions remained as to the adequacy of the removal, specifically whether additional soils should have been removed from three additional residences. When completed, the project had placed approximately 15,000 cubic yards of contaminated soil in the secure cell. However, due to a greater than expected quantity of soil excavated, some contaminated soil was left behind in a 2-acre area on the 53 and 55 Luzerne Road properties. That area was capped with one foot of horse manure and six inches of topsoil.

NYSDEC records indicate that leachate removal was stopped in 1985 and the cap was improved in 1986 to include a geomembrane. Monitoring continued monthly until 1991 and

2. Background Information

followed on a quarterly basis thereafter. Monitoring included one upgradient shallow well, one downgradient well, and the secure cell center standpipe. Upgradient groundwater PCB concentrations vary up to 22 µg/l (May 1989), but were typically reported as less than 10 µg/l. The suspected source of these upgradient concentrations is the Glens Falls Landfill. Downgradient groundwater PCB concentrations vary up to 400 µg/l (May 1989), but were typically reported less than 100 µg/l. Leachate concentrations showed a significant increase from typically less than 100 µg/l prior to December 1989 to 98% in June 1991. Leachate levels show a steady decrease from a 10.5 foot depth in April 1989 to a 7.2 foot depth in March 1995. This decrease of leachate levels, without pumping, may indicate a leak in the liner system. In response, approximately 40,000 gallons of leachate were removed from the secure cell during Summer 1995.

In May 1987, a Phase II investigation of the Glens Falls Landfill was completed (RECRA 1987). The scope of the study included air monitoring, a geophysical survey, subsurface investigations (including the installation of five shallow groundwater wells and two hand augers), and the collection of seven soil, seven groundwater, and two sediment samples (see Figure 2-3). The findings included in the report indicated:

- **Environmental Setting:** No wetlands or critical habitats.
- **Groundwater Usage:** The RECRA report indicates that most local residences are serviced by the Town of Queensbury and City of Glens Falls water departments. These departments draw water from the Hudson River, Halfway Creek, and three upland reservoirs. Nearest domestic wells are 1300 feet north of the 55-53 Luzerne Road site along Sherman Avenue in a suspected up- or sidegradient location. No information was included in the RECRA report regarding domestic wells in the downgradient direction. Wells are 20 to 40 feet deep.
- **Geophysical Results:** No indication of plume outside landfill boundary based on terrain conductivity. Seismic refraction indicated approximately 10 feet of loose sand followed by a more consolidated sand.
- **Hydrogeology:** Bedrock varies between shale and limestone and ranges in depth from 110 to 130 feet. Shallow soils (to water table) are lake sands, very fine sands to pebbly sands, well sorted, well drained, and easily excavated. Geotechnical testing indicated 98.8% sand with the remaining 1.2% clay and silt.

gpm
gallons per minute

msl
mean sea level



INTERSTATE ROUTE 87

SHERMAN AVENUE

DIRT ROAD

DIRT ROAD

DIRT ROAD

DRY POND

WOODED BRUSH

WOODED BRUSH

WETLAND
(APPROXIMATE BOUNDARY)

APPROXIMATE
LANDFILL
BOUNDARY

6' CLF

WOODED BRUSH

MW-101-3
383.57 PVC

CONC.
MON.

MW-101-4
366.68 PVC

MW-101-5
379.73 PVC

PCB-N1
377.89 GRD
381.08 PVC

PCB-E1
375.86 GRD
377.91 PVC

SECURED
PCB CELL

BM#1
PCB-
379.9
381.5



2. Background Information

- **Groundwater:** Groundwater flow is to the southeast with a hydraulic gradient of 0.005 ft/ft. Water table depths range between 375.82 to 363.24 mean sea level (msl).
- **Analytical Results:**
 - **Air:** No detects above background concentrations.
 - **Subsurface Soil:** 1,1-dichloroethene and 1,1,2,2-tetrachloroethane were detected in soil samples collected during installation of two wells boreholes, MW101-4 and MW101-5, located north of the secure cell.
 - **Surface Soil and Sediment:** PCBs were reported in all samples but one (HA101-1) located northeast of the secure cell. The maximum PCB concentration was reported at HA101-2 (160 parts per million [ppm]) located on the 53 Luzerne Road property. A halogenated organic compound scan (HOS) indicated these compounds in all samples, with a maximum at HA101-2.
 - **Groundwater:** PCBs were reported in samples from two wells, MW101-5 (a downgradient well at the landfill) and MW-101-1 (located near the AMG Industries facility). Aroclor 1016 was reported in a sample from MW101-5 at a concentration of 62 parts per billion (ppb). Halogenated organic compounds were reported in samples from both upgradient and downgradient wells. The maximum concentration (4 ppm) was reported in a sample from downgradient well MW101-5.

ppm
parts per million

HOS
halogenated organic
compound scan

In November 1991, a remedial investigation of the AMG property (including 53 and 55 Luzerne Road) was completed for AMG Industries (CHA 1991). The study included an electromagnetic survey and shallow soil investigation. The results indicated significant contamination remaining on the 53 Luzerne Road property. A maximum concentration of 62,300 ppm of PCB in soil was reported at a depth of approximately 10 feet. No contamination was reported on the 55 Luzerne Road property. Subsequent to the investigation, approximately 25 yards of soil were excavated from two locations near the AMG Industries facility (CHA 1992).

In March 1997, supplemental investigations were completed around the Glens Falls Landfill (E & E 1997). The primary focus of this study was to evaluate groundwater conditions in the vicinity of the Glens Falls Landfill. The study included 22 Geoprobe, the installation of four piezometers, a total of 36 shallow groundwater



2. Background Information

samples, and six soil samples from two locations. The results of this study indicated the 53 Luzerne Road property contains highly concentrated PCBs. PCBs are migrating off the site in the groundwater at levels contravening New York State groundwater standards. The sources of this groundwater contamination are either the landfill, the secure cell area, or the 53 Luzerne Road property, or a combination of each. Groundwater flow is to the east-south-east at 1.1 ft/day.

2.3 Work Plan Scope

Under this work assignment, E & E will provide RI/FS services to NYSDEC for the Luzerne Road Site inclusive of the three contiguous properties (53 Luzerne Road, 55 Luzerne Road, and the Secure Cell property), and up to nine private properties.

This work plan has been developed for the first phase of investigation. Following completion of these studies, and if directed to do so by NYSDEC, E & E will prepare an addendum to this work plan for supplemental second phase investigations.

Remedial Investigation

The RI to be conducted by E & E will include:

- Record search and identification of receptors;
- Surface and subsurface soil sampling (from borings and Geoprobos);
- Groundwater well installation, development, sampling, and slug testing; and
- Surface water/sediment sampling.

The objective of the RI will be to identify and define the extent of soil and groundwater contamination at the Luzerne Road Site, the residual contamination at up to nine private residences, and to identify the site's possible risks to human health and the environment. Data collected from the investigations will be tabulated, summarized, and evaluated.

A quantitative risk assessment will not be completed for the Luzerne Road Site. Based on previous investigations, it is expected that PCBs will pose the most significant human health risk at the site. It is commonly accepted to use established state and federal criteria when establishing cleanup goals for these substances. Thus, a quantitative assessment may not be necessary.



2. Background Information

An assessment of human exposure pathways will be completed in addition to a comparison of environmental testing data with state and federal criteria for identified contaminants. Based on this comparison and other data developed from the RI, a determination will be made whether a more rigorous quantitative assessment is necessary. The human health risk assessment is discussed in more detail in Section 3.4.

Feasibility Study

Upon receipt of data from the RI, an FS will be performed. The FS will identify which areas of the site may require remedial action and will develop and compare appropriate remedial alternatives.

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Major Tasks and Subtasks

The tasks and requirements of this work assignment are specified in Schedule 1, Item D, of E & E's standby Contract, *Work Element II - Phased Remedial Investigation/Feasibility Study*. The following is a summary of the work assignment scope.

3.1 Task 1: Project Work Plan

This task involves the development of this work plan for the Luzerne Road RI/FS. Work plan development is divided into two subtasks: 3.1.1 Site Visit and Scoping Session, and 3.1.2 Detailed Work Plan Development. The work plan is predicated on the Work Assignment No. D003493-16 issued by NYSDEC on February 9, 1999, and subsequent scoping discussions held with NYSDEC representatives.

3.1.1 Site Visit and Scoping Session

E & E met with Dave Tromp, Walt Demick, Eric Hausamann, and James Ludlam in Albany, New York, on February 25, 1999, to discuss site background information and visit the site. Subsequently, E & E visited the Glens Falls Department of Public Works (DPW) and the Town of Queensbury Planning Office to obtain additional background information. Based on a review of the site background information and discussions with NYSDEC, E & E developed a draft Scope of Work (SOW), which was submitted to NYSDEC on March 12, 1999. E & E and NYSDEC held a scoping conference call on March 30, 1999, during which NYSDEC approved the proposed SOW and E & E commenced preparation of this work plan.

3.1.2 Detailed Work Plan Development

E & E is submitting this work plan for NYSDEC's review and approval. This work plan addresses the issues discussed during scoping sessions and includes a description and purpose of the major tasks and subtasks, a project schedule identifying milestones and deliverables, a staffing plan, budget with 2-11 forms and supporting documentation, M/WBE utilization plan, subcontractor

DPW
Department of Public
Works

SOW
Scope of Work

3. Major Tasks and Subtasks

QA/QC

Quality Assurance/
Quality Control

HASP

Health and Safety Plan

VOC

volatile organic compound

TCL

Target Compound List

TAL

Target Analyte list

PPE

personal protective
equipment

identification, subcontractor SOW, a Quality Assurance/Quality Control (QA/QC) Plan, and a Health and Safety Plan (HASP).

3.2 Task 2: Remedial Investigations

The RI proposed for the Luzerne Road Site will investigate site soils, surface water/sediment, and groundwater to determine whether site contaminants are present in environmental site media and the extent of these contaminants. Investigation subtasks are listed below, along with the corresponding proposed analyses. Figures 3-1 and 3-2 show the proposed subsurface soil sampling grid and the proposed groundwater monitoring well locations at the Luzerne Road Site, respectively.

PCB is the primary site contaminant; therefore, PCB analysis will be included in all environmental evaluations. Also, because background data indicates a volatile organic compound (VOC) was detected during previous remediation activities, VOC analysis will be included on a limited basis. Additional analyses include those needed to provide data necessary for the FS. Due to the unknown contaminants in site groundwater, groundwater from selected existing and all new groundwater monitoring wells installed as part of this RI will be submitted for analysis for the full Target Compound List (TCL)/Target Analyte List (TAL) suite of analyses. Table 3-1 summarizes the proposed sampling and analysis at the Luzerne Road Site.

Note that all field activities are expected to be conducted by personnel wearing Level D personal protective equipment (PPE). Due to the potential presence of PCB in dust, upgrades to Level C may be necessary. In addition, VOC concentrations in the breathing zone will be continuously monitored.

3.2.1 Task 2.1: Field Remedial Investigation

3.2.1.1 Record Search and Contaminant Receptor Identification

Previous environmental site assessments of the site and adjacent areas have been conducted; however, background data presented on the site is not thorough. Therefore, E & E will begin the project by conducting background research to determine useful details concerning site history. Aerial photographs of the site from the 1960s, 1970s, and 1980s will be obtained, if possible, to determine which parts of the site or surrounding area may have been affected, but have not yet been explored. Contact with, and possibly visits to, local and state agencies will be made to obtain historical records on site activities and violations, if any. Interviews with

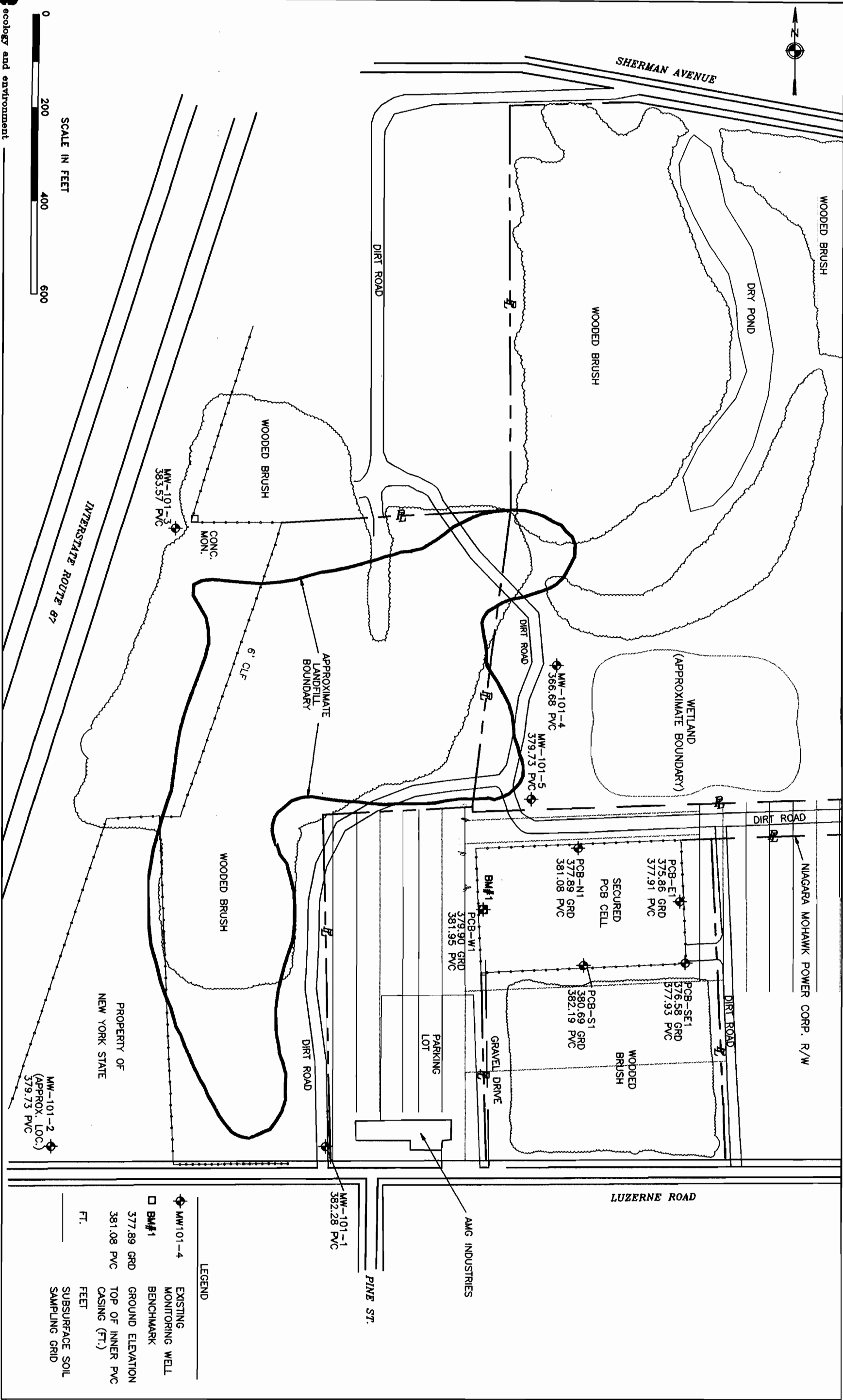
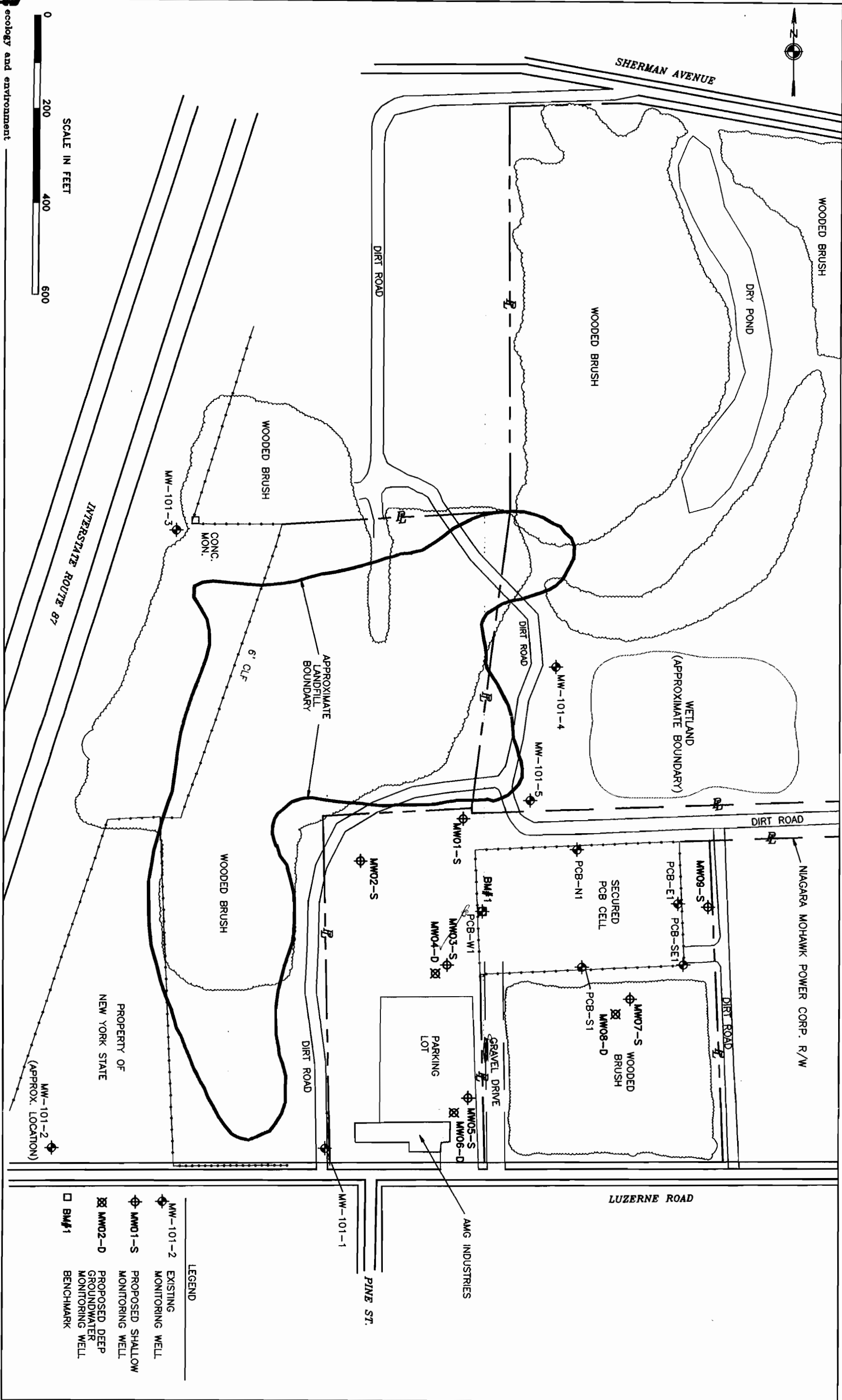


Figure 3-1
PROPOSED SUBSURFACE SOIL
SAMPLE GRID
LUZERNE ROAD SITE
QUEENSBURY, NEW YORK





3. Major Tasks and Subtasks

Table 3-1 Sampling and Chemical Analysis Cost Summary
Luzerne Road Site, Glens Falls, NY

Analysis	Method	Number of Field Samples	QA/QC Samples							Total Number of Samples
			Field Duplicates	Trip Blanks	Rinsate Blank	MS	MSD	MSB		
Groundwater - Existing Wells										
TCL Volatiles (VOCs)	CLP 95-1	10	1	2	0	1	1	1	1	16
TCL Semivolatiles (BNAs)	CLP 95-2	10	1	0	0	1	1	1	1	14
TCL PCB	8082	10	1	0	0	1	1	1	1	14
TCL Pesticides	8081B	10	1	0	0	1	1	1	1	14
TAL Metals (+Mercury)	CLP-M	10	1	0	0	1	1	1	1	14
Cyanide	CLP-M	10	1	0	0	1	1	1	1	14
Groundwater - New Wells (6 shallow & 3 deep)										
TCL Volatiles (VOCs)	CLP 95-1	9	1	1	0	0	0	0	0	11
TCL Semivolatiles (BNAs)	CLP 95-2	9	1	0	0	0	0	0	0	10
TCL PCB	8082	9	1	0	0	0	0	0	0	10
TCL Pesticides	8081B	9	1	0	0	0	0	0	0	10
TAL Metals (+Mercury)	CLP-M	9	1	0	0	0	0	0	0	10
Cyanide	CLP-M	9	1	0	0	0	0	0	0	10
Surface Water										
TCL PCBs	CLP 95-3	4	1	0	0	1	1	1	1	8
Sediment										
TOC	415.1M	12	1	0	0	1	1	1	1	16
Subsurface Soil - Containment Cell										
TCL Volatiles (VOCs)	CLP 95-1	4	1	1	1	1	1	1	1	10
TCL PCBs	8082	4	1	0	1	1	1	1	1	9
pH	9045C	4	1	0	1	1	0	0	0	6



3. Major Tasks and Subtasks

Table 3-1 Sampling and Chemical Analysis Cost Summary
Luzerne Road Site, Glens Falls, NY

Analysis	Method	Number of Field Samples	QA/QC Samples						Total Number of Samples
			Field Duplicates	Trip Blanks	Rinsate Blank	MS	MSD	MSB	
TOC	415.1	4	1	0	1	1	1	1	9
Oil and Grease	9071A	4	1	0	1	1	1	1	9
COD	410	4	1	0	1	0	0	0	6
Subsurface Soil - Geoprobe Confirmation									
TCL PCBs	8082	160	8	0	0	8	8	8	192
Subsurface Soil - Residential Soils									
TCL Volatiles (VOCs)	CLP 95-1	27	2	4	0	1	1	1	36
TCL PCBs	8082	27	2	0	0	1	1	1	32
TOC	415.1M	9	1	0	0	1	1	1	13
Subsurface Soil - Monitoring Wells									
TCL Volatiles (VOCs)	CLP 95-1	9	1	9	1	1	1	1	23
Subsurface Soil - Grid Sampling									
TOC	415.1M	22	1	0	0	1	1	1	26

Key:

ASC = E & E's Analytical Services Center
 MS = matrix spike
 MSD = matrix spike duplicate
 MSB = matrix spike blank
 PCB = polychlorinated biphenyl
 QA = Quality Assurance
 QC = Quality Control
 SVOCs = semivolatile organic compounds
 TAL = Target Analyte List
 TC = Target Compound List
 TOC = total organic carbon
 VOCs = volatile organic compounds



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surrounding business owners, the local town historian, and relevant City of Glens Falls employees will also be conducted to obtain additional background information. A search for uses of private drinking water wells will be made. E & E will attempt to identify whether the wells are used as either a primary drinking water source or as a supplemental source for watering lawns or gardens. In addition, uses of nearby surface water will be researched to determine if surface water is used for drinking water downgradient of the site. The search for private wells and surface water usage will be limited to downgradient or downstream locations only.

As a component of the record search, E & E will collect names and addresses of officials and residents who wish to be kept informed of the findings of the RI/FS. This list will be forwarded to, and maintained by, NYSDEC. Some investigation has already been conducted at the Glens Falls Landfill west of the site. Any additional information that may be available from site characterization activities conducted at that site (such as groundwater and soil data) will be pursued. Based on these data, potential receptors of contaminants will be identified. The data may also be used to modify sample quantities and analyses, and will be evaluated with respect to selection of sample locations. All collected data will be summarized and included in the RI report.

To assist in learning about past activities at the site, E & E proposes creating and distributing a questionnaire to local residents. The purpose of this questionnaire is to determine any important facts about the site that previous studies may have overlooked. Data from this questionnaire may be used to select groundwater monitoring well positions, or to identify other areas of sampling which should be included during Phase I activities.

3.2.1.2 On-Site Soil Investigation

To fully characterize the extent of soil contamination that may exist in the area of the secure cell, subsurface soil will be investigated in three efforts: shallow borings on a grid system, soil sampling during installation of groundwater monitoring wells, and soil sampling at the PCB landfill cell. Each effort is described below.

NYSDEC will first establish access permission to conduct the field investigation on all areas of this site to be studied. Site investigation activities will commence following establishment of entry permission.

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Shallow Subsurface Soil Sampling by DPT on Grid

PCB presence in soils surrounding the PCB cell will be sampled through a series of shallow soil borings installed according to a grid established over the study area. The grid will extend approximately 300 feet to the east and west of the secure landfill area, 100 feet wide to the north of the cell property, and 300 feet wide to the east of the cell property. Internodal spacing between core holes is planned to be 50 feet. In addition, two east-west positioned lines of coreholes will be installed south of the landfill cell; one adjacent to the fence and one at approximately the midpoint between the cell and Luzerne Road. Internodal spacing along these two lines of coreholes will also be 50 feet. Based on site conditions noted during a site walkover, clearing/grubbing likely will be necessary to facilitate access to this southern area, as well as some monitoring well locations. The proposed grid sampling area is indicated on Figure 3-1.

DPT
direct push technology

Soil borings will be installed into the water table using direct push technology (DPT). A Geoprobe or equivalent unit is expected to be used for the soil boring activity. Each soil boring will be continuously sampled in 3-foot increments from grade to a depth of approximately 2 feet into the water table, if possible, to identify the presence of an LNAPL layer or a smear zone, if either exists. Based on existing local geologic data gathered during subsurface investigations at the Glens Falls Landfill west of the Luzerne Road Site, the average DPT borehole depth is anticipated to be 20 feet.

A composite sample collected over each 3-foot soil interval will be analyzed for PCBs. Most analyses will be performed using a PCB screening testing system. The screening procedure will involve a modified form of the USEPA SW846 Method 8082. Appendix B includes a more detailed description of the screening procedure as well as the laboratory Standard Operating Procedure for completing the screening procedure. Screening data will be supported by submitting 10% of the samples to a NYSDOH-certified laboratory for verification by USEPA Method 8082.

Initially, soil borings will be installed on a 100-foot grid pattern. In those parts of the grid where PCB contamination is identified, nodes on 50-foot intervals will be installed. This will minimize the exploring areas where PCB does not exist.

Based on the size of the exploration area, E & E estimates soil cores will be installed at 202 grid nodes. On average, five soil samples will be collected from coreholes on the north and east sides of the site, as well as from coreholes on one of the southern two rows. E & E estimates seven samples will be collected from

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grid points positioned on the west side of the cell, and on the second of the two southern rows. Not including a contingency value for unplanned samples and quality assurance/quality control samples, E & E estimated 1,234 soil samples will be collected from the sampling grid and submitted for PCB analysis using a screening test system. Table 3-2 summarizes the borehole and sample quantities.

Table 3-2 Soil Boring and Subsurface Soil Sample Summary

Source	Holes	Lines	Total Nodes	Samples per Hole	Total Number of Samples
Geoprobe					
West Lines	16	2	32	7	224
	14	5	70	7	490
North Lines	8	2	16	5	80
South Lines	11	1	11	5	55
	10	1	10	7	70
East Lines	9	7	63	5	315
Grid Totals			202		1234
Residential Properties	3	9	27	7	189
Cell Landfill	4	1	4	3	12
Geoprobe Totals			233		1435
Hand Auger (Drainage Ways)					
Ditches	3	3	9	1	9
Wetland Area	3	1	3	1	3
Hand Auger Totals			12		12
Drill Rig					
Shallow Wells			6	13	78
Deep Wells			3	20	60
Drill Rig Totals			63		138
Grand Total					1585

Site records indicate VOCs were occasionally emitted from the soil during site excavation and cell construction activities. Therefore, organic vapor presence in soil cores and at the top of the soil borehole will be monitored during boring installation. Soil samples yielding detectable organic vapor readings (which are determined not to result from methane) will be submitted for volatile organic analysis.



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All soil cuttings will be containerized on site. These containerized soil cuttings will be placed within the fence of the PCB cell for temporary storage. All coreholes will be backfilled with bentonite chips to a depth of 2 feet from ground surface. Following bentonite hydration, the top 2 feet will be backfilled with bentonite/cement grout.

Containment Cell Subsurface Soil Sampling

Subsurface soil sampling will be accomplished using two methods: DPT borehole installation and soil borings for Shelby tube collection, as explained below.

■ DPT Boring Installation

Two DPT soil borings will be installed in the soil containment cell at locations to be determined in the field based on observations and data from surrounding core samples. Three soil samples from each corehole will be obtained for PCB and geotechnical characterization to provide data necessary for evaluating remedial technologies. Table 3-2 summarizes the boring and sample analysis quantities. Geotechnical analyses are listed in Table 3-3. These probe holes will penetrate the existing cap; thus, each will require backfilling with a sealing/plugging material such as cement/bentonite grout and/or bentonite pellets followed by hydration.

**Table 3-3 Geotechnical Analytical Summary,
Luzerne Road RI, Glens Falls, NY**

Analysis	Method Number	Estimated Number of Field Samples
Geotechnical Analysis of Site Soils		
Moisture Content	D2216	5
Humic Content	D2794-87	5
Atterberg Limit	D4318	5
Particle Size: Sieve Analysis	D422	5
Particle Size: Hydrometer	D422	5
Dry Density	D2937-94	5
Specific Gravity	D854	5



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■ Soil Boring and Shelby Tube Collection

At locations to be determined in the field, soil samples will be collected by use of a Shelby tube sample collection system. At each of three boreholes, the drill rig on site used to install the shallow monitoring wells will be used to bore through soil to the desired depth. The drill rig crew will then collect one Shelby tube sample. Shelby tubes will be submitted to a geotechnical analytical laboratory for dry density analysis. This information will be useful in evaluating remedial alternatives. Sample location depths will be determined based on PCB analysis data of soil collected by DPT, and based on soil type encountered.

Two other Shelby tube samples may be collected at other locations around the site at the discretion of the field team based on soil type and contaminant concentrations.

Soil Sampling During Monitoring Well Installation

During shallow groundwater monitoring well installation, soils will be continuously split-spoon sampled from grade to the desired depth, which is expected to be between 20 and 25 feet below ground surface (BGS). Soil from each of the split-spoon samples from each of six wells will be submitted for PCB analysis using the immunoassay system. If organic vapors are detected during borehole installation, one sample from the depth interval yielding these OVA readings will be collected and submitted for VOC analysis.

BGS
below ground surface

Split spoon samples will also be collected during deep monitoring well installation. However, due to site geologic conditions, split-spoon sampling can be conducted only until the depth at which the first large boulder is encountered.

3.2.1.3 Off-Site Residential Soil Investigation

Background records indicate that possible PCB presence at seven residential properties was remediated through soil excavation in 1979. However, post-excavation sampling was not conducted to verify the completeness of the remediation. In addition, questions remained regarding potential PCB contamination at two additional properties. During this RI field program, subsurface soil at remediation areas at each of these nine residences will be evaluated to more thoroughly determine if the previous remedial efforts were complete.

The field team leader, accompanied by a NYSDEC representative or designee, will visit each of the nine residences at which PCB contamination was previously found or is suspected due to past

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be constructed of 2-inch PVC, and equipped with a 10-foot screen positioned at the bottom of the borehole.

One of the three deep wells will be installed in a highly-contaminated area on the 53 Luzerne Road property. This well will be constructed with a telescoping design so as not to drag contaminated soil deeper into the aquifer. An upper large-diameter (8 or 10-inch) casing will be installed to a depth of 40 feet BGS. Once grouted into place, the well will be extended to a depth of approximately 120 feet using a 4-inch diameter drill bit. This will seal off the upper zone of the aquifer from the lower zone, minimizing the potential for vertical migration of contaminants through drilling activities.

One round of groundwater samples from each well will be collected; all samples will be submitted for the full TCL/TAL suite of analyses. At the time of sample collection, groundwater pH, temperature, conductivity, and turbidity will be evaluated.

Two rounds of groundwater level data will be scheduled, separated by an adequate time period to assess seasonal effects.

In addition to the six shallow and three deep new groundwater monitoring wells, 10 groundwater monitoring wells currently exist at the site. Each of these wells will be redeveloped. One sample from each of these 10 wells will be collected and submitted for full TCL/TAL analyses.

Hydraulic Conductivity

Hydraulic conductivity of the upper (overburden) aquifer will be evaluated by the use of either a rising head or falling head slug test on each of the wells, as described in the field procedure methodology (see Section 3.2.3). Data from these tests will be presented in the RI report. If water movement rates are sufficiently rapid so as not to yield high quality slug test data, single well drawdown tests will be performed.

3.2.1.5 Surface Water and Sediment Evaluation

In addition to site soils, the adjacent wetland north of the site, and three drainage way channels leading to or from it, will also be explored. If drainage ways contain water, one water sample will be collected from each. Also, one water sample will be collected from the wetland area. All water samples will be submitted for PCB analysis using Method 8082.

Sediment samples will be collected at three points in each drainage channel and at three points in the wetland. At each point, a hand

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auger will be used to extract soil samples from the upper 6 inches of the sediment. Sediment samples will be submitted for PCB analysis using the PCB screening system. Ten percent of the sediment samples collected will be submitted for PCB analysis using Method 8082 and for total organic carbon analysis.

3.2.1.6 PCB Screening Analysis

Soil and sediment samples will be submitted for a PCB screening analysis using a modified Method 8082 approach as described in Appendix B. The PCB screening will be performed at E & E's ASC. The analysis will be calibrated for Aroclor 1254 or 1016 only. These Aroclors have been targeted based on historical site data. If other PCBs are present or the samples exhibit a weathered pattern, the results will be reported as quantified by the nearest Aroclor. The detection limits will be 0.5 ppm for low level samples. Higher concentration samples will be analyzed at dilution with a high value of up to 2000 ppm. Samples requiring more than one dilution will be reported as extended or greater-than values. Samples with potential sulfur contamination will be cleaned up prior to analysis. The laboratory will provide summary results for all samples as well as copies of the chromatograms.

At least 10% of the samples will be confirmed by Method 8082 with extraction by Method 3550B. The confirmation results will require a one-week turnaround. The screening results and confirmation results will be reviewed weekly by the QA Officer to verify the screening methods are meeting data quality objectives.

IDW
investigation-derived
waste

3.2.1.7 Investigation-Derived Waste (IDW)

All soil cuttings generated during soil boring and monitoring well installation will be handled according to procedures outlined in Section 3.2.2.13. If soil cuttings are placed in drums, data from analysis of boring soils will be used to evaluate the contents of the drums so that they may be properly disposed. Drums will be moved to an on-site location as directed by NYSDEC.

3.2.1.8 Base Map Development and Site Survey

Surveying will consist of two separate ground survey tasks: one prior to field investigation activities and one following field investigation activities. Each of these tasks is described below.

Initial Survey

This initial surveying effort consists of two components: establishing a grid and conducting a topographic survey. Initially, a grid containing 202 points around the site will be created to establish Geoprobe soil boring locations. Internodal spacing will be 50 feet. All nodes are to be marked by a wooden lath equipped with a



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brightly-colored ribbon tied to the top. All laths are to be labeled according to the node labeling system established for the site.

The topographic survey consists of surveying the site and constructing a site topographic map utilizing a 1-foot contour interval. Each contour will be assigned a "Z" elevation within the AutoCAD electronic file for use in digital terrain modeling.

Also included in the topographic survey will be the surveying of selected fixed features. The horizontal and vertical positions of 10 existing groundwater monitoring wells will be established. At each well, ground elevation and top of inner casing are to be measured. Also, the horizontal location of fixed features will be established. The list of features includes, but is not limited to, Luzerne Road, Veterans Road, the perimeter of the wetland, approximately three streams, approximately four telephone poles, the AMG properties building, and the fence traversing the landfill toe.

CAD
computer-aided design

The surveying subcontractor (YEC Engineers) will provide E & E with a draft hard copy map and a computer-aided design (CAD) electronic file of this survey. YEC will establish local horizontal and vertical site control unless existing NGS monumentation is within approximately 0.5 miles of the site.

3.2.1.9 Post Investigation Survey

The second survey effort will involve two components. First, the vertical and horizontal position, ground surface elevation, and top of inner casing elevation of all groundwater monitoring wells installed during this RI will be measured. Second, at each of eight residences, the horizontal control of three Geoprobe borehole locations, the house, nearest street(s) adjacent to the property, and other relevant site features such as driveways and telephone poles will be established. This second survey is to be commenced during the last week of field activities so that the field investigation team can show the survey team the points to be surveyed. Note that this second survey involves entering onto private property; therefore, it will be conducted under the accompaniment and/or permission of NYSDEC personnel only.

Well elevation data collected during this second survey will be added to the first CAD base map. A separate residential area CAD map will be developed.

3.2.2 Field Methodology

The following sections describe the field methodologies for activities outlined in Sections 3.2.1 and 3.2.2.



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3.2.2.1 Base Map Development/Site Survey Procedures

A detailed topographic base map of the Luzerne Road Site and immediate vicinity will be developed by an MBE subcontractor (YEC) to E & E. The base map will be prepared by a ground survey. The ground survey will include the establishment of a local site benchmark based on a local USGS benchmark, if one is in close proximity to the site. If a USGS benchmark is not readily available, an arbitrary elevation will be assigned to the site benchmark(s) installed on the site. Additionally, horizontal and vertical controls will be established for a variety of notable site features. All relevant features of the sites and adjacent areas (e.g., site buildings, residences, fences, existing wells, etc.) will be plotted at a scale of 1 inch = 50 feet. Contours will be plotted at the appropriate intervals. The base maps will be produced on a CAD system and will be included in the RI report.

Additional surveying will be performed by the subcontractor in conjunction with the base maps. This additional surveying will include coordinates and elevations for each previously existing and new groundwater monitoring well, sampling location, and other key points. These locations will then be plotted on the base maps. Unsurveyed data (e.g., approximate property lines) developed through the use of current tax maps and the initial site visit will also be indicated on the map.

3.2.2.2 Air Monitoring

Air monitoring will be performed by the Site Safety Officer during drilling and soil boring activities to characterize airborne contaminant levels, including volatile organic vapors, cyanide gas, and particulates. The air monitoring will be conducted for the protection of site workers and the community, and to characterize environmental samples. The HASP specifies the monitoring equipment to be used for contaminants of interest and the frequency with which the monitoring will be performed.

Action levels for each monitoring instrument are also detailed in the HASP. Levels of organic vapors and particulates will be measured in the workers' breathing zone; action levels are based on those readings. Oxygen-deficient and combustible atmospheres will not be monitored in the workers' breathing zone. Instead, these monitors will be positioned at a location that will measure a worst-case contaminant level and will provide the earliest possible warning that a hazardous condition may be forming. Also, monitoring for particulates will be performed in the work zone, which will not be the breathing zone all of the time. This method will be more protective, as dust tends to be concentrated at the location where it is generated, rather than equally dispersed along the

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downwind perimeter of the site. Appropriate actions (initially, evacuation of the immediate work area) will be taken if established action levels are exceeded. Perimeter monitoring will be conducted if the action level is obtained at the work area. All air monitoring results, as well as wind direction and speed (estimates), will be documented in the site log book.

3.2.2.3 Subsurface Soil Sampling by DPT

Subsurface soil samples will be collected at the Luzerne Road Site in three parts of this RI: in the grid, at the containment cell, and on residential property. The samples will be collected using the equipment and procedures described below.

- Decontaminated stainless steel spoon;
- Glass jars;
- Appropriate sample containers (see Table 3-3); and
- Cooler with ice.

Each soil core will be laid on sheet plastic for extraction from the sampling device. Once extracted, the core will be scanned with an OVA to evaluate the presence and concentration of organic vapors. A general description of the soil core will be noted in the logbook. If organic vapors are present, a portion of the core will be used to fill two 40-ml VOA vials. The filled sample containers will be placed on ice. The remainder will be homogenized, and a portion will be used to fill one 4-oz jar. The jar will be labeled and submitted for PCB screenings and analysis.

3.2.2.4 Containment Cell Investigation

DPT soil boring in the containment cell will be conducted as described above. Shelby tube collection will be conducted by the subcontracted drilling team. All Shelby tubes collected are to be sealed with wax, labeled as to their orientation, and shipped promptly to the geotechnical laboratory for analysis.

3.2.2.5 Subsurface Soil Sampling During Monitoring Well Installation

Subsurface soil sampling during well installation will be conducted via split spoon sampling. For each split spoon collected, the following sampling equipment and procedures will be used:

- Decontaminated stainless steel spoon;
- Glass jars;



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- Appropriate sample containers (see Table 3-3); and
- Cooler with ice.

Once extracted from the hole, the split spoon sampler will be laid on sheet plastic and opened to expose the soil core. The core will be scanned with an OVA to evaluate the presence and concentration of organic vapors. A description of the soil core will be noted in the logbook. If organic vapors are present, a portion of the core will be used to fill two 40-ml VOA vials. The filled sample containers will be placed on ice. The remainder will be homogenized, and a portion will be used to fill one 4-oz jar. The jar will be labeled and submitted for PCB screening analysis.

3.2.2.6 Residential Property Investigation

Subsurface soil sampling by DPT boring installation at residential properties will be conducted as described above under Section 3.2.2.3. Soil boring locations will be marked for future surveying by the surveying team.

3.2.2.7 Monitoring Well Installation, Development, Sampling, and Aquifer Testing

Nine monitoring wells will be drilled, installed, developed, sampled, and aquifer tested at the Luzerne Road Site (see Figure 3-2). The monitoring wells are expected to be drilled and installed into overburden. Methods for drilling and installing both the shallow and deep overburden monitoring wells are described below.

Monitoring Well Installation

The boreholes for the shallow overburden or bedrock wells will be advanced through the overburden using 4.25-inch ID hollow-stem augers. Continuous split-spoon sampling will be conducted at each well. The samples will be collected using a standard 2-inch outside-diameter (OD) split spoon driven by a 140-pound drill rig hammer. If a hydraulic hammer is not used, blow counts will be recorded for each split-spoon sample. Drill cuttings generated during drilling will be handled according to procedures outlined in Section 3.2.2.13.

Two types of deep monitoring wells will be installed: telescoping and non-telescoping. For each of the three deep overburden wells, a 3.25-inch ID auger and continuous split-spoon sampling will be used to drill from grade to the depth at which split-spoon sampler refusal is reached. These small-diameter augers will then be extracted from the borehole. In the one telescoping casing, either an 8.25- or 10.25-inch auger will be used to drill to a depth of 40 feet. Depending on the auger size used, either 6- or 8-inch ID

OD
outside diameter

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carbon steel casing will then be inserted into the hole and grouted in place. The grout will be allowed to set a minimum of 24 hours prior to continuing well drilling. The remaining overburden will then be drilled using either 4- or 6-inch ODEX drilling equipment until bedrock is encountered. This is expected to be at a depth of approximately 110 to 130 feet. For the two non-telescoping wells, a 4- or 6-inch ODEX drilling system will be used to drill from grade to bedrock. Augers and drilling equipment will be decontaminated using high pressure steam.

The shallow wells will be constructed using 10 feet of 2-inch Schedule 40 PVC machine-slotted screen (0.010-inch slot) which will be installed from the bottom of the hole up to 2 feet above the top of the water table, followed by 2-inch ID Schedule 40 PVC riser casing. The deep monitoring wells will be constructed similarly. However, their screens will be completely submerged for all nine wells, and a sand filter pack composed of chemically inert, well-sorted, coarse-grained sand will be placed from the bottom of the hole to 1 to 2 feet above the top of the screen. A 2-foot-thick bentonite pellet seal will be placed above the sand, followed by Portland cement/5% bentonite grout to surface. The wells will be completed either 2 feet aboveground surface with locking, protective steel casings set in concrete drainage pads, or flush to ground surface (see Figures 3-3 and 3-4). The necessity for flush mount wells will be determined in the field. Vented PVC well caps will be placed on each well casing for wells completed aboveground, and water-tight caps will be placed on flush mount wells. The deep overburden well scenario is similar. However, the screen is set at the bottom of the hole, entirely within the aquifer.

Monitoring Well Development

Following construction of new wells, each new and existing well will be developed using PVC or stainless steel bailers and/or submersible pumps until pH, specific conductance, and temperature have stabilized and turbidity of the discharge is 50 nephelometric turbidity units (NTUs) or less. The wells will initially be surged in order to draw fine sediments out of the sand pack and into the well for removal. If, after significant effort, substantial improvement has been noted through the development process but the proposed goal of 50 NTUs has not been met, the E & E and NYSDEC project managers will be notified. Development completion will then be based upon mutual agreement between E & E and NYSDEC. Development water from the wells will be handled according to methodology described in Section 3.2.2.13.

NTUs
nephelometric turbidity
units



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Groundwater Sampling

Groundwater samples will be collected from the nine new and 10 previously-existing groundwater monitoring wells at the Luzerne Road Site. The wells will be sampled no sooner than 24 hours after development is complete in order to allow the well to recover with groundwater representative of the underlying formations in the immediate vicinity of the well.

Purging and sampling will be accomplished using disposable polyethylene bailers on new polypropylene line. Prior to purging, static water levels will be measured to within ± 0.01 foot in each well and piezometer. All wells will be purged of three to five times the volume of water standing in the well. Purged water will be containerized in the same manner as the development water. Temperature, pH, specific conductance, and turbidity will be measured and recorded during purging. If 50 NTUs cannot be obtained after well purging, the well(s) will be allowed to settle no longer than 24 hours before sampling the metals portion. Upon returning to the well, E & E will remeasure and record the turbidity. No additional purging will be performed. If 50 NTUs cannot be achieved, the E & E and NYSDEC project managers will be consulted. Turbidity at the time of sampling will be noted on the chain-of-custody documents. No field filtering will be performed. The groundwater samples will be tested for the parameters outlined in Table 3-1.

Aquifer Testing

Upon completion of monitoring well installation, development, and sampling, aquifer testing will be performed on the nine new wells. The procedure will consist of slug injection/withdrawal tests to determine the hydraulic conductivity and transmissivity of the soils in the immediate vicinity of each well screen. This will be accomplished by recording water level changes (± 0.01 foot) by a downhole data logger following the injection (falling head test) and withdrawal (rising head test) of a solid slug or slug of water to and from the well being tested. If the well screen and sand filter pack are completely submerged in the aquifer, a falling head test will be performed. However, if the well screen or filter pack is partially above the water table, then a rising head test will be performed because any water displaced in the well by slug injection will favorably saturate the unsaturated portion of the sand pack, resulting in erroneous readings.

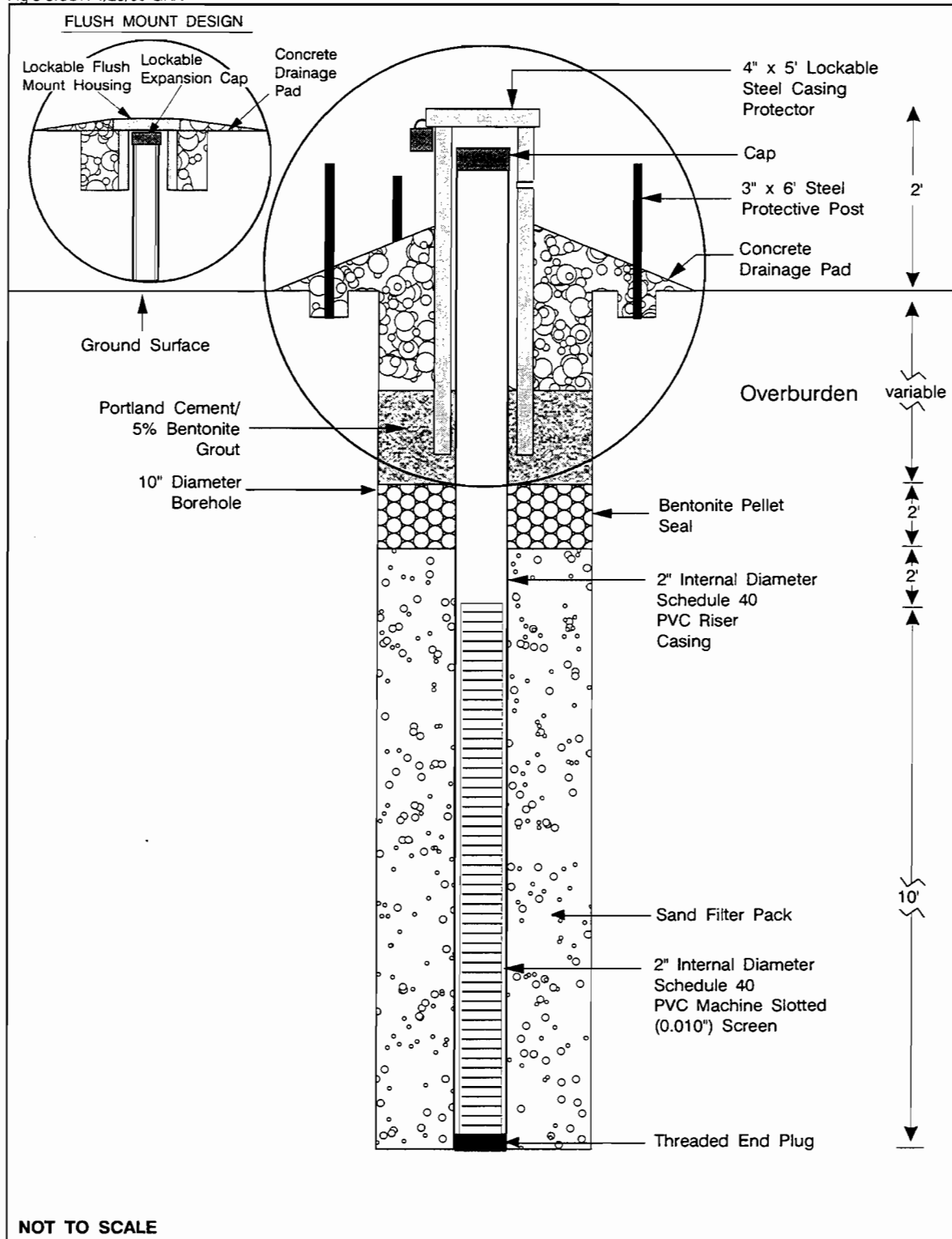


Figure 3-3 PROPOSED CONSTRUCTION FOR SHALLOW OVERBURDEN MONITORING WELLS

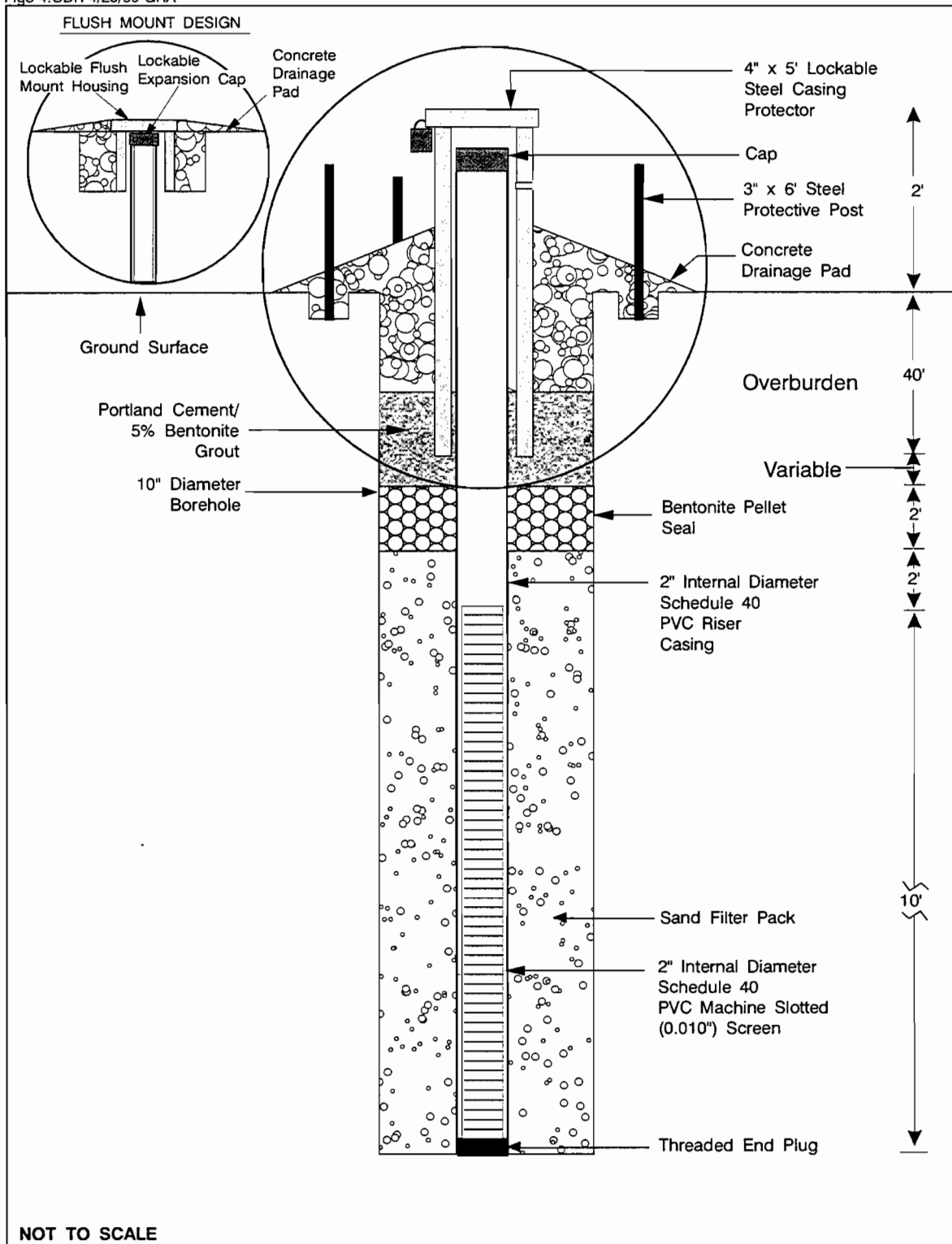


Figure 3-4 PROPOSED CONSTRUCTION FOR TELESCOPING OVERBURDEN GROUNDWATER MONITORING WELL

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The tests will be performed using the equipment and methodologies described below.

Equipment and Supplies

- Water level indicator;
- Burgh Schoenenberger Loggerhead data logger, or equivalent;
- Solid slug of known volume;
- Bailer and dedicated nylon rope;
- Large capacity funnel;
- Clean potable water; and
- Laptop computer.

Slug Test Procedures

Falling Head Test

- Measure and record static water level in well;
- Determine if falling head test is applicable (i.e., screen and sand pack must be fully submerged in the aquifer). If not, then perform rising head test only (see below);
- Spray loggerhead with clean water to dislodge any solids in holes at the tip;
- Insert loggerhead in well several feet below the surface of the water table to allow clearance for the solid slug to be inserted (if used). Do not allow the unit to touch the bottom of the well because solids may plug transducer tip;
- Allow well to equilibrate to the initial static water level; and
- Rapidly insert a solid slug (by lowering the slug into the well with dedicated nylon rope until it is completely submerged) or inject several gallons of clean water into the well (by pouring the water from a bucket into a large funnel). Begin recording the falling head with the loggerhead data logger as soon as the slug is completely in the well. If a solid slug is used, be careful not to lower the slug into the transducer probe. Record the

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falling head until it has returned to at least 90% of its initial static level or until no significant change in head is recorded within one hour.

Rising Head Test

- Measure and record static water level in well;
- If the loggerhead is not already in the well from the falling head test, spray the transducer with clean water to dislodge any solids in holes at the tip;
- Insert the loggerhead in well several feet below the surface of the water table to allow clearance for the solid slug to be inserted. Do not allow the unit to touch the bottom of the well because solids may plug the transducer tip;
- If the solid slug is not already in the well below the water table from the falling head test, insert the slug or bailer in the well, and allow the well to equilibrate to the initial static water level; and
- Rapidly remove the slug or bailer and begin recording the rising head with the loggerhead as soon as the slug is completely out of the water column within the well. Record the rising head until it has returned to at least 90% of its initial static level or no significant change in head is recorded within one hour.

3.2.2.8 Surface Water/Sediment Sampling

Surface water samples will be collected from the wetland and wetland tributaries, if present. If no surface water is present at the time of sampling or upon completion of all field activities at the site, only the sediment portion at that sampling location will be collected. The samples will be collected using the equipment and procedures described below.

Surface Water Sampling

The surface water sample will be collected at the same location as the sediment sample. The surface water sample will be collected first, followed by the sediment sample, to minimize turbidity. Equipment and sampling procedures are described below.

Equipment and Supplies

- pH, specific conductivity, temperature, and turbidity meters;

**3. Major Tasks and Subtasks**mL
milliliter

- Dedicated stainless steel or glass beakers (500 milliliter [mL] minimum volume), or 8-oz glass jars;
- Appropriate sample containers and sample preservation solutions (see Table 3-4); and
- Cooler with ice.

Surface Water Sampling Procedures

- Submerge the appropriate container into the water. Submerge a decontaminated beaker, glass jar, or the appropriate sample container into the water. If a beaker or glass jar is used, slowly pour the contents into the appropriate sample bottles.
- Add preservatives (if necessary) as indicated in Table 3-4, and label the sample containers as specified in Section 3.2.2.10.
- Measure pH, temperature, specific conductance, and turbidity.

Table 3-4 Sample Containers, Volumes, Preservation, and Holding Times for Liquid Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time ^a
Purgeable (volatile) organics	40-ml glass vial with teflon-backed septum	Three; fill completely, leaving no head space	Cool to 4°C (ice in cooler) ^c	7 days
Extractable organics (BNAs) and pH	80-ounce glass amber bottles with teflon-lined caps	One; fill completely	Cool to 4°C (ice in cooler) ^c	Must be extracted within 5 days; analyzed within 40 days
Pesticides/PCBs	80-ounce glass amber bottles with teflon-lined caps	One; fill completely	Cool to 4°C (ice in cooler)	Must be extracted within 5 days; analyzed within 40 days
Metals (excluding hexavalent chromium) and Hardness	1-liter washed polyethylene bottle with polyethylene-lined caps	One; fill completely	Nitric acid to below pH 2 (approx. 1.5 ml concentration HNO ₃ per liter), cool to 4°C (ice in cooler)	6 months ^b

3. Major Tasks and Subtasks

Table 3-4 Sample Containers, Volumes, Preservation, and Holding Times for Liquid Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time ^a
Cyanide	1-liter polyethylene bottle with polyethylene-lined caps	One; fill completely	Sodium hydroxide to pH 12 and cool to 4°C (ice in cooler)	12 days or 24 hours, if sulfide present

Note: All sample bottles will be prepared in accordance with EPA bottle washing procedures and QC-tested before use.

^a Holding time is based on the time from verified time of sample receipt at the laboratory.

^b Maximum holding time for mercury is 26 days.

^c If residual chlorine is present in drinking water from residential taps, sodium thiosulfate will be added to the sample: 3 mg per 40-mL vial, and 80 mg per liter (189 mg per 80-ounce bottle).

Key:

BNAs = Base neutral acid extractables.

HNO₃ = Nitric acid.

PCBs = Polychlorinated biphenyls.

- Place samples in a cooler maintained with ice at 4°C. Ship the cooler to the laboratory via overnight delivery with chain-of-custody documents prepared in accordance with the procedure specified in Section 3.2.2.10.

Sediment Sampling

Equipment and Supplies

- Dedicated stainless steel spoons or trowels;
- Appropriate sample containers (see Table 3-5); and
- Cooler with ice.

Table 3-5 Sample Containers, Volumes, Preservation, and Holding Times for Soil, Sediment, and Solid Waste Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time ^a
Purgeable (volatile) organics ^c	40-ml glass vial with teflon-backed septum	Two; fill completely, leaving as little head space as possible	Cool to 4°C (ice in cooler)	7 days

3. Major Tasks and Subtasks

Table 3-5 Sample Containers, Volumes, Preservation, and Holding Times for Soil, Sediment, and Solid Waste Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time ^a
Extractable organics (BNAs)	8-oz. glass jar with teflon-lined cap	One; fill completely	Cool to 4°C (ice in cooler)	Must be extracted within 5 days; analyzed within 40 days
Pesticides/PCBs				Must be extracted within 5 days; analyzed within 40 days
Metals ^c				6 months ^b
Cyanide				12 days or 24 hours, if sulfide present
TOC				26 days
PCB Screening	4 oz. clear glass	One; fill completely	None	Extracted within 48 hours from sampling

Notes: All sample bottles will be prepared in accordance with EPA bottle-washing procedures and QC-tested before use. Additional samples also will be taken for geotechnical analyses.

^a Holding time is based on the time from verified time of sample receipt at the laboratory.

^b Maximum holding time for mercury is 28 days. For inorganic analyses, technical requirements for sample holding time have been established for water matrices only. However, they also are suggested for use as guidelines in evaluating soil/sediment data.

^c Specified requirements would also apply for this type of TCLP analysis.

Key:

BNAs = Base Neutral Acid Extractables.
 PCBs = Polychlorinated biphenyls.
 TOC = Total organic carbon.

Sediment Sampling Procedures

- Using a stainless steel spoon or trowel, collect samples to be analyzed for volatile organics first, if an OVA reading is detected, followed by the remainder of the sample parameter portions. All miscellaneous debris is removed first.
- Place samples in a cooler maintained with ice at 4°C. Ship the cooler to the laboratory via overnight delivery with chain-of-custody documents prepared in accordance with procedures specified in Section 3.2.2.10.

3.2.2.9 Sample Containers and Preservation

The volumes and containers for the liquid and solid samples are presented in Tables 3-4 and 3-5, respectively. Sample preservation and holding time requirements also are presented in these tables. For additional information pertaining to sampling requirements

3. Major Tasks and Subtasks

QAPP
Quality Assurance Project
Plan

(including QA/QC), see the Quality Assurance Project Plan (QAPP) in Appendix B of this work plan. Pre-washed sample containers will be provided by E & E's Analytical Services Center (ASC) and prepared in accordance with EPA bottle washing procedures.

ASC
Analytical Services
Center

Samples will be stored on ice pending delivery to E & E's ASC. In addition, all water sample portions to be submitted for metals analysis will be preserved by adding concentrated nitric acid until the sample pH is lowered to 2.0 standard units or less. All water sample portions to be submitted for cyanide analysis will be preserved by adding concentrated sodium hydroxide until the sample pH is raised to 12.0 standard units or higher. Sample pH will be checked in the field by pouring a small amount of the previously preserved sample into a separate container and checking the pH using indicator paper. Preservation procedures will be documented in the field logbooks. If residential tap water samples are chlorinated, the VOC portion will be preserved with 3 mg of sodium thiosulfate per 40-mL vial and 80 mg per liter (189 mg per 80-oz bottle).

DOT
United States Department
of Transportation

POC
point of contact

3.2.2.10 Sample Labeling, Packaging and Shipping, and Custody

Sample Labeling

All samples will be assigned a unique sample identifier. Labels for each sample container will contain the sample identifier, date of sample collection, analytical parameters, and type of preservation used. Any change in the label information prepared prior to the sample collection will be initialed by the sampler.

Sample Packaging and Shipping

Sample containers will be placed inside sealed plastic bags as a precaution against cross-contamination caused by leakage or breakage. The bags will be placed in coolers in such a manner as to eliminate the chance of breakage during shipment. Ice in plastic bags will be placed in the coolers to keep the samples at 4°C throughout shipment.

Sample shipment will be performed in strict accordance with all applicable United States Department of Transportation (DOT) regulations. The samples will be shipped to E & E's ASC in Lancaster, New York, by an overnight courier service. Arrangements will be made with the E & E ASC point of contact (POC) for samples that are to be delivered to a laboratory on a weekend and for water samples requiring hexavalent chromium analysis, so that holding times are not compromised.



3. Major Tasks and Subtasks

E & E ASC POC:

Mr. William Howard
Ecology and Environment Analytical Services Center
4493 Walden Avenue
Lancaster, NY 14086
716/685-8080

Sample Custody

A sample is considered to be in custody under the following situations:

- The sample is directly in your possession,
- The sample is clearly in your view,
- The sample is placed in a locked location, or
- The sample is in a designated secure area.

In order to demonstrate that the samples and coolers have not been tampered with during shipment, adhesive custody seals will be used. The custody seals will be placed around the cap of each sample container and across the cooler lids in such a manner that they will be visibly disturbed upon opening of the sample container or cooler. The seals will be signed or initialed and dated by field personnel when affixed to the container and cooler.

Documentation of sample chain-of-custody is necessary to demonstrate that the integrity of the samples has not been compromised between collection and delivery to the laboratory. Each sample cooler will be accompanied by a chain-of-custody record to document the transfer of custody from the field to the laboratory. All information requested in the chain-of-custody record will be completed. In addition, the airbill number assigned by the overnight courier will be listed on the chain-of-custody record. One copy of the chain-of-custody form will be retained by the samplers and placed in the project records file. The remaining pages will be sealed in a plastic bag and placed inside the cooler. Upon receipt at the laboratory, the chain-of-custody documents will be completed. It is the responsibility of E & E ASC to document the condition of custody seals and sample integrity upon receipt.

3. Major Tasks and Subtasks

CLP
Contract Laboratory
Program

ASP
Analytical Services
Protocol

TSP
trisodium phosphate

3.2.2.11 Analytical Program

Table 3-1 provides a summary of sampling and analysis for the Luzerne Road Site. Analysis of all samples collected during the RI/FS will be subject to the NYSDEC Contract Laboratory Program (CLP) as defined in the Analytical Services Protocol (ASP) of December 1995. All analyses will be performed by E & E's ASC. Data generated by E & E's ASC will undergo internal data validation and independent data validation by a third party data validator (Chemworld Environmental, Inc.).

3.2.2.12 Decontamination Procedures

All decontamination will be performed in accordance with NYSDEC-approved procedures. Sampling methods and equipment have been chosen to minimize decontamination requirements and prevent the possibility of cross-contamination. All drilling and DPT soil boring equipment will be decontaminated prior to drilling or boring, after drilling each monitoring well or installation of each boring, and after the completion of all drilling and soil boring. Special attention will be given to the drilling assembly, augers, split spoons, and the backhoe bucket. Split spoons will be decontaminated prior to and following each use. Decontamination of drilling will consist of:

- Removal of foreign matter, followed by
- High-pressure steam cleaning.

Split spoons and other non-disposable sampling equipment will be decontaminated using the procedure above or by the following procedure:

- Initially clean all foreign matter;
- Scrub with brushes in trisodium phosphate (TSP) solution;
- Rinse with deionized water;
- Rinse with 10% nitric acid;
- Triple-rinse with deionized water; and
- Allow to air dry.

A temporary decontamination area will be established in the secure area on each site using heavy plastic sheeting as a pad. The primary purpose of the pad will be to decontaminate heavy equipment, such as the drill rig and backhoe. Fluids generated during



3. Major Tasks and Subtasks

decontamination will be handled according to procedures outlined in Section 3.2.2.13.

3.2.2.13 Disposal of Investigation-Derived Waste

At least four types of IDW will be generated: drill cuttings, drill decontamination water, groundwater, and PPE. Waste streams will be segregated and not mixed. Drill cuttings from well and boring installations will be containerized on site and disposed of in accordance with New York State Technical and Administrative Guidance Memorandum (TAGM) HWR-89-4032 issued by NYSDEC on November 21, 1989. A registry of all drums, a description of their sources and contents, and documentation of the analytical results from tests on the containerized solids will be provided to the client.

TAGM

New York State Technical
and Administrative
Guidance Memorandum

Investigation-derived soils and water will be field-screened using visual inspection and an OVA to determine initially whether these wastes are contaminated. If non-volatile contamination is visually noted, the IDW will be placed in 55-gallon drums. Drill cuttings that are not contaminated (based on PCB screening analyses) will be spread on the ground, if possible. If clean cuttings cannot be placed at the well location, they will be drummed. If contaminated soils are identified by field screening, these soils will be containerized in DOT-approved 55-gallon drums.

All groundwater brought to the surface via sampling, well development, or well purging will be containerized in DOT-approved 55-gallon drums.

All drummed cuttings and water will be stored in a secure area on site until analytical results for the respective sites are received. The contents of drums from areas suspected or determined to be contaminated based on PCB screening analytical results may need further characterization to determine the suitability of subsequent disposal methods. If necessary, sampling and disposal of contaminated materials will be performed by the contractor under a contract modification.

All expendable materials generated during the investigation (including, but not limited to, Tyvek clothing, gloves, spoons, and plastic sheeting from the decontamination pad) will be placed in 55-gallon drums and stored at a secure location on site. All drums containing IDWs will be labeled with the type of generated material, site name, location where the material was generated, and date when the material was generated. E & E will not be responsible for waste disposal unless requested by NYSDEC under a separate agreement.

3. Major Tasks and Subtasks

Personal decontamination is discussed in the HASP, which is presented in Appendix B of this work plan.

3.3 Task 3: RI Report

3.3.1 Task 3.1: Luzerne RI Report

An RI report detailing the site background data compiled during the investigation, investigation procedures undertaken, and data interpretation will be published. It will also include a photolog documenting site activities and findings, and both shallow and deep groundwater monitoring well soil boring logs. Data usability summary reports, as well as a general data quality review comparing PCB screening data with PCB verification sample data. The document will also contain both a human health and an ecological risk evaluation.

The RI report will screen the data to present a preliminary evaluation as to which areas may be considered hazardous and may require remedial action. Where contamination is detected, E & E will identify, present, and discuss routes of migration to potential human and environmental receptors and predicted fate of the contaminants.

3.4 Task 4: Risk Assessment

3.4.1 Task 4.1: Human Health Risk Assessment

In accordance with direction from NYSDEC, no formal quantitative risk assessment will be performed. Where contamination is detected, E & E will identify, present, and discuss both the routes of migration to potential human and environmental receptors and the predicted fate of the contaminants for both current and expected future site conditions. It is anticipated that adequate assessment of potential risks can be made through reference to available screening guidances such as NYSDEC's TAGM 4046 and EPA's Soil Screening Levels (SSLs) and New York State Class GA groundwater criteria.

SSL
Soil Screening Level

3.4.2 Task 4.2: Ecological Risk Assessment

As part of the RI Report, E & E will provide the applicable components of an ecological risk assessment. The goals of the ecological risk assessment for the site include:

- Documenting whether actual or potential ecological risks exist,
- Identifying which contaminants pose a risk, and
- Generating data to be used in evaluating remedial activities.



3. Major Tasks and Subtasks

FWIA

Fish and Wildlife Impact Assessment

Consistent with New York State Guidance (*Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites*, October 1994, NYSDEC Division of Fish and Wildlife), the ecological risk assessment will follow the first two steps of a Fish and Wildlife Impact Assessment (FWIA).

- Step I: Site Description: a. site maps; b. description of fish and wildlife resources; and c. description of fish and wildlife resource values.
- Step II: Contaminant-Specific Impact Assessment: a. pathway analysis; b. criteria-specific screening; and c. toxic effect analysis.

Step I: Site Description

Step I includes site mapping, field observations of the value of fish and wildlife resources at and in the vicinity of the site, and identification of applicable fish and wildlife regulatory criteria. To accomplish this task, two biologists will perform a two-day field investigation. Prior to the field investigation, the biologists will develop a base map from available topographical and aerial photography maps and use this information to develop a preliminary coertype map of the area within a 0.5-mile radius of the site. Additionally, federal and state natural resource agencies will be contacted regarding endangered, threatened, and special-concern plants and animals; significant fish and wildlife resources; and federal and state-designated freshwater wetlands present within 2 miles of the site. In the field, the biologists will confirm and extend the coertype map, identifying vegetative species and current land uses. It is anticipated that a sustained effort to identify species occurring within each coertype will not be necessary unless endangered or threatened species are identified. Observations of various species will be noted while completing the coertype survey.

Step II: Contaminant-Specific Impact Assessment

Step II of the FWIA (Contaminant-Specific Impact Assessment) is an iterative process. For planning purposes, E & E assumes that only elements A (pathway analysis) and B (criteria-specific screening) will be performed. In the pathway analysis, potential pathways of contaminant migration and exposure are identified. If potential pathways are identified, a criteria-specific screening will be performed using published numerical criteria established for specific media or biota. If numerical criteria are exceeded, then the need for further analysis of toxic effects is usually required. E & E will develop a scope of work for additional components of the ecological risk assessment if the initial analysis indicates that fish

3. Major Tasks and Subtasks

and wildlife resources are potentially exposed to toxic levels of site-related contaminants of concern.

3.5 Task 5: Feasibility Studies

The FS determines which areas of the site may require cleanup and evaluates alternative approaches to meeting cleanup objectives. The description of the FS in Work Element II of the Superfund Standby Contract calls for FSs that follow the TAGM 4030, *Selection of Remedial Actions at Inactive Hazardous Waste Sites*. In general, this guidance calls for:

- Development of remedial action objectives;
- Identification and screening of remedial technologies;
- Assembly of remedial technologies into remedial alternatives;
- Preliminary screening of remedial alternatives to reduce the number of retained alternatives;
- Detailed analysis of the retained alternatives; and
- Selection of remedy.

However, in the eight years since the publication of this TAGM, experience has been gained in the evaluation and application of remedial technologies, including the remediation of PCB-contaminated sites. Therefore, this process can be streamlined in order to more cost-effectively select a remedy for the site, while still ensuring that a full range of options has been considered. For the FS, E & E assumes that the process can be streamlined to minimize discussion of the identification and screening of technologies and to eliminate the need for a preliminary screening of remedial alternatives. Thus, the process to be followed for the FS is:

- Development of remedial action objectives;
- Identification of technologies appropriate for treating the types of contaminants present;
- Assembly of technologies into alternatives;
- Detailed analysis of alternatives; and
- Selection of remedy.



3. Major Tasks and Subtasks

Each of these components is discussed below.

3.5.1 Development of Remedial Action Objectives

The first step in the FS process is to determine which areas may require remediation. This is accomplished by first developing cleanup goals. Cleanup goals are set for each medium based on medium-specific receptors and exposure routes. A quantitative risk assessment is not being performed for this site; thus, cleanup goals cannot be back-calculated from acceptable risk levels for assumed or observed site-specific exposure routes. Instead, applicable or relevant and appropriate requirements (ARARs) or other guidances to be considered (TBCs) will be used to establish cleanup goals.

ARARs
applicable or relevant and
appropriate requirements

TBC
to be considered

MCLs
maximum contaminant
levels

No ARARs have been established for soil, except for certain compounds such as PCBs. Thus, cleanup goals require consideration of TBC guidance values, several of which use typical exposure scenarios to calculate soil contaminant concentrations that correspond to acceptable carcinogenic and systemic contaminant risks. These TBC guidance values include the *Determination of Soil Cleanup Objectives and Cleanup Levels* (NYSDEC TAGM 4046), the EPA SSLs, and the EPA Region III Screening Values.

For groundwater, the process is more straightforward. All groundwater in New York is considered a drinking water resource, and therefore subject to state drinking water standards. Class GA maximum contaminant levels (MCLs) will be considered ARARs for the groundwater at each site.

Once the cleanup goals have been set, the area requiring remediation will be determined by comparing the RI data to the cleanup goals.

3.5.2 Development of Remedial Alternatives

Development of remedial alternatives involves identifying technologies appropriate for treating the types of wastes identified in the RI and assembling those technologies into alternatives. Both treatment technologies and containment technologies will be identified. As discussed in Section 3.4, because of the relatively mature nature of treatment technologies for treating PCB-contaminated soils, it is unlikely that a screening process would be required to reduce the number of technologies to be used in alternatives. However, new or innovative technologies that may offer cost or effectiveness advantages will be considered and used in alternatives as appropriate.



3. Major Tasks and Subtasks

Once appropriate technologies have been identified, they will be assembled into alternatives. For example, one alternative may include pumping and treatment of the groundwater on or off site. The alternatives will provide a clear definition of the technologies they incorporate and will span the range of approaches from no action to full site remediation. E & E assumes that approximately five alternatives will be developed for each site, and that each alternative will address all contaminated media.

3.5.3 Detailed Analysis of Remedial Alternatives

In this component of the FS, each alternative will be fully described (including development of capital, operation and maintenance [O & M], and present worth costs), and then evaluated both individually and comparatively. The individual evaluations will analyze each alternative against the following seven criteria:

O&M
operation and
maintenance

- Short-term impacts and effectiveness;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, and volume;
- Implementability;
- Cost;
- Compliance with ARARs and TBCs (as appropriate); and
- Overall protection of human health and the environment.

Consideration will also be given to site-specific criteria, public acceptance, and site redevelopment issues. Following individual analyses, the alternatives will be comparatively reviewed and evaluated.

3.5.4 Selection of Remedy

Based on the evaluation in the detailed analysis, E & E will select a remedy that is protective of human health and the environment, cost-effective, and meets ARARs to the extent practicable. The selection of remedy will be made considering a preference for alternatives that include, as a principal element, treatment that significantly and permanently reduces volume, toxicity, and/or mobility of contaminants. A conceptual design of the selected remedy will also be presented.



3. Major Tasks and Subtasks

3.6 Task 6: Support Activities

E & E will provide support to NYSDEC in its Citizen Participation Activities. E & E will attend two public meetings. The first will be to present the draft final work plan to the public. The second will be to present the final RI/FS to the public as part of the proposed remedial action plan/record of decision (PRAP/ROD) process. E & E's support activities may also include review of citizen participation documents (e.g., Citizen Participation Plan, fact sheets, announcements, press releases and media contacts, PRAP, ROD and Responsiveness Summary) for technical accuracy and preparation of up to three specialized figures or diagrams for presentation at the public meetings.

PRAP/ROD
proposed remedial action
plan/record of decision

1

2

3

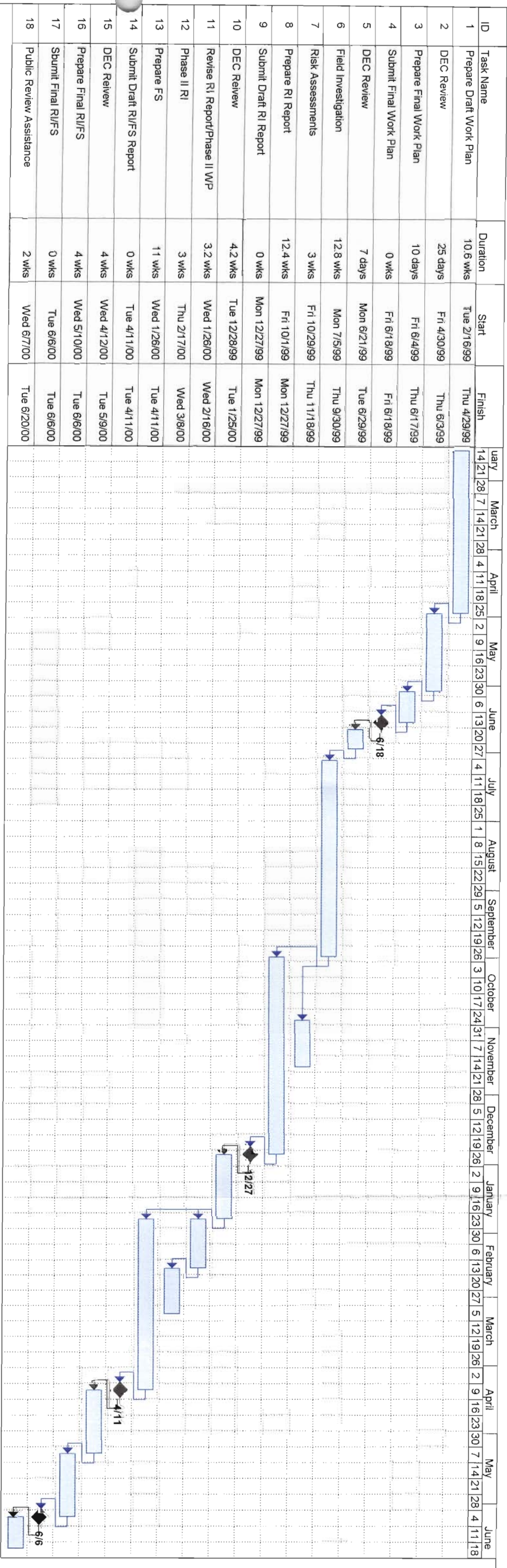
4

Schedule

The project schedule is presented on Figure 4-1.

Luzerne Road RI/FS

Project Schedule



5

Staffing Plan

E & E proposes the following primary staffing plan for completion of this work assignment:

Program Manager: G. Strobel, P.E.
Project Director: M. Wawrowski, P.E.
Project Manager: S. Blair, P.E.

Task 1: Work Plan

J. Nickerson - Prepare Work Plan
S. Blair - Prepare Work Plan
J. Sundquist, Ph.D. - Prepare Work Plan
M. Wawrowski - Prepare Work Plan
T. Lewandowski, P.E. - Review Work Plan

Task 2: Site Characterization

J. Nickerson: Field Team Leader
Two Geologists/Engineers from YEC Engineers: Field Assistants
R. Meyers: Geologist

Task 3: RI Report

J. Nickerson: Author
V. Angelaki: Data Evaluation/Summarization
S. Blair: Review RI

Task 4: Risk Assessment

D. Race: Human Health Risk Assessment
S. Peterson: Ecological Risk Assessment
D. Ross: Field Biologist
C. Comer: Field Biologist

Task 5: FS

M. Morgante: Author
S. Ress: Technology Evaluation/Costing
S. Blair: Review FS



5. Staffing Plan

Task 6: Support Activities

J. Nickerson: Presenter

S. Blair: Presenter

6

Subcontracting Requirements

Three subcontractors (including one subconsultant) are required for this project.

An MBE subconsultant (YEC Engineering P.C.) will be used for survey work and assistance in the field. The scope of work for Lu Engineers is included in Appendix A. An estimate for this subconsultant cost is included in the estimated budget and presented in Appendix A.

Drilling services also will be subcontracted. E & E has three drillers retained on a standby basis. A driller has been selected from among these three firms based on low costs for this particular project, according to their standby rates and site-specific mobilization costs. The costs for each of the drillers for this project are summarized in Appendix A. As shown in this summary, Applied Earth Technologies, a WBE, has the lowest cost for this particular project and will be hired for drilling at this site.

A WBE subcontractor (ChemWorld Environmental, Inc.) will be used to perform data reviews and prepare data usability summary reports (DUSRs) for the samples analyzed under this RI. The scope of work to be performed, as well as quotations received to perform this data review work, are presented in Appendix B.



6. Subcontracting Requirements

7

Budget Assumptions

The following Schedule 2.11 contains a breakdown of estimated costs associated with completion of this work assignment.

E & E has prepared this schedule in accordance with the contractual requirements in the standby contract. Also indicated on Schedule 2.11 (b-1) are direct administrative labor hours budgeted as requested in NYSDEC's cover letter to the Work Assignment for this site.



ecology and environment, inc.

7. Budget

Section 7

Schedule 2.11(a) Summary of Work Assignment Price

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.

State Superfund Standby Contract #D003493

Work Assignment # : D003493-16

Project Name: Luzerne Road RI/FS

1.	Direct Salary Costs (Schedule 2.11(b))	\$78,259
2.	Indirect Costs	\$144,780
3.	Direct Non-Salary costs (Schedules 2.11(c) and (d))	\$170,446

Subcontract Costs

Cost-Plus-Fixed-Fee Subcontracts (Schedule 2.11(e))

	<u>Name of Subcontractor</u>	<u>Services to be Performed</u>	<u>Subcontract Price</u>
	A YEC, Inc.	Survey	67442
	B		
	C		
	D		
4.	Total Cost-Plus-Fixed-Fee Subcontracts		<u>67,442</u>

Unit Price Subcontracts (Schedule 2.11(f))

	<u>Name of Subcontractor</u>	<u>Services to be Performed</u>	<u>Subcontract Price</u>
	A Atlantic Testing	Geotechnical Analysis	1293
	B Applied Earth Technologies	Drilling	81599
	C Chem World	Data Validation	3535
	D Applied Earth Technologies	Clearing	1000
5.	Total Unit Price Subcontracts		<u>87,427</u>
6.	Subcontract Management Fee		3,264

7.	Total Subcontract Costs (Lines 4+5+6)	158,133
8.	Fixed Fee	16,728
9.	Total Work Assignment Price (Lines 1+2+3+7+8)	<u>568,346</u>

NOTE: Rates are in accordance with Section 2.10 of the State Superfund Standby Contract #D003493

Section 7

Schedule 2.11(b) Direct Labor Hours Budgeted

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.

State Superfund Standby Contract #D003493

Work Assignment #: D003493-16

Project Name: Luzerne Road RI/FS

DIRECT LABOR HOURS BUDGETED - BY NSPE GRADE

Rates for Year Ending February 1, 2000

TASK DESCRIPTION	IX	VIII	VII	VI	V	IV	III	II	I	Total Hours	Labor Cost	Overhead 185%	SUBTOTAL	Fee 7.50%	TOTAL
TASK 1: Work Plan Development	0	8	28	120	128	25	33	36	2	380	\$10,368	\$19,181	\$29,549	\$2,216	\$31,765
TASK 2: Remedial Investigation	0	8	16	164	490	310	0	20	0	1,008	26,218	48,503	74,721	5,604	80,325
TASK 3: RI Report	0	16	16	120	260	25	88	142	10	677	16,770	31,025	47,795	3,585	51,380
TASK 4: Risk Assessment	0	8	0	40	0	164	0	0	0	212	5,167	9,559	14,726	1,104	15,830
TASK 5: Feasibility Study	0	40	100	300	0	1	93	24	2	560	17,054	31,550	48,604	3,645	52,249
TASK 6: Citizen Support	0	0	0	40	40	0	10	10	0	100	2,682	4,962	7,644	573	8,217
Est. Direct Labor Hours	0	80	160	784	918	525	224	232	14	2,937					
Est. Direct Labor Cost	\$0	\$3,434	\$5,915	\$24,524	\$24,465	\$11,435	\$4,328	\$3,974	\$184	TOTALS	\$78,259	\$144,780	\$223,039	\$16,728	\$239,767

Engineer/Contract # D003493
 Project Name Luzerne Road Site RI/FS
 Work Assignment No. 16

Date Prepared April 1999

**Schedule 2.11(b-1)
 Direct Administrative Labor Hours Budgeted**

NSPE Labor Classification	9	8	7	6	5	4	3	2	1	Total No. of Direct Administrative Labor Hrs. Budgeted
Task 1 Work Plan			12					2	2	16
Task 2 RI	2		20		2			16		40
Task 3 RI Report	2		14					8		24
Task 4 Risk Assessment			2					4		6
Task 5 FS	2		14					8		24
Task 6 Citizen Support			2					4		6
Task 7										
Task 8										
Task 9										
Task 10										
Task 11										
Task 12										
Total Hours	6		64		2			42	2	116

Contract/Project administrative hours would include (subject to contract allowability)

but not necessarily be limited to the following activities:

1. Work Plan Development
 - Conflict of Interest Check
 - Develop budget schedules and supporting documentation
2. Review work assignment (WA) progress
 - Conduct progress reviews
 - Prepare monthly project report
 - Update WA progress schedule
 - Prepare monthly M/WBE Utilization Report
3. Review work assignment costs
 - Prepare monthly cost control report
 - Cost control reviews
4. CAP Preparation
 - Oversee and prepare monthly CAP
 - Respond to payment issues/disallowances
 - NSPE list updates
 - Equipment Inventory
5. Manage subcontracts
 - Implement and manage program management and staffing plans
6. Conduct Health and Safety Reviews
7. Word processing and graphic artists
8. Report editing
9. Report editing

Contract/Project administration hours would not include activities such as:

1. QA/QC reviews
2. Technical oversight by management
3. Develop subcontracts
4. Work plan development
5. Review of deliverables

Section 7

Schedule 2.11(c) Direct Non-Salary Costs

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.

State Superfund Standby Contract #D003493

Work Assignment # : D003493-16

Project Name: Luzerne Road RI/FS

ITEM	Maximum Reimbursement Rate	Unit	Estimated No. of Units	Total Estimated Costs
A. IN-HOUSE COSTS*				
Communication Costs	\$ 5.00	Call	353	1,765.00
Reproduction	\$ 0.05	Page	22,580	1,129.00
Blueprinting	\$ 1.75	Page	-	-
CAD Computer Usage	\$ 10.00	Hour	80	800.00
Protective Clothing: Level D	\$ 15.00	Day	86	1,290.00
Protective Clothing: Level C	\$ 50.00	Day	-	-
Protective Clothing: Level B	\$ 70.00	Day	-	-
Shipping: Lab Samples	\$ 102.00	75 lbs.	7	714.00
Shipping: Equipment		lbs.	-	-
Shipping: Other Fedex Priority	\$ 31.00	10 lbs.	24	744.00
Postage		0	-	400.00
Purchased Items - Incidentals		Lump Sum		-
Equipment Purchased Under Contract		Lump Sum		12,232.70
Site Dedicated Equipment/Miscellaneous		Lump Sum		8,826.78
E&E Analytical Services		Lump Sum		123,031.00
		Subtotal		150,932.48
B. MISCELLANEOUS				
1. TRAVEL**				
Airfare: Buffalo/Albany	\$ 258.00	RT	24.00	6,192.00
Per Diem: Albany	\$ 40.00	Day	-	-
Per Diem: Warren County	\$ 35.00	Day	87.00	3,045.00
Lodging: Warren County	\$ 74.00	Night	66.00	4,884.00
Auto Rental	\$ 50.00	Day	10.00	500.00
Van Rental	\$ 69.99	Day	69.00	4,829.31
Local Mileage	\$ 0.315	Mile	200.00	63.00
Parking		Day	-	-
Gasoline/Tolls		RT	-	-
		Subtotal		19,513.31
TOTAL DIRECT NON-SALARY COSTS				\$ 170,445.79

NOTES: *PPE Costs are estimated. Actual costs will be billed.

NOTES: **See Quotes in Appendix A

Schedule 2.11(c) - 1

Direct Non-Salary Costs, Proposed Sampling Costs Work Assignment
D003493-16, Luzerne Road Site RI/FS

Item		Maximum Reimbursement Rate (Specify Unit) (\$)	Estimated Number of Units	Turn-Around Mark-up (\$)	Total Estimated Cost (\$)
Analysis	Method				
TCL Volatiles (VOCs)	CLP 95-1	\$ 100.00	96	\$0	\$9,600.00
TCL Semivolatiles (BNAs)	CLP 95-2	\$ 240.00	24	\$0	\$5,760.00
TCL PCB *	8082	\$ 100.00	96	\$9,600	\$19,200.00
TCL PCB/ Pesticides	8081/8082	\$ 100.00	169	\$0	\$16,900.00
PCB Screening **	Modified 8082	\$ 42.00	1585		\$66,570.00
TAL Metals (+Mercury)	CLP-M	\$ 90.00	24	\$0	\$2,160.00
Cyanide	CLP-M	\$ 20.00	24	\$0	\$480.00
pH	9045C	\$ 5.00	6	\$0	\$30.00
Total Organic Carbon	415.1	\$ 30.00	64	\$0	\$1,920.00
Oil and Grease	9071A	\$ 35.00	9	\$0	\$315.00
COD	410	\$ 16.00	6	\$0	\$96.00
Total Cost					\$ 123,031.00

Notes:

* An expedited turnaround markup fee has been included for 96 PCB soil screening verification samples. This is necessary so verification results may be obtained within a reasonable time frame to verify and if necessary adjust soil screening procedure to site conditions.

** Five quotes for PCB screening testing are included in Appendix A

Section 7
Schedule 2.11(d) Equipment Usage Schedule
ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D003493
Work Assignment # : D003493-16
Project Name: Luzerne Road RI/FS

ID No	ITEM	Maximum Reimbursement Rate	Time Period	Estimated No. of Periods	Estimated No. of Units	Total Estimated Cost
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NO EQUIPMENT RENTAL CHARGES ARE ALLOWED PER STANDBY CONTRACT

TOTAL EQUIPMENT USAGE

Schedule 2.11(d) - 1 Equipment Purchase Under Contract
D003493-16, Luzerne Road Site RI/FS

Equipment Purchase Items	Unit Cost (\$)	Number of Units	O&M Rate (\$/month)	Term of Usage (months)	Tax 8%	Cost (\$)
Camera	\$668.99	1	0	3	\$53.52	\$722.51
Camera Accessory Kit	\$151.99	1	0	3	\$12.16	\$164.15
Telephone/Fax	\$200.00	1	0	3	\$16.00	\$216.00
Mini-Ram	\$1,495.00	2	0	2	\$239.20	\$3,229.20
Laptop PC	\$2,003.00	1	0	2	\$160.24	\$2,163.24
OVA	\$2,495.00	1	0	2	\$199.60	\$2,694.60
Oxygen Meter/Explosimeter	\$2,168.00	1	0	2	\$173.44	\$2,341.44
Turbidity Meter	\$649.67	1	0	2	\$51.89	\$701.56
Total Equipment Purchase						\$12,232.70

See attached quotes.

Schedule 2.11(d) - 3

Vendor Rented Equipment
D003493-16, Luzerne Road Site RI/FS

Equipment Rented	Unit Cost (\$)	Number of Units	Estimated Usage	Cost (\$)
Total Equipment Rented				\$0.00

There will be no outside rentals of equipment for this project.

Equipment Purchase Items	Number of Units	Unit Cost (\$)	Cost (\$)
--------------------------	-----------------	----------------	-----------

Field Trailer Mobilization/Demob.	1	\$365.00	\$365.00
Field Trailer Rental (6 months)	1	\$1,020.00	\$1,020.00
Hydrogen Supply	1	\$33.48	\$33.48
Hydrogen Supply Tank Rental (6 months)	1	\$26.70	\$26.70
Portable toilet (monthly)	6	\$70.00	\$420.00
Basic Telephone Monthly Service (per month)	6	\$30.00	\$180.00
Power Connection	1	\$1,600.00	\$1,600.00
Power/Month (per month)	6	\$30.00	\$180.00
Telephone Service Hookup	1	\$125.00	\$125.00
Drums for Purge and Development Water	22	\$55.00	\$1,210.00
Weighted Disposable Polyethylene 36" Bailers (24/case)	1	\$240.00	\$240.00
Equipment Shipping	8	\$60.00	\$480.00
Soil Sampling Jars *	1585	\$0.96	\$1,521.60
Miscellaneous Field Supplies - rope, ice, bags, etc. (per day)	41	\$25.00	\$1,025.00
Total Purchased Dedicated Equipment			\$8,426.78

Notes:

See attached quotes.

* Additional soil sampling jars necessary for screening samples only.

Supplement To Form 2.11(d)

Project Equipment Purchased Under Other Work Assignments

The following equipment will be used on this work assignment, although it was purchased under another work assignment.

Item	Cost	Project On Which Purchased
Water Level Indicator	\$4947.57	Perfection Plating
Water Level Indicator	\$4947.57	Rose Valley Landfill
2 Loggerheads	\$3,224	Rose Valley Landfill
2 Loggerheads	\$3,224	Niagara Transformer
pH/Temperature/Conductivity Meters	\$426.83	Perfection Plating
pH/Temperature/Conductivity Meters	\$426.83	Rose Valley Landfill
Organic Vapor Analyzer (OVA)	\$2,495	Rose Valley Landfill
Laptop Computer	\$2,003	Rose Valley Landfill
Turbidity Meter	\$648.67	Rose Valley Landfill
Oxygen/Explosimeter	\$2,168	Rose Valley Landfill

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Luzerne Road Site
Total Project Cost Summary

April 16, 1999

<u>NAME OF SUBCONTRACTOR</u>	<u>SERVICES TO BE PERFORMED</u>	<u>SUBCONTRACT PRICE</u>
YEC, INC.	Survey, CAD, Geoprobe & Drilling	\$67,441.76

A. Direct Salary Costs

<u>Professional Responsibility Level</u>	<u>Labor Classification</u>	<u>Average Reimbursement Rate (\$/Hr.)</u>		<u>Maximum Reimbursement Rate (\$/Hr.)</u>		<u>Estimated Number of Hours</u>	<u>Total Estimated Direct Salary Cost (\$)</u>
Principal	VIII	1999	47.69	1999	51.51	16	763.04
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	1999	31.53	1999	34.68	133	4,193.49
Staff Geologist/ Scientist/Engineer	IV	1999	27.40	1999	30.14	2	54.80
Staff Geologist/ Scientist/Engineer/CAD Operator	III	1999	23.78	1999	26.40	657	15,623.46
Senior Technician/Staff Engineer/Scientist/Geologist	II	1999	17.60	1999	19.71	4	70.40
Technician/Draftsperson	I	1999	15.94	1999	17.85	140	2,231.60
Total Direct Salary Costs:							22,936.79

B. Indirect Costs - 117% of direct salary cost

Indirect Costs: 26,836.04

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

<u>Item</u>	<u>Maximum Reimbursement Rate</u>	<u>Estimated No. of Units</u>	
Per Diem	108.00 /man-day	61 man-days	6,588.00
Mileage	0.31 /mile	4000 miles	1,240.00
Tolls	10.00 /trip	10 Trips	100.00
Survey Equipment Rental	65.00 /day	10 day	650.00
CAD Equipment	15.00 /hour	30 hours	450.00
Level D Protection	15.00 /man-day	55 man-days	825.00
Tele./Postage/Repro./Field supplies	350.00 lump sum		350.00
Total Direct Non Salary Costs:			10,203.00

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee: 7,465.93

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Luzerne Road Site
Survey & CAD Mapping

April 16, 1999

<u>NAME OF SUBCONTRACTOR</u>	<u>SERVICES TO BE PERFORMED</u>	<u>SUBCONTRACT PRICE</u>
YEC, INC.	Survey & CAD Mapping	\$21,878.14

A. Direct Salary Costs

<u>Professional Responsibility Level</u>	<u>Labor Classification</u>	<u>Average Reimbursement Rate (\$/Hr.)</u>		<u>Maximum Reimbursement Rate (\$/Hr.)</u>		<u>Estimated Number of Hours</u>	<u>Total Estimated Direct Salary Cost (\$)</u>
Principal	VIII	1999	47.69	1999	51.51	4	190.76
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	1999	31.53	1999	34.68	133	4,193.49
Staff Geologist/ Scientist/Engineer	IV	1999	27.40	1999	30.14	0	0.00
Staff Geologist/ Scientist/Engineer/CAD Operator	III	1999	23.78	1999	26.40	30	713.40
Senior Technician/Staff Engineer/Scientist/Geologist	II	1999	17.60	1999	19.71	0	0.00
Technician/Draftsperson	I	1999	15.94	1999	17.85	140	2,231.60
Total Direct Salary Costs:							7,329.25

B. Indirect Costs - 117% of direct salary cost

Indirect Costs: 8,575.22

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

<u>Item</u>	<u>Maximum Reimbursement Rate</u>	<u>Estimated No. of Units</u>	
Per Diem	108.00 /man-day	17 man-days	1,836.00
Mileage	0.31 /mile	1200 miles	372.00
Tolls	10.00 /trip	3 trips	30.00
Survey Equipment Rental	65.00 /day	10 day	650.00
CAD Equipment	15.00 /hour	30 hours	450.00
Level D Protection	15.00 /man-day	0 mndays	0.00
Tele./Postage/Repro./Field supplies	250.00 lump sum		250.00
Total Direct Non Salary Costs:			3,588

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee: 2,385.67

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Luzerne Road Site
Health & Safety Plan, Geoprobe & Drilling Support

April 16, 1999

<u>NAME OF SUBCONTRACTOR</u>	<u>SERVICES TO BE PERFORMED</u>	<u>SUBCONTRACT PRICE</u>
YEC, INC.	HASP, Geoprobe & Drilling Support	\$45,563.62

A. Direct Salary Costs

<u>Professional Responsibility Level</u>	<u>Labor Classification</u>	<u>Average Reimbursement Rate (\$/Hr.)</u>		<u>Maximum Reimbursement Rate (\$/Hr.)</u>		<u>Estimated Number of Hours</u>	<u>Total Estimated Direct Salary Cost (\$)</u>
Principal	VIII	1999	47.69	1999	51.51	12	572.28
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	1999	31.53	1999	34.68	0	0.00
Staff Geologist/ Scientist/Engineer	IV	1999	27.40	1999	30.14	2	54.80
Staff Geologist/ Scientist/Engineer/CAD Operator	III	1999	23.78	1999	26.40	627	14,910.06
Senior Technician/Staff Engineer/Scientist/Geologist	II	1999	17.60	1999	19.71	4	70.40
Technician/Draftsperson	I	1999	15.94	1999	17.85	0	0.00
Total Direct Salary Costs:							15,607.54

B. Indirect Costs - 117% of direct salary cost

Indirect Costs: 18,260.82

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

<u>Item</u>	<u>Maximum Reimbursement Rate</u>	<u>Estimated No. of Units</u>	
Per Diem	108.00 /man-day	44 man-days	4,752.00
Mileage	0.31 /mile	2800 miles	868.00
Tolls	10.00 /trip	7	70.00
Survey Equipment Rental	65.00 /day	0 day	0.00
CAD Equipment	15.00 /hour	0 hours	0.00
Level D Protection	15.00 /man-day	55 mndays	825.00
Tele./Postage/Repro./Field supplies	100.00 lump sum		100.00
Total Direct Non Salary Costs:			6,615.00

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee: 5,080.25

Name of Subcontractor	Services to be Performed	Subcontract Price (\$)	Management Fee (\$)
Chemworld Environmental, Inc.	Data Validation	\$3,535.00	0

Analysis	Method	Maximum Reimbursement Rate (Specify Unit) (\$)	Estimated Number of Units	Total Estimated Cost (\$)
TCL Volatiles (VOCs)	CLP 95-1	\$8.00	96	\$768.00
TCL Semi-Volatiles (BNAs)	CLP 95-2	\$9.00	24	\$216.00
TCL PCB/ Pesticides	CLP 93-3	\$8.00	265	\$2,120.00
TAL Metals (+Mercury)	CLP-M	\$9.00	24	\$216.00
Cyanide	CLP-M	\$2.00	24	\$48.00
pH	9045C	\$0.00	6	\$0.00
Total Organic Carbon	415.1	\$2.00	64	\$128.00
Oil and Grease	9071A	\$3.00	9	\$27.00
COD	410	\$2.00	6	\$12.00
Total Cost				\$ 3,535.00

SUBTOTAL SUBCONTRACT	\$3,535.00
SUBCONTRACT MANAGEMENT FEE	0
TOTAL	\$3,535.00

See attached quotes.

Schedule 2.11(f) - 2

Unit Price Subcontractors, Work Assignment Number
D003493-16, Luzerne Road Site RI/FS

Name of Subcontractor	Services to be Performed	Subcontract Price (\$)	Management Fee (\$)
Applied Earth Drilling	Drilling	\$81,599.00	\$3,263.96

Item	Maximum Reimbursement Rate (Specify Unit) (\$)	Estimated Number of Units	Total Estimated Cost (\$)
SEE ATTACHED BID SHEET WITH UNIT RATES, QUANTITIES AND TOTALS			
Total Cost			\$ -

SUBTOTAL SUBCONTRACT \$81,599.00

SUBCONTRACT MANAGEMENT FEE \$3,264

TOTAL \$84,863.00

See attached quotes.

Name of Subcontractor	Services to be Performed	Subcontract Price (\$)	Management Fee (\$)
Atlantic Testing Laboratories Ltd.	Geotechnical Testing	\$1,292.50	0

Analysis	Method	Maximum Reimbursement Rate (Specify Unit) (\$)	Estimated Number of Units	Total Estimated Cost (\$)
Moisture Content	D2216	\$5.50	5	\$27.50
Humic Content	D2794-87	\$27.50	5	\$137.50
Atterburg Limit	D4318	\$77.00	5	\$385.00
Particle Size: Sieve Analysis	D422	\$82.50	5	\$412.50
Particle Size: Hydrometer	D422	Combined Above	5	
Dry Density	D2937-94	\$16.50	5	\$82.50
Specific Gravity	D854	\$49.50	5	\$247.50
Total Cost				\$ 1,292.50

SUBTOTAL SUBCONTRACT	\$1,292.50
SUBCONTRACT MANAGEMENT FEE	0
TOTAL	\$1,292.50

See attached quotes.

Schedule 2.11(f) - 4

Unit Price Subcontractors, Work Assignment Number
D003493-16, Luzerne Road Site RI/FS

Name of Subcontractor	Sevices to be Performed	Subcontract Price (\$)	Management Fee (\$)
Applied Earth Drilling	Clearing	\$1,000.00	\$0.00

Item	Maximum Reimbursement Rate (Specify Unit) (\$)	Estimated Number of Units	Total Estimated Cost (\$)
1Day Site Clearing - John Deer 450 Dozer			\$1,000.00
Total Cost			\$ 1,000.00

SUBTOTAL SUBCONTRACT \$1,000.00

SUBCONTRACT MANAGEMENT FEE \$0

TOTAL \$1,000.00

See attached quotes.

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D003493
Work Assignment # : D003493-16
Project Name: Luzerne Road R/I/FS

Page _____ of _____
Date Prepared _____
Billing Period _____
Invoice No. _____

TASK 1: Work Plan Development	Expenditure Category	A Costs Claimed This Period	B Paid to Date	C Total Disallowed to Date	D Total Costs Incurred to Date (A+B+C)	E Estimated Costs to Completion	F Estimated Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/Over (G-F)
1.	Direct Salary Costs							\$10,368	
2.	Indirect Costs (185%)							\$19,181	
3.	Subtotal Direct Salary & Indirect Costs							\$29,549	
4.	Travel							\$395	
5.	Other Non-Salary Costs							\$221	
6.	Subtotal Direct Non-Salary Costs							\$616	
7a.	Subcontractors							\$0	
7b.	Subcontract Management Fee							\$0	
8.	Total Work Assignment Cost							\$30,165	
9.	Fixed Fee							\$2,216	
10.	Total Work Assignment Price							\$32,381	

Section 7
Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

Project Name: Luzerne Road RI/FS

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 Date Prepared _____
 Billing Period _____
 Invoice No. _____

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Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

ECOLOGYY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D003493
Work Assignment # : D003493-16
Project Name: Luzerne Road RI/FS

Page _____ of _____
Date Prepared _____
Billing Period _____
Invoice No. _____

TASK 3: RI Report	Expenditure Category	A	B	C	D	E	F	G	H
		Costs Claimed This Period	Paid to Date	Total Disallowed to Date	Total Costs Incurred to Date (A+B+C)	Estimated Costs to Completion	Estimated Total Work Assignment Price (A+B+E)	Approved Budget	Estimated Under/Over (G-F)
1.	Direct Salary Costs							\$16,770	
2.	Indirect Costs (185%)							\$31,025	
3.	Subtotal Direct Salary & Indirect Costs							\$47,795	
4.	Travel							\$0	
5.	Other Non-Salary Costs							\$1,650	
6.	Subtotal Direct Non-Salary Costs							\$1,650	
7a.	Subcontractors							\$3,535	
7b.	Subcontract Management Fee							\$0	
8.	Total Work Assignment Cost							\$52,980	
9.	Fixed Fee							\$3,585	
10.	Total Work Assignment Price							\$56,565	

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

Project Name: Luzerne Road RI/FS

\$17,299

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.

State Superfund Standby Contract #D003493

Work Assignment # : D003493-16

Project Name: Luzerne Road R/FS

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Date Prepared _____
Billing Period _____
Invoice No. _____

TASK 5: Feasibility Study	A Costs Claimed This Period	B Paid to Date	C Total Disallowed to Date	D Total Costs Incurred to Date (A+B+C)	E Estimated Costs to Completion	F Estimated Total Work Assignment Price (A+B+E)	G Approved Budget	H Estimated Under/Over (G-F)
Expenditure Category								
1. Direct Salary Costs							\$17,054	
2. Indirect Costs (185%)							\$31,550	
3. Subtotal Direct Salary & Indirect Costs							\$48,604	
4. Travel							\$0	
5. Other Non-Salary Costs							\$1,203	
6. Subtotal Direct Non-Salary Costs							\$1,203	
7a. Subcontractors							\$0	
7b. Subcontract Management Fee							\$0	
8. Total Work Assignment Cost							\$49,807	
9. Fixed Fee							\$3,645	
10. Total Work Assignment Price							\$53,452	

Schedule 2.11(g) Monthly Cost Control Report/Summary of Fiscal Information

Project Name: Luzerne Road RI/FS

TASK 6: Citizen Support							
Expenditure Category	A	B	C	D	E	F	H
	Costs Claimed This Period	Paid to Date	Total Disallowed to Date	Total Costs Incurred to Date (A+B+C)	Estimated Costs to Completion	Estimated Total Work Assignment Price (A+B+E)	Approved Budget
							Estimated Under/Over (G-F)
1. Direct Salary Costs							\$2,682
2. Indirect Costs (185%)							\$4,962
3. Subtotal Direct Salary & Indirect Costs							\$7,644
4. Travel							\$1,708
5. Other Non-Salary Costs							\$225
6. Subtotal Direct Non-Salary Costs							\$1,933
7a. Subcontractors							\$0
7b. Subcontract Management Fee							\$0
8. Total Work Assignment Cost							\$9,577
9. Fixed Fee							\$573
10. Total Work Assignment Price							\$10,150

Schedule 2.11(g) - Supplemental

COST CONTROL REPORT SUBCONTRACTS

Engineer Ecology and Environment Engineering, P.C.

Page 1 of 1

Contract No. D003493

Date Prepared

Project Name Luzerne Road RI/FS

Billing Period

Work Assignment No. D003493-16

Invoice No.

Subcontract Name	A Subcontract Costs Claimed this Application Inc. Resubmittals	B Subcontract Costs Approved for Payment on Previous Applications	C Total Subcontract Costs to Date (A plus B)	D Subcontract Approved Budget	E Management Fee Budget	F Management Fee Paid	G Total Costs to Date (C plus F)
1. YEC, Inc			67,442.00	0			
2. Atlantic Testing Labs, Ltd			1,292.50	0			
3. Applied Earth Tech.			81,599.00	3,264			
4. ChemWorld			3,535.00	0			
5. Applied Earth Tech.			1,000.00	0			
6.							
7.							
8.							
9.							
10.							
11. TOTALS			154,865.50	3,264			

Project Manager Steve Blair

Date June 1999

NOTES:

- (1) Costs listed in Columns A, B, C & D do not include any management fee costs.
- (2) Management fee is applicable to only properly procured, satisfactorily completed, unit price subcontracts over \$10,000.
- (3) Line 11, Column G should equal Line 7 (Subcontractors), Column D of Summary Cost Control Report.

Section 7
Schedule 2.11(h) Summary of Labor Hours

ECOLOGY AND ENVIRONMENT ENGINEERING, P.C.
State Superfund Standby Contract #D003493
Work Assignment # : D003493-16
Project Name: Luzerne Road RI/FS

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Date Prepared _____
Billing Period _____
Invoice No. _____

Rates for Year Ending February 1, 2000

TASK	NSPE Grade Rate/Hour	IX		VIII		VII		VI		V		IV		III		II		I		TOTAL HOURS	
		EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.	EXP./	EST.
		\$64.74		\$42.93		\$36.97		\$31.28		\$26.65		\$21.78		\$19.32		\$17.13		\$13.14			
TASK 1: Work Plan Development		0	0	0	8	0	28	0	120	0	128	0	25	0	33	0	36	0	2	0	380
TASK 2: Remedial Investigation		0	0	0	8	0	16	0	164	0	490	0	310	0	0	0	20	0	0	0	1,008
TASK 3: RI Report		0	0	0	16	0	16	0	120	0	260	0	25	0	88	0	142	0	10	0	677
TASK 4: Risk Assessment		0	0	0	8	0	0	0	40	0	0	0	164	0	0	0	0	0	0	0	212
TASK 5: Feasibility Study		0	0	0	40	0	100	0	300	0	0	0	1	0	93	0	24	0	2	0	560
TASK 6: Citizen Support		0	0	0	0	0	0	0	40	0	40	0	0	0	10	0	10	0	0	0	100
TOTAL HOURS		0		80		160		784		918		525		224		232		14		2,937	
TOTAL COST		\$0		\$3,434		\$5,915		\$24,524		\$24,465		\$11,435		\$4,328		\$3,974		\$184		\$78,260	

**CONSULTANT/CONTRACTOR DETAILS M/WBE-EEO UTILIZATION PLAN
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

Consultant/Contractor Name: Ecology and Environment Engineering, P.C.	
Contract Type/Number: D003493-16	Contract Award Date:
Address: 368 Pleasant View Drive	City: Lancaster State: New York Zip Code: 14086
Project Owner Name: New York State Department of Environmental Conservation	Project/Grant No.:
Address: 50 Wolf Road	City: Albany State: New York Zip Code: 12233
Authorized Representative:	Title:
Authorized Signature:	

EEO AND MBE/WBE CONTRACT SUMMARY

M/WBE CONTRACT SUMMARY	%	Amount	EEO CONTRACT SUMMARY	%	No./Emp.	Wk./Hrs.
1. Total Dollar Value of the Prime Contractor	100	\$568,346	6. Total for all Employees			
2. State Share Amount			7. Total Goal for Minority Employees			
3. MBE Goal/Amount	15	85,251.90/78,518	8. Total Goal for Female Employees			
4. WBE Goal/Amount	5	28,417./\$5,134	9. EEO Combined Totals			
5. MBE/WBE Combined Totals	20	164,652				

Office of Minority & Women's Business Programs Use Only

Proposed Goals		Date Approved	Date Disapproved	Initials
MBE (%)	EEO-Minorities (%)			
WBE (%)	EEO-Minorities (%)			

SECTION I - MBE INFORMATION: In order to achieve the MBE Goals, New York State Certified MINORITY-OWNED firms are expected to participate in the following manner

MBE Firm	Projected MBE Contract Amount and Award Date	Description of Work MBE	Contract Schedule/Start Date(s)	Contract Payment Schedule	Project Completion Date
Name: YEC Engineers Address: Clarkstow Executive Park 642 Corporate Way, Ste. 4M City: Valley Cottage State/Zip Code: New York 10989 Telephone No.: 914/268-3203	\$ 67,442. DATE: _____	Field services and surveying			
Name: Alvarez & Bremer Address: 9336 Transit Rd. City: East Amherst State/Zip Code: New York 14051 Telephone No.: 716/688-4567	\$ 11,076. DATE: _____	Airfare and Lodging			
Name: Address: City: State/Zip Code: Telephone No.:	\$ _____ DATE: _____				

SECTION I - WBE INFORMATION:

In order to achieve the WBE Goals, New York State Certified WOMEN-OWNED firms are expected to participate in the following manner

WBE Firm	Projected WBE Contract Amount and Award Date	Description of Work WBE	Contract Schedule/Start Date(s)	Contract Payment Schedule	Project Completion Date
Name: ChemWorld Environmental Address: 14 Orchard Way North City: Rockville State/Zip Code: Maryland 20854 Telephone No.: 301/294-6144	\$ 3,535. DATE: _____	Data Review/DUSR Preparation			
Name: Applied Earth Technologies Address: 6589 Hwy. 11 City: Canton State/Zip Code: New York 13617 Telephone No.:	\$ 81,599. DATE: _____	Drilling			
Name: Applied Earth Technologies Address: 6589 Hwy. 11 City: Canton State/Zip Code: New York 13617 Telephone No.:	\$ 1,000. DATE: _____	Clearing			

SECTION III - EEO INFORMATION: In order to achieve the EEO Goals, Minorities and Females are expected to be employed in the following job categories for the specified amount of work hours.

Job Categories	Total Work Hours of Contract	All Employees		Minority Employees			
		Male	Female	African-American	Asian	Native American	Hispanic
Officials/ Managers							
Professionals							
Technicians							
Skilled Workers							
Office/Clerical							
Craftsman							
Laborers							
Services/ Workers							
Totals							

8

MBE/WBE Utilization Plan

8.1 Introduction

E & E fully subscribes to the New York State policy that MBE/WBE firms be afforded the maximum opportunity to participate in contracts offered by New York State agencies. As a prime contractor to NYSDEC, E & E is committed to full compliance with Executive Law Article 15-A and pertinent federal regulations to further MBE/WBE goals and to achieve significant participation by MBE/WBE firms to a level commensurate with their capabilities and responsibilities.

In this section, E & E's general MBE/WBE Utilization Plan is described, including goals for this work assignment and details regarding the services, firms, and portions of work scheduled to be provided by MBE/WBE firms under this work assignment.

8.2 General MBE/WBE Utilization Strategy

E & E maintains an up-to-date affirmative action plan and MBE/WBE hiring plan to ensure equal opportunity for all job applicants, employees, and subcontractors. For the New York State Superfund standby contract, E & E uses the following procedures and resources to meet the established MBE/WBE goals for each work assignment:

- The E & E program and project managers identify and evaluate work that requires or is appropriate for subcontractor services during work plan development. These subcontracting opportunities are then divided into discrete tasks that may each be completed by MBE or WBE firms.
- When the discrete tasks are identified, E & E's program or project manager reviews the New York State Directory of Certified Minority and Women-Owned Business Enterprises on the Internet at www.empire.state.ny.us.



8. MBE/WBE Utilization Plan

- The project manager identifies qualified MBE/WBE contractors and solicits these firms for bids as outlined in Section 8.4 of this plan, Criteria for Selection.

8.3 Typically Subcontracted Services

Typically, E & E has found that opportunities exist for MBE/WBEs in the following work categories:

- Site security fencing;
- Protective services;
- Drilling and monitoring well installation;
- Soil borings;
- Physical soil tests;
- Site and topographical surveys;
- Title searches;
- Engineering services;
- Structural engineering;
- Geophysical engineering;
- Geophysical surveys;
- Photographic services;
- Heavy equipment rental;
- Laboratory data validation;
- Travel services; and
- Photocopying report reproduction services.

8.4 Criteria for Selection

Subcontractors (Nonprofessional Services)

The criteria described below are used to obtain and evaluate bids for nonprofessional subcontracted services. Following the identification of discrete tasks and potential MBE/WBE firms by the



8. MBE/WBE Utilization Plan

program and project managers, bid solicitations are requested from qualified firms and, to the extent possible, one or more MBE/WBE firms are requested to bid on each task. If the bids exceed \$10,000, at least five bids will be obtained. If the bids range between \$5,000 and \$10,000, three bids will be obtained. In either case, based on the bids submitted, an award will be made to the most responsible MBE/WBE bidder provided that the bid is within 10% of the lowest bid and NYSDEC agrees to accept the MBE/WBE. If the bids are less than \$5,000, E & E plans to enlist a sole-source procurement from an MBE/WBE firm.

Subconsultants (Professional Services)

Professional services will be subcontracted to MBE/WBE firms pursuant to applicable New York State regulations.

Small Direct Non-Salary Purchase and Rentals

When appropriate, E & E will purchase miscellaneous supplies and services and rent field equipment with New York State certified MBE/WBE supply vendors and travel agencies. If an item costs less than \$1,000, E & E will be satisfied that the price is reasonable. For items costing between \$1,000 and \$1,500, two bids will be obtained. Three bids will be obtained for items costing between \$1,500 and \$2,500.

8.5 Work Assignment No. 16 Goals

The established percentage goals for this work are as follows:

		<u>Dollar Amount</u>
Total project amount:		\$568,346
Total percent of MBE/WBE work goal:	20%	113,669
- Total percent of MBE work goal:	15%	85,252
- Total percent of WBE work goal:	5%	28,417

8.6 Proposed MBE/WBE Utilization-Work Assignment No. 16

Three tasks, or portions of these tasks, from the Luzerne Road RI/FS have been identified as appropriate for subcontracting. The tasks to be subcontracted, the proposed MBE/WBE subcontractor, and the value of work are identified on Table 8-1. The MBE subconsultants' SOW and price quotes and the WBE subcontractor's SOW and bid are identified in Appendix A.

**8. MBE/WBE Utilization Plan****Table 8-1 MBE/WBE Subcontractor Information**

Task	Task Description	Subcontractor Scope of Work	MBE/WBE Subcontractor	Value (\$)
1	RI	Airfare - Buffalo, NY/ Albany, NY	Alvarez & Bremer Travel, Inc. (MBE)	\$258
2	RI	Field services and surveying	YEC Engineering, PC (MBE)	\$67,442
2	RI	Drilling	Applied Earth Technologies (WBE)	\$81,599
2	RI	Site Clearing	Applied Earth Technologies (WBE)	\$1,000
2	RI	Airfare - Buffalo, NY/ Albany, NY	Alvarez & Bremer Travel, Inc. (MBE)	\$4,386
2	RI	Lodging, Glens Falls, NY	Alvarez and Bremer Travel, Inc. (MBE)	\$4,440
4	Fish and Wildlife Risk Evaluation	Airfare - Buffalo, NY/ Albany, NY	Alvarez & Bremer Travel, Inc. (MBE)	\$516
4	Fish and Wildlife Risk Evaluation	Lodging, Glens Falls, NY	Alvarez and Bremer Travel, Inc. (MBE)	\$148
6	Public Participation Support	Airfare - Buffalo, NY/ Albany, NY	Alvarez & Bremer Travel, Inc. (MBE)	\$1,032
6	Public Participation Support	Lodging, Glens Falls, NY	Alvarez and Bremer Travel, Inc. (MBE)	\$296
3	RI Analytical/Data Validation	Data Review; Data Usability Summary Report (DUSR) Preparation	ChemWorld Environmental, Inc. (WBE)	\$3,535
Total MBE Subcontract				\$78,518
Total WBE Subcontract				\$86,134
Total Contract				\$568,346
Percent Total Contract (MBE)				13.82 %
Percent Total Contract (WBE)				15.16 %

A

Bids and Quotes



A. Bids and Quotes

Subconsultant Scope of Work



ecology and environment, inc.

Subconsultant Scope of Work

Exhibit 1
Scope of Work for Professional Services at the
Luzerne Road Site
Town of Queensbury, NY

1.0 Introduction

1.1 Overview

Ecology and Environment, Engineering, P.C. (E&E) will be performing a remedial investigation at the Luzerne Road site, located in Glens Falls, New York. E & E intends to use a subconsultant to assist in the associated field effort. This scope of work (SOW) describes the work required and the schedule. The work involves field support for certain site investigation activities and conducting two events of site surveying.

1.2 Site Description

The Luzerne Road site is the location of a former copper scavenging operation. Scavengers salvaged copper from electrical transformers, and in the process, dumped the PCB-containing liquid contents of the transformers onto the ground. A soil remediation activity was conducted in the late 1970's, during which PCB-contaminated soil was excavated and placed in a secure cell constructed on site. In the early to mid 1990s, monitoring indicated a release of PCB fluid from the cell may have occurred. The objective of this RI is to determine the magnitude and extent of the PCB contamination at this site.

The study area, which includes the site and surrounding area, comprises approximately 7 acres. The area is relatively flat-lying and lightly vegetated. A structure (AMG industries) is located on the adjacent property to west, and the area south of the secure cell is covered mostly by trees. Further east of the site is Veterans Road. Northwest of the site is the Glens Falls Landfill, and north of the site is a wetland. Several wells are located between the wetland and the landfill toe.

2.0 Health and Safety Plan

YEC Engineering, P.C. (YEC) shall provide a site-specific health and safety plan (HASP) in accordance with the requirements of 29 Code of Federal Regulations (CFR) 1910.120. The HASP will apply to both the survey work described in section 3, below, and the field work assistance described in section 4, below. YEC Engineer's HASP will be an original document specific to the site. The HASP will be reviewed, though not approved, by E & E. The E & E HASP will be available for reference by YEC Engineers.

3.0 Surveying

Surveying will consist of two separate ground survey tasks; one prior to field investigation activities, and one following field investigation activities. Each of these are described below.

3.1 Initial Survey

This initial surveying effort consists of three components: establishing a grid; a topographic survey, and a fixed feature survey. Initially, YEC will set out a grid containing 210 points around the site to establish geoprobe soil boring locations. Internodal spacing will be 50 feet. All nodes are to be marked by a wooden lath equipped with a brightly-colored ribbon tied to the top. All laths are to be labeled according to the node labeling system established for the site.

The topographic survey consists of surveying the site and constructing a site topographic map utilizing a 1-foot contour interval. Each contour will be assigned a "Z" elevation within the AutoCAD electronic file for use in digital terrain modeling. The attached United States Geologic Survey (USGS) topographic map photocopy depicts the area of the site to be addressed by the topographic survey. E & E also will require a copy of all field log and/or data dumps, and summaries of field accuracy checks.

Also included in the topographic survey will be the surveying of selected fixed features. The horizontal and vertical positions of ten existing groundwater monitoring wells will be established. At each well, ground elevation and top of inner casing are to be measured. Also, the horizontal location of fixed features will be established. The list of features includes, but is not limited to, Luzerne Road, Veterans Road, the perimeter of the wetland (to be delineated by E & E), approximately three streams, approximately four telephone poles, the AMG Properties building, and the fence traversing the landfill toe.

YEC will provide E & E with a draft hard copy map and a CAD electronic file using (AutoCAD 12) of this survey within two weeks (ten business days) following completion of field activities. Following any revisions by E & E, YEC will finalize the figure and provide E & E with six hard copies within five (5) business days of receiving E & E's comments.

The subcontractor (YEC) will establish local horizontal and vertical site control unless existing NGS monumentation is within a ~0.5 miles of the site. It is the responsibility of the subcontractor to determine whether or not this monumentation exists.

3.2 Post Investigation Survey

The second survey effort will involve two components. First, the vertical and horizontal position, ground surface elevation, and top of inner casing elevation of all groundwater monitoring wells installed during this RI will be measured. Secondly, at each of eight residences, YEC will establish horizontal control of three geoprobe borehole locations, the house, nearest street(s) adjacent to the property, and other relevant site features such as driveways and telephone poles. This second survey is to be commenced during the last week of field activities so that the field investigation team can show the survey team the points to be surveyed. Note that this second survey involves entering onto private property; therefore, it will only be conducted under the accompaniment and/or permission of NYSDEC personnel.

Well elevation data collected during this second survey will be added to the first CAD basemap. YEC is to use the residential survey data to construct a separate residential area CAD map using AutoCAD release 12. YEC will provide E & E with a draft hard copy of the updated site base map and a CAD electronic file using (AutoCAD 12) of the residential survey within one week (five business days) following completion of field surveying activities. Following any revisions by E & E, YEC will finalize the figure and provide E & E with six hard copies within three (5) business days of receiving E & E's comments.

4.0 Field Crew Assistance

YEC will assist E & E by providing one support person to each of two field crews during the performance of certain Remedial Investigation (RI) tasks to work under the supervision of the site manager. The subcontractor will provide NSPE grade II or III persons to fill these positions. One field person will be on site with a Geoprobe crew for a period of approximately 35 consecutive field days, excluding holidays and weekends. The second field person will assist in the monitoring well installation activities; they will be on site for a period of approximately 20 consecutive field days, excluding holidays and weekends. This 20-day period is expected to commence after approximately 10 field days of the Geoprobe crew operating; its entire operation is simultaneous to the Geoprobe crew operation. The responsibilities of these two persons is to provide any necessary assistance to the field teams, to conduct soil sampling; purging, development, and sampling of wells; conduct surface water and sediment sampling, and to use air monitoring equipment.

Work will be conducted Monday through Friday; field days will average 10 hours. The subcontractors will arrive onsite on Monday mornings by no later than 10 AM; all other field days are to begin at the site at 7:00 a.m. Fridays are expected to conclude at approximately 3:00 p.m.

YEC Engineer's bid will include all costs necessary for the workers to perform the services outlined above. This includes, but is not limited to, development of the HASP, conducting the ground surveying, field crew assistance, and the following:

- Wages and Overhead;
- Travel and Lodging; and
- Level D Personal Protection (including tyvek suits, disposable gloves, and boot covers).

Note that all rates must be in accordance with YEC's standby agreement with E & E.

Extra travel time beyond that proposed shall not be invoiced to the project. E & E shall supply air monitoring and water sampling equipment, logbooks, and other field supplies.

Bid items for these categories are included in the bid sheet in Exhibit 2. However, it is emphasized that despite the line items listed in the bid sheet, the costs bid shall include all costs for providing the professional services as required.

Note that resumes of all persons working on this project are to be submitted with the bid.

5. Schedule

The work described in this scope of work is expected to take place during the summer of 1999. Surveying will likely occur in June, and field activities investigation activities likely will be conducted in July and August. However, please note that these dates are estimates.

The subcontractors investigation team personnel must be available for the continuous 35 days of fieldwork once the work commences. The survey crew must be available prior to commencing subsurface investigation activities, and immediately following subsurface investigation activities.

Exhibit 2

Bid Schedule For Professional Services at the Luzerne Road Site

Item	Unit Cost	Quantity	Total Cost
Site Health and Safety Plan (HASP)	\$____/ea	1	
Site Surveys, including travel			
Initial Topographic Survey	\$____ (lump sum)	1	
Well and Residential survey	\$____ (lump sum)	1	
Field assistance personnel, not including travel			
NSPE Grade III, Geoprobe Team	\$____/hr	__ hrs.	
NSPE Grade III, Drilling Team	\$____/hr	__ hrs.	
Travel, Survey Crew	\$____/trip	2	
Travel, Field Assistance Personnel	\$____ trip	7	
Level D Personal Protection, Survey Crew	\$____/day	__ man-days	
Level D Personal Protection, Field Crew	\$____/day	__ man-days	
Total			

Subconsultant Quotation



ecology and environment, inc.

Subconsultant Quotation

YEC, INC./YEC ENGINEERING, P.C.

Clarkstown Executive Park
612 Corporate Way, Suite 4M
Valley Cottage, NY 10989
Tel: (914) 268-3203 Fax: (914) 268-5313

April 19, 1999

Steven Blair
Ecology and Environment Engineering, P.C.
Buffalo Corporate Center
368 Pleasantview Dr
Lancaster, New York 14086

RE: YEC, Inc. Proposal Package for
Luzerne Road Survey & Field Crew Assistance

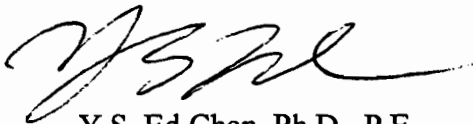
Dear Mr. Blair:

Attached please find the following information/forms for YEC's Survey & Field Crew Assistance tasks for the Luzerne Road Site project:

- (1) YEC Schedules 2.11(e);
- (2) Completed Subcontractor Acknowledgement Form;
- (3) Completed Vendor/Subcontractor Certification;
- (4) Completed Subcontractor's Bid Response Form;
- (5) Proposed YEC Key Staff Resumes; and
- (6) YEC Certifications of Insurance (1 for General Liability & 1 for Professional Liability).

If you have any questions please feel free to contact us.

Sincerely,



Y.S. Ed Chen, Ph.D., P.E.
President, YEC, Inc.

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Luzerne Road Site
Total Project Cost Summary

April 16, 1999

<u>NAME OF SUBCONTRACTOR</u>	<u>SERVICES TO BE PERFORMED</u>	<u>SUBCONTRACT PRICE</u>
YEC, INC.	Survey, CAD, Geoprobe & Drilling	\$67,441.76

A. Direct Salary Costs

<u>Professional Responsibility Level</u>	<u>Labor Classification</u>	<u>Average Reimbursement Rate (\$/Hr.)</u>		<u>Maximum Reimbursement Rate (\$/Hr.)</u>		<u>Estimated Number of Hours</u>	<u>Total Estimated Direct Salary Cost (\$)</u>
Principal	VIII	1999	47.69	1999	51.51	16	763.04
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	1999	31.53	1999	34.68	133	4,193.49
Staff Geologist/ Scientist/Engineer	IV	1999	27.40	1999	30.14	2	54.80
Staff Geologist/ Scientist/Engineer/CAD Operator	III	1999	23.78	1999	26.40	657	15,623.46
Senior Technician/Staff Engineer/Scientist/Geologist	II	1999	17.60	1999	19.71	4	70.40
Technician/Draftsperson	I	1999	15.94	1999	17.85	140	2,231.60
Total Direct Salary Costs:							22,936.79

B. Indirect Costs - 117% of direct salary cost

Indirect Costs: 26,836.04

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

<u>Item</u>	<u>Maximum Reimbursement Rate</u>	<u>Estimated No. of Units</u>	
Per Diem	108.00 /man-day	61 man-days	6,588.00
Mileage	0.31 /mile	4000 miles	1,240.00
Tolls	10.00 /trip	10 Trips	100.00
Survey Equipment Rental	65.00 /day	10 day	650.00
CAD Equipment	15.00 /hour	30 hours	450.00
Level D Protection	15.00 /man-day	55 man-days	825.00
Tele./Postage/Repro./Field supplies	350.00 lump sum		350.00
Total Direct Non Salary Costs:			10,203.00

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee: 7,465.93

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Luzerne Road Site
Survey & CAD Mapping

April 16, 1999

<u>NAME OF SUBCONTRACTOR</u>	<u>SERVICES TO BE PERFORMED</u>	<u>SUBCONTRACT PRICE</u>
YEC, INC.	Survey & CAD Mapping	\$21,878.14

A. Direct Salary Costs

<u>Professional Responsibility Level</u>	<u>Labor Classification</u>	<u>Average Reimbursement Rate (\$/Hr.)</u>	<u>Maximum Reimbursement Rate (\$/Hr.)</u>	<u>Estimated Number of Hours</u>	<u>Total Estimated Direct Salary Cost (\$)</u>
Principal	VIII	1999 47.69	1999 51.51	4	190.76
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	1999 31.53	1999 34.68	133	4,193.49
Staff Geologist/ Scientist/Engineer	IV	1999 27.40	1999 30.14	0	0.00
Staff Geologist/ Scientist/Engineer/CAD Operator	III	1999 23.78	1999 26.40	30	713.40
Senior Technician/Staff Engineer/Scientist/Geologist	II	1999 17.60	1999 19.71	0	0.00
Technician/Draftsperson	I	1999 15.94	1999 17.85	140	2,231.60
Total Direct Salary Costs:					7,329.25

B. Indirect Costs - 117% of direct salary cost

Indirect Costs: 8,575.22

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

<u>Item</u>	<u>Maxium Reimbursement Rate</u>	<u>Estimated No. of Units</u>	
Per Diem	108.00 /man-day	17 man-days	1,836.00
Mileage	0.31 /mile	1200 miles	372.00
Tolls	10.00 /trip	3 trips	30.00
Survey Equipment Rental	65.00 /day	10 day	650.00
CAD Equipment	15.00 /hour	30 hours	450.00
Level D Protection	15.00 /man-day	0 mndays	0.00
Tele./Postage/Repro./Field supplies	250.00 lump sum		250.00
Total Direct Non Salary Costs:			3,588.00

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee: 2,385.67

Schedule 2.11 (e)
Cost Plus Fixed-Fee Subcontracts

Luzerne Road Site
Health & Safety Plan, Geoprobe & Drilling Support

April 16, 1999

<u>NAME OF SUBCONTRACTOR</u>	<u>SERVICES TO BE PERFORMED</u>	<u>SUBCONTRACT PRICE</u>
YEC, INC.	HASP, Geoprobe & Drilling Support	\$45,563.62

A. Direct Salary Costs

<u>Professional Responsibility Level</u>	<u>Labor Classification</u>	<u>Average Reimbursement Rate (\$/Hr.)</u>	<u>Maximum Reimbursement Rate (\$/Hr.)</u>	<u>Estimated Number of Hours</u>	<u>Total Estimated Direct Salary Cost (\$)</u>
Principal	VIII	1999 47.69	1999 51.51	12	572.28
Senior Geologist/Scientist/ Engineer/ Licensed Surveyor	V	1999 31.53	1999 34.68	0	0.00
Staff Geologist/ Scientist/Engineer	IV	1999 27.40	1999 30.14	2	54.80
Staff Geologist/ Scientist/Engineer/CAD Operator	III	1999 23.78	1999 26.40	627	14,910.06
Senior Technician/Staff Engineer/Scientist/Geologist	II	1999 17.60	1999 19.71	4	70.40
Technician/Draftsperson	I	1999 15.94	1999 17.85	0	0.00
Total Direct Salary Costs:					15,607.54

B. Indirect Costs - 117% of direct salary cost

Indirect Costs: 18,260.82

C. Maximum Reimbursement Rates for Direct Non-Salary Costs:

<u>Item</u>	<u>Maximum Reimbursement Rate</u>	<u>Estimated No. of Units</u>	
Per Diem	108.00 /man-day	44 man-days	4,752.00
Mileage	0.31 /mile	2800 miles	868.00
Tolls	10.00 /trip	7	70.00
Survey Equipment Rental	65.00 /day	0 day	0.00
CAD Equipment	15.00 /hour	0 hours	0.00
Level D Protection	15.00 /man-day	55 mndays	825.00
Tele./Postage/Repro./Field supplies	100.00 lump sum		100.00
Total Direct Non Salary Costs:			6,615.00

D. Fixed Fee (15% of Total Direct and Indirect Salary Costs)

Fixed Fee: 5,080.25

VENDOR/SUBCONTRACTOR CERTIFICATION

Please complete the following as applicable.

Vendor/Subcontractor Certification (Federal)

The Vendor/Subcontractor, YEL, Inc., represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the Federal Acquisition Regulations as:

- ☒ Small Business
☒ Small Disadvantaged Business
☐ Women Owned Small Business
☐ Large Business
☐ Other _____

[Signature]
Certifying Officer of Corporation
President
Title
4/16/99
Date

Subcontractor Certification (State)

The Vendor/Subcontractor, YEL, Inc., represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the laws of the State of New York as:
(State)

- ☒ Minority Owned Business
☒ Disadvantaged Business
☐ Women Owned Business
☐ Other _____

☐ A copy of the certification is attached hereto (if applicable)

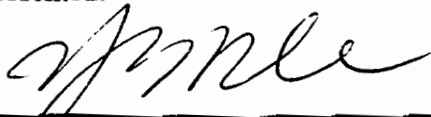
[Signature]
Certifying Officer of Corporation
President
Title
4/16/99
Date

Notice: Any person who misrepresents a firm status as a business concern in order to obtain a contract or subcontract to be awarded under preference programs established by law may be subject to criminal or civil action and other penalty as may be prescribed by law.

SUBCONTRACTOR ACKNOWLEDGMENT FORM

I, Y. S. Ed Chen, on behalf of Subcontractor, confirm the following:

1. I have reviewed and am in Agreement with the costs presented in the attached Bid b Proposal Sheet/Schedule of Prices, and understand that the work described in the plans and specifications will be completed in full for the price presented;
2. I have reviewed all pertinent documents made available to us in preparing the cost estimate, including the Draft Subcontract Agreement; and
3. I agree to enter into the Subcontract Agreement without further modification, if selected for this project and understand that E & E at its discretion may determine our bid to be nonresponsive if any subsequent Subcontract Agreement modification is presented.



Signature of Authorized Subcontractor
Representative

YEL, Inc

Name of Subcontractor

SUBCONTRACTOR'S BID RESPONSE FORM

TO: Ed Chen, Ph.D., P.E.
President
YEC Engineering, P.C.
Clarkstown Executive Park
612 Corporate Way, Suite 4M
Valley Cottage, New York 10989

RE: Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Services Needed: Data Usability Summary Form Preparation
Client: New York State DEC
E & E Project No.: QQ08

DATE: April 12, 1999

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

☒ Bid enclosed.

☐ No bid due to the following:

Please maintain our company on your bidder's list.

Signature: 

Printed: Y. S. Ed Chen

Title: President

Date: 4/16/99

Y.S. ED CHEN, Ph.D., P.E.**EDUCATION**

Rensselaer Polytechnic Institute, Ph.D., Chemical/Environmental Engineering (1979)
University of Connecticut, M.S., Civil/Environmental Engineering (1977)
National Cheng Kung University, B.S., Civil Engineering (1973)
OSHA Health and Safety Training for Hazardous Waste Activities (40 hours)

PROFESSIONAL AFFILIATIONS AND RELEVANT PUBLICATIONS

Registered Professional Engineer: NY, NJ, MA.

Dr. Chen has published over 15 technical articles on hazardous waste treatability studies and disposal techniques. He is also a full member of the Society of Sigma Xi at the Manhattan College Chapter.

EMPLOYMENT HISTORY

1991 - present President, YEC Engineering, P.C.
1985 - present President, YEC, Inc., Valley Cottage, NY
1986 - 1987 RCRA Seminar Instructor, J.T. Baker Chemical, Phillisburg, NJ
1984 - 1986 Senior Project Manager, SAIC/JRB Associates, Paramus, NJ
1981 - 1984 Project Manager, Wehran Engineering, Middletown, NY
1979 - 1981 Postdoctorate Scientist, Manhattan College, Environmental Engineering

EXPERIENCE SUMMARY

Dr. Chen has strong technical and management credentials in hazardous waste treatment and disposal techniques, developing of innovative technologies and hazardous sludge management. He has more than 16 years of hands-on experience on Remedial Investigations and Feasibility Studies (RI/FS) and Remedial Design projects for hazardous waste Treatment, Storage and Disposal Facilities and at uncontrolled hazardous waste sites. He has successfully managed many RCRA compliance, site investigations, industrial waste/groundwater treatment, hydrogeologic investigations and process design for clients in the pesticides, organic chemicals, electroplating, pharmaceutical, petroleum and pulp and paper industries.

Dr. Chen has specialized experience in the process design and cost estimates of thermal destruction systems for the disposal of hazardous chemical wastes including fluidized bed incineration systems and carbon regeneration furnaces. He has also participated in the development of innovative technologies including sulfide precipitation, anaerobic biological fluidized bed process, oxidation ditch system design, rapid infiltration system and dissolved oxygen microelectrode technique, etc.

Currently, Dr. Chen is managing several hazardous waste Site Assessments, Remedial Investigations, Air Monitoring for Asbestos Abatement, and Concrete/Reinforcing Steel Testing and Inspection projects for the New York State Department of Environmental Conservation under the State Superfund Remedial Action Program, and for the U.S. Department of Justice under the Bureau of Prisons' Construction Program.

NSPE V

DONALD R. STEDGE, L.S.

EDUCATION

Mohawk Valley Community College, Utica, NY, A.A.S. Civil Engineering Technology,
A.A.S. Surveying Technology (1982)
OSHA Health and Safety Training for Hazardous Waste Activities (40 hours)

PROFESSIONAL LICENSES

Land Surveyor, New York, 1987
Land Surveyor, New Jersey, 1988
Professional Planner, New Jersey, 1989

PROFESSIONAL AFFILIATIONS

President - Delaware-Hudson Land Surveyors Association
Director - New York State Association of Professional Land Surveyors
Member - New Jersey Association of Professional Land Surveyors
Member - National Society of Professional Surveyors
Member - American Congress on Surveying and Mapping
Lectured on Professional Standards at the January 1989 Conference of the New York State Professional Land Surveyors Association

EMPLOYMENT HISTORY

1990 - present Senior Surveyor, YEC, Inc., Valley Cottage, NY
1987 - 1990 Surveyor, Donald R. Stedge, L.S., P.C., Central Valley, NY
1986 - 1987 Survey Analyst, Joseph T. Caruso, P.E., P.C. and Associates, Nanuet,
1985 - 1986 Survey Analyst, Henry Horowitz, Inc., West Nyack, NY
1984 - 1985 Crew Chief/Survey Analyst, Bunney Associates, Katonah, NY
1983 - 1984 Caruso and Haller, P.C., Nanuet, NY
1982 - 1983 Crew Chief, Dillin and Sorace Associates, New City, NY
1980 - 1982 Rodman/Instrumentman, Thomas F. Leo, P.L.S., Stony Point, NY

EXPERIENCE SUMMARY

Mr. Stedge is a licensed surveyor in states of New York and New Jersey. He is also a licensed land planner in the State of New Jersey. Mr. Stedge has 15 years experience in the land surveying and civil engineering profession. His experience includes boundary and topographic surveys, construction stake-out surveys, property boundary surveys, wetland delineation, contour mapping, utility layouts, roadwork, and hazardous waste site surveys. During his six years at YEC as Senior Surveyor, he has conducted over 50 NYSDEC hazardous waste site investigation surveys. These surveys included a location of site features, sampling and monitoring well locations, soil gas grids, etc. While at YEC, he has also completed site surveys for the following agencies: NYCTA, NYCDEP, NYSDOT, and NJDEPE. The surveys included title searches of the surveyed properties and surrounding properties.

From 1997 to 1998, Mr. Stedge conducted the survey for the NYSDOT Hutchinson River Parkway (HRP) reconstruction. The design included road realignment, rerouting Blind Brook, new ramps, one bridge realignment, utility realignment, and some property taking. His task was to update an existing NYSDOT aerial photo map for the final stage design. This included surveying location and elevation of road centerline, curbs, sidewalks, utilities, culverts, stream crossing profiles, drainage data and bridges for the HRP from Purchase St., NY to Glenville Road, CT. 4 bridges (Purchase St, Lincoln Ave, Ridge St, and King St) were surveyed and bridge data collected (per design requirements). A wetland delineation survey was conducted. A soil boring survey and staking, as well as a noise barrier survey and staking was also conducted. The utility survey included water, sewer, drainage, electric, cable, telephone, and gas based on features found in the field, utility company markout and maps.

NSPE V

JOHN Q. ROBINSON, JR.

EDUCATION

University of Texas, El Paso Texas, M.S., Geology (1989)
Hartwick College, Oneonta, New York, B.A. Geology (1978)

CERTIFICATIONS/APPOINTMENTS

Supervisor of Health and Safety Operations at Hazardous Materials Sites, 29 CFR 1910.120 (E)(3) and (4) OSHA
NJ Certification for Underground Storage Tank Subsurface Evaluation, Closure No. 0003723
Pennsylvania Certified Professional Geologist (CPG#9585) Geologist Registration No. PG-001003-G
Chairman, Vernon Township Environmental Commission
Geographic Information Systems (GIS) Professional Certification (Pending)

EMPLOYMENT HISTORY

1997 - present YEC, Inc., Valley Cottage, New York
Senior Project Manager/Hydrogeologist

1993 - present GeoEnvironmental Research, Vernon, New Jersey
Executive Director of nonprofit corp.

1992 - 1996 Lawler, Matusky & Skelly Engineers, Pearl River, New York
Senior Project Manager/Hydrogeologist

1986 - 1992 ECKENFELDER, Inc., Mahwah, New Jersey
Project Manager/Hydrogeologist

1983 - 1986 University of Texas, El Paso, Texas
Research Assistant and Teaching Assistant

1982 - 1983 Shannon and Wilson, Inc., Houston, Texas
Geologist

1980 - 1982 Michael Baker Jr., Inc., Fairbanks, Alaska
Assistant Geologist

1979 - 1980 The Louisiana Land and Exploration Company, Houston, Texas
Technical Assistant, Assistant Geologist

EXPERIENCE SUMMARY

Mr. Robinson has 18 years experience as a geologist. His experience includes project management of hydrogeological investigations, including overburden and bedrock assessments at hazardous waste sites. Bedrock evaluations include geophysical logging data collection and interpretation, permeability testing, and detailed description and interpretation of over 33,000 feet of drill core (evaporates, carbonates, massive shale, and metamorphic bedrock). He has also worked on UST projects, waste site investigation and remediation, monitoring plans, wellhead protection plans, landfill siting and permit review. Field experience also includes drilling and geoprobe supervision, soil sampling and monitoring well installation, groundwater sampling, and remedial investigation/feasibility studies (RI/FS). He has managed projects ranging in budget from \$2.5K to \$1.5M for the regulatory, transportation, pharmaceutical, and chemical industries.

EDUCATION

Manhattan College, BS - Environmental Engineering (1997)

CERTIFICATIONS

New York State Certified Intern Engineer
OSHA Health and Safety Training for Hazardous Waste Activities (40 hours)
NYS Asbestos Designer License
NYS Asbestos Air Monitoring License
NYS Asbestos Inspector License
NY City Transit Authority Track Training Certification
Confined Space Training Certification

EMPLOYMENT HISTORY

1997 - present YEC, Inc., Valley Cottage, New York
Staff Engineer/Asbestos Sampler

1995 - 1997 Ark-Con Construction, New Rochelle, NY
Carpenter, Taper

1993 - 1995 GW Plumbing, New Rochelle, NY
Repair crew organizer

EXPERIENCE SUMMARY

Mr. Ciotti is an Environmental Engineer with experience in groundwater remediation, hazardous waste remediation and asbestos investigation. Mr. Ciotti assisted in the construction management of the Hand Battery Laboratory site in South Nyack, NY, a NYSDEC inactive hazardous waste site. His duties included on-site remedial management, quality assurance and quality control, coordination with Local and State government agencies and public relations with the local community.

Mr. Ciotti was also involved in the maintenance and monitoring for 11 groundwater remediation systems at various New York City Transit Authority UST facilities undergoing remediation. His duties included maintenance of the systems pumps, piping and tanks, along with monitoring tasks including groundwater sampling, oil/water interface measurement, water level measurement and coordination with the subcontractor to haul petroleum waste products.

More recently, Mr. Ciotti has assisted in the fieldwork for remedial investigations at different locations and the annual groundwater sampling at the Tuxedo Park Landfill site. His responsibilities for the remedial investigations include soil sampling from geoprobe operations, oversight of monitoring well installation and field crew supervision for asbestos and lead investigations. His duties at the Tuxedo Park Landfill include well purging, groundwater sampling, preparation of field blanks and blind duplicates and interpretation of the analytical results.

PUBLICATIONS

"Handbook of Hazardous Air Pollutants", 1997 (contributing author)
"Engineering and Environmental Ethics: The Case Study Approach", 1997 (contributing author)

EDUCATION

Manhattan College, B.S. - Environmental Engineering (1998)

CERTIFICATIONS

NYS Education Department Certified Intern Engineer (E.I.T.)
 OSHA Health and Safety Training for Hazardous Waste Activities (40 hour)
 NYC Asbestos Investigator License
 NYS Asbestos Inspector, and Air Sampling Licenses
 PCM Airborne Asbestos Analyst Certification
 NYC Transit Authority Track Training Certification

EMPLOYMENT HISTORY

1997 - present Staff Engineer, YEC, Inc., Valley Cottage, New York

1996 - 1997 Certified Laboratory Analyst / Assistant, Testwell Craig Laboratories, Ossining, NY

EXPERIENCE SUMMARY

Mr. Del Duca has field experience sampling groundwater and soil for volatile compound contamination. He has assisted in general O & M, and monitoring the groundwater remedial systems at 12 NYCTA Underground Storage Tank facilities undergoing remediation. He performed maintenance of the systems' pump, piping, and tanks. He conducted monitoring tasks such as groundwater sampling, oil/water interface measurement, water level measurement, and coordination with the subcontractors to haul waste petroleum product. He is experienced in the inspection of various UST and AST's at these sites for precision tightness testing, or in-ground closures.

Mr. Del Duca has experience in oversight of the installation of sixty four (64), 2 inch PVC recovery wells, by means of three types of drilling techniques including 6 inch air hammer, 4' air hammer with odex, and 6' open and closed head augers, for a large-scale soil and water remediation system. This system was installed at the New York Bus Services property, located in the Bronx, New York, along the Hutchinson River bulkhead.

Mr. Del Duca has field experience in landfill closure inspection for the 44-acre Old Al Turi landfill in Goshen, New York. His responsibilities included overseeing the installation of new monitoring wells, C&D acceptance monitoring, landfill cover construction oversight, and a three layer landfill liner inspection oversight. His other construction experience includes assisting YEC's residence engineer in completing a NYSDEC soil remediation project at Hand Battery site, Nyack, N.Y. YEC's responsibilities under this project involved full time inspection of construction activities for remediating 17 residential areas surrounding the Hand property. Mr. Del Duca has assisted an environmental consulting firm in monitoring the removal of C&D contaminated backfill material at various residences in West Harrison, New York. YEC's responsibilities under this project included overseeing geoprobe drilling of several properties for possible contamination. YEC also prepared and analyzed sieve samples of the excavated areas to determine the extent of the C&D contamination. Mr. Del Duca has also assisted YEC's resident engineer in the as-built structural audit of a new 1000-bed inmate facility for the Federal Bureau of Prisons in Brooklyn, New York.

Mr. Del Duca, is certified as an airborne asbestos analyst by Phase Contrast Microscopy (PCM). He is familiar with bulk, and airborne asbestos analysis by Transmission Electron Microscopy (TEM), and Polarized Light Microscopy (PLM). Between 1996 to present, he has conducted asbestos analysis, bulk and air sampling, inspections, and survey reports for abatement projects under contracts to NYSDOT, NYCDOS NYCTA, NYCSCA and NYCDDC. Some inspections include full transit subway station, and electrical substation surveys, as well as a DOT facility 10 building specific survey, and several NYC public school surveys. Several surveys also included inspecting, and sampling for lead based paints, and PCB containing materials.

NSPE II

FERNANDO A. PEREZ

EDUCATION

Manhattan College, B.S. - Civil Engineering (1996)

CERTIFICATIONS

OSHA Health and Safety Training for Hazardous Waste Activities (40 hours)

ACI Grade 1 Concrete Inspector License

Confined Space Entry Certification

NYS Asbestos Air Monitoring/Inspector Licenses

EMPLOYMENT HISTORY

1997 - present YEC, Inc., Valley Cottage, New York
Staff Engineer

1991 - 1996 Yonkers Parks & Recreation, Yonkers, NY
Counselor staff supervisor

1996 Westchester Parks and Recreation, Croton, NY
Lifeguard/supervisor

EXPERIENCE SUMMARY

Mr. Perez is a Staff Engineer at YEC, Inc. He also assisted in maintenance and monitoring of the groundwater remedial system at 11 NYC Transit Authority UST facilities undergoing remediation. He performed maintenance of the system's pump, piping, and tanks. He also conducted monitoring tasks such as soil sampling, groundwater sampling, oil/water interface measurement, water level measurement, and coordination with the subcontractor to haul waste petroleum products.

Mr. Perez participated in the closure of the Tuxedo Waste Disposal Site. He provided field oversight to ensure that the contractor conformed to the approved plans and specifications for capping and closure. Responsibilities included groundwater sampling, recording daily work completed, contractor's use of personnel, material and equipment, deviation from work plan, unusual circumstances, progress reporting, security and safety logs, meeting and general correspondence, and construction photos.

Mr. Perez is currently providing technical enforcement support services for consent order compliance at the 44-acre Old Al Turi Landfill site. Some of his responsibilities include overseeing the installation of new monitoring wells, oversight of a three layer landfill liner installation, monitoring site construction activities, sampling and inspecting loads of construction and demolition debris, accepting or rejecting loads based on their compliance with NYSDEC guidelines, and preparing a final summary report of all site activities.

PAUL GOODMAN**EDUCATION**

Johnson and Wales University, A.S. (1981)

CERTIFICATIONS

OSHA Health & Safety Hazardous Training Materials

Confined Space Entry

NYS Restricted Handler

Lead Inspection and Abatement (USEPA, USHUD)

NYS Asbestos Project Monitor/ NYS Asbestos Inspector/ NYS Asbestos Air Monitoring

EMPLOYMENT HISTORY

1998 - present YEC, Inc., Valley Cottage, New York
Project Manager

1992 - 1998 ERD Environmental, Congers, NY
Project Coordinator/Project Manager

1989 - 1992 Asbestos Research and Environmental Associates, Haverstraw, NY
Senior Field Technician

EXPERIENCE SUMMARY

Mr. Goodman has over 10 years experience in environmental engineering, hazardous materials investigation/assessments and landfill closures. His responsibilities have included: coordination of all environmental sampling including: asbestos, lead-based paint and indoor air quality projects for various public and private projects from the bidding phase to completion, including, subcontractor management, quality control/code compliance, invoicing, daily supervision of all field personnel, daily review of project logs, liaison between management and field personnel and inventory control/management.

Mr. Goodman has been involved in the training of field personnel in compliance with Federal, State and City regulations. Mr. Goodman has also performed environmental assessment surveys and geoprobe soil sampling which included investigation of potential PCB, VOC'S, SVOC'S, Metals and lead containing paint materials, as well as any other hazardous materials.

Mr. Goodman's most recent field experience has been overseeing the landfill closure for the Old Al Turi landfill in Goshen, New York. His responsibilities include: Monitoring site construction activities, inspecting loads of construction debris (C&D) for hazardous waste using a photoionization detector (PID), visual inspection for excessive unacceptable material in compliance with NYCDEC guidelines, sampling of fill material and overseeing the capping of the landfill including the installation of the liner and observing the installation of new monitoring wells.

MARIE WEBSTER**EDUCATION**

Manhattan College, Riverdale, NY, Civil Engineering (in progress)
Rockland Community College, Suffern, New York, A.S. Engineering Science (1995)
North Carolina State University, Raleigh, North Carolina, Mathematics (1974)
Engineering Drafting School, Lakewood, Colorado, Architectural Drafting (1981)

EMPLOYMENT HISTORY

1990 - present Sr. CADD Operator/Sr. Engineering Technician, YEC, Inc., Valley Cottage, NY
1987 - 1988 Team Leader, Paciulli, Simmons and Associates, Fairfax, VA
1984 - 1987 Draftsperson, City of Mesa, Mesa, AZ
1983 - 1984 Draftsperson, Valley Engineering and Surveying, Tempe, AZ
1981 - 1982 Draftsperson, Leonard Rice Consulting Water Engineers, Denver, CO

EXPERIENCE SUMMARY

Ms. Webster has over 14 years experience in civil engineering drafting. At YEC, she is responsible for preparing maps from field surveys conducted, either hand drawn or in CAD format, of inactive hazardous waste sites under investigation. Previous experience includes preparing working drawings (plans and profiles) including: site plans, utility plans, drainage plans, and pavement plans for planned subdivisions and building sites. She has also prepared maps for court presentation in a dispute involving water rights disputes.

Ms. Webster other duties include engineering report preparation, database management, contract administration duties, subcontractor management, proposal preparation, progress reports, licensing, etc. She recently completed a preliminary site assessment of the New Cassel Industrial Site which included a thorough file search on the history of operations at 17 sites.

Office management duties include: computer network administrator; computer file and database upkeep; file organization; and record keeping.

COMPUTER SKILL

Experience with the following software:

- CADD software: Autocad Release 12, COGO, DTM
- Wordprocessing software: Wordperfect, Word
- Spreadsheet software: Lotus 1-2-3, Quattro Pro, Excel
- Database software: Access 97

ACORD CERTIFICATE OF LIABILITY INSURANCE

12/02/98

PRODUCER

Beardsley, Brown & Bassett
55 Walls Drive
Fairfield, CT 06430
203 254-7525

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURERS AFFORDING COVERAGE

RED

REC, Inc.
612 Corporate Way
Valley Cottage, NY 10989

INSURER A: Gulf Insurance Group

INSURER B:

INSURER C:

INSURER D:

INSURER E:

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
	GENERAL LIABILITY				EACH OCCURRENCE \$
	<input type="checkbox"/> COMMERCIAL GENERAL LIABILITY				FIRE DAMAGE (Any one fire) \$
	<input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> OCCUR				MED EXP (Any one person) \$
					PERSONAL & ADV INJURY \$
					GENERAL AGGREGATE \$
	GEN'L AGGREGATE LIMIT APPLIES PER:				PRODUCTS -COMP/OP AGG \$
	<input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC				
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT (Per accident) \$
	<input type="checkbox"/> ANY AUTO				BODILY INJURY (Per person) \$
	<input type="checkbox"/> ALL OWNED AUTOS				BODILY INJURY (Per accident) \$
	<input type="checkbox"/> SCHEDULED AUTOS				PROPERTY DAMAGE (Per accident) \$
	<input type="checkbox"/> HIRED AUTOS				
	<input type="checkbox"/> NON-OWNED AUTOS				
	GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT \$
	<input type="checkbox"/> ANY AUTO				OTHER THAN EA ACC \$
					AUTO ONLY: AGG \$
	EXCESS LIABILITY				EACH OCCURRENCE \$
	<input type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE				AGGREGATE \$
					\$
	<input type="checkbox"/> DEDUCTIBLE				\$
	<input type="checkbox"/> RETENTION \$				\$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				WC STATU-TORY LIMITS <input type="checkbox"/> OTH-ER \$
					E.L. EACH ACCIDENT \$
					E.L. DISEASE-EA EMPLOYEE \$
					E.L. DISEASE-POLICY LIMIT \$
A	OTHER Professional Liability	GS5857001	10/05/98	10/05/99	\$1,000,000 Aggregate \$1,000,000 Occurrence \$10,000 Deductible

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

The certificate holder above is listed as Additional Insured on the Policy. Professional Service Agreement No.QQ1000-E for Engineering Services in Support of Ecology & Environment's NYSDEC Stand-By Contract. This is a Claims Made Policy -10/5/94 Retro Date. Pollution Liability is included in this policy.

CERTIFICATE HOLDER

☒ ADDITIONAL INSURED; INSURER LETTER

CANCELLATION

N.Y. State Dept. of
Environmental Conservation and
Ecology and
Environment Engineering, P. C.,
368 Pleasant View Drive
Lancaster, NY 14086

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY)
4/16/99

PRODUCER

Paris-Kirwan Associates, Inc.
1040 University Avenue
Rochester, NY 14607

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER **A** Hartford Insurance Co.
COMPANY LETTER **B**
COMPANY LETTER **C**
COMPANY LETTER **D**
COMPANY LETTER **E**

INSURED

YEC, Inc. &
YEC Engineering, PC
612 Corporate Way
Valley Cottage NY 10989

COVERAGE

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO. LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFF. DATE (MM/DD/YY)	POLICY EXP. DATE (MM/DD/YY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMM. GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCC. <input type="checkbox"/> OWNER'S & CONTRACTOR'S PROT	01SBACG0943	2/17/99	2/17/00	GENERAL AGGREGATE 2000000 PROD-COMP/OP ACC. 2000000 PERS. & ADV. INJURY 1000000 EACH OCCURRENCE 1000000 FIRE DAMAGE (One First) 300000 MED. EXP. (One First) 10000
A	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRING AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/> GARAGE LIABILITY	01SBACG0943	2/17/99	2/17/00	COMBINED SINGLE LIMIT 1000000 BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE
A	ACCESS LIABILITY <input checked="" type="checkbox"/> UNINSURED FORM <input type="checkbox"/> OTHER THAN UNINSURED FORM	01SBACG0943	2/17/99	2/17/00	EACH OCCURRENCE 1000000 AGGREGATE 1000000
A	WORKERS' COMPENSATION AND EMPLOYER'S LIABILITY	01WECVT2485	2/17/99	2/17/00	STATUTORY LIMITS EACH ACCIDENT 100000 DISEASE-POLICY LIMIT 500000 DISEASE-EACH EMP. 100000
	OTHER				

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND ECOLOGY
AND ENVIRONMENT ENGINEERING, P.C. NAMED AS ADDITIONAL INSURED.

CERTIFICATE HOLDER

ECOLOGY AND ENVIRONMENT
ENGINEERING, P.C., D. GOULDING
388 PLEASANT VIEW DRIVE
LANCASTER, NY 14086

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Angelo Corvelli

1

2

3

Drilling Scope of Work



ecology and environment, inc.

Drilling Scope of Work

This work effort is part of a remedial investigation being conducted for our client. The purpose of this effort is to thoroughly investigate and appraise the potential impact to public health, welfare and the environment from past activities involving the release of PCBs. The site is located at 53 Luzerne Road in Glens Falls, New York. A total of nine wells, six shallow and three deep, as well as approximately 210 geoprobe boreholes, will be installed. Two drill crews will be required. The geoprobe crew will operate for the entire project duration, while the monitoring well crew will operate for approximately the second half of the field effort.

The geology beneath the site consists of lacustrine sands underlain by shale and limestone. Depth to bedrock is estimated to be approximately 120 feet below ground surface (BGS); no bedrock wells are to be installed. Groundwater is anticipated to be encountered at 16- to 24-feet BGS.

The following scope of work describes the various tasks involved in the project. The task descriptions correspond to the task costing information requested in Exhibit 2. The subcontractor will be responsible for:

- submission of a written health and safety plan for drilling activities at least five business days PRIOR TO COMMENCING WORK ON SITE;
- mobilizing all necessary equipment and supplies to the site AT THE BEGINNING of the respective field tasks (geoprobe and monitoring well installation);
- providing a steam cleaner and water tank for decontaminating all equipment FOR EACH DRILL CREW;
- arranging for water and power sources near the site;
- drilling and installing six shallow and three deep overburden monitoring wells as described in Tasks 2 and 3;
- providing a minimum of 3 complete split spoon samplers and conducting continuous split spoon sampling during all monitoring well borehole installation;

- using a second work crew, installing approximately 210 geoprobe boreholes, facilitating collection of both groundwater and subsurface soil samples, then backfilling each borehole with bentonite chips and bentonite/cement grout, as described in Task 4;
- removing all non-contaminated disposables such as sand bags, cement bags, and sheet plastic generated during drilling operations.

The subcontractor shall be prepared to be on site at the agreed-upon time and date arranged with E & E at the time of contract awarding. All drilling equipment needed will be on site at this time. Currently, it is anticipated field work will start in the summer of 1999. The geoprobe activity will commence first. After approximately two weeks of geoprobe activity, the drill rig crew will arrive on site and install all groundwater monitoring wells simultaneous to the continued operation of the geoprobe crew. Once on site, the subcontractor shall complete the work within four consecutive 5-day work weeks, as noted in Exhibit 2.

All nine wells and 210 geoprobe boreholes will be installed in relatively flat areas throughout the property. All work is expected to be conducted wearing Level D personal protection, although all personnel must be prepared to upgrade to Level C protection, if required.

The Lurzerne Road site is not a secure location. Leaving equipment on site overnight is at the discretion of the drilling contractor.

E & E will establish utility clearance for all subsurface activities. Contaminated investigation-derived waste disposal is the responsibility of the overall client.

TASK 1. MOBILIZATION/DEMOBILIZATION

Mobilize and demobilize equipment and personnel for all tasks described above; assemble and disassemble decontamination pad; and write and submit a site-specific health and safety plan for all drilling activities. The health and safety plan must be submitted to E & E for review (not approval) at least 5 business days prior to commencing any project-related activities.

TASK 2. SHALLOW OVERBURDEN MONITORING WELL INSTALLATION

Six overburden groundwater monitoring wells will be installed in the uppermost water bearing zone, which is assumed to be approximately 16 to 24 feet BGS. Each well borehole will be drilled using 4 1/4 inch hollow stem augers. Continuous split spoon samples will be collected from grade to total depth. Once total depth is reached, a 10-foot long well screen of 2-inch inner diameter (ID) schedule 40, flush threaded, polyvinyl chloride (PVC) with 0.01-inch slots will be placed on the bottom of the well. Threaded to the bottom of the 10-foot long screen will be a PVC end plug and threaded to the top of the screen will be 2 inch ID PVC well casing which will extend to two feet above grade. A sand filter pack of Morie brand # 0 or equivalent will be

TASK 3. DEEP OVERBURDEN MONITORING WELL INSTALLATION

Once total depth is reached, a 10-foot long well screen of 2-inch inner diameter (ID) schedule 40, flush threaded, polyvinyl chloride (PVC) with 0.01-inch slots will be placed on the bottom of the well. Threaded to the bottom of the 10-foot long screen will be a PVC end plug and threaded to the top of the screen will be 2 inch ID PVC well casing which will extend to two feet above grade. A sand filter pack of Morie brand # 0 or equivalent will be poured around the well screen from the bottom of the well to two feet above the screen. A seal of bentonite chips will be placed two feet above the sand pack hydrated using a clean water source. A slurry of cement/5% bentonite grout will be installed via tremie line from the bentonite seal to grade. A slip cap with a 3/8-inch vent hole will be placed on the PVC casing.

TASK 4. GEOPROBE BOREHOLE INSTALLATION

Well Protection

Each of the nine monitoring wells will be completed with a four-inch ID steel protective casing equipped with a locking cover. This protective casing will be set into the grout approximately three feet below grade and extend above the PVC well cap by two inches. A two-foot square by 3 1/2-inches thick, concrete drainage pad will be poured around the well casing within one day following well completion. A 1/4- to 1/2-inch diameter drain hole will be drilled through the steel protective casing not more than four inches above the surface of drainage pad. The steel casing will be painted using liquid (brush-on) bright yellow paint. Wells will be labeled via use of a paint stick. All wells will be secured with padlocks that are keyed alike.

Decontamination

Decontamination must be performed so that all down-hole equipment, as well as the back of the drill rig, can be effectively cleaned of site contamination. Decontamination will be accomplished by using high pressure steam. A decontamination pad is to be constructed to assist in keeping cleaned items from contacting the ground surface. Steam cleaning will be required before drilling each monitoring well borehole and prior to exiting the site. All down-hole geoprobe equipment will be decontaminated with clean water andalconox between each borehole. All decontamination fluids are to be containerized by the drilling subcontractor.

Investigation Derived Waste

It is planned that all Investigation Derived Waste (IDW), including soil cuttings and decontamination wastes, will be contained in 55-gallon drums by the drilling subcontractor. The drummed IDW will be moved to a central on-site staging area by the drilling subcontractor at the direction of E & E. Sampling and disposal of these wastes will not be the responsibility of the drilling subcontractor.

MEMORANDUM

TO: Drilling companies bidding on Luzerne Road drilling program

FROM: Jon Nickerson, RI Task Leader

RE: Changes to drilling scope of work

DATE: April 9, 1999

CC: S. Blair, P.E.

Various inquiries have been made regarding the drilling program at the Luzerne Road site. The following clarifications and changes have been made. Attached is a modified Exhibit 2.

1. Water samples will be collected from approximately 10 geoprobe holes; not from all 210 holes.
2. An additional effort involving installation of three boreholes at each of eight residences has been added. Also, two more boreholes will be added at the scope of work at the main site.
3. Based on an average installation rate of seven geoprobe boreholes per day, Geoprobe drilling is to be completed within a 34 working day period.
3. Only one of the deep wells will require a telescoping casing. The tophole of this well is to be drilled using 12 1/4-inch I.D. augers, and drilled to a depth of 40 feet. Ten-inch I.D. steel casing is then to be grouted in place. Following a minimum 24-hour period, the well is to be extended to a depth of 120 feet using 4 1/4" I.D. augers. The entire borehole is to be split spooned sampled from grade to total depth. Due to the time required to install 4 1/4 augers through the 10" casing to a depth of 40 feet, a line item of one hour of drill string assembly has been added.
4. The other two deep wells will be drilled from grade to a depth of 120 feet using a conventional non-telescoping approach. These wells will be split spoon sampled from grade to a total depth.
5. All monitoring well installation is to be completed in 13 working days.

REMINDER: All drilling is charged at unit rates. The total quantities stated in Exhibit 2 are estimates. E & E does not in any way guarantee that the quantities listed will be required during this RI.

MEMORANDUM

TO: Drilling companies bidding on Luzerne Road drilling program

FROM: Jon Nickerson, RI Task Leader

RE: Changes to drilling scope of work

DATE: April 14, 1999

CC: S. Blair, P.E.

E & E has learned additional information about the subsurface geology at the Luzerne Road site which indicates a change to the scope of work is necessary. In speaking with those who have experience drilling in the Warren County area, E & E has learned that the overburden soils below a depth of approximately 35 feet contain large cobbles and boulders. While this geology will not affect the geoprobe work or the shallow monitoring well installation work scopes, it has severe ramifications to the deep groundwater monitoring well installation work scope. This geology is extremely difficult to penetrate using augering methods. The approach which has proven successful in the past is using an ODEX system. E & E has thus modified the work scope to the following.

TASK 3: DEEP MONITORING WELL INSTALLATION

For the two non-telescoping deep wells, a 3 1/4" I.D. auger will be advanced as deep as possible, with continuously split spooning starting from ground surface. Once refusal is encountered by the split spoon, the augers will be removed (The hole will likely collapse, but this is not consequential.) A 4- or 6-inch I.D. (approximately) ODEX drill system will be advanced from grade to the desired depth (approximately 120 feet). A 2-inch diameter PVC well equipped with a 10-foot segment of screen will be installed. Casing stick-up will be 2-foot. A sand pack will extend from the bottom of the well to a height of 2 feet above the top of the screen. A 2-foot bentonite seal will then be installed and hydrated. Following a minimum period of one hour, a cement-bentonite slurry will be installed from the top of bentonite to a grade. The well will be equipped with a locking steel protective casing, and two-foot square anti-percollation collars will be constructed around each well not more than one day following construction.

E & E recognizes that the ODEX system uses various non-standard sizes for the flush-joint casing and bits. The final diameter of the hole need only be large enough to successfully construct a good well.

For the one deep well to be installed in the contaminated zone, 8 1/4 I.D augers will be advanced to a depth of 40 feet, with continuous split spooning. 6-inch casing will then be grouted in place as the augers are removed. Following a minimum period of 24 hours, the 4-inch ODEX system will be used to drill from a depth of 40 feet to a depth of 120 feet. A 2-inch diameter well will

Memorandum: Revised Deep Monitoring Well Installation Scope of Work

April 14, 1999

Page 2 of 2

then be constructed as described above.

All cuttings must be containerized, and the containers must be staged at a designated drum storage area on site by the drill crew.

Please complete the modified Exhibit 2 attached. Also, note that due to this change, all drilling quotations for this project are due by 11:00 on Tuesday, April 20, 1999. Faxed copies are acceptable as long as an original is received by noon on Friday, April 23, 1999. Bidders may choose to subcontract ODEX drilling. If this is done, note that E & E's contract requirements apply to all sub-subcontractors, as well.

EXHIBIT 2
PRICE SCHEDULE
LUZERNE ROAD SITE
GLENS FALLS, NEW YORK
(Modified April 14, 1999)

TASK 1. MOBILIZATION/DEMobilIZATION

Write health and safety plan for drilling personnel;
mobilize drill rig, geoprobe, drilling equipment, drilling
supplies, and well construction materials

(Lump Sum Cost) \$ _____

Decon pad construction and disassembly \$ _____

TASK 1 TOTAL: \$ _____

TASK 2. SHALLOW MONITORING WELL INSTALLATION

150 ft. of 4 1/4-inch hollow stem auger drilling (25 ft./well) (\$ _____/ft.) \$ _____

150 ft. of continuous split spoon sampling (78 samples) (\$ _____/ea.) \$ _____

60 ft. of 2-inch I.D., Sch. 40, 0.010 machine slotted,
flush threaded, PVC screen (10 ft./well) (\$ _____/ft.) \$ _____

6 2-inch PVC slip-on top caps (\$ _____/ea.) \$ _____

6 2-inch PVC flush threaded end caps (\$ _____/cap) \$ _____

102 ft. 2-inch I.D., Sch 40 PVC flush-joint well casing
(17 feet/well) (\$ _____/ft.) \$ _____

72 ft. 0.10-size sand filter pack (\$ _____/ft.) \$ _____

12 ft. bentonite pellet seal (\$ _____/ft.) \$ _____

66 ft. bentonite/cement grout (\$ _____/ft.) \$ _____

6 above-ground completions with lockable steel
protective casing, lock, 3 weep holes, concrete
drainage pad (\$ _____/well) \$ _____

7 events of decontamination (\$ _____/hr.) \$ _____

18 55-gallon steel drums (\$ _____/ea.) \$ _____

2 hours of Drum Staging

TASK 2 TOTAL: \$ _____

TASK 3. DEEP MONITORING WELL INSTALLATION

280 ft. of 3 1/4-inch hollow stem auger drilling (120 feet for each non-telescoping hole; 40 feet in telescoping hole	(\$_____/ft.)	\$_____
280 ft. of continuous split spoon sampling (140 samples)	(\$_____/ea.)	\$_____
240 feet of 4-inch or 6-inch ODEX drilling in two non-telescoping holes	(\$_____/ft.)	\$_____
40 ft. of 8 1/4-inch hollow stem auger drilling in telescoping hole	(\$_____/ft.)	\$_____
40 ft. 6-inch steel casing, grouted in place	(\$_____/ft.)	\$_____
One hour labor for installing 4-inch ODEX drill string in 6-inch casing	(\$_____/hr.)	\$_____
30 ft. of 2-inch I.D., Sch. 40, 0.010 machine slotted, flush threaded, PVC screen	(\$_____/ft.)	\$_____
3 2-inch PVC slip-on top caps	(\$_____/ea.)	\$_____
3 2-inch PVC flush threaded end caps	(\$_____/cap)	\$_____
336 ft. 2-inch I.D., Sch 40 PVC flush-joint well casing (112 feet/well)	(\$_____/ft.)	\$_____
36 ft. 0.10-size sand filter pack (12 ft. / well)	(\$_____/ft.)	\$_____
6 ft. bentonite pellet seal (2 ft./well)	(\$_____/ft.)	\$_____
318 ft. bentonite/cement grout	(\$_____/ft.)	\$_____
3 above-ground completions with lockable steel protective casing, lock, 3 weep holes, concrete drainage pad	(\$_____/well)	\$_____
5 events of decontamination (One initial decon; one following installation of 40-foot tophole; and one following installation of each well)		
Drums for containerizing all cuttings	(\$_____/drum)	\$_____
Drum staging	(\$_____/hr.)	\$_____

TASK 3 TOTAL: \$_____

TASK 4: GEOPROBE BOREHOLE INSTALLATION

Install 236 geoprobe boreholes; collect continuous soil samples from grade to specified depth. Collect groundwater using screen point and pump or mini-bailer from 10 of these 236 boreholes. Approximate depth of each hole is anticipated to be between 20 and 25 feet BGS. Each borehole will be backfilled with bentonite chips to within two feet of grade, then backfilled with bentonite/cement grout. All down-hole equipment will be decontaminated between borings.

Geoprobe and operator, and steam cleaning equipment	(\$ ____/day)	\$ ____
4248 ft. bentonite chips	(\$ ____/ft)	\$ ____
472 ft. bentonite/cement grout	(\$ ____/ft)	\$ ____

Other costs (please specify)	(\$ ____/ea)	\$ ____
	(\$ ____/ea)	\$ ____
	(\$ ____/ea)	\$ ____

TASK 4 TOTAL:	\$ ____
----------------------	---------

TOTAL CONTRACT NOT-TO-EXCEED PRICE:	\$ ____
--	---------

ALL WORK SHALL BE COMPLETED IN 33 CONSECUTIVE BUSINESS DAYS,
EXCLUDING WEEKENDS AND HOLIDAYS.

Please provide unit costs for the following items. If any of these items are required on the job,
costs based on the following rates will be added to the total not-to-exceed price.

Shelby tubes	\$ ____/ea.
Upgrade to Level C respiratory protection	\$ ____/hr.

Drilling Quotations



ecology and environment, inc.

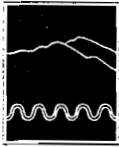
Drilling Quotations

Drilling Quotation Summary Comparison Table

Adjustments to the bids were required due to some bidders not providing quantities for all bid items. Also, each bidder was required to add the cost to conduct four hours of site clearing and collect five Shelby tubes. The following table summarizes these changes:

Vendor	Original Drilling Cost Quotation	Item	Unit Cost	Item Cost	Total Drilling Cost
Applied Earth Technologies	\$78,538.40	- Site Clearing	\$81/hr., 4 hrs.	\$ 324	\$ 81,599.40
		- Additional ODEX Drilling	\$26.40/ft.; 80 feet	\$ 2,112	
		- Shelby Tube Collection	5 tube;\$150 ea.	\$ 625	
American Auger	\$95,611	- Site Clearing	\$95/hr., 4 hrs.	\$ 380	\$ 100,691
		- Additional Day of Geoprobe	\$1,250 /day	\$ 1,250	
		- Shelby Tube Collection	5 tubes; \$150 ea.	\$ 750	
		-Subtract water truck	\$2,700	\$ 2,700	
SJB Services, Inc.	\$105,459	- Site Clearing	\$130/hr., 4 hrs.	\$ 520	\$ 110,729
		- Additional ODEX Drilling	\$55/ft.; 80 feet	\$ 4,400	
		- Shelby Tube Collection	5 tubes @ \$70 ea.	\$ 350	

See Attached Quotes.



Applied Earth Technologies

Environmental and Geotechnical Services

800-607-6883

One Roosevelt Highway, Suite 117
Colchester, Vermont 05445
802-655-0211 • FAX 802-655-1258
email: aet@together.net

6589 US Highway 11
Canton, New York 13617
315-265-5036 • FAX 315-265-5104
email: terratec@earthweb.com

April 20, 1999

Proposal 9904012

Mr. Jon Nickerson
Ecology & Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086
Phone: 716-684-8060
FAX: 716-684-0844

**RE: Drilling Services at Luzerne Road Site, Glens Falls, Warren County, NY
E&E Project QQ08**

Dear Mr. Nickerson:

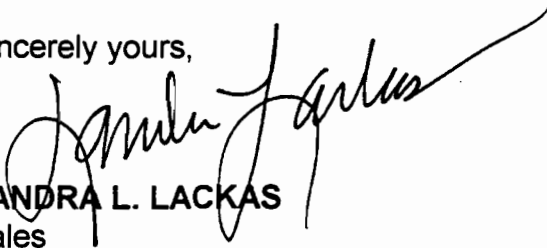
Applied Earth Technologies (AET) is pleased to present this proposal for your consideration as follows:

- Pricing in Exhibit 2
- Copy of Current Certificate of Insurance
- Subcontractor Acknowledgment Form
- Subcontractor Certification Form with New York WBE Certification
- Subcontractor's Bid Response Form
- Notices

We will perform all services in a professional manner in accordance with all applicable federal, state and local regulations.

Thank you for considering Applied Earth Technologies. Please don't hesitate to call me at 800/607-6883 or 315/265-5036 with any questions regarding this project or any other that we may assist you with.

Sincerely yours,



SANDRA L. LACKAS
Sales

(Signing for Antonia L. Bouchard, CEO)

PRICE SCHEDULE – EXHIBIT 2

See Attachment.

CERTIFICATE OF INSURANCE

See Attachment.

SUBCONTRACTOR ACKNOWLEDGEMENT

See Attachment.

SUBCONTRACTOR CERTIFICATION

See Attachment.

SUBCONTRACTOR'S BID RESPONSE FORM

See Attachment.

NOTICES

This quotation is submitted with the following assumptions:

1. E&E will clear all boring locations for public and private underground utilities and provide written notice to AET of such.
2. AET will prepare a Site Safety Plan and submit to E&E for review at least 5 days prior to commencing work.
3. AET will mobilize 3 drilling teams.

4. There are no obstructions that will restrict the free movement of personnel and/or equipment.
5. The Client will:
 - clear access to the site;
 - assure that the site is drill rig accessible;
 - identify the boring locations & decontamination/drum staging area;
 - develop & sample the wells.
6. Drumming of waste will be required. Drums will be staged. Disposal of the waste will be the Client's responsibility.
6. Site restoration may be required on a case-specific basis and is not included in the pricing.
7. Standby time (time delays uncontrolled by AET) will be invoiced based on the fee of \$140/hour.
8. Level D Personal Protection Equipment is required. AET will be prepared to upgrade to Level C if required.
9. Prevailing wages or Davis Bacon Act wages do not apply for Warren County NY.
10. Schedule: Geoprobe Drilling/Sampling = 34 days
Drilling/Sampling/Monitoring Well Installation = AET estimates 7 days

All current federal and state laws and regulations take precedence over this contract.

TASK 3. DEEP MONITORING WELL INSTALLATION

280 ft. of 3 1/4-inch hollow stem auger drilling (120 feet for each non-telescoping hole; 40 feet in telescoping hole)	(\$16.30 /ft.)	\$ 4564
280 ft. of continuous split spoon sampling (140 samples)	(\$16.30 /ea.)	\$ 4564
240 feet of 4-inch or 6-inch ODEX drilling in two non-telescoping holes	(\$26.70 /ft.)	\$ 6336
40 ft. of 8 1/4-inch hollow stem auger drilling in telescoping hole	(\$19.10 /ft.)	\$ 764
40 ft. 6-inch steel casing, grouted in place	(\$99.00 /ft.)	\$ 3960
One hour labor for installing 4-inch ODEX drill string in 6-inch casing	(\$275 /hr.)	\$ 275
30 ft. of 2-inch I.D., Sch. 40, 0.010 machine slotted, flush threaded, PVC screen	(\$8.30 /ft.)	\$ 249
3 2-inch PVC slip-on top caps	(\$4.00 /ea.)	\$ 12.00
3 2-inch PVC flush threaded end caps	(\$18.00 /cap)	\$ 54.00
336 ft. 2-inch I.D., Sch 40 PVC flush-joint well casing (112 feet/well)	(\$6.00 /ft.)	\$ 2016
36 ft. 0.10-size sand filter pack (12 ft. / well)	(\$5.20 /ft.)	\$ 187.20
6 ft. bentonite pellet seal (2 ft./well)	(\$31.05 /ft.)	\$ 186.30
318 ft. bentonite/cement grout (<i>by Tremie method</i>)	(\$8.00 /ft.)	\$ 2544
3 above-ground completions with lockable steel protective casing, lock, 3 weep holes, concrete drainage pad	(\$140 /well)	\$ 420
5 events of decontamination (One initial decon; one following installation of 40-foot tophole; and one following installation of each well)	\$ 70 /hr	350
Drums for containerizing all cuttings - 18	(\$55 /drum)	\$ 990
Drum staging - 2 hours	(\$60 /hr.)	\$ 120
TASK 3 TOTAL:		\$27591.50

TASK 4: GEOPROBE BOREHOLE INSTALLATION

Install 236 geoprobe boreholes; collect continuous soil samples from grade to specified depth. Collect groundwater using screen point and pump or mini-bailer from 10 of these 236 boreholes. Approximate depth of each hole is anticipated to be between 20 and 25 feet BGS. Each borehole will be backfilled with bentonite chips to within two feet of grade, then backfilled with bentonite/cement grout. All down-hole equipment will be decontaminated between borings.

Page 3 of 3

34d. - Geoprobe and operator, and steam cleaning equipment	(\$ 880/day)	\$ 29920
4248 ft. bentonite chips	(\$0.50/ft)	\$ 2124
472 ft. bentonite/cement grout	(\$3.25/ft)	\$ 1532
Other costs (please specify)		
13- 55 gallon steel drums	(\$ 55/ea)	\$ 715
2 hr - drum staging	(\$ 60/ea)hr	\$ 120
10 - expendables	(\$17.25/ea)	\$ 172.50
TASK 4 TOTAL:		\$ 34583.50
TOTAL CONTRACT NOT-TO-EXCEED PRICE:		\$ 78538.40

ALL WORK SHALL BE COMPLETED IN 33 CONSECUTIVE BUSINESS DAYS, EXCLUDING WEEKENDS AND HOLIDAYS. (Geoprobe work is estimated 234 days)

Please provide unit costs for the following items. If any of these items are required on the job, costs based on the following rates will be added to the total not-to-exceed price.

Shelby tubes	\$ 125/ea.
Upgrade to Level C respiratory protection	\$ ____/hr.

Drilling/ Well Installation/ Logging
increase to upgrade to Level C = 10%

ACORD. CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD/YY)

DUCKER

Black and Parker, Inc.
55 East Jackson Boulevard
Suite 600
Chicago, IL 60604-4187

TAM

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER A	RELIANCE NATIONAL COMPANIES
COMPANY LETTER B	FEDERAL INSURANCE COMPANY (CHUBB)
COMPANY LETTER C	
COMPANY LETTER D	
COMPANY LETTER E	

INSURED

Applied Earth Technologies
6589 U.S. Highway 11
Canton, NY 13617

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
A	GENERAL LIABILITY	NSA1114600-01 PKG	4/15/98	4/15/99	GENERAL AGGREGATE \$N/A
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OP AGG. \$2,000,000
	<input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR.				PERSONAL & ADV. INJURY \$INCL OCC
	<input type="checkbox"/> OWNERS & CONTRACTORS PROT.				EACH OCCURRENCE \$2,000,000
	<input checked="" type="checkbox"/> X, C, U				FIRE DAMAGE (Any one fire) \$ 250,000
A	AUTOMOBILE LIABILITY	NKA1114638-01 BAP	4/15/98	4/15/99	MED EXPENSE (Any one person) \$N/A
	<input checked="" type="checkbox"/> ANY AUTO				COMBINED SINGLE LIMIT \$2,000,000
	<input type="checkbox"/> ALL OWNED AUTOS				BODILY INJURY (Per Person) \$
	<input type="checkbox"/> SCHEDULED AUTOS				BODILY INJURY (Per Accident) \$
	<input type="checkbox"/> HIRED AUTOS				PROPERTY DAMAGE \$
B	EXCESS LIABILITY	(99)79759193 XSL	4/15/98	4/15/99	EACH OCCURRENCE \$1,000,000
	<input type="checkbox"/> UMBRELLA FORM				AGGREGATE \$1,000,000
	<input checked="" type="checkbox"/> OTHER THAN UMBRELLA FORM				PROD. COMP/OP \$1,000,000
	<input type="checkbox"/> PHYS. DAMAGE				X STATUTORY LIMITS
	<input checked="" type="checkbox"/> Phys. damage \$500 coll/comp ded				EACH ACCIDENT \$2,000,000
A	WORKER'S COMPENSATION AND EMPLOYERS' LIABILITY	NWA1114639-01 WC	4/15/98	4/15/99	DISEASE-POLICY LIMIT \$2,000,000
	<input type="checkbox"/> WORKER'S COMPENSATION				DISEASE-EACH EMPLOYEE \$2,000,000
	<input type="checkbox"/> AND				
	<input type="checkbox"/> EMPLOYERS' LIABILITY				
A	OTHER	NTF2509759-01	4/15/98	4/15/99	CLAIMS MADE COVERAGE
	Pollution/Professional Liability				\$1,000,000 each claim
					\$1,000,000 aggregate

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

CERTIFICATE HOLDER 00038

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

FOR BIDDING PURPOSES ONLY

AUTHORIZED REPRESENTATIVE

TAM

SUBCONTRACTOR ACKNOWLEDGMENT FORM

I, Sandra Lackas, on behalf of Subcontractor, confirm the following:

1. I have reviewed and am in Agreement with the costs presented in the attached Bid Proposal Sheet/Schedule of Prices, and understand that the work described in the plans and specifications will be completed in full for the price presented;
2. I have reviewed all pertinent documents made available to us in preparing the cost estimate, including the Draft Subcontract Agreement; and
3. I agree to enter into the Subcontract Agreement without further modification, if selected for this project and understand that E & E at its discretion may determine our bid to be non-responsive if any subsequent Subcontract Agreement modification is presented.

Sandra Lackas
Signature of Authorized Subcontractor
Representative

Applied Earth Technologies
Name of Subcontractor Canton NY

SUBCONTRACTOR'S CERTIFICATION FORM

The Subcontractor, Applied Earth Technologies represents and certifies that it is as prescribed by:

TerraTech Incorporated dba Applied Earth Technologies
(Company Name)

applicable provisions of the laws of the State of New York, a:

☐ Minority Owned Business

☐ Disadvantaged Business

☒ Women Owned Business

☐ Other _____

☒ A copy of the certification is attached hereto (if applicable)

Antonia L. Bouchard

Certifying Officer of Corporation

CEO

Title

4-19-99

Date

Notice: Any person who misrepresents a firm status as a business concern in order to obtain a contract or subcontract to be awarded under preference programs established by law may be subject to criminal or civil action and other penalty as may be proscribed by law.

Rev. 8/95
Boilerlegal-2600

Empire State Development

Michelle Marquez-Melecio
Vice President
Affirmative Action, Compliance and Certification

July 23, 1997

ANTONIA BOUCHARD
TERRATECH INCORPORATED
6589 U S HIGHWAY 11
CANTON, NY 13617

Dear ANTONIA BOUCHARD:

This letter is sent to confirm your continued certification as a WBE-Owned Business Enterprise.

Be advised that your certification remains in effect until such time as you are contacted by this Office for recertification.

Please keep in mind that any changes which affect ownership, managerial, and/or operational control, (i.e. company name, business address, telephone numbers, principal products/services and bonding capacity, etc) must be reported to this Office within 30 days of the occurrence of such changes. Failure to submit any changes could result in your firm's certification status being revoked and the name of your firm removed from the Directory.

If your certification status is questioned by any public or private entity, you may direct the inquiry to this Office for further clarification. Should you have any questions regarding this matter, you may contact me at (518) 473-0582.

We wish you continued success in your future endeavors.

Sincerely,

Michelle Marquez-Melecio

Michelle Marquez-Melecio

File # 4951

JUL 25

SUBCONTRACTOR'S BID RESPONSE FORM

TO: *Sandra Lackas*
Ms. Sondra Lockas
Applied Earth Technologies
6589 US Hwy 11
Canton, NY 13617

DATE: April 8, 1999

Re: Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Services Needed: Drilling
Client: New York State DEC
E & E Project No.: QQ08

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

Jon Nickerson
Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

Telephone No.: 716/684-8060
Fax No.: 716/684-0844

☒ Bid enclosed.

☐ No bid due to the following:

Please maintain our company on your bidder's list.

Signature

Printed

Title

Sandra Lackas
Sandra Lackas
Sales Date 4-19-99



Applied Earth Technologies

Environmental and Geotechnical Services

800-607-6883

One Roosevelt Highway, Suite 110
Colchester, Vermont 05446
802-655-0211 • FAX 802-655-1258
email: cel@together.net

6589 US Highway 11
Canton, New York 13617
315-265-5036 • FAX 315-265-5104
email: terrotec@northweb.com

April 26, 1999

Proposal 9904012R1

Mr. Jon Nickerson
Ecology & Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086
Phone: 716-684-8060
FAX: 716-684-0844

**RE: Drilling Services at Luzerne Road Site, Glens Falls, Warren County, NY
E&E Project QQ08 – Revision 1**

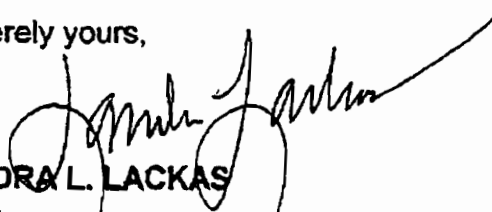
Dear Mr. Nickerson:

Per our discussion this morning, here is the response to your questions:

1. Geoprobe acetate liners are covered under the 10 expendables @ \$172.50.
2. Sourcing water = no added fees.
3. 80 additional feet of ODEX drilling @ \$26.40/foot.
4. 40 Hour Certification – covered for the subcontractor.
5. Site Clearing = \$81/hour (includes manpower and chain/handsaws).

Thank you for considering Applied Earth Technologies. Please don't hesitate to call me at 800/607-6883 or 315/265-5036 with any questions regarding this project or any other that we may assist you with.

Sincerely yours,


SANDRA L. LACKAS
Sales

(Signing for Antonia L. Bouchard, CEO)

**EXHIBIT 2
PRICE SCHEDULE
LUZERNE ROAD SITE
GLENS FALLS, NEW YORK
(Modified April 14, 1999)**

American Auger

TASK 1. MOBILIZATION/DEMOBILIZATION

Write health and safety plan for drilling personnel;
mobilize drill rig, geoprobe, drilling equipment, drilling
supplies, and well construction materials

(Lump Sum Cost) \$ 3000

Decon pad construction and disassembly

\$ 400.**TASK 1 TOTAL:**\$ 3400.**TASK 2. SHALLOW MONITORING WELL INSTALLATION**

150 ft. of 4 1/4-inch hollow stem auger drilling (25 ft./well)	(\$ <u>13.</u> /ft.)	\$ <u>1950.</u>
(2") 150 ft. of continuous split spoon sampling (78 samples)	(\$ <u>10.</u> /ea.)	\$ <u>1500.</u>
60 ft. of 2-inch I.D., Sch. 40, 0.010 machine slotted, flush threaded, PVC screen (10 ft./well)	(\$ <u>4.</u> /ft.)	\$ <u>240.</u>
6 2-inch PVC slip-on top caps	(\$ <u>5.</u> /ea.)	\$ <u>30.</u>
6 2-inch PVC flush threaded end caps	(\$ <u>7.</u> /cap)	\$ <u>42.</u>
102 ft. 2-inch I.D., Sch 40 PVC flush-joint well casing (17 feet/well)	(\$ <u>2.</u> /ft.)	\$ <u>204.</u>
72 ft. 0.10-size sand filter pack	(\$ <u>7.</u> /ft.)	\$ <u>504.</u>
12 ft. bentonite pellet seal	(\$ <u>15.</u> /ft.)	\$ <u>180.</u>
66 ft. bentonite/cement grout	(\$ <u>8.</u> /ft.)	\$ <u>528.</u>
6 above-ground completions with lockable steel protective casing, lock, 3 weep holes, concrete drainage pad	(\$ <u>100.</u> /well)	\$ <u>600.</u>
7 events of decontamination	(\$ <u>95.</u> /hr.)	\$ <u>665.</u>
18 55-gallon steel drums	(\$ <u>40.</u> /ea.)	\$ <u>720.</u>
2 hours of Drum Staging	125./hr.	250.
6 Water Truck @ 150./day		1620.
6 Crew Per Diem		\$ <u>4033.</u>
TASK 2 TOTAL: = 900.	@ 120./day = 720.	

9753

TASK 3. DEEP MONITORING WELL INSTALLATION

* 366 ft. 2" Well Installation inside 6" ODEX	24./ft.	8784.
280 ft. of 3 1/4-inch hollow stem auger drilling (120 feet for each non-telescoping hole; 40 feet in telescoping hole	(\$ 12. /ft.)	\$ 3360.
280 ft. of continuous split spoon sampling (140 samples)	(\$ 10. /ea.)	\$ 2800.
320 240 feet of 4-inch or 6-inch ODEX drilling in two non-telescoping holes	(\$ 37. /ft.)	\$ 11840.
40 ft. of 8 1/4-inch hollow stem auger drilling in telescoping hole	(\$ 19. /ft.)	\$ 760.
40 ft. 6-inch steel casing, grouted in place	(\$ 42. /ft.)	\$ 1680.
One hour labor for installing 4-inch ODEX drill string in 6-inch casing	(\$ 125./hr.)	\$ 125.
- 30 ft. of 2-inch I.D., Sch. 40, 0.010 machine-slotted, flush threaded, PVC screen	(\$ 4. /ft.)	\$
- 3 2-inch PVC slip-on top caps	(\$ 4. /ea.)	\$
- 3 2-inch PVC flush threaded end caps	(\$ 7. /cap)	\$
- 336 ft. 2-inch I.D., Sch 40 PVC flush joint well casing (112 feet/well)	(\$ 2. /ft.)	\$
- 36 ft. 0.10 size sand filter pack (12 ft. /well)	(\$ 7. /ft.)	\$
6 ft. bentonite pellet seal (2 ft./well)	(\$ 15. /ft.)	\$
- 318 ft. bentonite/cement grout.	(\$ 8. /ft.)	\$
3 above-ground completions with lockable steel protective casing, lock, 3 weep holes, concrete drainage pad	(\$ 100. /well)	\$ 300.
5 events of decontamination (One initial decon; one following installation of 40-foot tophole; and one following installation of each well)	95. /hr.	475.
Drums for containerizing all cuttings	(\$ 40. /drum)	\$
Drum staging	(\$ 125./hr.)	\$
(7 Water Truck 150./day) (7 PER Diem 3 man crew 120./day)		\$ 1890.
TASK 3 TOTAL: = 1050.		\$ 32014.

TASK 4: GEOPROBE BOREHOLE INSTALLATION

Install 236 geoprobe boreholes; collect continuous soil samples from grade to specified depth. Collect groundwater using screen point and pump or mini-bailer from 10 of these 236 boreholes. Approximate depth of each hole is anticipated to be between 20 and 25 feet BGS. Each borehole will be backfilled with bentonite chips to within two feet of grade, then backfilled with bentonite/cement grout. All down-hole equipment will be decontaminated between borings.

Page 3 of 3

33 Geoprobe and operator, and steam cleaning equipment	(\$1250/day)	\$ 41250.
4248 ft. bentonite chips	(\$ 1 /ft)	\$ 4248.
472 ft. bentonite/cement grout	(\$ 2 /ft)	\$ 944.

Other costs (please specify)		
1574-3' Liners	(\$ 3 /ea)	\$ 4722.
	(\$ /ea)	\$
	(\$ /ea)	\$

TASK 4 TOTAL:	\$51164.
---------------	----------

TOTAL CONTRACT NOT-TO-EXCEED PRICE:	\$95611.
-------------------------------------	----------

Probe
~~ALL~~ WORK SHALL BE COMPLETED IN ³⁴ ~~33~~ CONSECUTIVE BUSINESS DAYS,
 EXCLUDING WEEKENDS AND HOLIDAYS.

Please provide unit costs for the following items. If any of these items are required on the job, costs based on the following rates will be added to the total not-to-exceed price.

Shelby tubes	\$ 150 /ea.
Upgrade to Level C respiratory protection	\$ 45 /hr. Per man

2"
 *Well Installation inside 6" ODEX casing while removing 6" Casing
 is very difficult therefore standard 2" PVC Well rates
 do not apply.

APR 23 '99 12:21

PAGE.01



Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218

Phone: (716) 821-5911
Fax: (716) 821-0163

55 Oliver Street
Cohoes, New York 12047

Phone: (518) 238-1145
Fax: (518) 238-1249

P.O. Box 416 • 208 Le Fevre Road
Stockertown, PA 18083

Phone: (610) 746-2670
Fax: (610) 746-2669

TOLL FREE: 1-800-821-5911

FAX TRANSMITTAL

DATE: 4/21/99

PLEASE DELIVER TO THE FOLLOWING:

NAME: Jon Nickerson

FIRM: E & E

FAX NO: 684-0844

FROM: JOE GENOVESE
BUFFALO OFFICE

TOTAL NUMBER OF PAGES TO FOLLOW: 7

COMMENTS: _____

☐ ORIGINAL WILL NOT FOLLOW

☐ ORIGINAL WILL FOLLOW BY:

- ☐ REGULAR MAIL
- ☐ OVERNIGHT COURIER
- ☐ OTHER

NOTE:

IF YOU DO NOT RECEIVE ALL THE PAGES OR IF THE QUALITY IS NOT SUITABLE, PLEASE CALL (716) 821-5911 AS SOON AS POSSIBLE.



"QUALITY & SERVICE THE WAY IT USED TO BE"





Contract Drilling and Testing

1951-1 Hamburg Turnpike
Buffalo, NY 14218

Phone: (716) 821-5911
Fax: (716) 821-0163

55 Oliver Street
Cohoes, New York 12047

Phone: (518) 238-1145
Fax: (518) 238-1249

P.O. Box 416 • 208 Le Fevre Road
Stockertown, PA 18083

Phone: (610) 746-2670
Fax: (610) 746-2669

TOLL FREE: 1-800-821-5911

April 21, 1999

Ecology & Environment, Inc.
Buffalo Corporate Center
368 Pleasant View Drive
Lancaster, New York 14086
(716) 684-8060 / Fax (716) 684-0844

Attention: Jon Nickerson

Reference: **Drilling Services**
Luzerne Road Bid
Glen Falls, New York
E&E Project No.: QQ08

Dear Jon,

SJB SERVICES, INC. (SJB) is pleased to present our Unit Price Cost Summary for the above referenced site.

It is our understanding that the scope of work will include direct push and hollow stem auger and 4-inch ODEX methods for sampling and well installation as described in your Request for Proposal dated April 8, 1999. Please note our comments on page 3 of your cost summary.

Our costs to provide these services are included on the attached cost summary. Actual billing will reflect field quantities and the unit rates quoted.

We appreciate the opportunity to submit our proposal and we look forward to working with your firm on this project. If you should have any questions or wish to discuss our proposal further, please do not hesitate to contact our office at any time.

Very truly yours,
SJB SERVICES, INC.

Joseph L. Genovese
Joseph L. Genovese
Drilling Services Coordinator



"QUALITY & SERVICE THE WAY IT USED TO BE"



EXHIBIT 2
PRICE SCHEDULE
LUZERNE ROAD SITE
GLENS FALLS, NEW YORK
(Modified April 14, 1999)

TASK 1. MOBILIZATION/DEMOBILIZATION

Write health and safety plan for drilling personnel;
mobilize drill rig, geoprobe, drilling equipment, drilling
supplies, and well construction materials

(Lump Sum Cost) \$ 18,000.00

Decon pad construction and disassembly \$ 300.00

TASK 1 TOTAL: \$ 18,300.00

TASK 2. SHALLOW MONITORING WELL INSTALLATION

150 ft. of 4 1/4-inch hollow stem auger drilling (25 ft./well) (\$ 10. /ft.) \$ 1,500.00

150 ft. of continuous split spoon sampling (78 samples) (\$ 6. /ea.) \$ 900.00

60 ft. of 2-inch I.D., Sch. 40, 0.010 machine slotted,
flush threaded, PVC screen (10 ft./well) (\$ 3. /ft.) \$ 180.00

6 2-inch PVC slip-on top caps (\$ 4. /ea.) \$ 24.00

6 2-inch PVC flush threaded end caps (\$ 4. /cap) \$ 24.00

102 ft. 2-inch I.D., Sch 40 PVC flush-joint well casing
(17 feet/well) (\$ 1.50 /ft.) \$ 153.00

72 ft. 0.10-size sand filter pack (\$ 7. /ft.) \$ 504.00

12 ft. bentonite pellet seal (\$ 11. /ft.) \$ 132.00

66 ft. bentonite/cement grout (\$ 9. /ft.) \$ 594.00

6 above-ground completions with lockable steel
protective casing, lock, 3 weep holes, concrete
drainage pad (\$ 150. /well) \$ 900.00

7 events of decontamination (\$ 130. /hr.) \$ 910.00

18 55-gallon steel drums (\$ 40. /ea.) \$ 720.00

2 hours of Drum Staging (\$ 130. /hr.) \$ 260.00

TASK 2 TOTAL: \$ 6,801.00

TASK 3. DEEP MONITORING WELL INSTALLATION

280 ft. of 3 1/4-inch hollow stem auger drilling (120 feet for each non-telescoping hole; 40 feet in telescoping hole	(\$ 16. /ft.)	\$ 4,480.00
280 ft. of continuous split spoon sampling (140 samples)	(\$ 6. /ea.)	\$ 1,680.00
240 feet of 4-inch or 4-inch ODEX drilling in two non-telescoping holes	(\$ 55. /ft.)	\$ 13,200.00
40 ft. of 8 1/4-inch hollow stem auger drilling in telescoping hole	(\$ 19. /ft.)	\$ 760.00
40 ft. 6-inch steel casing, grouted in place	(\$ 25. /ft.)	\$ 1,000.00
One hour labor for installing 4-inch ODEX drill string in 6-inch casing	(\$130. /hr.)	\$ 130.00
30 ft. of 2-inch I.D., Sch. 40, 0.010 machine slotted, flush threaded, PVC screen	(\$ 3. /ft.)	\$ 90.00
3 2-inch PVC slip-on top caps	(\$ 4. /ea.)	\$ 12.00
3 2-inch PVC flush threaded end caps	(\$ 4. /cap)	\$ 12.00
336 ft. 2-inch I.D., Sch 40 PVC flush-joint well casing (112 feet/well)	(\$ 1.50 /ft.)	\$ 504.00
36 ft. 0.10-size sand filter pack (12 ft. / well)	(\$ 7. /ft.)	\$ 252.00
6 ft. bentonite pellet seal (2 ft./well)	(\$ 11. /ft.)	\$ 66.00
318 ft. bentonite/cement grout	(\$ 9. /ft.)	\$ 2,862.00
3 above-ground completions with lockable steel protective casing, lock, 3 weep holes, concrete drainage pad	(\$150. /well)	\$ 450.00
5 events of decontamination (One initial decon; one following installation of 40-foot tophole; and one following installation of each well)	(\$150./well)	\$ 750.00
Drums for containerizing all cuttings	(\$ 40. /drum)	\$ UNKNOWN
Drum staging	(\$130./hr.)	\$ UNKNOWN
Compressor, 350CFM, 250PSI (6 days)	(\$400./day)	\$ 2,400.00
TASK 3 TOTAL:		\$28,648.00

TASK 4: GEOPROBE BOREHOLE INSTALLATION

Install 236 geoprobe boreholes; collect continuous soil samples from grade to specified depth. Collect groundwater using screen point and pump or mini-bailer from 10 of these 236 boreholes. Approximate depth of each hole is anticipated to be between 20 and 25 feet BGS. Each borehole will be backfilled with bentonite chips to within two feet of grade, then backfilled with bentonite/cement grout. All down-hole equipment will be decontaminated between borings.

Page 3 of 3

Geoprobe and operator, and steam cleaning equipment	(\$1100/day)	\$ 37,400.00
4248 ft. bentonite chips	(\$ 3. /ft)	\$ 12,744.00
472 ft. bentonite/cement grout	(\$ 3. /ft)	\$ 1,416.00

Other costs (please specify)

Screen Point Sampling 10 Ea.	(\$15. /ea)	\$ 150.00
	(\$ /ea)	\$
	(\$ /ea)	\$

TASK 4 TOTAL: \$ 51,710.00

TOTAL CONTRACT NOT-TO-EXCEED PRICE: *** \$105,459.00

ALL WORK SHALL BE COMPLETED IN 33 CONSECUTIVE BUSINESS DAYS,
EXCLUDING WEEKENDS AND HOLIDAYS.

Please provide unit costs for the following items. If any of these items are required on the job,
costs based on the following rates will be added to the total not-to-exceed price.

Shelby tubes	\$ 70. /ea.
Upgrade to Level C respiratory protection	\$ 25. /hr.



*** **Note: Estimated Project Completion Between 33 – 40 Days**

Payment for deep locations to include reimbursement for abandonment and redrilling if refusal is encountered prior to reaching depth. If wells take longer than 2 days each to complete as per previous ODEX drilling, additional time would be added to the contract. All equipment damaged and lost downhole will be invoiced at cost plus 20 %.

Upon award and mobilization of ODEX equipment to the site, the mobilization and demobilization costs as per the contract documents will be invoiced in full.


SUBCONTRACTOR ACKNOWLEDGMENT FORM

I, Joseph J. Gnare, on behalf of Subcontractor, confirm the following:

- ✓ 1. I have reviewed and am in Agreement with the costs presented in the attached Bid Proposal Sheet/Schedule of Prices, and understand that the work described in the plans and specifications will be completed in full for the price presented;
- ✓ 2. I have reviewed all pertinent documents made available to us in preparing the cost estimate, including the Draft Subcontract Agreement; and
- ✓ 3. I agree to enter into the Subcontract Agreement without further modification, if selected for this project and understand that E & E at its discretion may determine our bid to be non-responsive if any subsequent Subcontract Agreement modification is presented.

Joseph J. Gnare
Signature of Authorized Subcontractor
Representative

SJB SERVICES, INC
Name of Subcontractor

✓ SEE NOTE PAGE 3 OF 3 

ACORD. CERTIFICATE OF INSURANCECSR-ET
ABCPA-8

DATE (MM/DD/YY)

06/22/98

PRODUCERHANNA INC. OF UPSTATE NY
LAKESHORE ROAD
BUFFALO NY 14219

Phone No. 716-822-1100

Fax No.

INSUREDS.J.B. Services, Inc.
1951 Hamburg Turnpike
Lackawanna NY 14218

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY A	Transcontinental Insurance Co.
COMPANY B	Ins. Co. of the State of PA
COMPANY C	Reliance Ins Co of Illinois
COMPANY D	

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
A	GENERAL LIABILITY	1082077114	04/15/98	03/31/99	GENERAL AGGREGATE \$ \$2,000,000.
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY				PRODUCTS - COMP/PROPAGS \$2,000,000.
	<input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR				PERSONAL & ADV INJURY \$ \$1,000,000.
	<input type="checkbox"/> OWNER'S & CONTRACTOR'S PROT				EACH OCCURRENCE \$ \$1,000,000.
	<input checked="" type="checkbox"/> X, C & U				FIRE DAMAGE (Any one fire) \$ \$50,000.
A	<input checked="" type="checkbox"/> PER PROJ/PER LOCA	1082077128	04/15/98	03/31/99	MED EXP (Any one person) \$ \$5,000
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT \$ \$1,000,000.
	<input checked="" type="checkbox"/> ANY AUTO				BODILY INJURY (Per person) \$
	<input type="checkbox"/> ALL OWNED AUTOS				BODILY INJURY (Per accident) \$
	<input checked="" type="checkbox"/> SCHEDULED AUTOS				PROPERTY DAMAGE \$
	<input checked="" type="checkbox"/> HIRED AUTOS				
	<input checked="" type="checkbox"/> NON-OWNED AUTOS				
	GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT \$
	<input type="checkbox"/> ANY AUTO				OTHER THAN AUTO ONLY: -
					EACH ACCIDENT \$
					AGGREGATE \$
B	EXCESS LIABILITY	4798-9755	03/31/98	03/31/99	EACH OCCURRENCE \$ \$5,000,000
	<input checked="" type="checkbox"/> UMBRELLA FORM				AGGREGATE \$ \$5,000,000
	<input type="checkbox"/> OTHER THAN UMBRELLA FORM				\$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	1082077100	04/15/98	03/31/99	<input checked="" type="checkbox"/> STATUTORY LIMITS
	<input type="checkbox"/> INCL				EACH ACCIDENT \$ \$1,000,000.
	<input type="checkbox"/> EXCL				DISEASE - POLICY LIMIT \$ \$1,000,000.
	THE PROPRIETOR/PARTNERS/EXECUTIVE OFFICERS ARE:				DISEASE - EACH EMPLOYEE \$1,000,000.
	OTHER				
C	POLLUTION LEGAL	NTP1632185	04/01/97	10/01/98	PER LOSS \$1,000,000.
	PROFESSIONAL LIAB				EA. OCC. \$1,000,000.
B		4798-9755	03/31/98	03/31/99	

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

#0209

CERTIFICATE HOLDER

0209006

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT. BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE



SUBCONTRACTOR'S BID RESPONSE FORM

TO: Mr. Joe Genovese
SJB Drilling
1951 Hamburg Turnpike
Box 5793-1
Buffalo, NY 14218

DATE: April 8, 1999

Re: Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Services Needed: Drilling
Client: New York State DEC
E & E Project No.: QQ08

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

Jon Nickerson
Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

Telephone No.: 716/684-8060
Fax No.: 716/684-0844

☒ Bid enclosed.

☐ No bid due to the following:

Please maintain our company on your bidder's list.

Signature

Printed

Title

Joseph L. Genovese
JOSEPH L. GENOVESE
COORDINATOR Date 4/13/99
DRILLING
SERVICES

Data Usability Summary Form Preparation Request for Quotation



ecology and environment, inc.

Data Usability Summary Form Preparation Request for Quotation

EXHIBIT 1

SCOPE OF WORK

Introduction

Ecology and Environment Engineering, P.C. (E & E), under contract with the New York State Department of Environmental Conservation (NYSDEC) is conducting a remedial investigation and feasibility study at the Luzerne Road Site, located in Glens Falls, New York. E & E's assignment involves collection and analysis of environmental media samples. Following analysis, samples are to be validated by a third party.

Scope of Work

E & E will provide analytical data packages and supporting sample information such as sample numbers of duplicate samples, trip blanks, rinsate blanks, and matrix spike/matrix spike duplicates (MS/MSDs). The subcontractor is to review the data and prepare data usability summary forms (DUSRs) for all data generated from the analysis of environmental media samples. Environmental media may include soil, water, and sediment. The analyses include:

- NYSDEC Method CLP-1 for volatile organic compounds.
- NYSDEC Method 95-2 for Semivolatiles, including Trichlorobenzene
- NYSDEC Method CLP-95-3 for polychlorinated biphenyls (PCBs);
- NYSDEC Method CLP-M for the suite of TAL metals
- NYSDEC Method CLP-M for cyanide
- NYSDEC Method 415.1 for total organic carbon
- NYSDEC Method 130.1 for hardness

The quantities of each of these analyses is not known at this time. However, it is anticipated that approximately 25 to 30 soil samples will be submitted for PCB analysis, and approximately 20 soils samples will submitted for VOC analysis. Water sampling will consist of approximately 25 samples submitted for full the TCL/TAL analytical suite. Five sediments will also likely be collected and submitted for PCB and TOC.

All DUSRs are to be prepared as per NYSDEC protocol. DUSR preparation will be performed at the unit rates listed in Exhibit B of this agreement.

Schedule

E & E is to receive a written validation report within 30 days following receipt of data from E & E. The project is expected to occur in the summer of 1999. Most validation, therefore, is expected to be completed in the second half of the summer.

EXHIBIT 2
COST SCHEDULE

The following unit rates are for preparing DUSRs on sample data for each of the analyses listed. These analyses correspond to the scope of work described in Exhibit 1.

<u>Analysis</u>	<u>Unit Cost</u>
Volatile organic compounds	\$__
Semivolatiles, including Trichlorobenzene	\$__
Polychlorinated biphenyls	\$__
TAL Metals	\$__
Cyanide	\$__
TOC	\$__
Hardness	\$__

Data Usability Summary Form Preparation Quotation



ecology and environment, inc.

Data Usability Summary Form Preparation Quotation

SUBCONTRACTOR'S BID RESPONSE FORM

TO: Schuessler
Andrea ~~Schussler~~
ChemWorld Environmental, Inc.
14 Orchard Way North
Rockville, MD 20854

RE: Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Services Needed: Data Usability Summary Form Preparation
Client: New York State DEC
E & E Project No.: QQ08

DATE: April 12, 1999

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

☒ Bid enclosed.

☐ No bid due to the following:

Please maintain our company on your bidder's list.

Signature: Andrea P. Schuessler

Printed: ANDREA P. Schuessler

Title: President Date: 4/19/99

EXHIBIT 2

COST SCHEDULE

ChemWorld Environmental, Inc.

The following unit rates are for preparing DUSRs on sample data for each of the analyses listed. These analyses correspond to the scope of work described in Exhibit 1.

<u>Analysis</u>	<u>Unit Cost</u>
Volatile organic compounds (CLP-1)	\$ <u>8</u>
Semivolatiles, including Trichlorobenzene (95-2)	\$ <u>10</u>
Polychlorinated biphenyls (95-3)	\$ <u>8</u>
TAL Metals (CLP-M)	\$ <u>9</u>
Cyanide (CLP-M)	\$ <u>2</u>
TOC (415.1)	\$ <u>2</u>
Hardness (130.1)	\$ <u>2</u>

PCB Screening Analysis Scope of Work



PCB Screening Analysis Scope of Work

Exhibit 1

Scope of Work

1. Background Information

Ecology and Environment Engineering, P.C., under contract with the New York State Department of Environmental Conservation, will be conducting a remedial investigation and feasibility study (RI/FS) at the Luzerne Road site in Glens Falls, New York. The purpose of the RI is to:

- Characterize the extent of PCB contamination in soil and groundwater at the site;
- Measure the concentration of PCBs in the storage cell, and determine the physical characteristics of the waste material stored in the cell;
- Determine whether contamination is confined to the site, or extends to adjacent properties; and
- Determine whether contamination is migrating off site via transport by surface water.

The analytical data will be used in an FS and, potentially, in remedial design. The purpose of an RI/FS is to identify the presence and extent of contamination in environmental media, to judge their potential impact on human and environmental receptors, and to recommend remedies for these impacts.

In addition to conventional laboratory methods for TCL and TAL analytes, a field screening approach will also be conducted to evaluate polychlorinated biphenyl (PCB) concentrations in site soils.

2. Field Screening Analyses

The screening method will be a modified Method 8082 analysis with a screening extraction equivalent to EPA Field Screening methods. The method will follow a laboratory's standard operating procedure (SOP). The extraction procedure includes weighing one gram of sample into a test tube, drying with sodium sulfate or absorbing the water with methanol, if necessary, and extracting with hexane by vortexing for one minute. Surrogate will be added prior to extraction. If the potential for sulfur interference is indicated, the extract will be subject to clean-up with elemental copper. The sample will be diluted and analyzed by a capillary column, gas chromatograph (GC) equipped with an electron capture detector.

A gas chromatograph (GC) will be calibrated initially with PCB Aroclor 1254 and 1016 in a linear range of at least 0.5 to 10 ppm. The calibration will be verified daily with acceptance criteria of 60% to 140%. If other PCBs are present or the samples exhibit a weathered pattern, the results will be reported as quantified by the nearest Aroclor. The detection limits will be 0.5 ppm for low level samples. Higher concentration samples will be analyzed at dilution with a

high value of up to 2000 ppm. Samples requiring more than one dilution will be reported as extended or greater-than values.

Quality control samples include a blank and matrix spike every 20 samples. Surrogate recoveries will be monitored on samples with concentrations up to 20 ppm. Surrogates in samples with higher concentrations will be diluted out of range. All matrix spike and surrogate recoveries must be within 60% to 140% or the sample will be re-extracted and re-analyzed to determine if the cause is matrix effects or analytical problems. If analytical problems are verified, the laboratory will contact the QA Officer to determine whether the entire batch requires re-extraction and re-analysis. A laboratory control sample may be used if persistent matrix problems are identified.

The laboratory will maintain a sample receipt logbook indicating the sample identification, sample date, sample analysis date, and date sample was returned for destruction. The laboratory also maintains a general logbook documenting all instrument maintenance, communications, method deviations, and other general items. The logbooks will be maintained as part of the project files at the end of the laboratory effort.

For the PCB screening samples, all results will be reported in wet weight. The report will include a summary of sample results, surrogate recoveries, and QC sample results. The laboratory will provide copies or originals of all chromatograms to the QA Officer on a weekly basis. All QC problems and corrective actions will be summarized. Any QC failures will be reported to the QA Officer immediately if corrective actions are not effective.

For the PCB screening samples, all results will be reported in wet weight. The report will include a summary of sample results, surrogate recoveries, and QC sample results. The laboratory will provide copies or originals of all chromatograms to the QA Officer on a weekly basis. All QC problems and corrective actions will be summarized. Any QC failures will be reported to the QA Officer immediately if corrective actions are not effective.

Prior to subcontract award, the subcontract lab must provide to E & E the following for approval:

- Affirmation of NYSDOH certification for solid waste PCB analysis;
- Copies of current acceptable performance evaluation samples for PCB analysis;
- List of instruments which will be used for this project;
- Copy of biographies of analysts which will be performing this work; and
- Copy of laboratory QA plan and SOP for PCB analysis.

3. Schedule

Approximately 1,600 soil samples are anticipated to be collected over a 7 week period spanning the months of July, August, and September, 1999. Daily sample quantities to be submitted to the laboratory are expected to range in size from 30 to 50 samples. All data is to be provided electronically and via Fax within 48 hours from the time of sample receipt.

Exhibit 2
PCB Analytical Screening
Luzerne Road RI

The following task is described in detail in Exhibit 1.

Task 1: Perform a PCB screening analysis on approximately 1600 soil samples. Data is to be provided on a 48-hour turnaround time basis based on time of sample receipt. Data is to be provided both electronically and via a faxed hard copy. One hard copy of each sample batch's analytical data is also to be provided by US Mail to E & E. Subcontract laboratory is responsible for providing soil sample jars to the site.

Price per soil sample PCB screening analysis: \$_____

PCB Screening Analysis Quotations

—

—

—

PCB Screening Analysis

Vendor	Unit Price	Quantity	Price
ChemTech	\$49	1,585	\$77,665
SCIlab	\$45	1,585	\$71,325
AMRO	\$45	1,585	\$71,325
Chopra-Lee	\$42.5	1,585	\$67,632
E & E	\$42	1,585	\$66,570

CHEMTECH

110 Route 4 • Englewood, New Jersey 07631
Phone: (201) 567-6868 Fax: (201) 567-1333

Fax

To: Ecology and Environment, inc.
Jon Nickerson

From: Chemtech
Emanuel Hedvat
emanuel@chemtech.net
<http://www.chemtechlab.com>

Fax: 716-684-0844

Pages: 5

Phone: 716-684-8060

Date: 4/28/99

Re:

- Comments

APR 28 '99 13:46 FR E E BUFFALO

716 684 0844 TO *603920912015671 P.07/14

Exhibit 2
PCB Analytical Screening
Luzerne Road RI

The following task is described in detail in Exhibit 1.

Task 1: Perform a PCB screening analysis on approximately 1600 soil samples. Data is to be provided on a 48-hour turnaround time basis based on time of sample receipt. Data is to be provided both electronically and via a faxed hard copy. One hard copy of each sample batch's analytical data is also to be provided by US Mail to E & E. Subcontract laboratory is responsible for providing soil samples jars to the site.

Price per soil sample PCB screening analysis: \$ 49.00

Based on:

48 hours faxed, and electronically in Excel format

1600 Samples

30-50 per shipment

APR 28 '99 13:46 FR E E BUFFALO

716 684 0844 TO *603920912015671 P.08/14

VENDOR/SUBCONTRACTOR CERTIFICATION

Please complete the following as applicable.

Vendor/Subcontractor Certification (Federal)

The Vendor/Subcontractor, Chemtech, represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the Federal Acquisition Regulations as:

- ☐ Small Business
☐ Small Disadvantaged Business
☐ Women Owned Small Business
☐ Large Business
☐ Other _____


Certifying Officer of CorporationPresident
Title4/28/99
Date

Subcontractor Certification (State)

The Vendor/Subcontractor, Chemtech, represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the laws of the State of New York as:
(State)

- ☒ Minority Owned Business
☒ Disadvantaged Business
☐ Women Owned Business
☐ Other _____
☒ A copy of the certification is attached hereto (if applicable)


Certifying Officer of CorporationPresident
Title4/28/99
Date

Notice: Any person who misrepresents a firm status as a business concern in order to obtain a contract or subcontract to be awarded under preference programs established by law may be subject to criminal or civil action and other penalty as may be prescribed by law.

APR 28 '99 13:45 FR E E BUFFALO

716 684 0844 TO *603920912015671 P.04/14

SUBCONTRACTOR'S BID RESPONSE FORM

TO: Kurt Hummler
Chemtech Consulting Group, Inc.
110 Route 4
Englewood, NY 07631

RE: Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Task: PCB Screening Analysis
Client: New York State DEC
E & E Project No.: QQ08

DATE: April 28, 1999

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

☒ Bid enclosed.

☐ No bid due to the following:

Please maintain our company on your bidder's list.

Signature: 

Printed: Emanuel Hedvat

Title: President Date: 4/28/99

**SCILAB ALBANY, INC.**

15 Century Hill Drive
P.O. Box 787
Latham, NY 12110
Tel: (518) 786-8100
Fax: (518) 786-7700

FAXTO: Steve BlairFROM: Brian McKeeCOMPANY: Ecology + EnvironFAX: 716-684-0844DATE: 4-28-99TOTAL NUMBER OF PAGES: 18 Incl. Cover

- | | |
|-------------------------------------|-----------------|
| <input checked="" type="checkbox"/> | -URGENT |
| <input checked="" type="checkbox"/> | -FOR REVIEW |
| <input checked="" type="checkbox"/> | -PLEASE COMMENT |
| <input type="checkbox"/> | -PLEASE REPLY |
| <input type="checkbox"/> | -PLEASE RECYCLE |

COMMENTS:

IF YOU DO NOT RECEIVE ALL PAGES INDICATED OR IF YOU HAVE A QUESTION,
PLEASE CALL US IMMEDIATELY.....THANK YOU

SUBCONTRACTOR'S BID RESPONSE FORM

TO: Brian McKee, Sr.
SciLab Albany, Inc.
15 Century Hill Drive
P.O. Box 787
Latham, NY 12110

RE: Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Task:
Client: New York State DEC
E & E Project No.: QQ08

DATE: April 28, 1999

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

 X Bid enclosed.

 No bid due to the following:

Please maintain our company on your bidder's list.

Signature: Brian K. McKee

Printed: BRIAN K. MCKEE

Title: DIRECTOR Date: 4/28/99

VENDOR/SUBCONTRACTOR CERTIFICATION

Please complete the following as applicable.

Vendor/Subcontractor Certification (Federal)

The Vendor/Subcontractor, _____, represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the Federal Acquisition Regulations as:

- ☐ Small Business
☐ Small Disadvantaged Business
☐ Women Owned Small Business
☐ Large Business
☐ Other _____

Certifying Officer of Corporation_____
Title_____
DateSubcontractor Certification (State)

The Vendor/Subcontractor, SCILAB-Albany, Inc., represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the laws of the State of New York as
(State)

- ☒ Minority Owned Business
☒ Disadvantaged Business
☐ Women Owned Business
☐ Other _____

☒ A copy of the certification is attached hereto (if applicable)_____
Certifying Officer of Corporation_____
Director_____
Title_____
4/28/99_____
Date

Notice: Any person who misrepresents a firm status as a business concern in order to obtain a contract or subcontract to be awarded under preference programs established by law may be subject to criminal or civil action and other penalty as may be prescribed by law.

Exhibit 2
PCB Analytical Screening
Luzerne Road RI

The following task is described in detail in Exhibit 1.

Task 1: Perform a PCB screening analysis on approximately 1600 soil samples. Data is to be provided on a 48-hour turnaround time basis based on time or sample receipt. Data is to be provided both electronically and via a faxed hard copy. One hard copy of each sample batch's analytical data is also to be provided by US Mail to E & E. Subcontract laboratory is responsible for providing soil samples jars to the site.

Price per soil sample PCB screening analysis: \$ 45 Plus all shipping costs or \$20 per pick-up

- M5+M5D'S ARE CONSIDERED SAMPLES



STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
ALBANY, N.Y. 12232
<http://www.dot.state.ny.us>

JOSEPH H. BOARDMAN
COMMISSIONER

GEORGE E. PATAKI
GOVERNOR

October 14, 1998

Dr. James M. Hong
SciLab Albany, Inc.
15 Century Hill Drive
Latham, N. Y. 12110

RE: DBE CERTIFICATION

Dear Dr. Hong:

The Office of Equal Opportunity Development and Compliance has completed its review of your application for Disadvantaged Business Enterprise (DBE) status.

The supporting documentation has led us to conclude that your firm has met the criteria as established in accordance with 49 CFR Part 23. Your firm will be listed in the Department's Registry of certified firms under the following:

080D - Water quality
080A - Geotech/Soils

080 B - Environmental Services - Misc.
080C - Air Quality

Any changes that affect ownership, independence or control must be reported to our Office within thirty (30) days of that change.

If you decide to expand your services to include additional items of work, you are required to make a written request. Your request must be accompanied by three (3) signed contracts that verify that your firm has previously performed the services requested, a detailed list of equipment and ownership documentation and/or rental and lease agreements for all necessary equipment utilized to perform the expansion function(s), and resumes of those individuals hired to perform the expansion services. Until this documentation has been reviewed and approved, your firm's products or services will be limited to those listed above.

Certification status is reviewed yearly. From time to time, the Department may examine facts concerning your continuing eligibility. As a condition of your certification, you have consented to examination of your books and records and interviews with your principals and employees for the purpose of such examination and to the revocation of your certification if such examinations or interviews are denied.

AMRO**Environmental
Laboratories Corporation**111 Herrick Street, Merrimack, NH 03054
TEL: (603) 424-2022 · FAX: (603) 429-3496DATE: 4-28-99TO: Mr. Steve BlairEcology and Environment, Inc.368 Pleasantview Dr.Lancaster, NY 14086FACS #: 1-716-684-0844FROM: Maria N. BorduzNo. of Pages including cover sheet : 31Comments: Bid Response formRe: Luzerne Road SiteGlenns Falls, NYPCB Screening AnalysisNew York State DEC

SUBCONTRACTOR'S BID RESPONSE FORM

TO:

Denise Barnett
AMRO Environmental Laboratory Corporation
111 Herrick Street
Merrimack, NY 03054

RE:

Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Task: PCB Screening Analysis
Client: New York State DEC
E & E Project No.: QQ08

DATE: April 28, 1999

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

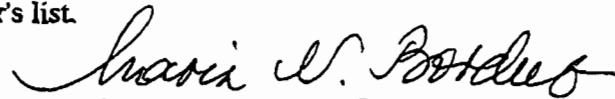
Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

☒ Bid enclosed.

☐ No bid due to the following:

Please maintain our company on your bidder's list.

Signature:



Printed:

MARIA N. BORDUZ

Title:

President

Date:

4-28-99

Exhibit 2
FCB Analytical Screening
Luzerne Road RI

The following task is described in detail in Exhibit 1.

Task 1: Perform a PCB screening analysis on approximately 1600 soil samples. Data is to be provided on a 48-hour turnaround time basis based on time or sample receipt. Data is to be provided both electronically and via a faxed hard copy. One hard copy of each sample batch's analytical data is also to be provided by US Mail to E & E. Subcontract laboratory is responsible for providing soil samples jars to the site.

Price per soil sample PCB screening analysis: \$ 45.00

SUBCONTRACTOR ACKNOWLEDGMENT FORM

I, Maria N. Bordeu, on behalf of Subcontractor, confirm the following:

1. I have reviewed and am in Agreement with the costs presented in the attached Bid b Proposal Sheet/Schedule of Prices, and understand that the work described in the plans and specifications will be completed in full for the price presented;
2. I have reviewed all pertinent documents made available to us in preparing the cost estimate, including the Draft Subcontract Agreement; and
3. I agree to enter into the Subcontract Agreement without further modification, if selected for this project and understand that E & E at its discretion may determine our bid to be nonresponsive if any subsequent Subcontract Agreement modification is presented.

Maria N. Bordeu

Signature of Authorized Subcontractor
Representative

AMRO Environmental Lab. Corp.

Name of Subcontractor

RECEIVED



STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
ALBANY, N.Y. 12232
<http://www.dot.state.ny.us>

JOSEPH H. BOARDMAN
COMMISSIONER

GEORGE E. PATAKI
GOVERNOR

Ms. Maria N. Borduz
Amro Environmental Laboratories Corp
111 Herrick Street
Merrimack, NH 03054

MAR 12 1998

RE: DBE RECERTIFICATION

Dear Ms. Borduz :

The Office of Equal Opportunity Development and Compliance has completed its review of your recertification application for status as a Disadvantaged Business Enterprise (DBE). The supporting documentation has led us to conclude that your firm continues to meet the criteria as established in accordance with 49 CFR Part 23. Your firm will be listed in the Department's Registry of certified firms under the following:

(080C) AIR QUALITY

(090) OTHER (ENVIRONMENTAL LABORATORY TESTING)

Certification status is reviewed yearly. From time to time, the Department may examine facts concerning your continuing eligibility. As a condition of your certification, you have consented to examination of your books and records, interviews with your principals and employees, and to the revocation of your certification if such examinations or interviews are denied.

If you have any questions regarding your DBE certification, please call me at (518) 457-1128.

Sincerely,

Gustavo Santos
Minority Business Specialist I
Office of Equal Opportunity
Development and Compliance

cc: M. Padilla-Orasel, NYSDDED (Albany)
M. Searles, NYSDDED (NYC)
M. Pugh, NFTA
Regional Compliance Specialist, Region 99
File

Chopra-Lee, Incorporated

FAX

Addressing the Environment in the Lab & in the Field

1815 Love Road
Grand Island, NY 14072
Tel.: (716) 773-7625
Fax: (716) 773-7624

TO: Mr. Steve Blair	FROM: Michael B. Rech
COMPANY: Ecology & Environment, Inc.	DATE: April 29, 1999
FAX #: 684-0844	PAGES INCLUDING COVER: 14

THIS FAX IS CONFIDENTIAL TO THE ADDRESSEE

Message:

Attached is Chopra-Lee's competed bid for the Luzerne Road Site. The original copy will be received by your office no later than 5:00 p.m. on Friday, April 30, 1999. If there are any problems with receiving this fax, please contact me immediately. Thank you for your time and consideration.

SUBCONTRACTOR'S BID RESPONSE FORM

TO: Michael B. Rech
Chopra-Lee, Incorporated
1815 Love Road
Grand Island, NY 14072

RE: Site Name: Luzerne Road Site
Site Location: Glens Falls, NY
Task:
Client: New York State DEC
E & E Project No.: QQ08

DATE: April 28, 1999

IN ORDER FOR US TO MAINTAIN AN ACCURATE AND CURRENT BIDDER'S LIST,
PLEASE COMPLETE THE FOLLOWING AND RETURN TO:

Ecology and Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086

☒ Bid enclosed.

☐ No bid due to the following:

Please maintain our company on your bidder's list.

Signature: Paul S. Chopra

Printed: PAUL S. CHOPRA

Title: LAB MANAGER Date: 27 APRIL 99

Exhibit 2
PCB Analytical Screening
Luzerne Road RI

The following task is described in detail in Exhibit 1.

Task 1: Perform a PCB screening analysis on approximately 1600 soil samples. Data is to be provided on a 48-hour turnaround time basis based on time of sample receipt. Data is to be provided both electronically and via a faxed hard copy. One hard copy of each sample batch's analytical data is also to be provided by US Mail to E & E. Subcontract laboratory is responsible for providing soil samples jars to the site.

Price per soil sample PCB screening analysis: \$ 42.50

SUBCONTRACTOR ACKNOWLEDGMENT FORM

I, PAUL S. CHOPRA, on behalf of Subcontractor, confirm the following:

1. I have reviewed and am in Agreement with the costs presented in the attached Bid b Proposal Sheet/Schedule of Prices, and understand that the work described in the plans and specifications will be completed in full for the price presented;
2. I have reviewed all pertinent documents made available to us in preparing the cost estimate, including the Draft Subcontract Agreement; and
3. I agree to enter into the Subcontract Agreement without further modification, if selected for this project and understand that E & E at its discretion may determine our bid to be nonresponsive if any subsequent Subcontract Agreement modification is presented.

Paul S. Chopra

Signature of Authorized Subcontractor
Representative

CHOPRA-LEE, INC.

Name of Subcontractor

VENDOR/SUBCONTRACTOR CERTIFICATION

Please complete the following as applicable.

Vendor/Subcontractor Certification (Federal)

The Vendor/Subcontractor, CHOPRA-LEE, INC., represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the Federal Acquisition Regulations as:

- ☐ Small Business
- ☐ Small Disadvantaged Business
- ☐ Women Owned Small Business
- ☐ Large Business
- ☐ Other _____

Certifying Officer of Corporation

Title

Date

Subcontractor Certification (State)

The Vendor/Subcontractor, CHOPRA-LEE, INC., represents and certifies that it is as prescribed by
(Company Name)
applicable provisions of the laws of the state of NEW YORK as:
(State)

- ☒ Minority Owned Business
- ☐ Disadvantaged Business
- ☐ Women Owned Business
- ☐ Other _____

☐ A copy of the certification is attached hereto (if applicable)

PAUL S. CHOPRA, PAUL S. CHOPRA
Certifying Officer of Corporation

Secretary / Treasurer
Title

APRIL 29, 1999
Date

Notice: Any person who misrepresents a firm status as a business concern in order to obtain a contract or subcontract to be awarded under preference programs established by law may be subject to criminal or civil action and other penalty as may be prescribed by law.



ECOLOGY & ENVIRONMENT, INC.
ASC PRICE QUOTATION

Quotation for NYSDEC/Luzerne Road

<u>ANALYSIS</u>	<u>METHOD</u>	<u>MATRIX</u>	<u>QTY</u>	<u>UNIT PRICE*</u>	<u>TAT</u>	<u>SUBTOTAL</u>
PCB screen		Soil		\$42.00	See below	\$0

TOTAL PRICE:

\$0

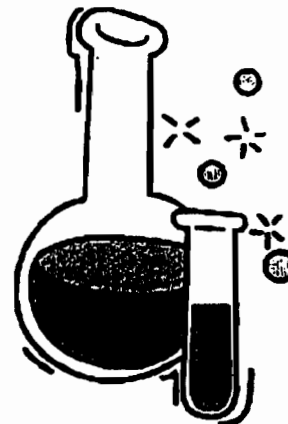
Unit prices include:

- Turnaround time for results only in an Excel spreadsheet format is 48 hours from sample receipt at the lab.
- An EDD will be supplied 7 days after sample receipt and will be an Excel spreadsheet.
- Sample containers are included
- The ASC will pay for shipping of samples from the Fedex office in Glens Falls.
- 1 PPM reporting limit
- Maximum of 40 samples per day
- Not reported on dry weight basis.
- shake and shoot (no extraction) analysis procedure.

TO: John Nickerson

PH:
FAX:

FROM:
Ecology & Environment, Inc.
Analytical Services Center
Gerry Strobel Jr. / Barb Krajewski
-Apr-99
Tel: 716/685-8080
FAX: 716/685-0852



Geotechnical Analysis Scope of Work and Quotation



ecology and environment, inc.

Geotechnical Analysis Scope of Work and Quotation

Geotechnical Testing

Vendor	Model/Item	Quantity	Unit Cost	Price
GZA GeoEnvironmental of New York	Moisture Content	5	6	\$30
	Humic Content	5	38	\$190
	Atterberg Limit	5	63	\$315
	Particle Size: Sieve Analysis	5	88	\$440
	Particle Size: Hydrometer	5	(combined above)	\$0
	Dry Density	5	25	\$125
	Specific Gravity	5	44	\$220
	Total			\$1,320
URS Greiner Woodward Clyde	Moisture Content	5	9	\$45
	Humic Content	5	42	\$210
	Atterberg Limit	5	99	\$495
	Particle Size: Sieve Analysis	5	61	\$305
	Particle Size: Hydrometer	5	123	\$615
	Dry Density	5	39	\$195
	Specific Gravity	5	48	\$240
	Health and Safety			\$275
	Total			\$2,380
Atlantic Testing Limited	Moisture Content	5	5.5	\$28
	Humic Content	5	27.5	\$138
	Atterberg Limit	5	77	\$385
	Particle Size: Sieve Analysis	5	82.5	\$413
	Particle Size: Hydrometer	5	(combined above)	\$0
	Dry Density	5	16.5	\$83
	Specific Gravity	5	49.5	\$248
	Total			\$1,293



ecology and environment engineering, p.c.

BUFFALO CORPORATE CENTER
368 Pleasantview Drive, Lancaster, New York 14086
Tel: 716/684-8060, Fax: 716/684-0844

April 15, 1999

Mr. Gary Klawinski
GZA Geoenvironmental of New York
364 Nagel Drive
Cheektowaga, NY 14225

RE: Geotechnical soils analysis quotation

Dear Mr. Klawinski:

Ecology and Environment Engineering, P.C. (E & E) is under contract with the New York State Department of Environmental Conservation to conduct a remedial investigation and feasibility study (RI/FS) at the Luzerne Road site in Queensbury, New York. This RI will require geotechnical analysis of soils. As discussed in our telephone conversation, E & E is seeking a quotation of unit prices to perform the geotechnical analyses listed in Table 1. In addition to these analyses, E & E with request one hard copy of the geotechnical data within 30 days upon receiving the samples.

Note that these samples are considered to contain a polychlorinated biphenyl (PCB) concentration in excess of 1 part per million. Likely concentrations will range in the hundreds of parts per million.

E & E has attempted to identify the ASTM methods which it intends to use for each of the analyses listed in Table 1. However, for those analyses for which no method number is listed, E & E requests GZA provide the ASTM method number.

Please provide your written quotation by 3:00 p.m. on Tuesday, April 20, 1999. A Faxed quotation is acceptable if an original copy is provided by Thursday, April 22. If you have any questions, please contact either myself or Steven Blair at 716/684-8060.

Sincerely,

Jon Nickerson
RI Task Leader

cc: S. Blair, P.E.

Table 1 Geotechnical Analytical Summary Luzerne Road RI Glens Falls, NY				
Analysis	Method Number	Estimated Number of Field Samples	Unit Cost	Total Cost
Geotechnical Analysis of Site Soils				
Moisture Content	D2216	5		
Humic Content		5		
Atterberg Limit	D4318	5		
Particle Size: Sieve Analysis	D422	5		
Particle Size: Hydrometer		5		
Dry Density		5		
Specific Gravity	D854	5		
Total Geotechnical Analysis Cost:				



GZA GeoEnvironmental of New York
Engineers and Scientists

364 Nagel Drive
Buffalo, New York 14225
(716) 685-2300

LETTER OF TRANSMITTAL

TO: Steve Blair
Ecology and Environment
Engineering, P.C.
368 Pleasantview Drive
Lancaster, New York 14086

DATE: 4/16/99	JOB NO.
RE: Geotechnical Soils Analysis Quotation	

COPIES	DATE	DESCRIPTION
1	4/16/99	Geotechnical Analytical Summary (Table 1)
1	4/16/99	Copy of ASTM standard for testing Humic Content (Organics)

THESE ARE TRANSMITTED as checked below:

___ For Approval ___ Approved as submitted ___ Resubmit ___ copies for approval
___ For your use ___ Approved as noted ___ Submit ___ copies for distribution
☒ As requested ___ Returned for corrections ___ Return ___ corrected prints
___ For review and comment ___ Other ___

NOTES:

Here is the quote for geotechnical testing that you have requested. GZA's standard turn around is 10 days. Ecology and Environment is responsible for disposing of the sample after testing is complete. Please call if you should have any questions.

SIGNED: David Birch

COPY TO: _____

If enclosures are not as noted, kindly notify us at once.

Table 1 Geotechnical Analytical Summary Luzerne Road RI Glens Falls, NY				
Analysis	Method	Estimated Number of Field Samples	Cost	Est. Price
Geotechnical Analysis of Site Soils				
Moisture Content	D2216	5	6.00	30.00
Plastic Content	D 2974-87	5	38.00	190.00
Atterberg Limit	D4318	5	63.00	315.00
Particle Size: Sieve Analysis	D422	5	88.00	440.00
Particle Size: Hydrometer	D422	5	Combined with sieve	
Dry Density	D2937-94	5	25.00	125.00
Specific Gravity	D854	5	44.00	220.00
Total Geotechnical Analysis Cost:				1370.00



ATLANTIC TESTING LABORATORIES, Limited

LABORATORY SERVICE AGREEMENT

Client	Ecology and Environment, Inc.				Client Contact	Deb Jusiak	
Address	638 Pleasant View Drive				Project Name	Luzerne Road	
City	Lancaster	State	NY	Zip	14088	Location	Glens Falls, NY
Phone No.	(716) 684-8060	Fax No.	(716) 684-0844		Project No.	AT998-040-6-99	

SCOPE OF SERVICES

1. Provide the services listed below.
2. Prepare and distribute test reports.
3. Disclaimer: All sampling services and testing procedures are performed in accordance with recognized methodologies. The full extent of any and all liability for actual and consequential damages shall be limited to reperformance or cost of said work. ATL is not liable for data interpretation by others, and/or actual and consequential damages resulting from services provided by others.

UNIT FEE SCHEDULE AND TOTAL ESTIMATED COST

Service	Quantity	Unit Fee	Cost
ASTM D 2216: Moisture Content of Soil and Rock	5	\$ 5.50	\$ 27.50
ASTM D 2974: Organic Content	5	\$ 27.50	\$ 137.50
ASTM D 4318: Atterberg Limits	5	\$ 77.00	\$ 385.00
ASTM D 422: Particle Size (Sieve Analysis-Without Hydrometer)	--	\$ 44.00	If Required
ASTM D 422: Particle Size (Sieve and Hydrometer)	5	\$ 82.50	\$ 412.50
ASTM C 29: Dry Density	5	\$ 16.50	\$ 82.50
ASTM D 854: Specific Gravity	5	\$ 49.50	\$ 247.50
Total Estimated Cost			\$ 1,292.50

Send Analysis Reports To:		Send Bill To:		Prepayment:	
Client		Client		Amount	
<input type="checkbox"/> Other (give complete address)		<input type="checkbox"/> Other (give complete address)		Prepaid \$ _____	
Name		Name		<input type="checkbox"/> Cash	
Address		Address		<input type="checkbox"/> Check No. _____	
City		City		Received By: _____	
State	Zip	State	Zip	Date: _____	

The above fees will be valid until December 1999.

Invoices are due when rendered. Accounts over 30 days are subject to a service charge of 1.5% per month or an annual rate of 18%.


ATL's authorization to proceed with the services described above will consist of the return of one executed copy of this agreement.

The preceding Scope of Services and Unit Fee Schedule, and the Statement of Standard Terms and Conditions, printed on the reverse side of this form, are accepted. Payment will be made in accordance with the above General Conditions.

Authorized Client Signature _____ Date _____

Ms. Deb Jusiak

Client Printed/Typed Name


ATL Representative Signature _____ Date 6/8/99

ALBANY
12 Arrowhead Lane
Cohoes, NY 12047
518/783-9073

CANTON
P.O. Box 29
Canton, NY 13617
315/386-4578

ATLANTIC TESTING LABORATORIES, LIMITED
ENDICOTT
406 North Street
Endicott, NY 13760
607/757-9326

FELTS MILLS
P.O. Box 91
Felts Mills, NY 13638
315/773-5390

CICERO
5866 State Route 31
Cicero, NY 13039
315/699-5281

UTICA
698 Stevens Street
Utica, NY 13502
315/735-3309



STANDARD TERMS AND CONDITIONS OF AGREEMENT

1. DEFINITIONS

Client - The public body or authority, corporation, association, firm, or person with whom Atlantic Testing Laboratories, Limited, has entered into this Agreement for services to be provided.

ATL - Atlantic Testing Laboratories, Limited, with Corporate Offices located at 6431 U.S. Highway 11, P.O. Box 29, Canton, New York, 13617. The firm retained to provide services as stated in this Agreement.

2. RIGHT OF ENTRY

The Client will provide for right of entry of the employees, agents, or subcontractors of ATL to perform and complete the work that is the subject of this Agreement.

Further, the Client authorizes ATL to make oral and/or written inquiry of appropriate federal, state, and local government agencies or authorities in respect to the services being rendered.

3. JOBSITE ACTIVITIES

ATL will perform services described in the Agreement in accordance with custom and practice in the locality in which the site is located. In no event shall ATL be responsible for methods of construction, superintendence, sequencing, or coordination of construction, or safety in, on, or about the jobsite, except as it relates to ATL's work.

4. OWNERSHIP AND REUSE OF DOCUMENTS

All reports, field data, field notes, laboratory test data, calculations, and other documents prepared by ATL as instruments of service shall remain the property of ATL.

The Client agrees that all reports and other work furnished to the Client or its agents, which is not paid for, will be returned to ATL upon demand and will not be used by the Client for any purpose whatsoever.

ATL will retain all pertinent records relating to the services performed for a period of seven years following submission of a final report, during which period the records will be made available to the Client at all reasonable times upon request and for the cost of retrieval and reproduction.

5. SUCCESSORS AND ASSIGNS

The Client and ATL each binds itself and its partners, successors, executors, administrators, and assigns to the other party of this Agreement and to the partners, successors, executors, administrators, and assigns of such other party, in respect to all covenants of this Agreement. Neither the Client nor ATL shall assign, sublet, or transfer its interest in the Agreement without the written consent of the other.

6. LIMITATION OF LIABILITY

The liability of ATL, its agents, employees, and subcontractors, for Client's losses and claims of loss, property damage, injury, death, or damage, including, without limitation, Client's claims of contribution and indemnification with respect to third-party claims, shall not exceed in the aggregate under this Agreement the total sum of fees for services rendered, or \$50,000, whichever is the lesser amount, for claims arising out of, by way of example but not by way of limitations, a) any environmental pollution or contamination, including, without limitation, any actual or threatened release of toxic, irritant, pollutant, hazardous waste, hazardous material, or waste gases, liquids, or solid materials; or b) negligence, professional negligence, including errors, omissions, or other professional acts, and including breach of contract.

ATL shall not be responsible for any loss, damage, or liability arising from any acts by the Client, its contractors, agents, staff, and other consultants employed by it.

7. INDEMNITY

To the fullest extent permitted by law, the Client agrees to indemnify and hold harmless ATL and its respective shareholders, directors, officers, consultants, agents, and employees from and against all liability claims, damages, losses, and expenses, direct and indirect, or consequential damages, including but not limited to attorney/court/arbitration costs, arising out of or resulting from the performance of work by ATL.

8. STANDARD OF CARE; WARRANTIES

Services provided by ATL under this Agreement will be performed in accordance with such documents as plans, specifications, and instructions provided by the

Client, and in a manner consistent with that level of care and skill ordinarily exercised by members of the industry under similar conditions using recognized methodologies. The full extent of any and all liability for actual and consequential damages for the services performed shall be limited to performance or cost of said work. ATL makes no other warranty, expressed or implied.

In accepting reports of observations, tests, and opinions provided pursuant to this Agreement, the Client acknowledges that the extent of ATL's obligation with respect thereto is limited to furnishing of such data, which shall not be solely relied upon by others as acceptance of any construction work, nor shall it relieve a contractor in any way from his obligations and responsibilities under the construction contract to conduct the work in conformance with the project plans and specifications.

ATL will be responsible only for the data furnished by it, but shall not be responsible for the interpretation by others of the information developed. The Client agrees to indemnify and hold ATL harmless from and against all claims, damages, losses, and expenses arising from the interpretation by others of data provided by ATL.

9. HAZARDOUS WASTES

The Client shall advise ATL of any hazardous wastes or hazardous substances existing at or near the site at which ATL is to perform work. If ATL discovers hazardous wastes or hazardous substances after it undertakes a project, or if ATL discovers the nature or extent of hazardous wastes or hazardous substances differs materially from what the Client advised ATL, the Client and ATL agree that the scope of services, schedule, and estimated fee budget shall be adjusted as needed to complete the work.

If reportable quantities of petroleum product and/or chemical contamination are discovered on the project site during performance of the work tasks described herein, or during any subsequent work completed at the project site, the appropriate local, state, and/or federal agencies will be notified immediately, as required by law.

The ownership of and responsibility for all contaminated materials, hazardous materials, and hazardous substances generated, released, uncovered, transported, and/or collected during the work tasks referred to herein will remain with the Client.

10. INSURANCE

ATL represents and warrants that it, together with its agents and staff, are protected by worker's compensation insurance, and that ATL has such coverage under public liability and property damage insurance policies that ATL deems to be adequate. Certificates for any such policies of insurance will be provided to the Client upon written request.

The Client recognizes that ATL's insurance policies contain certain exclusions, including those for certain claims arising from the discharge, dispersal, release, or escape of pollutants. The Client agrees to defend, indemnify, and hold ATL and its employees or agents harmless for and against all claims, causes of action, suits, proceedings, damages, losses, and expenses, including third party claims or actions, arising from ATL's work for the Client under this Agreement that falls within the scope of any exclusion from ATL's liability or property damage insurance policies.

11. DISPUTES

If a dispute arising out of or relating to the performance of the services to be provided under this Agreement results in legal action, the parties agree that the prevailing party shall be entitled to recover all reasonable costs incurred with respect to the claim, including staff time, court costs, attorneys' fees, and other claim-related expenses. In no event, however, shall ATL's liability exceed that amount agreed to in Item #6 above.

12. TERMINATION

This Agreement may be terminated by either party upon seven (7) days written notice in the event of substantial failure by the other party to perform in accordance with the terms hereof. Such termination shall not be effective if that substantial failure has been remedied before expiration of the period specified in the written notice.

In the event of termination, or suspension for more than three (3) months, prior to the completion of any reports contemplated by this Agreement, ATL may finalize such analyses and records as are necessary to complete its files and may also complete a report on the services performed to the date of notice of termination or suspension. The expenses of termination or suspension shall include all direct costs of ATL in completing such analyses, records, and reports, if applicable.

FACSIMILE TRANSMISSION SHEET

URS GREINER WOODWARD CLYDE

PHONE: (973) 812-1818

FAX: (973) 812-8640

Geotechnical Laboratory
45J Commerce Way
Totowa, New Jersey 07512TO: Deborah JusakFROM: Greg Thomas

CO. _____

FAX NO: (716) 684-0844

PROJ. NO. _____

No. of Pages: 3 DATE: 6/10/99

(Including this page)

Enclosed is a copy of our proposed
contract and prices for your review.

I am waiting to get a signed copy
back but probably won't have it until
this afternoon or tomorrow. I will send
it when it arrives.

Regards,

Greg Thomas

Should you have any questions or problems with this transmittal, please notify us as soon as possible.

GEOTECHNICAL LABORATORY SERVICE ORDER ("Order")

URS Greiner Woodward Clyde International Americas Inc. (URSGWC)

45 J Commerce Way
Totowa, NJ 07512
(973) 812-1818

Client Name: ecology and environment, inc.Order Date: 06/10/1999Address: 368 Pleasant View Drive

Project No.: _____

Lancaster, NY 14086Project Name: Luzerne Road RIPhone/Fax: (716) 684-8060 / (716) 684-0844Office Location: Totowa, NJContact: Deborah JusiakProject Manager: Greg Thomas

QUANTITY	DESCRIPTION OF LABORATORY SERVICES	TEST METHOD	UNIT PRICE	AMOUNT
5	Water Content		\$9	\$ 45.00
5	Organic Content by burn-off	ASTM D2974	\$42	\$ 210.00
5	Liquid and Plastic Limit		\$99	\$ 495.00
5	Sieve Analysis; Std. sieve set	ASTM D422	\$61	\$ 305.00
5	Combined Sieve and Hydrometer Analysis	ASTM D422	\$123	\$ 615.00
5	Total (Bulk) Unit Weight from tube sample (with Water Content)	ASTM D2937	\$39	\$ 195.00
5	Specific Gravity on minus No. 4 sieve material	ASTM D854	\$48	\$ 240.00
1	Health and Safety Program		\$275	\$ 275.00
	Sample Return or disposal @ cost+15% handling fee.			
TOTAL COST OF SERVICES				\$ 2,380.00

Client agrees to pay as described herein for the services indicated in this Order. Services are subject to the attached General Terms and Conditions for Laboratory Services.

URSGWC

Signature: _____

Printed Name: Majed KhouryTitle: Vice President

Signature Date: _____

ecology and environment, inc.

Signature: _____

Printed Name: _____

Title: _____

Signature Date: _____

GENERAL TERMS AND CONDITIONS FOR LABORATORY SERVICES

1. **Acceptance.** The Order consists of the instructions set forth in the Order form, attachments thereto and these terms and conditions. Acceptance of the Order, whether by written acknowledgment or receipt of samples, is expressly limited to the terms and conditions of the Order. No modification, deletion, addition or waiver shall be effective unless a written amendment is issued by URSGWC. The Order constitutes the entire contract between the parties with respect to URSGWC's performance and supersedes all other agreements or understandings, oral, or written pertaining to the subject matter of this Order.

2. **Payment.** Payment shall be in accordance with the Schedule of Fees and Charges in effect when the Services are performed. Client shall pay undisputed portions of each progress invoice within thirty (30) days of the date of the invoice. If payment is not maintained on a thirty (30) day current basis, URSGWC may suspend further performance until payments are current. Client shall notify URSGWC of any disputed amount within fifteen (15) days from date of the invoice, give reasons for the objection, and promptly pay the undisputed amount. Client shall pay an additional charge of one and one-half percent (1½%) per month or the maximum percentage allowed by law, whichever is the lesser, for any past due amount. In the event of a legal action for invoice amounts not paid, attorneys' fees, court costs, and other related expenses shall be paid to the prevailing party.

3. **Professional Responsibility.** URSGWC is obligated to comply with applicable standards of professional care in the performance of the Services. Client recognizes that opinions relating to environmental, geologic, and geotechnical conditions are based on limited data and that actual conditions may vary from those encountered at the times and locations where the data are obtained, despite the use of due professional care.

4. **Force Majeure.** URSGWC shall not be responsible for damages or delays in performance caused by force majeure, acts of God, or other events beyond its control.

5. **Risk Allocation.** The liability of URSGWC, its employees, agents and subcontractors (referred to collectively in this Article as "URSGWC"), for Client's claims of loss, injury, death, damage, or expense, including, without limitation, Client's claims of contribution and indemnification, express or implied, with respect to third party claims relating to services rendered or obligations imposed under this Order, shall not exceed, in the aggregate: (1) the total sum of URSGWC's fees or \$50,000, whichever is greater, for claims or liability arising out of professional negligence, including errors, omissions, or other professional acts, and including unintentional breach of contract; or (2) the total sum of \$250,000 for claims or liability arising out of negligence, breach of contract, or other causes for which URSGWC has any legal liability, other than as limited by (1) above.

6. **Waiver of Consequential Damages.** Neither Party shall be liable to the other for consequential damages, including, without limitation, loss of use or loss of profits, incurred by one another or their subsidiaries or successors, regardless of whether such damages are caused by breach of contract, willful misconduct, negligent act or omission, or other wrongful act of either of them.

7. **Samples.** URSGWC shall preserve uncontaminated soil, rock, water and other samples obtained from the project site as it deems necessary for the project, but not longer than forty-five (45) days, unless otherwise legally required, after the issuance of any document that includes the data obtained from those samples, unless other arrangements are mutually agreed upon in writing. At any time, URSGWC can request in writing that Client remove samples. Within ten (10) days of the request Client shall comply with such request, and pay and be responsible for the removal and lawful disposal of samples, unless other arrangements are mutually agreed upon in writing. However, if URSGWC and Client agree that URSGWC shall store such samples for a specified period, Client shall pay a storage fee. At the end of the storage period, Client shall be responsible for the cost of removal and lawful disposal of the samples.

8. **Contaminated Samples.** Client shall notify URSGWC in advance of the composition of samples. Client understands that should the samples (soil, rock, water or other) be contaminated with hazardous substances, the samples will not be tested, and Client shall arrange to have such samples removed from URSGWC's premises within five (5) days. Notwithstanding any other provision, Client shall indemnify, defend and hold harmless URSGWC, its employees, agents or subcontractors from any claims for any liability, penalty, injury, death, or damage (1) resulting from Client's failure to notify URSGWC in advance of shipment of samples to URSGWC's facilities that such samples are contaminated and (2) arising from any liability arising from packaging, transport or disposal of such contaminated samples.

9. **Year 2000 Compliance.** Client acknowledges that URSGWC, including its affiliates and subsidiaries, has no responsibility to independently verify that computers, computer chips, and/or software programs developed by others and used in the performance of, or incorporated into the Services, are Year 2000 compliant.

10. **Acknowledgment.** The parties acknowledge that there has been an opportunity to negotiate the terms and conditions of this Order and agree to be bound accordingly.

Equipment Purchase, Service, and Rental Quotations

1

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Summary of Equipment and Service Cost Comparisons

Random Aerosol Dust Monitor Price Comparison Table

Vendor	Item	Unit Price	Quantity	Total
Instrument Depot	pDR-1000	\$ 3,670	1	\$3,670
Hazco	MIE Personal Dataram Monitor	\$3,450	1	\$3,450
Response Rentals	MIE PDM-3	\$1,495	1	\$1,495

Laptop Computer and Printer

Vendor	Model/Item	Quantity	Price
Dell Computer Corp.	Dell Inspiron 3500 with carry case Epson Stylus 640 Color Printer	1	\$2,003.00
Gateway 2000, Inc.	Gateway Solo 2500 SE w/carry case Epson Stylus 640 Ink Jet Printer	1	\$2,028.00
COMPAQ	Presario 1600i series IJ200 Printer	1	\$2,178.00
Micron PC	TransPort TREK2 w/carry case Epson Stylus 640 Color Printer	1	\$2,047.00

Organic Vapor Analyzer (OVA)

Vendor	Model/Item	Quantity	Price
Hazco	Model 128, Foxboro w/o GC mode	1	\$4,000.00
Eirtech Instruments, Inc.	Model 128, Foxboro w/o GC mode	1	\$2,495.00
Foxboro	TVA 1000 instead of 128	1	\$8,45

Oxygen/Explosimeter/Hydrogen Sulfide Monitors

Vendor	Model/Item	Quantity	Price
Eirtech Instruments, Inc.	Model GT 302 PGM O ₂ Meter/explosimeter and H ₂ S meter	1	\$2,568.00
Hazco	Model GT 302 PGM O ₂ Meter/explosimeter and H ₂ S meter	1	\$2,168.00
Gastech, Inc.	Model GT 302 PGM O ₂ Meter/explosimeter and H ₂ S meter	1	\$2,573.0

Turbidity Meter

Vendor	Model/Item	Quantity	Price
Forestry Suppliers, Inc.	Orbeco-Hellige Portable turbidimeter	1	\$648.67
Eirtech Instrument, Inc.	LaMotte 2020, Portable turbidity meter	1	\$795.00
HACH	Model 2100P w/standards, case, etc.	1	\$775.00

Electrical Service Installation Comparison

Vendor	Service Description	Price
Pinnacle Electric	Connect electrical service to sire trailer; install one telephone pole; includes permits and inspection fees	\$1,600
EFG Electrical Service	Connect electrical service to sire trailer; install one telephone pole	\$1650
K & J Electric Company	Connect electrical service to sire trailer; install one telephone pole	\$4,500

Field office Trailer

Vendor	Model/Item	Quantity	Price
GE Capital Modular Space	Field Office/Trailer 6-month rental	6 months	\$1,020
	Trailer mobilization/demobilization	1	\$365
Williams Scotsman, Inc.	Field Office/Trailer 6-month rental	6 months	\$1,110
	Trailer mobilization/demobilization	1	\$ 515
Premier Modulars, Inc.	Field Office Trailer; 6-month rental; with steps	6-months	\$900
	mobilization/demobilization	1	\$709

Digital Camera

Vendor	Model/Item	Quantity	Price	Tax	Total
Olympus America, Inc.	D600L Digital Camera, 4MB, with accessory kit (batteries, charger)	1	\$820.98	\$65.68	\$ 886.66
Sony	1344 X 1024, rechargeable	1	\$1,789.95	\$143.20	\$1,933.15
Kodak	1536 X 1024, Rechargeable	1	\$839.95	\$67.20	\$ 907.15

Airfare; Round Trip between Buffalo and Albany

Vendor	Model/Item	Quantity	Price
Shuttle America	Round Trip, unrestricted coach	1	\$258
USAirways	Round Trip, unrestricted coach	1	\$498
Continental	Round Trip, unrestricted coach	1	\$502

Van Rental

Vendor	Model/Item	Quantity	Price
Thrifty	Daily Rate plus 100 miles	69	\$3,449
Budget	Daily Rate plus 100 miles	69	\$3,567
U-Haul	Daily Rate plus 100 miles	69	\$4,068

Items for Which Fewer Than Three Quotations Were Obtained

Vendor	Amount	Item/Service	Reason for Fewer Quotations
Taylor Welding Supply	\$60.18	Hydrogen supply; supply tank rental	Less than \$1,000
IBS Septic and Drain	\$420	Portable Toilet, monthly rental and cleaning	Less than \$1,000
Bell Atlantic	\$305	Telephone service (6 months) and hook-up	Monopoly

Random Aerosol Dust Monitor Price Comparison Table

Vendor	Item	Unit Price	Quantity	Total
Instrument Depot	pDR-1000	\$ 3,670	1	\$3,670
Hazco	MIE Personal Dataram Monitor	\$3,450	1	\$3,450
Response Rentals	MIE PDM-3	\$1,495	1	\$1,495

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Instrument Depot (A Division of ED)

FAX Transmission

Total Pages (Including this one) 5

From: Diane Simpson
To: Bob Meyers
Company: Ecology & Environment

Date: 04/16/99
Time: 8:37 AM
FAX #: 716-684-0844

Dear Bob:

The quote for a pDR-1000 this is the replacement instrument for the PDM-3.

The PDM-3 is no longer being manufactured. This instrument does not include datalogging. I have also included a specification sheet for this instrument.

VOICE: (800) 731-7071 • FAX: (716) 424-2166

INTERNET: <http://www.instrumentdepot.com> • EMAIL: info@instrumentdepot.com

1057 East Henrietta Rd, Rochester, NY 14623

PAGE.03

'satile Real-Time Aerosol Monitor

configuration produces optimal volume response to particles in the size range of 0.1 to 10 μm , achieving high correlation with standard gravimetric measurements of the respirable and thoracic fractions.

Passive Air Sampling Is Silent and Reliable

The *personalDataRAM*'s passive air sampling technique has been thoroughly field-proven since 1980 by thousands of MIE MINIRAMs, the unit's precursor. Air surrounding the monitor circulates freely through the open sensing chamber by natural convection, diffusion, and background air motion. With this passive nephelometric sampling method, concentration measurements do not depend on the air velocity through the sensing chamber.

Interfaces With a PC for Easy Programming and Downloading

The *personalDataRAM* is easily programmed from any IBM-compatible personal computer. Using the pDR-COM software provided with the unit, operating parameters such as logging period, display averaging time, alarm level and mode, etc., can be changed before the next run. Once configured for a test, the *personalDataRAM* will retain the setup information until you edit it again.



Using the pDR-COM software, logged data can be downloaded to a PC for direct tabular and graphic display, and/or printout. These data can also be imported into most common spreadsheet programs by following the instructions provided.

Other commands such as enable/disable logging and alarms, review of program parameters, and review of maximum/STEL data are entered directly through the *personalDataRAM*'s keyboard.



Simple Zeroing and Calibration

Each *personalDataRAM* comes gravimetrically calibrated (NIST traceable) in mg/m^3 using standard SAE Fine (ISO Fine) test dust. Zeroing with particle-free air is accomplished quickly and effectively under field conditions using the zeroing kit included. Special firmware controls an automatic calibration check referenced to the optical background set at the factory. Gravimetric field calibration can be performed by comparison with a filter sampler and by programming of the calibration constant.

Four Power Options

The *personalDataRAM* can be powered by:

- A replaceable 9V alkaline "transistor" battery which provides up to 18 hours of operation
- AC line power and a universal voltage power supply (included) for long-term, continuous monitoring
- An optional rechargeable, sealed nickel-metal-hydride battery pack that attaches rigidly to the *personalDataRAM*'s base, providing up to 48 hours of operation between charges
- Any external DC source (7 to 9V), such as a lantern battery.

For maximum flexibility, power sources can be changed even while operating the unit.

Maintenance, Service, and Factory Support

The *personalDataRAM* has no moving parts to wear out. (Only the 9V battery needs to be replaced.) Instructions for simple and easy periodic cleaning of the sensing chamber are provided. Routine factory check-out and calibration are recommended on a 2-year cycle.

MIE's experienced technical/application support can provide expert advice and practical solutions to aerosol-related problems. This invaluable resource is available to customers for the life of our instruments, many of which have been in field use for more than a quarter of a century.

Accessories for Enhanced Functionality and Performance

The *personalDataRAM* comes with several standard accessories. They include:

- Universal voltage power supply/charger
- Digital communications cable
- pDR-COM software disk
- Zeroing kit
- Belt clip kit
- Instruction manual
- Carrying case

Optional accessories include:

- Rechargeable (NiMH) battery pack
- Active sampling adapter kit
- Shoulder strap
- Remote alarm unit
- Multiple set carrying case

The active sampling adapter kit is designed for extractive sampling applications such as duct, stack, or chamber monitoring, where the *personalDataRAM* must be outside of the environment to be measured.

Safety Approvals and Certifications

The *personalDataRAM* is classified for intrinsically safe use in hazardous locations Class 1, Division 1, Groups A, B, C, & D. In addition, it meets US FCC and European CE rules.

MIE

Specifications

Concentration measurement range (auto-ranging):
0.001 to 400 mg/m³

Scattering coefficient range: 1.5×10^{-1} to 0.6 m
(approximately) @ $\lambda=880$ nm

Precision/repeatability (2-sigma):
 $\pm 10 \mu\text{g}/\text{m}^3$ for 1-second averaging
 $\pm 1.5 \mu\text{g}/\text{m}^3$ for 60-second averaging

Accuracy: $\pm 5\%$ of reading \pm precision

Resolution: 0.1% of reading or 0.001 mg/m³,
whichever is larger

Particle size range of maximum response: 0.1 to 10 μm

Concentration display updating interval: 1 second

Alarm level adjustment range: selectable over entire
measurement range

Alarm averaging time: real-time (1 to 60 seconds) or
STEL (15 minutes)

Data logging averaging periods: 1 second to 4 hours

Total number of data points in memory: 10,000

Number of data tags: 10 (1,000 data points per tag)

Logged data:

Each data point: average concentration, time, date,
and data point number

Run summary: overall average and maximum concen-
trations, time/date of maximum, total number of logged
points, start time/date, total elapsed time (run duration),
STEL concentration and time/date of occurrence,
averaging (logging) period, calibration factor, and
tag number

Elapsed time range: 30 days maximum

Time keeping and data retention: > 10 years

Readout display: LCD 16 characters (4 mm height) x 2 lines

Serial interface: RS232, 4800 baud

Computer requirements: IBM-compatible PC, 286 or
higher; Windows 3.1, 3.11, or '95; 2 MB memory or more;
hard drive; 3.5" or 5.25" floppy drive; VGA or higher
resolution monitor

Power:

Internal battery: 9V alkaline, 16-hour run time (typical)
AC source: universal voltage adapter (included)
100-250 volts, 50-60 Hz (CE marked)
Optional battery pack: rechargeable NiMH, 48-hour
run time (typical)

Operating environment: -10° to 50°C (14° to 122° F),
10 to 95% RH, noncondensing

Storage environment: -20° to 70°C (-4° to 158°F)

Dimensions: 153 mm (6.0 in) H x 92 mm (3.6 in) W x
63 mm (2.5 in) D

Weight: 0.5 kg (18 oz)

Standard accessories included: zeroing kit, belt clip set,
PC communications software disk, RS232 communications
cable, universal voltage AC adapter, carrying case, and manual

¹Referred to gravimetric calibration with SAE Fine test
dust (mmad = 2 to 3 μm , $\sigma_g = 2.5$, as aerosolized)

²At constant temperature

³User selectable

MIE



Instrument Depot, A Division of EI
1057 East Henrietta Rd. • Rochester, NY 14623
(716) 424-2037 Fax (716) 424-2166

Instrument Depot (Division EJ)**Price Quotation**

**1057 East Henrietta Rd.
Rochester, NY 14623
(800) 731-7071 • FAX (716) 424-2166**

Date:	04/16/99	Customer Inquiry Date:	
From:	Diane Simpson	Proposed Ship Date:	2 - 3 Weeks ARO
To:	Bob Meyers	Terms:	Net 30 days
Company Name and Address:	Ecology & Environment Lancaster, NY	To be Shipped Via:	UPS
Phone:	716-684-8060	F.O.B.:	SP
Fax:	716-684-0844	Salesperson:	DS

Here is our quotation for the goods named below, subject to the following :

CONDITIONS: The prices and terms of this quotation are not subject to verbal changes or other agreements, unless approved in writing by the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and equipment, plus all other causes beyond Seller's control. Prices are based on costs and conditions existing at date of quotation and are subject to change by the Seller before Purchaser's acceptance of equipment. Typographic, stenographic, and clerical errors are subject to adjustment and Purchaser hereby agrees to re-execute any document that requires correction or signature. Seller makes no warranty, expressed or implied, that the equipment is fit for any particular purpose. Shipment of any products are subject to availability. Seller will make a reasonable effort to meet any delivery quoted. In the absence of specific shipping instructions, or if Purchaser's instructions are deemed unsuitable, Seller reserves the right to ship by the most appropriate method. Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein, which may appear on Purchaser's formal order, will not be binding on the Seller.

Quantity	Description	Price	Amount
1	pDR-1000 personalDataRAM Hand-Held Monitor	\$ 3,670.00	\$ 3,670.00
	<u>Standard Accessories (Included with Instrument)</u> Soft-Shell Carrying Case Digital Communications Cable Software Disk Span Check Kit Z-Pouch Zeroing Kit Belt Clip Kit AC Power Supply (and charger for pDR-BP Battery Module)		
	<i>Total = 2(units) x \$3670.00 = \$7,340.00 plus Tax & shipping</i>		

Shipping, insurance and applicable taxes are additional.

Quote is valid for up to 45 days from date of issue.

Terms are subject to credit approval.

Facsimile Cover Page



HAZCO Services, Inc.

Nationwide Hotline: 800/332/0435

Coast-to-Coast Service

Florence, NJ; Santa Ana, CA; Denver, CO; Dayton, OH; Oak Ridge, TN;

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Title: QUOTATION

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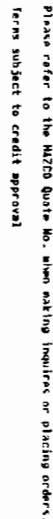
From: MARK KENNARD

Comments: ANY QUESTIONS PLEASE CALL. THANKS

DATE: 04/19/99

TIME: 10:22:33

PAGES: 002



PAGE.02

Response Rentals

Price Quotation

1057 East Henrietta Rd.
Rochester, NY 14623
(716) 424-2140 • FAX (716) 424-2166

Date:	04/15/99 5:20 PM	Customer Inquiry Date:	4/15/99
From:	Matt Shortino	Proposed Ship Date:	TBD
To:	Bob Meyers	Terms:	TBD
Company Name and Address:	Ecology & Environment	To be Shipped Via:	Best Way
Phone:	716-684-8060	F.O.B.:	SP
Fax:	716-684-0844	Salesperson:	MJS

Here is our quotation for the goods named below, subject to the following :

CONDITIONS: The prices and terms of this quotation are not subject to verbal changes or other agreements, unless approved in writing by the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and equipment, plus all other causes beyond Seller's control. Prices are based on costs and conditions existing at date of quotation and are subject to change by the Seller before Purchaser's acceptance of equipment. Typographic, stenographic, and clerical errors are subject to adjustment and Purchaser hereby agrees to re-execute any document that requires correction or signature. Seller makes no warranty, expressed or implied, that the equipment is fit for any particular purpose. Shipment of any products are subject to availability. Seller will make a reasonable effort to meet any delivery quoted. In the absence of specific shipping instructions, or if Purchaser's instructions are deemed unsuitable, Seller reserves the right to ship by the most appropriate method. Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein, which may appear on Purchaser's formal order, will not be binding on the Seller.

Quantity	Description	Price	Amount
(1)	MIE PDM-3 "Miniram" Personal Aerosol Monitor, including : Case, manual, sun shield, Z-bag calibrator, charger, reconditioned :	\$ 1,495.00	\$ 1,495.00
(1)	MIE PERSONAL DATARAM PDR-1000 Includes soft-shell carrying case, digital communications cable, software disk, span check-kit, z-pouch zeroing kit, belt clip kit, and AC adapter/charger. ** All reconditioned instruments include 90-day warranty on parts & labor, New units carry manufacturer's warranties only** <i>Total = 2 (units) x 1495.00 = \$2,990.00 plus tax & shipping</i>	\$ 3,670.00	\$ 3,670.00

Shipping, insurance and applicable taxes are additional.

Quote is valid for up to 45 days from date of issue.

Terms are subject to credit approval.

Computer/Printer Quotation Summary Comparison Table

Vendor	Model/Item	Quantity	Price
Dell Computer Corp.	Dell Inspiron 3500 with carry case Epson Stylus 640 Color Printer	1	\$2,003.00
Gateway 2000, Inc.	Gateway Solo 2500 SE w/carry case Epson Stylus 640 Ink Jet Printer	1	\$2,028.00
COMPAQ	Presario 1600i series IJ200 Printer	1	\$2,178.00
Micron PC	TransPort TREK2 w/carry case Epson Stylus 640 Color Printer	1	\$2,047.00


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DELL INSPIRON 3500

The Dell Inspiron 3500 – our newest line of thinner and lighter mobile computers – refuses to compromise performance for portability. Weighing in at 6.25 pounds with a 13.3" screen and floppy drive, these powerful notebooks deliver the latest Intel® Celeron® mobile processors. And with options like a DVD drive or an Iomega® Zip® drive (options add additional weight), you can get maximum storage without a maximum price!

Your Price*: **\$2,003⁰⁰**

Personal Lease**: **\$76/month*** (36 mos.)

YOUR CART

Items: 0

Total*: \$0.00

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▷ Retrieve a Saved Cart

☐ standard view
 ☐ all option view
 ☒ printfax view

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Date:	Thursday, April 08, 1999 2:48:18 PM CDT
Catalog Number:	04 19
Dell Inspiron 3500 Celeron® Notebook:	Intel Celeron® processor 300MHz, 13.3" XGA Active Matrix TFT KC30XHP - [460-5335]
Memory:	32MB 1DIMM 32M1D - [311-1402]
Hard Drive:	4.3GB Ultra ATA Hard Drive 43GB - [340-1531]
Operating System:	Microsoft Windows 98 on CD-ROM W98 - [420-0205]
Modem:	None N - [310-6520]
CD ROM:	24X max/10X min Variable CD-ROM Drive CD24 - [313-0301]
Inspiron 3500 Setup Video:	Inspiron 3500 Setup Video VID - [310-0304]
Bundled Software:	Microsoft Works Suite 99 with Money 99 Basic WORKS - [412-0617]
Accessories:	Nylon Carrying Case, Dual Compartment NCC - [310-0219]
Service:	3-Year Limited Warranty 3RR - [900-5336]/[900-5332]
Printers:	Epson Stylus 640 Color Printer (requires a printer cable) EPS640 - [867508]
Printers:	10' USB cable USBCABLE - [35291-41]

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Options flagged with this icon require a check for compatibility with other system configuration is in place.

Limited Warranties
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<u>Mid-Size Business</u> (400-2,000 total employees)	888-583-3355	512-728-0568
<u>Small Business</u> (<400 total employees)	800-917-3355	800-225-4893
Home/Home Office Customers		
<u>Personal users & students</u>	800-915-3355	800-317-3355
Government Customers		
<u>Federal Government</u>	800-694-3355	800-926-7595
<u>State and Local Government</u>	800-416-3355	800-433-9527
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<u>Higher Education - Institutions</u>	800-626-8286	800-365-5329
<u>Higher Education - Personal Purchases</u>	800-926-9587	888-242-0964
<u>K-12 Education - Institutions</u>	800-879-3300	888-820-7454

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888-264-7788

888-820-7457

Dell Computer Corporation
One Dell Way
Round Rock, Texas 78682

Your Price*:

\$2,003⁰⁰

Personal Lease**:

\$76/month* (36 mos.)**UPDATE PRICE****ADD TO CART**

This configuration is presented for your convenience only. It is available for purchase by US customers who take delivery in the US. Dell will not be responsible for typographical or other errors or omissions regarding prices or other information. All sales are subject to Dell's Term and Conditions of Sale.

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Thursday, April 08, 1999 2:48:18 PM CDT

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For the - 0010

Customize It & Buy It!

Gateway

Solo 2500 SE

Screen: 13.3inch XGA Active Matrix Color Display added: US\$150
Processor: Intel Celeron Processor 300MHz w/128K Full Speed L2 Cache
Memory: 32MB SDRAM expandable to 288MB
Graphics Accelerator: 128-Bit Accelerator w/ 2MB Video Memory
Hard Drive: 4GB Ultra ATA Removable hard drive
Floppy Drive: Integrated 1.44MB 3.5inch Floppy Disk Drive
CD-ROM: 8X min./20X max. CD-ROM drive
Multimedia Package: Integrated 16-bit Sound, Stereo Speakers, Internal Microphone, Headphone/Speaker Jack, Line-In and Line-out Mic Jacks
Fax/Modem: Not Included subtracted: US\$100
ISP: 1 Year gateway.net Internet Access
Expansion Slots: Two deep socketed PCMCIA Type II slots
Battery: NiMH battery and AC Pack
Keyboard: Full-Size 85-key Keyboard with MS Windows 95 Keys
Mouse: EZ Pad® Pointing Device
Carrying Case: Casual Carrying Case
Dimensions: 11.5inch x 9.3inch x 1.9inch, 7.1 lbs
Additional Software: McAfee Anti Virus Software
Application Software: Microsoft Works Suite 99 - Including Microsoft Word and Encarta
Operating System: Microsoft Windows 98
Certifications: FCC Class B, UL and CSA certified
Service Program: 1 Year Parts & Labor Limited Warranty
Printer: Epson Stylus Color 640 Ink Jet Printer added: US\$179

Base Price: US \$1799**Configured Price:** US \$2028**Quantity:** 1**Total Price:** US \$2028 - plus shipping, handling and any applicable taxes.**Or as low as:** \$56.34 per month** with Gateway Easy PaySM financing.

If you would like to finance through Easy PaySM, click here to open a new browser window and apply. Once you have applied, you will receive a reference number; return to this browser window and click Continue to complete your order. You will need to enter your reference number under the Payment Method area.

As configured, this system DOES NOT yet qualify for the Your:WareSM trade-in option. Financing this purchase with Easy PaySM is one way to qualify for Your:WareSM.

** Loan financing available on approved credit through independent lender. Payments based on 48-month term at an Annual Percentage Rate as low as 14.9%. Your APR may be higher. 2% access check fee (\$2 min./\$15 max); not applicable to Gateway purchases.

© I would like to order this system via the World Wide Web.

Clicking "Continue" below takes you to our secure server. Gateway uses Secure

Sockets Layer (SSL) encryption to assure that all information entered on the next screen -- including your credit card number -- can only be understood by us. **After thousands of online transactions worth millions of dollars, no Gateway client has ever reported misappropriation of a credit card number protected by SSL technology.** Check our article on [how SSL works and why we think it's extremely safe](#) to learn more.

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[Terms and Conditions of sale and limited warranty](#)

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COMPAQ*home and home office computing*

+130

**Presario 1600i series: configure to order**

Shipping charges and tax are not included in the configured price.
Retail pricing and availability may vary.

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Processor	Faster processors let your computer carry out complex tasks faster.
	Intel® Pentium® II Processor - 266MHz
Memory	More memory allows you to run more applications at the same time.
	64MB SyncDRAM
Screen	Provides a clear, bright image anywhere you take it.
	13.3" XGA Active Matrix Display
Hard Drive	Hard drives provide storage space for data and programs.
	4.3GB Ultra DMA Hard Drive
Modem	Connect to the world with a 56K internal modem.
	56K ITU V.90 Modem
CD-ROM	Get the latest in multimedia with a fast CD-ROM.
	24X Max CD-ROM
Video	See what you have been missing with the latest video processors.
	256-bit accelerated graphics w/ 2.5MB Video Memory
Cache	Increases system performance.
	256KB Integrated L2 Pipeline Burst Cache
Battery	Keep your system on, even when you're not connected to the wall p.
	Smart Lithium Ion Battery
Audio	Experience the sounds of the Internet and today's popular programs.
	JBL Pro Audio System with Bass Reflex
Diskette Drive	Diskette Drive
	3.5" 1.44 MB diskette drive
Operating System	Operating Systems make all of your hardware and software work to
	Microsoft Windows98
Factory Installed Software	Factory installed software to make the computing experience compl
	Microsoft Featured Home Collection + Word
Additional Options	
System Warranty	System Warranty
	1yr Parts / 1yr Pick-Up
Accessories	Accessories for life in the mobile world.
	<input type="checkbox"/> High-Capacity Lithium-Ion Battery (Add \$129.95)
Carrying Cases	Carry your portable in style with a carrying case.
	<input type="checkbox"/> Briefcase (Add \$119.00)

☒ Folio Case**Port Replicator** Connect your portable to your peripherals with the Port Replicator.☐ Port Replicator - 1600i Series (Add \$129.95)**Portable Surge Protector** Portable Surge Protector☐ Tripp Lite Super Notebook Protector (Add \$14.95)**Power Adapter** Rock your portable up wherever you are.☐ Tripp Lite 140 Watt Inverter (Add \$49.95)

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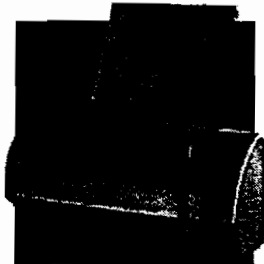
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United States April 8, 1999

United States April 8, 1999

COMPAQ

IJ200 Printer



\$129.99*

- Single-head thermal inkjet
- Up to 600 x 600 dpi print resolution
- Print speeds of up to 3.5 ppm black/1.5 ppm color
- Paper tray holds up to 30 sheets
- High speed, bi-directional parallel port

Easy, Quality Color Printing Made Affordable

Your wait for a color printer that combines quality with an unmatched value is over.

The Compaq IJ200 Color Inkjet Printer is the easy set-up, Windows®-compatible color printer that produces sharp text and stunning graphics on a wide range of papers and forms -- to meet all your home printing needs.

Print banners, create customized greeting cards, or just add a finishing touch to school or work projects -- with the Compaq IJ200, the creative possibilities are endless. And with its lightweight, space-saving design, the Compaq IJ200 fits into any room -- and your life -- beautifully.

FOOTNOTES:

* - Suggested retail price. Reseller price may vary.

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TransPort TREK²™

\$1,848 +129
Consumer Lease
 (For full financial information on consumer leasing, click above.)
\$73.18/mo
30 mo lease*

Standard Features

300MHz Mobile Celeron Processor
 32MB SDRAM (1 DIMM)
 Microsoft Windows 98
 Smart Lithium-ion battery
 24X-max CD-ROM drive
 4.3GB hard drive
 1.44MB 3.5" floppy drive
 12.1" SVGA Active Matrix Display
 Customer Selects No Modem
 Norton Anti-Virus
 Micron University Scholarship(easy registration)
 Customer Selects No Dragon Software
 Office 97 SBE with Office 2000 Upgrade
 Micron Easy Internet
 Nylon carrying case
 5 year processor/memory, 1 year parts/labor
 No service options ordered



Subtotal

\$1,848
Consumer Lease
 (For full financial information on consumer leasing, click above.)
\$73.18/mo 30 mo lease*

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Additions



Technical Information

Product
Code

Product Description

Stock Price

Buy

XPR5036 epson stylus color 640

8726
In
Stock

\$199.00

Buy

1440 x 720 dpi

5ppm black

3.5ppm color

Software: PhotoDeluxe 2, Print Shop Premier Edition, Ceatacard.

Search
Hardware

Go

Organic Vapor Analyzer Quotation Summary Comparison Table

Vendor	Model/Item	Quantity	Price
Hazco	Model 128, Foxboro w/o GC mode	1	\$4,000.00
Eirtech Instruments, Inc.	Model 128, Foxboro w/o GC mode	1	\$2,495.00
Foxboro	TVA 1000 instead of 128	1	\$8,458.00

Notes: OVA no longer made, TVA made instead
Low bid is for a refurbished OVA unit



5581 CENTREVILLE BUSINESS PARK
DAYTON, OH 45459
PHONE: (603) 352 6435
FAX: (603) 824 4425

INQUIRY NO.	PRICE QUOTE
HAZCO QUOTE NO.	15977
DATE:	4/07/99
TERMS:	1% 10 NET 30
DELIVERY:	PREPAID/SHIPPING POINT
F.O.B.:	BOB MEYERS
ATTENTION:	BOB MEYERS

Please refer to the HAZCO Quote No. when making inquiries or placing orders.
Prices subject to credit approval

BILL-TO:

ECOLOGY & ENVIRONMENT, INC
368 PLEASANTVIEW DR
ATTN: ACCOUNTS PAYABLE
LANCASTER NY 14086

SHIP-TO:

ECOLOGY & ENVIRONMENT, INC
368 PLEASANTVIEW DR
ATTN: BOB MYERS
LANCASTER NY 14086

PURCHASE ORDER NO:

PHONE: 716-684-8060

ACCOUNT NO:

0324160

FAX:

17166840844

ITEM #	QTY	PART NUMBER	DESCRIPTION	PRICE	U/M	EXT. PRICE
1	2	FO90330	FOXORO OVA 128 FID	4000.00	EA	8000.00
			INCLUDES PROBE, H2 REFILL ASSEMBLY, READOUT ASSEMBLY W/SAMPLE LINE, CASE, SHOULDER STRAP, CHARGER/ADAPTER CABLES, REPAIR KIT (O-RINGS/FILTERS), CLOSE AREA SAMPLING PROBE, AND MANUAL.			
2	1	EO10001	WATER LEVEL METER W/SS PROBE & LIGHT	526.42	EA	526.42
			150-FT LENGTH, GRADUATED IN 1/100TH FOOT			
			ESTIMATED SHIPPING WEIGHT 15 LBS. EST.			
			SHIPPING COST VIA UPS \$20.			
			7 IN STOCK AT HAZCO.			
			SOLINST PART NO. 101-M2P2-150			

QUOTED BY: BILL MCEADDEN

THIS QUOTE IS VALID FOR 28 DAYS

WAREHOUSE
CUSTOMER:

80

REGIONAL SALESPERSON:

GREG DEMPSEY

PAGE

3

Eirtech Instruments, Inc. Price Quotation

1057 East Henrietta Rd.
Rochester, NY 14623
(716) 424-2030 • FAX (716) 424-2166

Date:	4/6/99 12:20PM	Customer Inquiry Date:	April 6, 1999
From:	Jeffrey Brei	Proposed Ship Date:	TBD
To:	Bob Meyers	Terms:	Nct 30
Company Name and Address:	Ecology & Environment 4493 Walden Ave Lancaster, NY 14086	To be Shipped Via:	UPS
Phone:	716-685-1400	F.O.B.:	SP
Fax:	716-684-0844	Salesperson:	JB49

Here is our quotation for the goods named below, subject to the following :

CONDITIONS: The prices and terms of this quotation are not subject to verbal changes or other agreements, unless approved in writing by the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and equipment, plus all other causes beyond Seller's control. Prices are based on costs and conditions existing at date of quotation and are subject to change by the Seller before Purchaser's acceptance of equipment. Typographic, stenographic, and clerical errors are subject to adjustment and Purchaser hereby agrees to re-execute any document that requires correction or signature. Seller makes no warranty, expressed or implied, that the equipment is fit for any particular purpose. Shipment of any products are subject to availability. Seller will make a reasonable effort to meet any delivery quoted. In the absence of specific shipping instructions, or if Purchaser's instructions are deemed unsuitable, Seller reserves the right to ship by the most appropriate method. Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein, which may appear on Purchaser's formal order, will not be binding on the Seller.

Quantity	Description	Price	Amount
1	<p>Foxboro OVA-128 Organic Vapor Analyzer. Includes sidepack, tool kit, probe/readout, battery charger, hydrogen filler hose, shoulder strap, earphone, audible alarms, instruction manual, carrying case.</p> <p>Reconditioned. 90 day parts and labor warranty. Calibration kit, add \$385. Spare H2 cylinder, add \$150.</p> <p><i>Subject to availability and prior rental and/or sale</i></p>	\$ 2,495.00	

Shipping, insurance and applicable taxes are additional.

Quote is valid for up to 45 days from date of issue.

Terms are subject to credit approval.

(4 pgs)

Quotation No: SEE1293~

Please refer to this number when ordering.

Date: 4/7/99

To: BOB MEYERS

Please send your purchase order to:

THE FOXBORO CO
EMO
600 N BEDFORD ST
PO BOX 500
DEPT 1293
E BRIDGEWATER, MA 02333
USA
TEL:508-378-5513
FAX:508-378-5202
SEARLE@FOXBORO.COM

Attn: FAX: 716-684-0844

Inquiry Reference:

Orders placed on or before the expiration
date shown will be billed at prices quoted.


FOB: FOXBORO MA

Terms: NET-30

Estimated Shipment: 1 -2 WEEKS

This Quotation expires in 30 DAYS

Please find attached quotation for the
items you requested.


SEARLE

NOTE

Quotation No.: SEE1293~

Page:2

B.O. Order No.:

Date:4/7/99

Customer:

Reference:

Prices in US Dollar

ITEM	QTY	
1	1	CENTURY PORTABLE TOXIC VAPOR ANALYZER

Base Model: TVA1000B-AB2BFAZ-CD

TVA1000B FUNCTION: Provides Continuous Direct Readout And Logging Of Total Organic And Inorganic Vapor Concentrations For Screening And Survey Purposes.

A BATTERY CHARGER: 120 Vac, 50/60 Hz

B DETECTOR: Flame Ionization Detector Only (With Hydrogen Refill Adapter)

2 PROBE ASSEMBLY: Standard Probe Assembly

B CARRYING CASE: Standard Carrying Case

FAZ CLASSIFICATION: FM Certified For Use In Class I, Groups A,B,C, And D, Division I Hazardous Environments

C OPTIONAL MODEL SUFFIX(ES) INCLUDED: - Charcoal Filter Adapter For Probe

D OPTIONAL MODEL SUFFIX(ES) INCLUDED: - Extension Wand

Each Net: \$8,458.00

Total Net: \$8,458.00

SEARLE
EMO

Phone:508-378-5513
Fax: 508-378-5202

Quotation No.: SEE1293~

Page:3

B.O. Order No.:

Date:4/7/99

Customer:

Reference:

Prices in US Dollar

ITEM	QTY	
2	1	PC, CALIBRATION KIT 0VA 128

Base Model: CR009UY

PC, CALIBRATION KIT 0VA 128

1	Customer Tag	CALIBRATION KIT FOR USE WITH THE TVA1000B/FID	
	Each Net:	\$1,053.00	Total Net: \$1,053.00

SEARLE
EMOPhone:508-378-5513
Fax: 508-378-5202

Quotation No.: SEE1293~

Page:4

B.O. Order No.:

Date:4/7/99

Customer:

Reference:

Prices in US Dollar

ITEM	QTY	
3	1	PC, BATTERY PACK

Base Model: CR012LZ

PC, BATTERY PACK

Each Net:	\$363.00	Total Net:	\$363.00
		Quote Total Net:	\$9,874.00

SEARLE
EMOPhone:508-378-5513
Fax: 508-378-5202

1

2

3

O₂ Meter/explosimeter and H₂S meter Quotation Summary Comparison Table

Vendor	Model/Item	Quantity	Price
Eirtech Instruments, Inc.	Model GT 302 PGM O ₂ Meter/explosimeter and H ₂ S meter	1	\$2,568.00
Hazco	Model GT 302 PGM O ₂ Meter/explosimeter and H ₂ S meter	1	\$2,168.00
Gastech, Inc.	Model GT 302 PGM O ₂ Meter/explosimeter and H ₂ S meter	1	\$2,573.00

Eirtech Instruments, Inc. Price Quotation

1057 East Henrietta Rd.
Rochester, NY 14623
(716) 424-2030 • FAX (716) 424-2166

Date:	4/6/99 12:20PM	Customer Inquiry Date:	April 6, 1999
From:	Jeffrey Brei	Proposed Ship Date:	TBD
To:	Bob Meyers	Terms:	Net 30
Company Name and Address:	Ecology & Environment 4493 Walden Ave Lancaster, NY 14086	To be Shipped Via:	UPS
Phone:	716-685-1400	F.O.B.:	SP
Fax:	716-684-0844	Salesperson:	JB49

Here is our quotation for the goods named below, subject to the following :

CONDITIONS: The prices and terms of this quotation are not subject to verbal changes or other agreements, unless approved in writing by the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and equipment, plus all other causes beyond Seller's control. Prices are based on costs and conditions existing at date of quotation and are subject to change by the Seller before Purchaser's acceptance of equipment. Typographic, stenographic, and clerical errors are subject to adjustment and Purchaser hereby agrees to re-execute any document that requires correction or signature. Seller makes no warranty, expressed or implied, that the equipment is fit for any particular purpose. Shipment of any products are subject to availability. Seller will make a reasonable effort to meet any delivery quoted. In the absence of specific shipping instructions, or if Purchaser's instructions are deemed unsuitable, Seller reserves the right to ship by the most appropriate method. Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein, which may appear on Purchaser's formal order, will not be binding on the Seller.

Quantity	Description	Price	Amount
1	Gastech GT 302 Portable Gas Monitor. For monitoring LEL/O2/H2S. Includes instrument, built in datalogger, TWA/STEL alarms, liquid inhibiting probe and tubing.	\$ 2,275.00	
	<u>Options</u>		
	Carrying Case	\$ 165.00	
	Charger	\$ 128.00	

Shipping, insurance and applicable taxes are additional.

Quote is valid for up to 45 days from date of issue.

Terms are subject to credit approval.



6581 CENTINVILLE BUSINESS PARK
DAYTON, OH 45459
PHONE: (603) 332 4435
FAX: (603) 824 4435

INQUIRY NO:	PRICE QUOTE
HAZCO QUOTE NO:	15977
DATE:	4/07/99
TERMS:	1% 10 NET 30
DELIVERY:	PREPAID/SHIPPING POINT
F.O.B.I	BOB MEYERS
ATTENTION:	

Please refer to the HAZCO Quote No. when making inquiries or placing orders.
Prices subject to credit approval

BILL-TO:

ECOLOGY & ENVIRONMENT, INC
368 PLEASANTVIEW DR
ATTN: ACCOUNTS PAYABLE
LANCASTER NY 14086

SHIP-TO:

ECOLOGY & ENVIRONMENT, INC
368 PLEASANTVIEW DR
ATTN: BOB MEYERS
LANCASTER NY 14086

PURCHASE ORDER NO:

PHONE:

ACCOUNT NO:

0324160

FAX:

716-684-8060
17166840844

ITEM #	QTY	PART NUMBER	DESCRIPTION	PRICE	U/M	EXT. PRICE
3	1	910-129	THIS UNIT HAS P2 PROBE (STAINLESS STEEL)	426.83	EA	426.83
4	1	G030302	6 IN STOCK AT HAZCO.	1900.00	EA	1900.00
5	1	G030400	CASTECH GT302 TEL-O2-H2S MONITOR	123.08	EA	123.08
6	1	1600	ARO FOR AVAILABILITY.	145.00	EA	145.00
7	1	**101-M2-P4-150	CASTECH GT CHARGER, 115-VOLT	590.62	EA	590.62
			ONE IN STOCK AT HAZCO.			
			ONE IN STOCK AT HAZCO.			
			PELICAN CASE, 23.25" X 20.75" X 9"			
			WATER LEVEL METER W/P4			
			SAME AS ITEM 2 EXCEPT WITH P4 PROBE			
			(ENVIRONMENTAL PROBE)			

QUOTED BY: BILL MCEADDEN

THIS QUOTE IS VALID FOR

28 DAYS

WAREHOUSE
CUSTOMER

80

REGIONAL SALESPERSON:

GREG DEMPSEY

4/07/99 10:22:19

PAGE

2

GasTech, Inc.
8407 Central Avenue
Newark, CA 94560
510-745-8700
510-794-6201(fax)

Fax



To:	Bob Myers	From:	Mark Ready
Fax:	716-684-0844	Pages:	4
Phone:	716-684-8060	Date:	April 8, 1999
Re:	Quotation	CC:	

☐ Urgent ☒ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

● **Comments:**

Please reference your proposal # P990414MR6 upon ordering.

**Ecology & Environment Inc
PROPOSAL # P990414MR6****GT Series**

Part Number	Description	Price
72-6302-02	Model GT302, triple channel, oxygen, combustibles, hydrogen sulfide, Ni-Cd battery version.	\$ 2,280.00
81-6400-01	Calibration Kit	\$ 550.00

Standard Accessories:

13-0110	Strap, shoulder, adjustable
71-6100	Operators guide
80-0187	Probe w/filter
80-0505	Hose, polyurethane, 5'

Optional Accessories

Part Number	Description	Price
20-0650	Carrying case, GT Series instrument	\$ 165.00
49-2150	Ni-Cd battery charger, dual-rate, 115 VAC	\$ 128.00
82-5070	Datalogging option. Connects GT Series instrument to any IBM or IBM-compatible computer which operates on MS-DOS & has an 8086, 286, 386, or 486 microprocessor	\$ 110.00

Terms Net 30 days
Delivery One to two weeks ARO, FOB Newark, CA

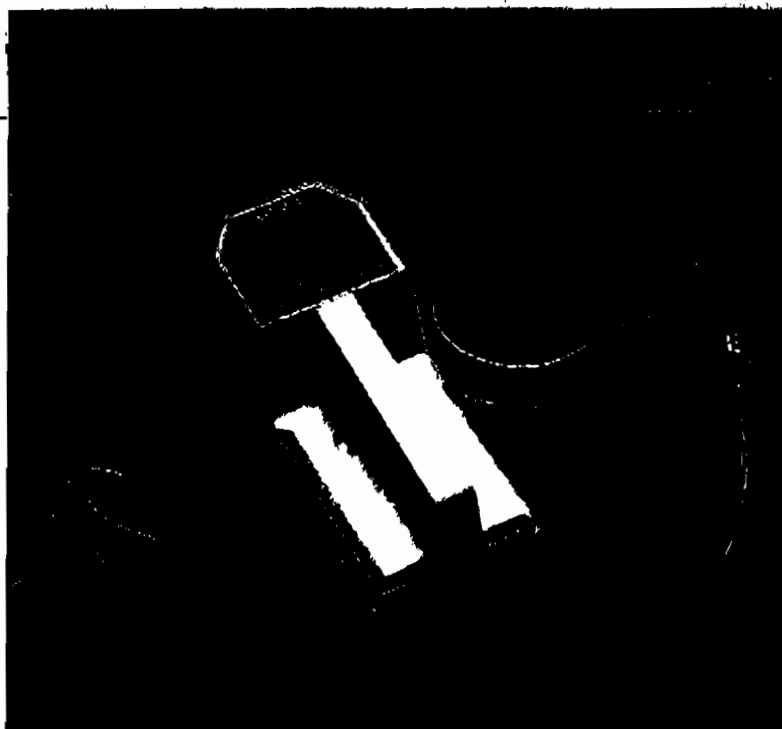
REFERENCE PROPOSAL NUMBER P990414MR6 WHEN ORDERING

GT Series

Portable Gas Monitors for One, Two, Three or Four Gases

Gas Tech's GT Series of portable gas monitors are designed to protect workers from hazardous gases in confined spaces and other industrial work sites. The monitors are available in several different gas combinations for the detection of hydrocarbons in the LEL/ppm range, oxygen content, carbon monoxide, hydrogen sulfide and other gases.

- Exclusive LIP™ (*Liquid Inhibiting Probe*) attachment prevents damage to the sample system by automatically shutting the pump off & sounding a low flow alarm if liquid or water is aspirated.
- Built in pump meets federal regulation compliance for pre-testing of confined spaces & other remote areas.
- LCD backlight display shows:
 - real-time gas concentrations
 - date & time
 - battery capacity
 - alarm set points
 - diagnostics
 - log remaining hours
 - TWA, STEL, minimum, & maximum readings can be called to the display.
- Monitoring of hydrocarbons in the LEL/ppm range is standard.
- Built-in datalogger.
- Weighs only five pounds.
- Microprocessor electronics & convenient top-mounted switches make operation & calibration simple.
- Four D size batteries—either alkaline or Ni-Cd.
- Battery & sensor replacement are easily performed, as is basic calibration of the instrument.
- Alarm points
 - user defined, programmable alarm levels
 - two levels of alarm with audible & visual indications to warn of unsafe gas levels
 - latching or self resetting modes
 - trigger if a low battery, low flow, or sensor failure should occur in the field.
- Unique "float probe" available for monitoring underground storage tanks for Model GT202.
- UL Classified and CSA Certified for Class I, Div. 1, Groups A, B, C & D.



New Chlorine Sensor Available

Chlorine is a highly toxic chemical. The GT Series portable gas monitors can detect chlorine at levels as low as 1 ppm. The new chlorine sensor is available for the GT Series portable gas monitors.

GT SERIES SPECIFICATIONS

Range of Gases Detected

Hydrocarbons	0 to 100% LEL in 1% increments 0 to 10,000 ppm in 20 ppm increments
Oxygen (O ₂)	0 to 30.0 % Vol in 0.1% increments
Carbon Monoxide (CO)	0 to 300 ppm in 1 ppm increments
Hydrogen Sulfide (H ₂ S)	0 to 200 ppm in 1 ppm increments
Sulfur Dioxide (SO ₂)	0 to 10.0 ppm in 0.1 ppm increments
Ammonia (NH ₃)	0 to 100 ppm in 1 ppm increments

Sensors

Hydrocarbons	Catalytic compensated
O ₂ , H ₂ S, CO, SO, NH ₃	Electrochemical

Sampling Method

Sample-draw, internal pump

Response Time

90% in 30 seconds
90% in 150 seconds (NH₃)

Accuracy

LEL: ±5% of reading
O₂: ±0.5% Vol
ppm, CO, H₂S, SO₂: ±10% of full scale
NH₃: ± 20% of reading
(when calibrated & maintained in accordance to instruction manual recommendations)

Repeatability

ppm and LEL: ±2% of reading
O₂: ±0.2% Vol
CO, H₂S, SO₂: ±5% of full scale
NH₃: ± 10% of reading
(when calibrated & maintained in accordance to instruction manual recommendations)

Operating Temperature

-4°F to 113°F (-20°C to 45°C)

Humidity Range

0 to 95% RH non-condensing

Alarms

Audible & visual alarms

Display

LCD, back light on demand

Power Source

Four D alkaline or Ni-Cd batteries

Battery Life

10 hours @ 68°F (20°C)
Due to the nature of alkaline cells, battery life is greatly reduced at low temperatures
Ni-Cd batteries are recommended for low temperature applications

Controls

Six top-mounted buttons

Dimensions

10 in. (254 mm) L x 6 in. (152 mm) H x
5 in. (127 mm) W

Weight

Approximately 5 pounds (2.25 kg)

Case Material

High impact, chemical & RF resistant, polycarbonate-polyester plastic

Intrinsic Safety Rating

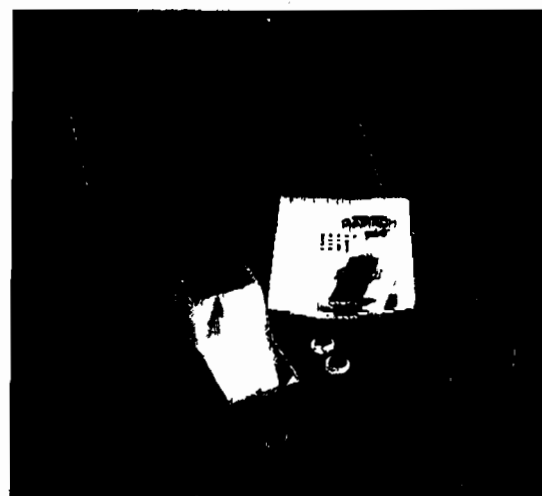
UL and CSA approved
Class I, Div. I, Groups A, B, C, & D

Warranty

One year materials & workmanship

Optional Accessories;

- Confined Space Kit
- Calibration Kit
- Auxilliary Hydrophobic Filter
- Storage Case
- Dilution Fitting
- 30 inch Probe
- Extra Length Hoses, Up to 100'
- Remote Buzzer
- Data Retrieval Package
- Battery Charger (220 VAC, 115 VAC, 12 VDC)



GT Series carrying case with instrument and standard accessories.



8407 Central Avenue • Newark, CA 94560-3431

PH (510) 745-8700 • FAX (510) 794-6201

www.gastech-inc.com

A Thermo Instrument
Systems Inc. Company

The Gas Tech logo, IIP, Safe T Mate and Safe T Net are trademarks of Gas Tech, Inc. All other product names and logos are trademarks of their respective owners.
Specifications and availability subject to change without notice



Turbidimeter Quotation Summary Comparison Table

Vendor	Model/Item	Quantity	Price
Forestry Suppliers, Inc.	Orbeco-Hellige Portable turbidimeter	1	\$648.67
Eirtech Instrument, Inc.	LaMotte 2020, Portable turbidity meter	1	\$795.00
HACH	Model 2100P w/standards, case, etc.	1	\$775.00

10.396d
(P) 116-084-0800

APR 06 1999 14:35

Bob Myers
716-084-0844

ORDER ESTIMATE
ESTIMATE DATE: 4/06/99

FORESTRY SUPPLIERS, INC.
105 W RANKIN ST.
JACKSON MS 39201
-800-647-5368

4651 ECOLOGY & ENVIRONMENT INC

368 PLEASANT VIEW DR
LANCASTER NY 14086-1316
716-684-8060

ITEM#	Q/O	U/M	DESCRIPTION	PRICE	EXT PRICE
77180	1	EA	TURBIDIMETER, PORTABLE, W/CASE SERIAL #	648.670	648.67
90791	1	EA	WATER LEVEL METER, 150' SS PROBE P2 Probe OE SEE ITEM BELOW	497.470	497.47
90604	1	EA	WATER LEVEL METER, 150' P4 Probe	558.140	558.14

ISC %: .000

ONE: 5 TOT WGT: 18.500 UNITED PARCEL SERVICE (UPS)

OT PKG: 1

MT SUB TAX: 1,713.13 TAX JURSDICTION:

MDSE AMT: 1,704.28
DISC AMT: .00
FRT AMT: 8.60
PKG CHG: .25
MISC AMT: .00
TAX AMT: .00
F.E.T.: .00

INVOICE AMT: 1,713.13

SALES PERSON: REDDITTD

[Signature]
[Signature]

Eirtech Instruments, Inc. Price Quotation

1057 East Henrietta Rd.

Rochester, NY 14623

(716) 424-2030 • FAX (716) 424-2166

Date:	4/6/99 12:20PM	Customer Inquiry Date:	April 6, 1999
From:	Jeffrey Brei	Proposed Ship Date:	TBD
To:	Bob Meyers	Terms:	Net 30
Company Name and Address:	Ecology & Environment 4493 Walden Ave Lancaster, NY 14086	To be Shipped Via:	UPS
Phone:	716-685-1400	F.O.B.:	SP
Fax:	716-684-0844	Salesperson:	JB49

Here is our quotation for the goods named below, subject to the following :

CONDITIONS: The prices and terms of this quotation are not subject to verbal changes or other agreements, unless approved in writing by the Seller. All quotations and agreements are contingent upon strikes, accidents, fires, availability of materials and equipment, plus all other causes beyond Seller's control. Prices are based on costs and conditions existing at date of quotation and are subject to change by the Seller before Purchaser's acceptance of equipment. Typographic, stenographic, and clerical errors are subject to adjustment and Purchaser hereby agrees to re-execute any document that requires correction or signature. Seller makes no warranty, expressed or implied, that the equipment is fit for any particular purpose. Shipment of any products are subject to availability. Seller will make a reasonable effort to meet any delivery quoted. In the absence of specific shipping instructions, or if Purchaser's instructions are deemed unsuitable, Seller reserves the right to ship by the most appropriate method. Conditions not specifically stated herein shall be governed by established trade customs. Terms inconsistent with those stated herein, which may appear on Purchaser's formal order, will not be binding on the Seller.

Quantity	Description	Price	Amount
1	LaMotte 2020 Portable Turbidity Meter.	\$ 795.00	

Shipping, insurance and applicable taxes are additional.

Quote is valid for up to 45 days from date of issue.

Terms are subject to credit approval.

QUOTATION

ECOLOGY - ENVIRONMENT INC
368 PLEASANTVIEW DR
LANCASTER, NY 140860000

ATTN: BOB MEYERS

Hach Bid Reference Number: Q386343



ISO 9001 Certified

DATE: 4/07/99

Send **HACH COMPANY**
Purchase **PO BOX 608**
Orders To: **Loveland, Colorado 80539-0608**
PHONE: 800-227-4224
FAX: 970-669-2932
http://www.hach.com

Project Ref. No.: QUOTATION REQUEST

USE HACH REFERENCE NUMBER WHEN PLACING ORDER TO ASSURE QUOTED PRICES.

CC: BILL ALLENSON
FAX: 716-684-0844

We are pleased to quote on your inquiry as follows:

CATALOG NUMBER	DESCRIPTION	QUANTITY	UNIT PRICE	EXTENDED PRICE
46500-00	MODEL 2100P PORTABLE RATIOING TURBIDIMETER WITH AUTO/MANUAL RANGE SELECTION FROM 0-1000 NTU AND RESOLUTION TO 0.01 NTU IN THE LOWEST RANGE. COMPLETE WITH FORMAZIN STANDARD, CARRYING CASE, CELEX SECONDARY STANDARDS, SAMPLE CELLS, 4-AA CELLS, MANUAL.	1.00	775.00	775.00

THIS QUOTATION DOES NOT
INCLUDE FREIGHT CHARGES.
PLEASE REFER TO THE ENCLOSED
FREIGHT SCHEDULE WHICH BASED
ON A TOTAL DOLLAR AMOUNT PER
SHIPMENT. THANK YOU!

TERMS:
PREPAY AND BILL FOB SHIPPING POINT
Prices firm for orders received by JUNE 07, 1999.
Shipment within 30 days after the receipt of
firm order.
PAYMENT NET 30 DAYS FROM INVOICE DATE
TERMS:

TOTAL U.S.\$ 775.00

PAYMENT TERMS ARE SUBJECT TO HACH COMPANY CREDIT REVIEW.

Freight Charges on orders will be prepaid and added to invoice. Special freight pricing
may apply to next day and second day shipments over \$200.00.

While verbal orders totaling \$5,000.00 or more will be accepted, a confirming written
purchase order is needed to ship the order. Send order, including terms and conditions,
to address or fax shown above.

SALES TAXES ARE NOT INCLUDED IN QUOTATION.
APPLICABLE SALES AND USE TAXES WILL BE ADDED
TO INVOICE BASED ON U.S.A. DESTINATION OF GOODS
UNLESS A VALID RESALE/EXEMPTION CERTIFICATE
FOR THE DESTINATION STATE IS PROVIDED.

Nicole Steen

Signed: HACH COMPANY

THIS QUOTATION IS SUBJECT TO THE CONDITIONS THAT FOLLOW.



ISO 9001 Certified

HACH COMPANY

PO Box 389 • Loveland, Colorado 80539-0389

970-669-3050 • Fax: 970-669-2932

www.hach.com

Dear Hach Customer:

Thank you for inquiring about Hach Products. The attached quotation provides prices for the products of interest to you. If you have any concerns or questions about this quotation, please call us at 1-800-227-4224. We look forward to serving you.

MAIL PURCHASE ORDERS TO:

HACH COMPANY
P.O. Box 608
Loveland, CO 80539-0608
FAX: 970-669-2932

MAIL REMITTANCE TO:

HACH COMPANY
Dept. 198
Denver, CO 80281-0198

CALL US TOLL FREE! 800-227-4224**SIRR PLAN**

The SIRR Plan (Scheduled Inventory Reagent Replacement) makes it easy for you to receive shipments of fresh reagents exactly when you need them. By forecasting your reagent supply requirements for the year, you can arrange for frequently used reagents to be automatically shipped at designated intervals.

The SIRR Plan requires a minimum of four shipments per year and automatically qualifies for a 10% discount on reagents ordered. Call Customer Service at the above toll-free number for additional information.

TECH HELP AVAILABLE ON-LINE

If you have any technical questions about Hach products or procedures, here's a new address you can add to your e-mail directory: tech-help@hach.com. When requesting assistance, simply explain the problem you are experiencing, and include your Hach customer account number (if available), a contact name and your e-mail address or phone number. In most cases, we will respond within 24 hours. Of course, if you're not wired yet, you can still reach our technical support staff at 1-800-227-4224.

START-UP SERVICE AND MAINTENANCE AGREEMENTS

When you purchase a new process instrument from Hach, you have an opportunity to ensure your instrument's smooth installation and its continued optimum performance. The User Service Agreement (USA) is available for scheduled preventative maintenance on process analyzers.

Contact our Hach Service Department at the above toll-free number for information on Hach's USA program, installation, start-up, or operator training. **Start up is free with the purchase of a USA Agreement.**

SUBMITTALS

Manuals - Each Hach instrument is shipped with one instruction manual. Additional manuals are available for a nominal charge.

Transmittal Drawings (reproducible) are \$15.00 per set.

Certified prints are \$10.00 per set per instrument.

FREIGHT CHARGES*

Total Price of Merchandise Ordered**	Standard Surface	Second Day Delivery***	Next Day Delivery***
\$0.00 — \$24.99	\$5.00	\$12.00	\$25.00
\$25.00 — \$49.99	\$7.00	\$17.00	\$35.00
\$50.00 — \$199.99	\$9.00	\$27.00	\$45.00
\$200.00 — \$499.99	\$12.00	\$37.00	\$55.00
Over \$500	\$15.00	\$47.00	\$70.00

* For products billed to and shipped to USA destination. Freight charges on orders are prepaid and added to invoice.

** Freight for SIRR Plan orders is charged on each shipment release and is based on the total price of each shipment release.

*** Next Day and Second Day Delivery not guaranteed in Alaska and Hawaii or for order placed after 2:30 p.m. Mountain Time.

Special Freight pricing may apply to Second Day and Next Day shipments over \$200.00. Special freight pricing may apply to Second Day and Next Day shipments over \$200.00.

Facility Location: 5600 Lindbergh Drive • Loveland, Colorado 80538 USA

TERMS AND CONDITIONS

These terms and conditions supersede all other provisions, conditions, and representations or warranties expressed or implied. Acceptance of Buyer's offer to purchase goods or services is expressly limited to the following terms and conditions. In the absence of any agreement in writing signed by authorized Hach personnel and by Buyer, acceptance by Buyer of goods or services specified in the invoice shall be deemed acceptance of the following terms and conditions.

Payment: Payment is due thirty days from date of invoice if Buyer is an established customer who is current with payments, or a new customer with a favorable rating by Dun and Bradstreet, or who had provided adequate credit information; otherwise, shipments are prepaid by the Buyer or C.O.D. Past-due balances are subject to interest charges at the maximum rate permitted by law. Buyer shall pay all applicable taxes (e.g., sales or use taxes), all costs of transportation and insurance, license fees, and any other incidental expenses incurred in connection with the sale by Hach to Buyer.

Risk of Loss: Risk of loss or damage to the goods shall be on Buyer from the time Hach delivers the goods to a carrier for shipment to Buyer, notwithstanding any agreement by Hach to install or supervise installation of the goods. Notwithstanding any defect or nonconformity of the goods, risk of loss or damage shall remain on Buyer until Buyer returns the goods, at its own expense, to the location specified by Hach. Buyer, at its own expense, shall fully insure the goods against all loss or damage until Buyer has paid in full or until Hach has accepted delivery of goods returned to it for any reason.

Inspection: Buyer shall inspect the goods and approve or reject them immediately upon receipt of shipment. Buyer shall notify Hach, within two weeks after receipt of the goods, of any and all claims for defect or rejection. Where there is any evidence of shipping damage, Buyer will file an appropriate claim with the transportation company.

Contingencies: Hach cannot guarantee a particular date of delivery. In no event shall Hach be liable for failure or delay in performance if such failure or delay is due to an act of God; war; labor difficulties; fire; flood; subcontractor; supplier or buyer-caused delays; accidents; inability to obtain containers; raw materials or manufacturing facilities; or compliance under a law; regulation or order of any governmental authority or instrumentality thereof; or any other causes of any kind beyond the control of Hach. Hach reserves the right, in its full discretion, to allocate inventories and current production, to substitute suitable materials, and to make partial shipment when, in its opinion, circumstances warrant such allocation, substitution, or shipment.

Equipment Warranty: Hach warrants equipment of its manufacture against defective materials or workmanship for a period of at least one year from the date of shipment. The liability of Hach under this warranty is limited, at Hach's option, solely to (a) repair, (b) replace with equivalent Hach equipment, or (c) an appropriate credit adjustment not to exceed the original equipment sales price of equipment returned to Hach, provided that:

- 1) Buyer promptly notifies Hach on discovery of the defects, stating where applicable, the product type and serial numbers and fully describing the circumstances giving rise to the claim. Hach must receive such notification within the applicable warranty period; and
- 2) On receipt of instructions from Hach, Buyer returns the equipment as instructed with transportation charges prepaid by Buyer; and
- 3) Hach's examination of such equipment discloses to its satisfaction that the defects have not resulted from any negligence, misuse, improper installation, accident, or unauthorized repair or alteration by Buyer. Hach's determination of the cause and nature of the failure of the equipment shall be final.

This warranty does not apply to limited life electrical components which deteriorate with age. In the case of equipment and accessories not manufactured by Hach, but which are furnished with equipment of Hach's manufacture, Hach's liability is limited to whatever warranty is extended by the manufacturers thereof and which may be transferable to Buyer.

THIS WARRANTY IS APPLICABLE TO ORIGINAL BUYER ONLY AND SHALL BE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE. THE FOREGOING SHALL CONSTITUTE THE SOLE AND EXCLUSIVE REMEDY OF BUYER AND THE SOLE AND EXCLUSIVE LIABILITY OF HACH, WHETHER BUYER'S CLAIMS SHALL BE FOR BREACH OF WARRANTY OR NEGLIGENCE. HACH NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION WITH THE SALE OF THE EQUIPMENT. IN NO EVENT SHALL HACH BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES. If Hach determines that Buyer has returned the equipment without good cause, Hach shall notify Buyer and return the equipment at Buyer's expense; in addition, Hach may, at its sole discretion, impose a charge for testing and examination of any equipment so returned.

Chemical Warranty: Hach warrants all chemicals to be of high quality, to be free of material defects on the date of shipment, and to be as specified on the container label or in our literature. Hach will replace the chemical or refund the purchase price of any chemicals not as warranted, provided such claim for replacement or refund is received within six months from the date of shipment. In no event, however, shall Hach be liable for any damage resulting from improper handling or storage by the shipper or Buyer; or improper use by Buyer. HACH EXTENDS THIS WARRANTY TO ORIGINAL BUYER ONLY. REPLACEMENT OR REFUND IS THE EXCLUSIVE AND SOLE REMEDY OF BUYER. IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES. HACH DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

Standards: Unless otherwise agreed upon in writing, all materials shall be furnished subject to Hach's standard practices, tolerances and variations.

Special Service Charges: Complete installation and operating instructions are provided with each instrument. However, if Hach is requested to provide a field representative for the purpose of technical direction of the installation and/or servicing of the equipment manufactured by Hach, then Buyer shall reimburse Hach for transportation and specified per diem for this service. Special orders, bulk chemicals and items unsuitable for restocking may not qualify for credit or will be assessed a refurbishing fee.

Not for Export: Products purchased herein are for domestic use or installation only. Exportation of these products voids all warranties.

Waiver: No waiver by Hach of any breach of these provisions shall constitute a waiver of any subsequent breach of such provisions of this agreement. No change in or waiver of the provisions of this agreement shall be valid or binding unless approved by Hach in writing. The laws of the State of Colorado shall govern any agreement between Buyer and Hach.

Limits on Usage: The chemicals sold by Hach may not be used as drugs, cosmetics or food additives. Chemical reagents labeled "For Research and Development Only" or "R & D Only" may be purchased only for use in compliance with the Toxic Substances Control Act. These chemical reagents may not be used for commercial purposes.

FAX SHEET



HACH COMPANY

P.O. Box 389, Loveland, CO 80539 U.S.A., Telephone: 970-669-3050, FAX: 970-669-2932

Scheduled Inventory Reagent Replacement Plan (SIRR Plan)

Save time and money by scheduling inventory replacements in advance

For customers who can forecast their reagent supply requirements for an extended period of time (typically one year), Hach offers the economical and convenient Scheduled Inventory Reagent Replacement (SIRR) Plan. The plan applies to the purchase of all reagent items— analyzer reagents, COD vials, AccuVac® Ampuls, standards, liquids and powdered reagents—and offers many benefits:

- **10% Discount.** The SIRR Plan entitles you to a 10% discount off the price of reagents.
- **Lower Inventory Costs.** By arranging for supplies to arrive when you need them, you minimize storage expenses while assuring a fresh supply of reagents.
- **Reduced Paperwork.** You submit just one purchase order for the entire year's order.

Here's how it works:

1. Forecast the reagents you anticipate using during a one-year period and establish a schedule of reasonable delivery dates. Place your order with Hach and include catalog numbers, quantities, and delivery dates. Specify first ship date and identify desired intervals (weekly, monthly, quarterly, etc.). You are always free to call Hach for a price quotation.
2. When we confirm the opening of your SIRR Plan account, you will have the opportunity to review and approve your terms and conditions.
3. One month prior to the expiration of your contract, you will receive a quotation for the next contract period, at which point you may choose to renew.

SAVE 10% ON REAGENT COSTS

Terms and conditions

1. Customer purchase orders which reflect prices quoted by Hach will be honored for the agreement term.
2. Hach will grant a 10% discount per shipment for each item ordered for the term of the agreement. A minimum of four shipments per year* is required. SIRR Plan discounts apply only to reagent items. Customers will be invoiced for freight charges after each shipment is sent.
3. During the contract period, additional items must be placed on a separate order. However, occasional customer requests for changes in purchase quantities or delivery schedules may be granted. Any delivery changes require advance notice of at least 30 days—and 60 days for specially produced items.
4. Hach reserves the right to refuse changes in contractual terms. Customers electing to terminate the SIRR Plan agreement before it expires will be assessed a cancellation fee amounting to 3% of the cost of the unshipped balance.
5. All other terms stated in Hach catalogs, quotations and invoices will apply.

For more information

Contact Hach Customer Service by calling 1-800-227-4224.

*If you have an EC1000 Process pH or ORP Monitoring System, you may specify three shipments annually.

Note: This program is for instruments located in the United States only.
AccuVac is a trademark of Hach Company.

FAX SHEET



HACH COMPANY

P.O. Box 389, Loveland, CO 80539 U.S.A., Telephone: (970)669-3050

FAX: (970)669-2932

2100P Portable Turbidimeter

Combines the performance of a laboratory instrument with the convenience of portability

The 2100P Portable Turbidimeter combines microprocessor-controlled operation and Hach's patented Ratio™ optics to bring greater accuracy, sensitivity and reliability to field testing.

▪ **Ratio Optics.** The two-detector optical system compensates for color in the sample, light fluctuation and stray light, allowing analysts to achieve laboratory-grade performance on a wide range of samples, under a wide range of conditions.

▪ **Portable testing.** The lightweight turbidimeter comes field ready with four AA alkaline batteries (optional battery eliminator available), all necessary apparatus, and a rugged carrying case.

▪ **Greater sensitivity.** With a measurement range of 0-1000 NTU and resolution to 0.01 NTU, the 2100P is ideal for regulatory monitoring,* process control or field studies.

▪ **Choice of ranges.** Choose one of three manual range modes (0-9.99, 10-99.9 and 100-1000 NTU) or automatic range mode for measuring samples that vary widely in turbidity.

▪ **Illustrated instructions.** Each instrument is supplied with a complete instruction manual to guide you step by step through calibration, testing and maintenance procedures.

▪ **Signal averaging.** The 2100P also features a selectable signal averaging mode, which compensates for fluctuations in readings caused by large particles drifting through the light path.

▪ **Two-year warranty.** Hach warrants the 2100P Portable Turbidimeter against defective materials or workmanship for two years from the date of purchase.

Complete portable laboratory available

For comprehensive field testing capabilities, complement the 2100P Turbidimeter with Hach's CEL/700 Portable Laboratory. Ideal for regulatory monitoring and environmental testing, the portable laboratory features the instrumentation, apparatus and reagents for performing 27 common water quality tests. For more information request literature number 1301.

*The 2100P Portable Turbidimeter meets or exceeds design and performance criteria as specified in the United States Environmental Protection Agency method 180.1.

SPECIFICATIONS

Ranges: 0-1000 NTU in automatic range mode; 0-9.99, 10-99.9 and 100-1000 NTU in manual range selection

Accuracy: ± 2% of reading or ± 1 least significant digit; ± 3% of reading at 500-1000 NTU

Repeatability: ± 1% of reading or ± 0.01 NTU, whichever is greater

Resolution: 0.01 NTU on lowest range

Stray Light: ≤0.02 NTU

Sample Required: 15 mL

Power Requirement: Four AA alkaline batteries or optional 120 or 230 Vac battery eliminator.

Construction: High-impact ABS plastic shell

Dimensions: 22.2 x 9.5 x 8.9 cm (8.75 x 3.75 x 3.5')

Shipping Weight: 3.6 kg (8 lb)

Warranty: Two years

How to Order

Each 2100P Portable Turbidimeter is supplied with three sample cells, 118 mL of 4000 NTU Formazin Primary Standard, three Gelex® Secondary Standards, four AA alkaline batteries, 15 mL of silicone oil, instrument/procedure manual with quick reference card, and carrying case.

Cat. No. 46500-00 2100P Portable Turbidimeter

Optional Accessories

Cat. No. 46079-00 Battery Eliminator, 120V

Cat. No. 46080-00 Battery Eliminator, 230V



To receive complete details on the 2100P Portable Turbidimeter, request literature number 1790.

Electrical Service Installation Comparison

Vendor	Service Description	Price
Pinnacle Electric	Connect electrical service to sire trailer; install one telephone pole; includes permits and inspection fees	\$1,600
EFG Electrical Service	Connect electrical service to sire trailer; install one telephone pole	\$1650
K & J Electric Company	Connect electrical service to sire trailer; install one telephone pole	\$4,500

Proposal

PINNACLE ELECTRIC

13 Helen Drive
Queensbury, NY 12804
(518) 793-5224

ATTN: LER ANGELAKI

PROPOSAL SUBMITTED TO: ECOLOGY AND ENVIRONMENT	PHONE	DATE APRIL 18, 1999
STREET	JOB NAME CONSTRUCTION SITE ELECTRICAL SERVICE	
CITY, STATE AND ZIP CODE BUFFALO N.Y.	JOB LOCATION 53 LUZERNE RD QUEENSBURY N.Y.	

We hereby submit specifications and estimates for:

INSTALLATION OF ELECTRICAL SERVICE FOR CONSTRUCTION SITE TRAILER TO BE LOCATED AT # 53 LUZERNE RD. QUEENSBURY, N.Y. TOTAL COST TO INCLUDE ALL MATERIAL AND LABOR. INSPECTION FEES AND CONTACTS WITH POWER COMPANY TO BE PROVIDED BY CONTRACTOR AND ALSO COVERED UNDER TOTAL COST. MATERIALS AND LABOR TO BE GUARANTEED FOR ONE YEAR FROM DATE OF INSTALLATION.

We Propose

hereby to furnish material and labor — complete in accordance with the above specifications, for the sum of:

SIXTEEN HUNDRED AND 00/100 dollars (\$ **1600.00**).

Payment to be made as follows:

ONE HALF @ START OF JOB WITH BALANCE DUE UPON COMPLETION

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alterations or deviations from the above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate.

Authorized
Signature _____

Note: This proposal may be withdrawn by us if not accepted within _____ days.

Acceptance of Proposal — The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Date of Acceptance: _____

Signature _____

Signature _____

EFG ELECTRICAL SERVICE

44 Meadowbrook Road
QUEENSBURY, NY 12804

Invoice

1062

(518) 745-8711

TO

Lea

716-684-8360-2613

DATE

4/19/99

JOB NO.

JOB NAME

AMG

JOB LOCATION

#53 Luzerne Road
Queensbury, New York

TERMS

716-684-0844

	DESCRIPTION	PRICE	AMOUNT
>	The Estimate is Based on Approximation for <u>under ground</u> Service - 100 Amp To work Trailer. IF under-ground is not Feasible Then A pole will have to be Set		
	100 Amp Service To Meter Pan From Under Ground		950 00
>	ADD pole		
			950 00

Original

Thank You

Proposal

K & J ELECTRIC CO., INC.
 11 Walnut Street P.O. Box 562
 GLENS FALLS, NEW YORK 12801
 (518) 793-0098

PROPOSAL SUBMITTED TO <i>Ecology + Environment Inc.</i>		PHONE	DATE <i>4-30-88</i>
STREET <i>368 Pleasant Hill Dr</i>		JOB NAME <i>53 Luzerne Rd service</i>	
CITY, STATE AND ZIP CODE <i>Lancaster, NY 14086</i>		JOB LOCATION	
ARCHITECT	DATE OF PLANS	JOB PHONE	

We hereby submit specifications and estimates for:

*Installation of pole & service for Luzerne Rd
Trailer*

We Propose hereby to furnish material and labor — complete in accordance with above specifications, for the sum of:

Four Thousand Three Hundred dollars (\$*4300.00*).

Payment to be made as follows:

Net 30 days

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workmen's Compensation Insurance.

Authorized
Signature

Jack Hewell

Note: This proposal may be withdrawn by us if not accepted within _____ days.

Acceptance of Proposal — The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Date of Acceptance: *recycled paper*

Signature _____

Signature _____

ecology and environment

Field office Trailer

Vendor	Model/Item	Quantity	Price
GE Capital Modular Space	Field Office/Trailer 6-month rental	6 months	\$1,020
	Trailer mobilization/demobilization	1	\$365
Williams Scotsman, Inc.	Field Office/Trailer 6-month rental	6 months	\$1,110
	Trailer mobilization/demobilization	1	\$ 515
Premier Modulares, Inc.	Field Office Trailer; 6-month rental; with steps	6-months	\$900
	mobilization/demobilization	1	\$709



GE Capital *Modular Space*

SYRACUSE

402 N. CENTRAL AVENUE

MINO A NY 13116

Phone: 1-800-523-7918

Fax: 610-725-5631

Did You Know That We Can Provide Many VALUE-ADDED PRODUCTS AND SERVICES Including:

- OFFICE, RECEPTION and CLASSROOM FURNITURE · RESIDENTIAL and DORMITORY FURNISHINGS · STEPS, RAMPS and DECKS
- LOCKERS, SHELVES, and STORAGE EQUIPMENT · EXTENDED SERVICE PLANS ON PURCHASED UNITS
- COMPREHENSIVE DAMAGE and LIABILITY WAIVER · SITE SERVICES · MONITORED SECURITY SYSTEM

FACSIMILE TRANSMISSION SHEET

Date: **04/08/1999 11:22:55 (EST)**

To: **BOB MYERS**
Company: **ECOLOGY & ENVIRONMENT**
Phone: **716-684-8060**
Fax: **716-684-0844**

From: **PATTY KRATZ**

Fax Id: **134668**

Thank you for the opportunity to provide you with this quote. We do not have a weekly rental price, but if your lease goes over one month it will be pro-rated for the additional days used.
If you have any questions please call me at 1-800-523-7918 extension 5434.

Thanks,
Patti Kratz

***PREMIER
MODULARS INC.***

***** Facsimile Transmission *****

Date: 6/10/99

To: DEB JUSIAK
From: CHIP DUGER

Fax Phone: 716-684-0844

Tel Phone: 716-684-8060

Total number of pages including cover sheet:

Message: DEB,

THANK YOU FOR THE TIME AND COURTESIES EXTENDED TO ME DURING OUR PHONE CONVERSATION. I AM INCLUDING THE QUOTE FOR YOUR REVIEW. PLEASE FEEL FREE TO CALL IF YOU HAVE ANY QUESTIONS, AS WE WANT YOUR BUSINESS.

SINCERELY,


CHIP DUGER

P.O. BOX 224 SYRACUSE, NY 13211
TEL 315-454-3866 * FAX 315-454-3955

***PREMIER
MODULARS INC.***

- QUOTE -

Date: 6/10/99
To: DEB JUSIAK
ECOLOGY & ENVIRONMENT
368 PLEASANTVIEW DR.
LANCASTER, N.Y. 14086
From: CHIP DUGER

We are pleased to quote the following equipment for you:

Specifications:

Amount:

(1) 8 X 32 OFFICE UNIT
8 X 28 BOX SIZE

RENTAL: \$125.00 PER MO.

OPTIONS:

DELIVERY TO ALBANY	\$275.00
RETURN TO SYRACUSE	\$275.00
BLOCK AND LEVEL	\$99.00
UNBLOCK	\$60.00
STEPS (PER SET)	\$25.00 PER MO

Quote Valid for 30 Days From Receipt of quote.

Quote Accepted by: _____

Date: _____

QUOTE IS BASED ON SITE BEING LEVEL AND ACCESSIBLE BY TRUCK.
CUSTOMER WILL BE CHARGED FOR ADDITIONAL CHARGES DUE TO SITE
NOT BEING LEVEL OR ACCESSIBLE BY TRUCK.

PLEASE NOTE: UPON DELIVERY OF UNIT PLEASE INSPECT
THOROUGHLY, ANY DAMAGES NOT IDENTIFIED AT THAT TIME WILL BE
BILLED TO CUSTOMER AT END OF RENTAL TERM.

P.O. BOX 224 SYRACUSE, NY 13211
TEL 315-454-3866 * FAX 315-454-3955



GE Capital Modular Space

Quotation

BRANCH OFFICE:
SYRACUSE
402 N. CENTRAL AVENUE
MINOA NY 13116

Contact: PATTY KRATZ
Phone: 1-800-523-7918
Fax: 610-725-5631

Quote No.: 197519
Quote Expires: 05/08/1999
Date: 04/08/1999
Page No.: 1

Customer

ECOLOGY & ENVIRONMENT
Attn: BOB MYERS
Phone: 716-684-8060
Fax: 716-684-0844

Deliver To

NY

Our Business Is Helping You Solve Your Space Needs

One Stop Shopping: Steps, Furniture, Ramps, Security Screens, Waiver

- * Local Sales and Service Support
- * Calendar Month Billing
- * National 24 hour Sales and Service Center
- * No Automatic Cleaning Charges

LINE	DESCRIPTION	AMOUNT	PERIOD
001	<u>Lease</u> Class: STRV Unit Width = 8', Unit Length = 28' Delivery to Glen Falls 1 month BUILDING DELIVERY BLOCK AND LEVEL BUILDING RETURN* UNBLOCK* TOTAL ONE TIME CHARGES <u>OPTIONAL EQUIPMENT</u> Option 1: STEPS (Qty: 1 at \$30.00)	 140.00 120.00 80.00 120.00 45.00 365.00 30.00	 per month one time one time one time one time per month

*** Billed at Termination



GE Capital Modular Space

Quotation

BRANCH OFFICE:
SYRACUSE

Contact: PATTY KRATZ
Phone: 1-800-523-7918
Fax: 610-725-5631

Quote No.: 197519
Quote Expires: 05/08/1999
Date: 04/08/1999
Page No.: 2

LINE	DESCRIPTION	AMOUNT	PERIOD
002	<u>Lease</u> Class: STRV Unit Width = 8', Unit Length = 28' Delivery to Herkimer 1 month BUILDING DELIVERY BLOCK AND LEVEL BUILDING RETURN* UNBLOCK* TOTAL ONE TIME CHARGES <u>OPTIONAL EQUIPMENT</u> Option 1: STEPS (Qty: 1 at \$30.00)	 140.00 130.00 80.00 130.00 45.00 385.00 30.00	 per month one time one time one time one time per month

*** Billed at Termination

With regard to an "Operating Lease" transaction, in lieu of lessee providing evidence of comprehensive and liability insurance, lessee may opt to purchase GECMS's comprehensive and liability waiver.

This Quotation is based on the standard terms and conditions of the GE Capital Modular Space Lease, Finance Lease, or Sale Agreement and is subject to Credit Approval. GECMS does not warrant that the equipment meets any local or state code not specifically listed. Pricing quoted herein is good for 30 days and excludes all state and local taxes, fees, permits and utility connections. Equipment is subject to availability.

We Want to Earn Your Business!

APR-08-1999 11:47

E AND E BUFFALO

716 684 0844 P.01/01

Mobile Offices • Storage Products
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WILLIAMS SCOTSMAN, INC.

P.O. Box 50

Phoenix, NY 13135

Phone: 315-695-1313

Fax: 315-695-1317

Toll free: 800-782-1500

Fax

To: Meyers, Bob

From: Lane, Thomas

Fax: 1-716-684-0844

Pages: 6 including cover page

Phone: (716)684-8060

Date: 4/8/99

Re: Request for Quotation

I am pleased to enclose a confirmation of the prices for the 32 x 8 Stor-A-Van w/Office (28 x 8 box size) we discussed. I will be faxing a complete quotation including all clarifications for all trailers requested. Please select the quotation of choice and fax it back to me.

If you have any questions or additions, please feel free to contact me.

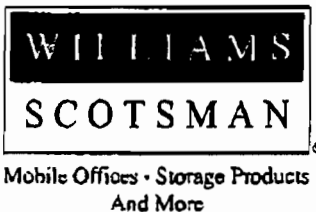
Thank you for considering Williams Scotsman!

Thomas Lane
Sales Representative

Attachment(1):
WS Quote No. 138892-1
quote138889

TL/SFA

4-8-99
The fax to Bob Meyers
at Ecology's Environment
from Thomas Lane
has only 3 pages;
your cover sheet
states "7, including
cover page". Please
remit or advise.
FAX # 716-684-0844



WILLIAMS SCOTSMAN, INC.
P.O. Box 50
Phoenix, NY 13135
Phone: 315-695-1313
Fax: 315-695-1317
Toll free: 800-782-1500
Thomas Lane, Sales Representative

QUOTATION NO. 138892-1		
CUSTOMER Bob Meyers Ecology & Environmental, Inc. 368 Pleasant View Drive Lancaster, NY 14086	SHIP TO Ecology & Environmental, Inc. Russia, NY	QUOTE DATE April 08, 1999 QUOTE EXPIRATION May 08, 1999
PHONE: (716)684-8060	FAX: (716)684-0844	E-MAIL:

UNIT DESCRIPTION & PRICING			
32 x 8 Stor-A-Van w/Office (28 x 8 box size)			
INSURANCE VALUATION:	\$6,500.00	DELIVERY FREIGHT:	\$169.00
MONTHLY LEASE RATES:		BLOCK AND LEVEL:	\$99.00
<input type="checkbox"/> 2 months	\$300.00	KNOCKDOWN:	\$38.00
		RETURN FREIGHT:	\$169.00

<input checked="" type="checkbox"/> CHECK DESIRED OPTIONS			
Initial Options	Ext. Amt.	Monthly Options	Ext. Amt.
<input type="checkbox"/> OSHA Aluminum Steps - Setup @ \$20.00	\$20.00	<input type="checkbox"/> OSHA Aluminum Steps (per month) @ \$35.00	\$35.00
<input type="checkbox"/> Deadbolts @ \$40.00	\$40.00	<input type="checkbox"/> (3) Security Screens (per month) @ \$5.00 each	\$15.00
<input type="checkbox"/> (3) Security Screens - Installation @ \$5.00 each	\$15.00		
<input type="checkbox"/> L.F. Aluminum skirting @ \$1,008.00	\$1,008.00		
<input type="checkbox"/> L.F. Vinyl skirting @ \$576.00	\$576.00		
<input type="checkbox"/> (6) Tiedowns into asphalt and/or concrete @ \$90.00 each	\$540.00	Final Options	Ext. Amt.
<input type="checkbox"/> (6) Tiedowns into dirt @ \$60.00 each	\$360.00	<input type="checkbox"/> OSHA Aluminum Steps - Knockdown @ \$20.00	\$20.00
See Page 2 for more details regarding this quotation			

CUSTOMER:	BY:	TITLE:	DATE:
Ecology & Environmental, Inc.			



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WILLIAMS SCOTSMAN, INC.

P.O. Box 50

Phoenix, NY 13135

Phone: 315-695-1313

Fax: 315-695-1317

Toll free: 800-782-1500

Thomas Lane, Sales Representative

Page 2 of 2

QUOTATION NO. 138892-1

CLARIFICATION(S):

1. Step setup pricing is based on level ground with clear access to site. Unlevel ground will incur additional charges for leveling of steps.
2. Pricing is based upon clear, dry, accessible site with maximum 2' elevation change over length of unit. W/S cannot be responsible for site conditions out of our control.
3. If tiedowns are selected, Dig Safe # is required. Please allow 2-3 days after delivery of unit for installation. No site restoration is included in this pricing.
4. Skirting pricing is based on average height of 36" and does not include teardown at end of lease. A separate price for skirting teardown is enclosed. Skirting teardown does not include disposal of skirting.

COMMENT(S):

- Unit is covered by Williams Scotsman's full term lease warranty utilizing our full time service staff. No cleaning charges for normal wear and tear.
- Delivery is based on clear access to site for truck and trailer to truck set unit.
- Wait time after the first 1/2 hour is \$65.00 per hour.

Customer hereby agrees to the above quoted prices and specifications. Customer further authorizes Williams Scotsman to make appropriate arrangements for the delivery of the above described Equipment. Upon delivery, and until a subsequent Lease Agreement is executed by Williams Scotsman (as Lessor) and Customer (as Lessee), the Standard Williams Scotsman Leasing Terms and Conditions, which are incorporated by reference herein, will govern this transaction.

CUSTOMER:	BY:	TITLE:	DATE:
Ecology & Environmental, Inc.			

The items described above comprise the Equipment which the Customer desires to lease from Williams Scotsman. All equipment is subject to availability. Physical Damage and Commercial Liability Insurance coverage are required beginning on the date of the Equipment's Delivery. Prices quoted above do not include any local, state, federal or personal property taxes or any fees. Payment terms are net 20 days. Permits, footings, steps, site preparation, electrical, and plumbing connections are not included in the quoted price unless specifically stated.



Mobile Offices - Storage Products
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WILLIAMS SCOTSMAN, INC.

P.O. Box 50
Phoenix, NY 13135
Phone: 315-695-1313
Fax: 315-695-1317
Toll free: 800-782-1500

Thomas Lane, Sales Representative

Page 1 of 2

QUOTATION NO. 138889-1

CUSTOMER

Bob Meyers
Ecology & Environmental, Inc.
368 Pleasant View Drive
Lancaster, NY 14086

SHIP TO

Ecology & Environmental, Inc.
Luzum Rd
Glens Falls, NY

QUOTE DATE

April 08, 1999

QUOTE EXPIRATION

May 08, 1999

PHONE: (716)684-8060

FAX: (716)684-0844

E-MAIL:

UNIT DESCRIPTION & PRICING

32 x 8 Stor-A-Van w/Office (28 x 8 box size) per the enclosed floorplan.

INSURANCE VALUATION:	\$6,500.00	DELIVERY FREIGHT:	\$95.00
MONTHLY LEASE RATES:		BLOCK AND LEVEL:	\$99.00
<input type="checkbox"/> 2 months	\$300.00	KNOCKDOWN:	\$38.00
		RETURN FREIGHT:	\$95.00

☒ **CHECK DESIRED OPTIONS**

<u>Initial Options</u>	<u>Ext. Amt.</u>	<u>Monthly Options</u>	<u>Ext. Amt.</u>
<input type="checkbox"/> OSHA Aluminum Steps - Setup @ \$20.00	\$20.00	<input type="checkbox"/> OSHA Aluminum Steps (per month) @ \$35.00	\$35.00
<input type="checkbox"/> Deadbolts @ \$40.00	\$40.00	<input type="checkbox"/> (3) Security Screens (per month) @ \$5.00 each	\$15.00
<input type="checkbox"/> (3) Security Screens - Installation @ \$5.00 each	\$15.00		
<input type="checkbox"/> L.F. Aluminum skirting @ \$1,008.00	\$1,008.00		
<input type="checkbox"/> L.F. Vinyl skirting @ \$576.00	\$576.00		
<input type="checkbox"/> (6) Tiedowns into asphalt and/or concrete @ \$90.00 each	\$540.00		
<input type="checkbox"/> (6) Tiedowns into dirt @ \$60.00 each	\$360.00		
		<u>Final Options</u>	<u>Ext. Amt.</u>
		<input type="checkbox"/> OSHA Aluminum Steps - Knockdown @ \$20.00	\$20.00

See Page 2 for more details regarding this quotation.

CUSTOMER:

Ecology & Environmental, Inc.

BY:

TITLE:

DATE:



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WILLIAMS SCOTSMAN, INC.

P.O. Box 50

Phoenix, NY 13135

Phone: 315-695-1313

Fax: 315-695-1317

Toll free: 800-782-1500

Thomas Lane, Sales Representative

Page 2 of 2

QUOTATION NO. 138889-1

CLARIFICATION(S):

1. Step setup pricing is based on level ground with clear access to site. Unelevel ground will incur additional charges for leveling of steps.
2. Pricing is based upon clear, dry, accessible site with maximum 2' elevation change over length of unit. W/S cannot be responsible for site conditions out of our control.
3. If tiedowns are selected, Dig Safe # is required. Please allow 2-3 days after delivery of unit for installation. No site restoration is included in this pricing.
4. Skirting pricing is based on average height of 36" and does not include teardown at end of lease. A separate price for skirting teardown is enclosed. Skirting teardown does not include disposal of skirting.

COMMENT(S):

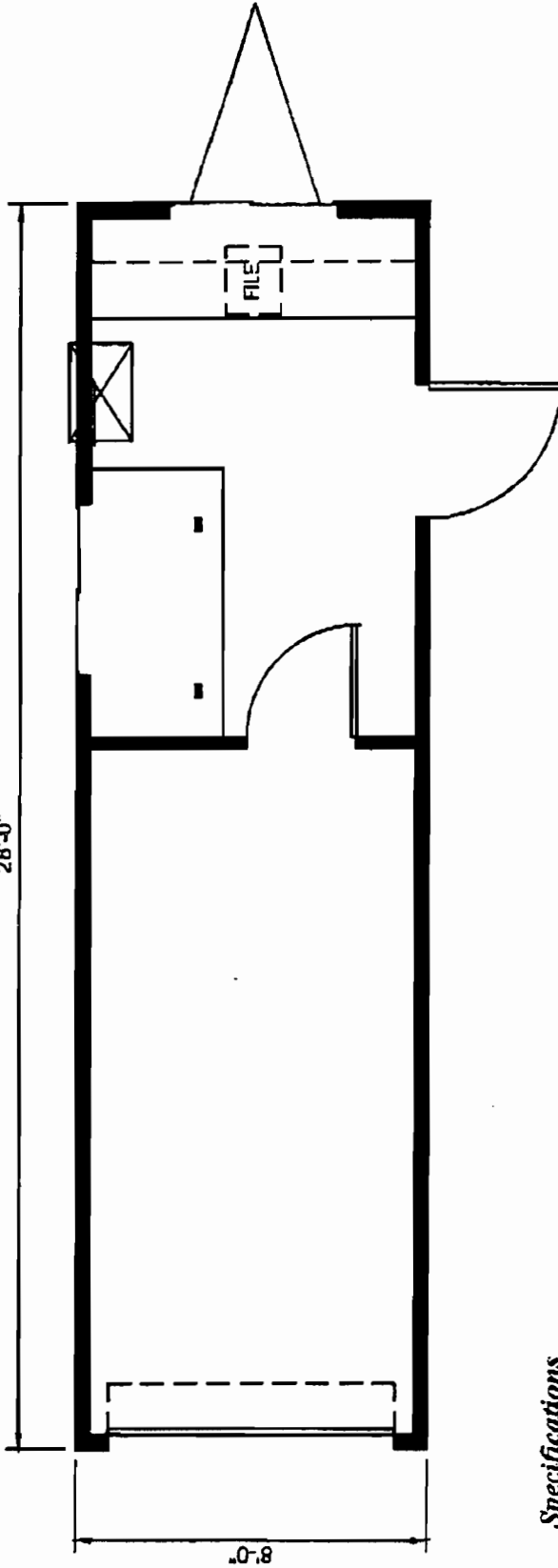
- Unit is covered by Williams Scotsman's full term lease warranty utilizing our full time service staff. No cleaning charges for normal wear and tear.
- Delivery is based on clear access to site for truck and trailer to truck set unit.
- Wait time after the first 1/2 hour is \$65.00 per hour.

Customer hereby agrees to the above quoted prices and specifications. Customer further authorizes Williams Scotsman to make appropriate arrangements for the delivery of the above described Equipment. Upon delivery, and until a subsequent Lease Agreement is executed by Williams Scotsman (as Lessor) and Customer (as Lessee), the Standard Williams Scotsman Leasing Terms and Conditions, which are incorporated by reference herein, will govern this transaction.

CUSTOMER:	BY:	TITLE:	DATE:
Ecology & Environmental, Inc.			

The items described above comprise the Equipment which the Customer desires to lease from Williams Scotsman. All equipment is subject to availability. Physical Damage and Commercial Liability Insurance coverage are required beginning on the date of the Equipment's Delivery. Prices quoted above do not include any local, state, federal or personal property taxes or any fees. Payment terms are net 20 days. Permits, footings, steps, site preparation, electrical, and plumbing connections are not included in the quoted price unless specifically stated.

28'-0"



Specifications

Size

- 32' Long (including hitch)
- 28' Box size
- 8' Wide
- 7' Ceiling height

Interior Finish

- Paneled walls
- Vinyl tile floors
- Gypsum ceiling
- Private office
- Wide open shells available

Furniture

- One built-in desk with file cabinet
- One built-in plan table
- Overhead shelf

Electric

- Fluorescent ceiling lights
- 110/240 volt single phase electric
- 60 AMP breaker box

Windows/Doors

- Horizontal slider windows
- Vision panel door with standard lock
- Overhead roll-up door

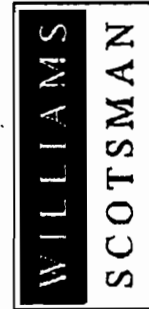
Heating and Cooling

- Electric baseboard heat
- Three-wall AC unit

Exterior Finish/Frame

- Aluminum siding
- I-Beam frame
- Standard drip rail gutters

Additional floor plans available. Floor plans and specifications may vary from those shown and are subject to in-stock availability.



Mobile Offices • Storage Products
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Storage Van 32x8

WILLIAMS SCOTSMAN, INC.

P.O. Box 50

Phoenix, NY 13135

Phone: 315-695-1313

Fax: 315-695-1317

Toll free: 800-782-1500

Digital Camera

Vendor	Model/Item	Quantity	Price	Tax	Total
Olympus America, Inc.	D600L Digital Camera, 4MB, with accessory kit (batteries, charger)	1	\$820.98	\$65.68	\$ 886.66
Sony	1344 X 1024, rechargeable	1	\$1,789.95	\$143.20	\$1,933.15
Kodak	1536 X 1024, Rechargeable	1	\$839.95	\$67.20	\$ 907.15

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Search Results

	Plat/OS	Media	In Stock	Price
Olympus America Inc				
CABLE KIT-D220L/320L/500L/600L	MSD	CABL	3	\$27.99
620L (200531)				
DIGITAL CAMERA SERIAL CABLE FOR	MSD	CABL	0	\$19.99
THE D200L & D300L CAMERA MAC/PC (200-505)				
VIDEO CABLE FITS D-220L D-320L	MSD	CABL	11	\$13.99
D-340R/D-400 ZOOM DIGITAL CAMERAS				
(200529)				
DIRECT PRINTER CABLE	MSD	CABL	24	\$19.99
FOR D-500L AND D-600L ONLY (200532)				
AC ADAPTER CABLE CU-100	MSD	CABL	0	\$9.99
FOR FILM SCANNER REQUIRES AW-101AC				
(203007)				
8MB SMARTMEDIA CARD FOR D-1000	NMS	MEM	5	\$76.99
(147462)				
4MB CARD/CM4 F/D1000 RECORDER	MSD	SUPL	98	\$49.99
(147453)				
MAFP-1U FLASHPATH ADAPTER FOR	MSD	SUPL	0	\$78.99
8MB PCMCIA SMARTMEDIA (200518)				
2MB CARD/ CM2 F/D1000 RECORDER	MSD	SUPL	0	\$27.99
(147452)				
16MB SMARTMEDIA CARD FITS	NMS	SUPL	190	\$82.99
D620L D340L/R D400Z (M-16PU)				
8MB SMARTMEDIA CARD (M-8PE)	MSD	SUPL	527	\$40.99
D220L D320L D500L D600L D620L (200546)				
PCMCIA CARD ADAPTER MA-2E	MSD	SUPL	13	\$78.99
SMARTMEDIA TO PCMCIA ADAPTER (200545)				
DESK TOP KIT W/IAVOICE	MSD	EXT	4	\$208.99
MIN CARD READER/WRITER DSS PLAYER				
(147-461)				
D620L DIGTL CAMERA 3XOPTCL ZOOM	PC	PERP	1344	\$835.99
8MBDRAM/5 IMAGES IN 3SEC/FLASH SYNC				
(225065)				
1.45X TLCNVTR LENS D500L/620L	MSD	ACCS	19	\$76.99
43-46 STEP-UP RING INCLUDED (200540)				
B-MACRO LENS	MSD	ACCS	19	\$97.99
(REQUIRES STEP-UP RING (387694) (103895)				
ACCESSORY KIT FOR D-220L D-320L	MSD	ACCS	356	\$75.99
D-340L 2MB PICTRA SFTWR (200523)				
D-600L UV HAZE FILTER FOR	MSD	ACCS	0	\$23.99
CAMERA ** ALSO FITS D-620L ** (108140)				
STEP-UP RING: D500L D600L D620L	MSD	ACCS	108	\$12.99
(43MM - 55MM) (200527)				
D400 ZOOM DIGTL CAMERA 1.3MG PX	NMS	PERP	771	\$584.99
3XOPTICAL ZOOM/8MB SMARTMEDIA CARD				
(225005)				
NI-MH BATTERY SET (B-30SU)	MSD	ACCS	130	\$45.99
4-PACK W/CHARGER (200517)				
D-600L DIGITAL CAMERA 4MB	NMS	PERP	390	\$668.99
1280 X 1024 50 IMAGES 9 IMAGE LCD (225050)				
LEATHER CAMERA CASE D500 D600L	MSD	ACCS	8	\$30.99
D620L (200526)				
VINYL SOFT CASE FOR D220L	MSD	ACCS	80	\$18.99
D320L CAMERAS (200525)				
B-28 WIDE ANGLE LENS	MSD	ACCS	0	\$139.99
(REQUIRES A STEP-UP RING (387694) (103890)				
D620L ACCESSORY KIT ALSO FITS	MSD	ACCS	1289	\$151.99
D600L D500L D620L (200524)				
NI-MH BATTERY (B-01-4PE)	MSD	ACCS	17	\$20.99
REPLACEMENT 4-PK (200544)				
LENS CAP FOR D500/600L/620L	MSD	ACCS	0	\$5.99
(200528)				
D340R DIGTL CAMERA W/2-4MB CRDS	NMS	PERP	810	\$333.99
SMART MEDIA AUTOFLASH 4 MINFOCUS				
(225000)				

Includes Case, X-batteries,
charger, Bmb card, Software
AC Adapter

AC ADAPTER C-7AU FITS ALL DIGITAL CAMERAS (200543)	NMS	ACCS	0	\$41.99
AC ADAPTER C-6AE 220 VOLT FOR ALL DIGITAL CAMERAS (200538)	NMS	ACCS	7	\$43.99
D-400 ZOOM LEATHER CARRY CASE ONLY FITS THE D-400 ZOOM MODEL (200554)	MSD	ACCS	29	\$22.99
VINYL CASE D-200L/D-300L ONLY (200501)	MSD	ACCS	0	\$11.99
AC ADAPTER AW-101 FOR FLM SCANR REQUIRES CU-100 AC ADAPTER (203008)	MSD	ACCS	0	\$47.99
C-2000 DIGITAL CAMERA 3X ZOOM 1600 X 1200 NOT CE CERTIFIED (225020)	NMS	PERP	0	\$920.99
P-300 PRINTER PAPER KIT 30SHEET 16CUT STICKER/RIBBON CARTRIDGE (200512)	MSD	SUPL	25	\$55.99
P60NE PRINTER PAPER KIT 60 SHEETS 3 3/8 X 4 1/2 INCHES (200510)	MSD	SUPL	112	\$29.99
P60NS1E PRINTER PAPER KIT 1 CUT STICKER BOX OF 60 (200511)	MSD	SUPL	9	\$47.99
FLASHPATH ADAPTER MAFP-2E FOR ALL SMARTMEDIA (200-557)	MSD	SUPL	0	\$90.99
P-300 PERSONAL PHOTO PRINTER DYE SUB 24-BITCOLOR 1024X1376 (201005)	NMS	PRNT	176	\$356.99
P-330 DYE-SUB PHOTO/VIDEO PRINTER 24BIT COLOR 4X5.5IN (201017)	NMS	PRNT	15	\$416.99
LAP TOP PC CARD KIT DSS PLYR & CAT PCMCIA ADAPTER (147-451)	MSD	ACCS	6	\$111.99
D1000 RECORDER W/IAVOICE SW 2MB CARD CABL PCMCIA ADAPT (141512)	NMS	SYST	97	\$241.99
DESKTOP COMMUNICATION KIT W/ MINIATURE CARD READER-WRITER/DSS (147450)	MSD	ACCS	14	\$186.99
D1000 RECORDER W/IA VOICE W/2MB FLASH (141510)	NMS	SYST	4	\$174.99
LAPTOP INTERFACE KIT W/IAVOICE PC CARD ADAPTER/DSS SFTW MOBIL VIA (147-460)	MSD	ACCS	0	\$134.99
TRANSCRIPTION ACCESSORY KIT W/FOOTSWITCH RS19/HEADSET99/ADAPTER (147-455)	MSD	ACCS	0	\$94.99
ES-10 DIGITAL PHOTO SCANNER A-10 ADAPTER & CENTURION APS CAMERA (201015)	PC	PERP	10	\$689.99
ES-10 SCSI FILM SCANNER 30 SECOND SCAN 3.8 MILLION PIXELS (201002)	NMS	PERP	0	\$366.99
HN-100 NEGATIVE STRIP HOLDER FOR THE ES-10 SCANNER (203010)	MSD	ACCS	29	\$15.99
ES-10 PARALLEL FILM SCANNER 35MM 3.8 MILLION PIXEL (201001)	PC	PERP	0	\$341.99
A-10 ADAPTER FOR APS FILM FOR USE WITH ES-10 SCANNER (201003)	MSD	ACCS	23	\$169.99
AC ADAPTER AW-100 FOR PAR SCANNER REQUIRES CU100 (203014)	MSD	ACCS	0	\$47.99
SLIDE HOLDER HS-100 FOR FILM SCANNER (203009)	MSD	ACCS	0	\$15.99
ADAPTER C-10 135 ADAPTER REPLACEMENT FOR FILM SCANNER (203011)	MSD	ACCS	0	\$63.99

Friday, April 16, 1999 9:00am US/Pacific

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Click on a camera or manufacturer of your choice for a wider description.

All digital cameras we carry are new, include ALL necessary software, cables, manuals, warranty and accessories to start taking pictures and downloading them onto your PC or MAC, unless stated otherwise.

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Sony



DSC-D700

Resolution: 1344 x 1024

Memory: 8MB

Sample Image: N/A

Features: Flash, 5x Zoom, LCD Display, Expandable Memory, Rechargeable Li Battery, Video Output.

Type of expandable memory: (Type II)

Camera:

\$1789.95

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MVC-FD-91

Resolution: 1024 x 768

Memory: Floppy

Sample Image: [Click here \(JPEG\)](#)
[Click here \(MPEG\)](#)

Features: Intelligent Flash, 2x Floppy, 14x Zoom w/ SteadyShot, LCD Display, Expandable Memory, Rechargeable Li Battery, Records Video and Audio.

Type of expandable memory: (Floppies)

Camera:

\$974.95

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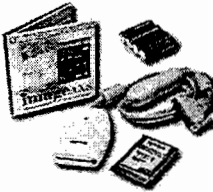

Click on a camera or manufacturer of your choice for a wider description.

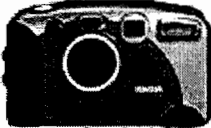
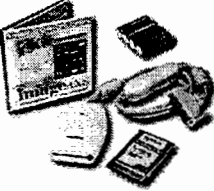


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[\[Sony\]](#)
[\[Sound Vision\]](#)
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Kodak	
 DC-265	Resolution: 1536 x 1024 Memory: 16MB Sample Image: N/A Features: Flash, LCD Display, Expandable Memory, Video Output, Includes Batteries and Recharger, 3x Optical Zoom, 2x Digital Zoom, IrDa, Serialport, USB. Type of expandable memory: (Compactflash)
	 Free Kodak Expansion Pack! Camera: \$899.95 ADD TO SHOPPING CART
	Resolution: 1536 x 1024 Memory: 8MB Sample Image: Click here (JPEG) Features: Flash, LCD Display, Expandable Memory, Video Output, Includes AC-Adapter, 3x Optical Zoom, 2x Digital Zoom, IrDa, Serialport, USB.

<p><u>DC-260</u></p>	<p>Type of expandable memory: (Compactflash)</p> <p>Camera: \$839.95 ADD TO SHOPPING CART</p>
<p> <u>DC-240</u></p>	<p>Resolution: 1280 x 960 Memory: 8MB Sample Image: Click here (JPEG) Features: Flash, LCD Display, Expandable Memory, Video Output, Batteries and Charger, 3x Optical Zoom, 2x Digital Zoom, Serialport, USB.</p> <p>Type of expandable memory: (Compactflash)</p> <p></p> <p><u>Free Kodak Expansion Pack!</u></p> <p>Camera: \$659.95 ADD TO SHOPPING CART</p>
<p> <u>DC-220</u></p>	<p>Resolution: 1152 x 864 Memory: 8MB Sample Image: Click here (JPEG) Features: Flash, LCD Display, Expandable Memory, Video Output, Includes AC-Adapter, 2x Optical Zoom, 2x Digital Zoom, IrDa, Serialport, USB.</p> <p>Type of expandable memory: (Compactflash)</p> <p>Camera: \$629.95 ADD TO SHOPPING CART</p>
<p> <u>DC-210</u> <u>Plus</u></p>	<p>Resolution: 1152 x 864 Memory: 8MB Sample Image: Click here (TIFF) Click here (JPEG) Features: Flash, LCD Display, Expandable Memory, Includes AC-Adapter, Video Output, 2x Zoom.</p> <p>Type of expandable memory: (Compactflash)</p>

Airfare; Round Trip between Buffalo and Albany

Vendor	Model/Item	Quantity	Price
Shuttle America	Round Trip, unrestricted coach	1	\$258
USAirways	Round Trip, unrestricted coach	1	\$498
Continental	Round Trip, unrestricted coach	1	\$502

Shuttle America
Unrestricted Coach

**American
Express One**
Business Travel Services

American Express One
368 Pleasant View Drive
Lancaster, NY 14086
Phone: 716 684-8060 Ext. 2582

 **Corporate
Services**

FARUFALB10JUN-SS Shuttle Am.
ORG-BUF DST-ALB TRIP-OUTBOUND CXR-SS 10JUN99 USD
THE FOLLOWING CARRIERS ALSO PUBLISH FARES BUF-ALB:
AA CO UA US
8 PERCENT TAXES INCLUDED-USE FT FOR BREAKDOWN - SEE N*/USTAX1
SEGMENT TAXES NOT INCLUDED SEE N*/USTAX2
PSGR FACILITY CHARGES MAY APPLY-ENTER PXCHELP
QTE F/B BK FARE EFF EXP TKT AP MIN/MAX RTG
1 - Y Y X 129.00 00 - - ## -/ - 1
1 TRAVEL MUST BE NONSTOP OR DIRECT

Z7S4.Z7S4*ABF 0845 09-JUN-1999 A85B02

Round Trip = \$129.00 x 2 = \$258.00

U.S. Air
Unrestricted Coach

**American
Express One**
Business Travel Services

American Express One
368 Pleasant View Drive
Lancaster, NY 14086
Phone: 716 684-8060 Ext. 2582



FABUFALB10JUN-US

ORG-BUF DST-ALB TRIP-OUTBOUND CXR-US 10JUN99 USD

THE FOLLOWING CARRIERS ALSO PUBLISH FARES BUF-ALB:

A CO S5 UA

8 PERCENT TAXES INCLUDED-USE FT FOR BREAKDOWN - SEE N*/USTAX1

SEGMENT TAXES NOT INCLUDED SEE N*/USTAX2

PSGR FACILITY CHARGES MAY APPLY-ENTER PXCHLP

QTE	F/B	BK	FARE	EFF	EXP	TKT	AP	MIN/MAX	RTG
1	-	K28NR	K#X	129.00	-	-	-	#	3
2	-	M28	M#X	199.00	-	-	-	-	3
3	-	Y8	Y#X	249.00	OW	-	-	-	351
4	-	VRZ67NR	V#R	198.00	-	-	-	#	351

3 TRAVEL MUST BE NONSTOP

351 ROC SYR

Z784.Z784*ARF 0845 09-JUN-1999 A85B02

Round Trip = \$249.00 x 2 = \$498.00

Continental
Unrestricted Coach

**American
Express One**
Business Travel Services

American Express One
388 Pleasant View Drive
Lancaster, NY 14086
Phone: 716 684-8060 Ext. 2582

**AMERICAN
EXPRESS**
Corporate
Services

4BUFALB10JUN-CO
URG-BUF DST-ALB TRIP-OUTBOUND CXR-CO 10JUN99 USD
THE FOLLOWING CARRIERS ALSO PUBLISH FARES BUF-ALB:
AA 85 UA US
8 PERCENT TAXES INCLUDED-USE FT FOR BREAKDOWN - SEE N*/USTAX1
SEGMENT TAXES NOT INCLUDED SEE N*/USTAX2
PSGR FACILITY CHARGES MAY APPLY-ENTER PXCHLP

QTE	F/B	BK	FARE	EFF	EXP	TKT	AP	MIN/MAX	RTG
1	- F	A#X	796.00	-	-	-	-	-/-	3
2	- AB	A#X	378.00	-	-	-	-	-/-	3
3	- Y	Y#X	535.00	-	-	-	-	-/-	3
4	- Y8	Y#X	251.00 <i>OW</i>	-	-	-	-	-/-	3
5	- TRD67IP	T#R	198.00	-	-	-	##	-/-	3
6	- BR	B#R	398.00	-	-	-	-	-/-	3

3 CLE DTT EWR

Z7S4.Z7S4*ABF 0845 09-JUN-1999 A85B02

Round Trip = $\$251.00 \times 2 = \502.00

Van Rental

Vendor	Model/Item	Quantity	Price
Thrifty	Daily Rate plus 100 miles	69	\$3,449
Budget	Daily Rate plus 100 miles	69	\$3,567
U-Haul	Daily Rate plus 100 miles	69	\$4,068

Note: A cost of \$20 per day is to be added to each of the final prices to include the cost of taxes and gasoline.

☎ CONTACT REPORT ☎	
☎ Telephone <✓> ☎ Conference <> ☎ Other <>	
CONTACT:	
FIRM/AGENCY:	Thrifty Car Rental
ADDRESS:	
PHONE/FAX:	(716) 662-0300
TO:	file
FROM:	Steve Blair
DATE:	10 June 1999
SUBJECT:	Van Rental Quote for Luzerne Road Site
CC:	

COMMENTS:

I spoke with a representative from Thrifty Car Rental on June 10, 1999 to obtain a quote for cargo van rental. The representaive quoted me a price of \$24.99 per day, and \$0.25 per each mile.

☎ CONTACT REPORT ☎	
☎ Telephone <✓> ☎ Conference <> ☎ Other <>	
CONTACT:	
FIRM/AGENCY:	Budget Car and Truck Rental and U-Haul
ADDRESS:	
PHONE/FAX:	(716) 662-5071 - Budget (716) 884-1900 - U-Haul
TO:	Steven Blair
FROM:	Deb Jusiak
DATE:	8-9 June 1999
SUBJECT:	Van Rental Quote for Luzerne Road Site
CC:	

COMMENTS:

I spoke with a representative from Budget Car and Truck Rental on June 8, 1999 to obtain a quote for cargo van rental. She quoted me a price of \$32.95 per day, with 25 free miles per day and \$0.25 per each additional mile. She would not give me a price in writing until I made a reservation.

On June 9, 1999, I received another van quote from a U-Haul representative. He quoted me a price of \$19.95 per day, no free miles and each mile costs \$0.39. Basically, the U-Haul cargo vans are intended for local use only.

Items for Which Fewer Than Three Quotations Were Obtained

Vendor	Amount	Item/Service	Reason for Fewer Quotations
Taylor Welding Supply	\$60.18	Hydrogen supply; tank rental	Less than \$1,000
IBS Septic and Drain	\$420	Portable Toilet	Less than \$1,000
Bell Atlantic	\$305	Telephone service and hook-up	Less than \$1,000
Bulldozer	\$1,000	Site Clearing	MBE

Angelaki

SUBSIDIARY OF UNITED WELDING SUPPLY CO., INC., SCHENECTADY, NY

TAYLOR WELDING SUPPLY CO., INC.

FAX COMMUNICATION

(518) 798-3034

TO: Ecology, Environmental at Sea.

FROM: TWS Gary Harrington

DATE: _____

TIME: _____

SUBJECT: _____

NO. OF PAGES (INCLUDING COVER) 3

COMMENTS:
Copy of Quote - Credit app

If you have any questions or any problems receiving this fax,
please feel free to contact our office at the number below.

TAYLOR WELDING
E. Jones, Envero **SUPPLY CO., INC.**

Ecology. Envero
att Sea Angelake

WE ARE PLEASED TO SUBMIT THE FOLLOWING QUOTATION:

QUANTITY	DESCRIPTION	PART NUMBER	UNIT PRICE	TOTAL
1	Large Hydrogen cyl			31.00
	Rental per cyl. per month			4.45

Terms
Delivery
F.O.B

Yours very truly,
Taylor Welding Supply Co., Inc.

Gary Harrington

(518) 7983034

CREDIT APPLICATION

TAYLOR WELDING SUPPLY CO., INC.

P.O. Box 741

Glens Falls, NY 12801

798 9533

BUSINESS PHONE

HOME ADDRESS

WORKING ADDRESS

MARRIAGE

PARTNERSHIP

CORPORATION

LEGAL OWNER(S) OR OFFICER(S) NAME

NAME

TITLE

RESIDENT ADDRESS

RESIDENT PHONE

MAIL BILLING INSTRUCTION

PURCHASE ORDERS ISSUED?

BANK'S NAME AND ADDRESS

☒ Checking

☐ Savings

☐ Loan

SOCIAL SECURITY NO.

LICENSE PLATE NO.

PLACE OF EMPLOYMENT AND ADDRESS

LIST MAJOR CREDIT CARDS AND ACCOUNT NUMBERS:

Credit Card

Account Number

BUSINESS REFERENCES WHERE CREDIT HAS BEEN EXTENDED Must have 3

Name

Address

Telephone #

Name

Address

Telephone #

UNDERSTAND YOUR TERMS AND AGREE TO ABIDE BY THEM.

By making this application for credit I authorize you to make an investigative consumer report whereby information is obtained through personal interviews with my neighbors, friends, or others with whom I am acquainted. This inquiry includes information as to my character, general reputation, personal characteristics and manner of living. I understand that I have the right to make a written request within a reasonable period of time to receive additional, detailed information about the nature and scope of this investigative consumer report.

If account is authorized to purchase on open account, be it understood that all purchases be due and payable net 30 days. The undersigned official, to induce the granting of credit to the above named firm hereby personally guarantees the Company's credit.

Signed by:

Date

Individually and as an officer of the firm

**BS SEPTIC & DRAIN SERVICE
2 LOWER WARREN STREET
QUEENSBURY NY 12804
(518) 798-8194
FAX: 798-3213**

DATE: 4/19/99

TO:

**Lee Angelaki
Ecology & Environmental Inc.**

PROPOSAL

Location: Luzume Rd, Queensbury NY 12804

Description of Work: Portable Toilet Rental (approximately 3 mo.)

Price:

Weekly rate: 17.50

Monthly rate: 70.00

ACCEPTED BY: _____

DATE: _____

APR-08-1999 13:40

ICS/EXECUTONE

7166338542 P.02/02

transmission and delivery

related services.

QUOTE FOR 1MB SERVICE THROUGH BELL ATLANTIC

Non-Recurring Charge

Line Charge	\$50.05
Service Charge	\$56.00
Premise Visit	\$19.00
Total	\$125.05

PLUS TAXES ?
NO

Monthly Charge

Line Charge	\$16.23
FCC Charge	\$ 8.15
Total	\$24.38

PLUS TAXES
~ 23%
= \$29.99/mo.

HardwareStreet.com

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Select Hardware Category

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Olympus America Inc	Plat/OS	Media	In Stock	Price
CABLE KIT-D220L/320L/500L/600L 620L (200531)	MSD	CABL	3	\$27.99
DIGITAL CAMERA SERIAL CABLE FOR THE D200L & D300L CAMERA MAC/PC (200-505)	MSD	CABL	0	\$19.99
VIDEO CABLE FITS D-220L D-320L D-340R/D-400 ZOOM DIGITAL CAMERAS (200529)	MSD	CABL	11	\$13.99
DIRECT PRINTER CABLE FOR D-500L AND D-600L ONLY (200532)	MSD	CABL	24	\$19.99
AC ADAPTER CABLE CU-100 FOR FILM SCANNER REQUIRES AW-101AC (203007)	MSD	CABL	0	\$9.99
8MB SMARTMEDIA CARD FOR D-1000 (147462)	NMS	MEM	5	\$76.99
4MB CARD/CM4 F/D1000 RECORDER (147453)	MSD	SUPL	98	\$49.99
MAFP-1U FLASHPATH ADAPTER FOR 8MB PCMCIA SMARTMEDIA (200518)	MSD	SUPL	0	\$78.99
2MB CARD/ CM2 F/D1000 RECORDER (147452)	MSD	SUPL	0	\$27.99
16MB SMARTMEDIA CARD FITS D620L D340L/R D400Z (M-16PU)	NMS	SUPL	190	\$82.99
✓ 8MB SMARTMEDIA CARD (M-8PE) D220L D320L D500L D600L D620L (200546)	MSD	SUPL	527	\$40.99 ✓
PCMCIA CARD ADAPTER MA-2E SMARTMEDIA TO PCMCIA ADAPTER (200545)	MSD	SUPL	13	\$78.99
DESK TOP KIT W/IAVOICE MIN CARD READER/WRITER DSS PLAYER (147-461)	MSD	EXT	4	\$208.99
D620L DIGTL CAMERA 3XOPTCL ZOOM 8MBDRAM/5 IMAGES IN 3SEC/FLASH SYNC (225065)	PC	PERP	1344	\$835.99
1.45X TLCNVTR LENS D500L/620L 43-46 STEP-UP RING INCLUDED (200540)	MSD	ACCS	19	\$76.99
B-MACRO LENS (REQUIRES STEP-UP RING (387694) (103895)	MSD	ACCS	19	\$97.99
ACCESSORY KIT FOR D-220L D-320L D-340L 2MB PICTRA SFTWR (200523)	MSD	ACCS	356	\$75.99
D-600L UV HAZE FILTER FOR CAMERA ** ALSO FITS D-620L ** (108140)	MSD	ACCS	0	\$23.99
STEP-UP RING: D500L D600L D620L (43MM - 55MM) (200527)	MSD	ACCS	108	\$12.99
D400 ZOOM DIGTL CAMERA 1.3MG PX 3XOPTICAL ZOOM/8MB SMARTMEDIA CARD (225005)	NMS	PERP	771	\$584.99
✓ NI-MH BATTERY SET (B-30SU) 4-PACK W/CHARGER (200517)	MSD	ACCS	130	\$45.99
✓ D-600L DIGITAL CAMERA 4MB 1280 X 1024 50 IMAGES 9 IMAGE LCD (225050)	NMS	PERP	390	\$668.99 ✓
✓ LEATHER CAMERA CASE D500 D600L D620L (200526)	MSD	ACCS	8	\$30.99
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D340R DIGTL CAMERA W/2-4MB CRDS SMART MEDIA AUTOFLASH 4 MINFOCUS (225000)	NMS	PERP	810	\$333.99

668.99
+ 151.99
Total = 820.98
plus Tx & shipping

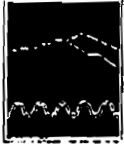
✓ { 8mb, charger batteries
last, AC Adapter and
soft wrap

AC ADAPTER C-7AU FITS ALL DIGITAL CAMERAS (200543)	NMS	ACCS	0	\$41.99
AC ADAPTER C-6AE 220 VOLT FOR ALL DIGITAL CAMERAS (200538)	NMS	ACCS	7	\$43.99
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P60NE PRINTER PAPER KIT 60 SHEETS 3 3/8 X 4 1/2 INCHES (200510)	MSD	SUPL	112	\$29.99
P60NS1E PRINTER PAPER KIT 1 CUT STICKER BOX OF 60 (200511)	MSD	SUPL	9	\$47.99
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D1000 RECORDER W/VIAVOICE SW 2MB CARD CABL PCMCIA ADAPT (141512)	NMS	SYST	97	\$241.99
DESKTOP COMMUNICATION KIT W/ MINIATURE CARD READER-WRITER/DSS (147450)	MSD	ACCS	14	\$186.99
D1000 RECORDER W/VIA VOICE W/2MB FLASH (141510)	NMS	SYST	4	\$174.99
LAPTOP INTERFACE KIT W/VIAVOICE PC CARD ADAPTER/DSS SFTW MOBIL VIA (147-460)	MSD	ACCS	0	\$134.99
TRANSCRIPTION ACCESSORY KIT W/FOOTSWITCH RS19/HEADSET99/ADAPTER (147-455)	MSD	ACCS	0	\$94.99
ES-10 DIGITAL PHOTO SCANNER A-10 ADAPTER & CENTURION APS CAMERA (201015)	PC	PERP	10	\$689.99
ES-10 SCSI FILM SCANNER 30 SECOND SCAN 3.8 MILLION PIXELS (201002)	NMS	PERP	0	\$366.99
HN-100 NEGATIVE STRIP HOLDER FOR THE ES-10 SCANNER (203010)	MSD	ACCS	29	\$15.99
ES-10 PARALLEL FILM SCANNER 35MM 3.8 MILLION PIXEL (201001)	PC	PERP	0	\$341.99
A-10 ADAPTER FOR APS FILM FOR USE WITH ES-10 SCANNER (201003)	MSD	ACCS	23	\$169.99
AC ADAPTER AW-100 FOR PAR SCANNER REQUIRES CU100 (203014)	MSD	ACCS	0	\$47.99
SLIDE HOLDER HS-100 FOR FILM SCANNER (203009)	MSD	ACCS	0	\$15.99
ADAPTER C-10 135 ADAPTER REPLACEMENT FOR FILM SCANNER (203011)	MSD	ACCS	0	\$63.99

Friday, April 16, 1999 9:00am US/Pacific

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**Applied Earth
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Environmental and Geotechnical Services

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June 10, 1999

**Proposal 9904012R2
Project 99418850**

Mr. Jon Nickerson
Ecology & Environment, Inc.
368 Pleasantview Drive
Lancaster, NY 14086
Phone: 716-684-8060
FAX: 716-684-0844

**RE: Drilling Services at Luzerne Road Site, Glens Falls, Warren County, NY
E&E Project QQ08 – Revision 2**

Dear Mr. Nickerson:

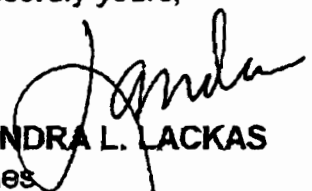
Per our discussion, here is the fee for the additional scope of work:

1. One Day Of Site Clearing = \$ 1000 (John Deere 450)

Jon, for your information, in that area, Caterpillar D8's only rent for a week or more.
This dozer will take care of the work.

Please don't hesitate to call me or Greg Handly at 800/607-6883 or 315/265-5036 with
any further questions regarding this project or any other that we may assist you with.

Sincerely yours,


SANDRA L. LACKAS

Sales

(Signing for Antonia L. Bouchard, CEO)

021 | Site Preparation & Excavation Support

2 SITE WORK

021 100 Site Clearing			CREW	DAILY OUTPUT	LABOR-HOURS	UNIT	1999 BARE COSTS				TOTAL INCL O&P
							MAT.	LABOR	EQUIP.	TOTAL	
104	7040	8" diameter	B-85	7	5.714	Ea.		131	115	246	330
	7080	12" diameter		6	6.667			153	135	288	385
	7120	18" diameter		5	8			184	162	346	465
	7160	24" diameter		4	10			230	202	432	575
	7240	36" diameter		3	13.333			305	269	574	770
	7280	48" diameter		2	20			460	405	865	1,150
108	0010	CLEARING Brush with brush saw	A-1	.25	32	Acre		685	275	960	1,375
	0100	By hand	*	.12	66.667			1,425	570	1,995	2,875
	0300	With dozer, ball and chain, light clearing	B-11A	2	8			199	420	619	770
	0400	Medium clearing		1.50	10.667			266	560	826	1,025
	0500	With dozer and brush rake, light		1	16			400	840	1,240	1,550
	0550	Medium brush to 4" diameter		.60	26.667			665	1,400	2,065	2,575
	0600	Heavy brush to 4" diameter		.40	40			995	2,100	3,095	3,850
	1000	Brush mowing, tractor w/rotary mower, no removal									
	1020	Light density	B-84	2	4	Acre		114	104	218	288
	1040	Medium density		1.50	5.333			151	139	290	385
	1080	Heavy density		1	8			227	208	435	575
116	0010	FELLING TREES & PILING With tractor, large tract, firm									
	0020	level terrain, no boulders, less than 12" diam. trees									
	0300	300 HP dozer, up to 400 trees/acre, 0 to 25% hardwoods	B-10M	.75	16	Acre		415	1,500	1,915	2,300
	0340	25% to 50% hardwoods		.60	20			520	1,875	2,395	2,875
	0370	75% to 100% hardwoods		.45	26.667			695	2,525	3,220	3,850
	0400	500 trees/acre, 0% to 25% hardwoods		.60	20			520	1,875	2,395	2,875
	0440	25% to 50% hardwoods		.48	25			650	2,350	3,000	3,600
	0470	75% to 100% hardwoods		.36	33.333			870	3,150	4,020	4,775
	0500	More than 600 trees/acre, 0 to 25% hardwoods		.52	23.077			600	2,175	2,775	3,325
	0540	25% to 50% hardwoods		.42	28.571			745	2,700	3,445	4,100
	0570	75% to 100% hardwoods		.31	38.710			1,000	3,650	4,650	5,575
	0900	Large tract clearing per tree									
	1500	300 HP dozer, to 12" diameter, softwood	B-10M	320	.038	Ea.		.98	3.53	4.51	5.
	1550	Hardwood		100	.120			3.13	11.30	14.43	17.
	1600	12" to 24" diameter, softwood		200	.060			1.56	5.65	7.21	8.
	1650	Hardwood		80	.150			3.91	14.15	18.06	21.
	1700	24" to 36" diameter, softwood		100	.120			3.13	11.30	14.43	17.
	1750	Hardwood		50	.240			6.25	22.50	28.75	34.
	1800	36" to 48" diameter, softwood		70	.171			4.47	16.15	20.62	24.
	1850	Hardwood		35	.343			8.95	32.50	41.45	49.
021 140 Stripping											
144	0010	STRIPPING Topsoil, and stockpiling, sandy loam									
	0020	200 H.P. dozer, ideal conditions	B-10B	2,300	.005	C.Y.		.14	.36	.50	
	0100	Adverse conditions	*	1,150	.010			.27	.73	1	1
	0200	300 HP dozer, ideal conditions	B-10M	3,000	.004			.10	.38	.48	
	0300	Adverse conditions	*	1,650	.007			.19	.69	.88	1
	0400	400 HP dozer, ideal conditions	B-10X	3,900	.003			.08	.35	.43	
	0500	Adverse conditions	*	2,000	.006			.16	.69	.85	1
	0600	Clay, dry and soft, 200 HP dozer, ideal conditions	B-10B	1,600	.008			.20	.52	.72	
	0601	Strip topsoil, clay, dry & soft, 200 HP dozer, ideal conditions		1,600	.008			.20	.52	.72	
	0700	Adverse conditions		800	.015			.39	1.05	1.44	1
	1000	Medium hard, 300 HP dozer, ideal conditions	B-10M	2,000	.006			.16	.57	.73	
	1100	Adverse conditions	*	1,100	.011			.28	1.03	1.31	1
	1200	Very hard, 400 HP dozer, ideal conditions	B-10X	2,600	.005			.12	.53	.65	
	1300	Adverse conditions	*	1,340	.009			.23	1.03	1.26	1

B

Quality Assurance Project Plan



B. Quality Assurance Project Plan



B. Quality Assurance Project Plan

Introduction

The Quality Assurance Project Plan (QAPP) is an integral part of the work plan for the Luzerne Road RI/FS. The QAPP covers all areas related to the production, review, and reporting of analytical data for the project. Where possible, the QAPP references specific areas of the work plan for information on sampling and analytical requirements. All laboratory QC requirements are provided in NYSDEC ASP, December 1995; the analytical method; or laboratory standard operating procedures (SOPs). The appropriate references and related information are briefly described below.

B.1 Site Information

Site background information is presented in Section 2 of the work plan. Overall, the purpose of the RI is to:

- Characterize the extent of PCB contamination in soil and groundwater at the site;
- Measure the concentration of PCBs in the storage cell, and determine the physical characteristics of the waste material stored in the cell;
- Determine whether contamination is confined to the site, or extends to adjacent properties; and
- Determine whether contamination is migrating off site via transport by surface water.

Sampling and analytical requirements of the work plan are summarized in Table 3-1. The primary contaminants of concern are PCBs, although all types of potential contaminants will be investigated by analysis for TCL and TAL metals. The analytical methods are NYSDEC ASP Contract Laboratory Program (CLP) methods.

All analytical methods will be standard EPA methods following NYSDEC ASP requirements.

Sample container and holding time requirements are specified in Tables 3-2 and 3-3 of the work plan. The holding times are based on verified time of sample receipt and are consistent with NYSDEC ASP requirements.

In addition to laboratory QA samples, field QC samples will be collected as specified in Table 3-1. The types of field QC samples are as follows:



B. Quality Assurance Project Plan

- Field duplicates will be collected for each matrix from each area. The collection frequency will be at least one duplicate per 10 field samples. Field duplicates will be used to evaluate the precision of the sampling and analytical program.
- Rinsate blanks will be collected for areas in which non-dedicated sampling equipment is used, primarily in soil sampling. The collection frequency will be at least one rinsate per 10 field samples using deionized (DI) water obtained from the laboratory. The rinsates will be used to monitor the effectiveness of decontamination procedures between samples.
- Trip blanks will be collected from each area in which samples are analyzed for TCL VOCs. The trip blanks will be prepared in the laboratory or in the field using organic-free DI water obtained from the laboratory. A trip blank will be kept with the field samples each day VOCs are collected and shipped to the laboratory in a cooler containing all the VOC samples.
- Additional sample volume will be provided for MS/MSD analysis for both soil and water samples. The overall collection frequency will be at least one per 20 field samples. The MS/MSD will be used to evaluate potential matrix effects on the quality of the analytical data. The laboratory will analyze matrix spike blanks for each MS/MSD to verify that the method was performed within specification.

B.2 Data Quality Objectives

The analytical data are being generated as part of an RI and will be used in an FS and, potentially, in remedial design. The purpose of an RI/FS is to identify the presence and extent of contamination in environmental media, to judge their potential impact on human and environmental receptors, and to recommend remedies for these impacts.

Quantitative human health risk and environmental risk assessments are being performed as part of this project. In addition, site contamination will be evaluated through comparison to guidance values (for soils and sediments) and standards (for groundwater and surface water) that may be applicable to the media at the Luzerne Road Site.

The methods selected for analysis are adequate for generating data required for calculating site-specific risks to human and environmental receptors, and for comparison to standards and guidance values. For soils, concentrations that would pose significant

B. Quality Assurance Project Plan

threats to human or environmental health are generally well above the detection limit for the contaminants. Some guidance values are back-calculated from models that attempt to estimate soil concentrations acceptable for the prevention of contamination of groundwater through leaching into the aquifer. For some carcinogenic organics, this approach provides guidance values below typical detection limits. However, because of the non-site-specific assumptions in these guidance values, soil rarely must be of such low concentrations to be protective of groundwater. Thus, evaluation of soil concentrations is not limited by the detection limits typically obtained by the analytical methods planned for these investigations.

Groundwater concentration standards are generally lower than soil guidance criteria due to an exposure basis of direct ingestion. All groundwater in New York State is considered a drinking water resource. For metals, the analytical methods selected provide detection limits above class GA groundwater standards. The exceptions are beryllium, with a standard of 3 µg/L compared to a detection limit of 5 µg/L, and aluminum, with a groundwater standard of 100 µg/L compared to a detection limit of 200 µg/L. These are insignificant limitations, however, as natural background concentrations of each of these metals are often found above the detection limit. Thus, concentrations elevated from anthropogenic sources should be readily observable as levels above background.

The NYSDEC ASP CLP methods selected for groundwater samples do not provide detection limits below class GA standards for all compounds detected. However, detection limits are sufficiently low (generally down to 10 µg/L for volatiles, and much lower for semivolatiles) to detect a plume (should one be present). In addition, ASP CLP methods are commonly used for groundwater investigations at hazardous waste sites and have been found to reliably demonstrate the presence of plumes, where present.

B.3 Screening Analyses

The screening method will be a modified Method 8082 analysis with a screening extraction equivalent to EPA Field Screening methods. The method will follow the laboratory standard operating procedure (SOP). The extraction procedure includes weighing one gram of sample into a test tube, drying with sodium sulfate or absorbing the water with methanol, if necessary, and extracting with hexane by vortexing for one minute. Surrogate will be added prior to extraction. If the potential for sulfur interference is indicated, the extract will be subject to clean-up with elemental copper.

B. Quality Assurance Project Plan

The sample will be diluted and analyzed by a capillary column, gas chromatograph (GC) equipped with an electron capture detector.

The GC will be calibrated initially with PCB Aroclor 1254 and 1660 in a linear range of at least 0.5 to 10 ppm. The calibration will be verified daily with acceptance criteria of 60% to 140%. If other PCBs are present or the samples exhibit a weathered pattern, the results will be reported as quantified by the nearest Aroclor. The detection limits will be 0.5 ppm for low level samples. Higher concentration samples will be analyzed at dilution with a high value of up to 2000 ppm. Samples requiring more than one dilution will be reported as extended or greater-than values.

Quality control samples include a blank and matrix spike every 20 samples. Surrogate recoveries will be monitored on samples with concentrations up to 20 ppm. Surrogates in samples with higher concentrations will be diluted out of range. All matrix spike and surrogate recoveries must be within 60% to 140% or the sample will be re-extracted and re-analyzed to determine if the cause is matrix effects or analytical problems. If analytical problems are verified, the laboratory will contact the QA Officer to determine whether the entire batch requires re-extraction and re-analysis. A laboratory control sample may be used if persistent matrix problems are identified.

The laboratory will maintain a sample receipt logbook indicating the sample identification, sample date, sample analysis date, and date sample was returned for destruction. The laboratory also maintains a general logbook documenting all instrument maintenance, communications, method deviations, and other general items. The logbooks will be maintained as part of the project files at the end of the laboratory effort. All PCB samples will be collected in standard glass jars and stored at room temperature. Samples for PCB confirmation will be preselected by the field crew and collected in laboratory-provided containers. The confirmation samples will be stored onsite in a cooler prior to shipment to the laboratory.

B.4 Laboratory Analysis

All analytical work will be performed by E & E's ASC. The ASC is certified by NYSDOH for all methods, including ASP CLP methods. The laboratory QA program is specified in the laboratory's QA Manual (Revision 1, October 1998). The QA Manual is a policy document with specific procedures outlined in laboratory SOPs. The laboratory will follow its current SOPs for CLP, general chemistry, and RCRA methods. The laboratory will

B. Quality Assurance Project Plan

follow NYSDEC ASP holding time and reporting requirements. For CLP methods, the laboratory will use NYSDEC ASP QC criteria. For other methods specified in the work plan, the laboratory will use laboratory reporting limits and internal QC criteria based on statistically generated control limits. Copies of the most current QA Manual, SOPs, and internal control limits are available upon request.

B.5 Data Reporting and Validation

All laboratory reports will be consistent with NYSDEC ASP requirements for Superfund deliverables for the CLP methods and Format B deliverables for general chemistry methods. Samples for RCRA characteristics will be reported with Format A deliverables. All data packages will include NYSDEC ASP Summary Forms. The data package will be sent to the independent validator for the project. The laboratory must also provide a summary package of case narrative and summary forms for results for the project team. No electronic data deliverable is required for this site. Laboratory reports are due 30 days from sample collection.

All data will be subject to independent data usability review by ChemWorld Environmental, Inc. The data usability review will follow NYSDEC requirements for completeness and compliance. The data validator will produce a data validation report (due 60 days from sample collection) as specified in NYSDEC requirements for the contract.

E & E will review the data usability review report (DUSR) to evaluate the impact of any data concerns on the overall usability of results. The findings will be summarized in the QA/QC section of the RI report and reflected in any data qualifiers added to the data in the RI report tables. The DUSR report will be included in the RI report as an appendix.

For the PCB screening samples, all results will be reported in wet weight. The report will include a summary of sample results, surrogate recoveries, and QC sample results. The laboratory will provide copies or originals of all chromatograms to the QA Officer on a weekly basis. All QC problems and corrective actions will be summarized. Any QC failures will be reported to the QA Officer immediately if corrective actions are not effective.

At least 10% of the samples will be confirmed by Method 8082 with a Method 3550B extraction. The confirmation results will require a one week turnaround. The screening results and



B. Quality Assurance Project Plan

confirmation results will be reviewed weekly by the QA Officer to verify the screening methods are meeting data quality objectives.

The QA Officer will perform at least one on-site audit to monitor the field activities and laboratory screening analysis. An audit report will be prepared and submitted with the final report. Any potential problems will be reported to NYSDEC immediately.

Each sample will be tested as is; samples will not be dehydrated, and results will be presented as wet-weight data. For each sample, 1-gram sodium sulfate extraction will be performed. The sample solution will then be diluted 20-fold, and a direct injection of this solution into the GC will occur. If the resulting data indicate a second dilution of either 2- or 200- fold is necessary to more accurately define the PCB concentration, one additional dilute-and-shoot analysis will be performed. This approach is capable of accurately quantifying PCB concentrations in the 50 to 2000 ppm range.

Note that this analysis is targeting only PCB Aroclor 1254 and 1016; it is not a complete scan of all PCBs. Due to the nature by which the PCBs were released to site soils, trichlorobenzene is likely to be present at this site. However, trichlorobenzene will not interfere with this analytical approach.

TITLE: PCB Soil Screening Analysis for PCB 1254 and/or 1260 by Method 8082			
Original Author: G. Rudz		Revision Author: G. Rudz	
Implementation Date: 6/11/99		Last Annual Review Date: 6/11/99	
File Information: L:\SOPs\Final\GC\GC79.ene-06/11/99 4:34 PM			
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

1.0 SCOPE AND APPLICATION

1.1 This Standard Operating Procedure (SOP) describes the procedure for identifying and quantifying polychlorinated biphenyl compounds in soils and sediments by a gas chromatographic procedure.

2.0 METHOD SUMMARY

2.1 Each sample is tested as is; samples are not dehydrated, and results are presented as wet-weight data. For each sample, a 1-gram extraction into 10 mL hexane is performed. The sample extract is diluted 20-fold, and directly injected into a gas chromatograph equipped with an electron capture detector. If the resulting data indicate a dilution is necessary to more accurately define the PCB concentration, a second dilution of either 2- or 200-fold is performed. This approach is capable of accurately quantifying PCB concentrations in the 10 to 35,000 ppm range.

2.2 Note that this SOP is targeting only Aroclor 1254 and 1260.

2.3 Extracts of soil samples for PCB are analyzed on a gas chromatograph equipped with capillary columns and electron capture detectors. The GC is calibrated by injecting three levels of the analytes of interest and measuring response. An aliquot of a sample is injected into the GC and quantitative analysis is performed on the resulting chromatogram by comparing sample response to standard response.

2.4 The following deviations from the method are taken.

2.4.1 The target list of compounds usually reported by this method are listed in Table 11-1.

2.4.2 Minor changes in chromatographic conditions may be used to optimize separation and sensitivity.

2.4.3 DCB is the primary surrogate, TCMX is a secondary surrogate.

2.4.4 Due to the likelihood that one or more surrogates may be interfered with, the following criteria are applied.

2.4.4.1 DCB in Laboratory Control Samples and method blanks must be recovered within in-house limits.

2.4.4.2 DCB recovery will be determined for all samples; if recovery is outside in-house limits, TCMX recoveries will be evaluated and reported.

2.4.4.3 Cases where both DCB and TCMX recoveries fail to meet criteria, and matrix effects are not evident, samples will require rerunning; if still out, reextraction and reanalysis.

3.0 HEALTH AND SAFETY

3.1 All employees should protect themselves at a minimum with safety glasses, protective gloves and a lab coat. For more information see the E & E, Inc., Analytical Services Center Chemical Hygiene Plan located in the QA Library Island shelf 2.

4.0 REFERENCES

4.1 SW-846 3rd Edition, Update III, June 1997, Methods 8000B, 8082, 3660B, 3665A.

4.2 Use checklist C-055 for analyst and peer review.

5.0 DEFINITIONS/ACRONYMS

5.1 MDL - Method Detection Limit as determined by 40 CFR Part 136, Appendix B. Method detection limits must be determined yearly for both water and soil matrixes. See SOP A.18 for procedure.

5.2 PQL - Practical Quantitation Limit is the concentration above the MDL that can be reasonably obtained and is used as the limit of reporting (Table 1).

5.3 TCMX - Tetrachlorometaxylene.

5.4 DCB - Decachlorobiphenyl.

6.0 INTERFERENCES/POTENTIAL PROBLEMS

6.1.1 Phthalates may cause false positives. Care should be exercised to reduce exposure of samples to plastics.

6.1.2 Elemental Sulfur – if present in the samples, may cause interferences. Sulfur clean-up using copper may be required. Refer to Section 10.5.4.

6.1.3 Heavy baseline and organics in samples may be cleaned up using acid-partitioning. Refer to Section 10.5.5.

7.0 INSTRUMENTATION AND EQUIPMENT

- Varian 3400 or Hewlett Packard 5890 equipped with electron capture detector and autosampler
- PE Nelson data system with TURBO*CHROM Software
- Restek RTX-5, 30 m column x 0.53mm 1.0 μ m film (or equivalent)
- Restek RTX-35, 30 m column x 0.53mm 0.5 μ m film (or equivalent)
- Volumetric flasks, Fisher or equivalent
- Gastight syringes, Krackler, or equivalent
- Screwcap vials with Teflon-lined septa, Krackler, or equivalent
- Disposable wiretrol pipettes, Krackler, Restek, or equivalent

8.0 REAGENTS AND MATERIALS

Table 8-1			
SUMMARY OF STANDARD AND REAGENTS			
Description	Source		Concentration
AR1016/1260 MIX	Restek or equivalent		1000 μ g/mL each
AR 1254 MIX	Restek or equivalent		1000 μ g/mL
Pesticide Surrogate Mix	Restek or equivalent		2000 μ g/mL TCMX and 2000 μ g/mL DCB
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

8.2 Standard Solution Preparation

8.2.1 All stock solutions commercially obtained shall be certified. Certificates are to be kept on file for all stocks received. All stocks and standards are to be stored at 2 - 6 C or lower.

8.2.2 Stock standards expire one year from the date opened, unless an earlier vendor supplied expiration date supercedes.

8.2.3 Working standards expire six months from date prepared unless expiration is superceded by stock expiration.

8.2.4 Unopened stock standards expire or per vendor-specified date if not provided (2) years from Date of Receipt.

Table 8-2			
STANDARD AND REAGENT PREPARATION			
Stock	Standard Name	Amount of Stock Diluted To	Final Concentration
Pesticide Surrogate Mix	Pest. Surr. Int.	250 μ L to 50 mL Hexane	10 μ g/mL
AR1016/1260 Mix Pest Surr. Int	AR1660L	2.5 μ L plus 25 μ L to 50 mL Hexane	See Table 8-3
AR1016/1260 Mix Pest Surr. Int	AR1660M	10 μ L plus 100 μ L to 50 mL Hexane	See Table 8-3
AR1016/1260 Mix Pest Surr. Int	AR1660H	50 μ L plus 500 μ L to 50 mL Hexane	See Table 8-3
AR1254 Mix Pest Surr Int	AR1254L	2.5 μ L plus 25 μ L to 50 mL Hexane	See Table 8-4
AR1254 Mix Pest Surr Int	AR1254M	10 μ L plus 100 μ L to 50 mL Hexane	See Table 8-4
AR1254 Mix Pest Surr Int	AR1254H	50 μ L plus 500 μ L to 50 mL Hexane	See Table 8-4
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

Table 8-3			
COMPONENTS AND CALIBRATION CONCENTRATIONS OF AR 1660			
Compound	μg/mL		
	AR1660L	AR1660M	AR1660H
TCMX	0.005	0.020	0.100
AR1016	0.050	0.200	1.000
AR1260	0.050	0.200	1.000
DCB	0.005	0.020	0.100
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

Table 8-4			
AR1254 CALIBRATION LEVELS			
Compound	$\mu\text{g/mL}$		
	AR1254L	AR1254M	AR1254H
TCMX	0.005	0.020	0.100
AR1254	0.050	0.200	1.000
DCB	0.005	0.020	0.100
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

9.0 PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Holding Time

Table 9-1				
HOLDING TIMES				
Matrix	Client/Project	Preparation (Days)	Analysis (Days)	Container Type and Preservative
Solid	Standard	14 for soil	The PCB extracts from sample preparation are to be analyzed within 40 days from extraction date.	Extracts are stored in a secure area (Sample Custody) in a separate refrigerator from original samples at 2-6 C.
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None	

10.0 PROCEDURE

10.1 Apparatus Setup

10.1.1 The GC is equipped with two columns connected by a "Y" connector to one injection point and 2 electron capture detectors.

10.1.2 The carrier gas flow and temperature profile may vary somewhat to optimize analytical separation.

10.1.3 Recommended temperatures are set as follows: Injector = 200°C; Detector = 300°C Temperature program: Column Initial = 150°C. Initial Hold = 1.0 min. Column Rate = 5°C/min. Column Final = 280°C. Final Hold = minimum of 10 minutes and may be extended due to presence of late-eluting compounds in extracted samples.

10.1.4 The autosampler injects 2.0 μL of sample extract into each GC column. (i.e., 4 μL total injection).

10.1.5 Transfer of extracts to instrument autosampler vials shall be accomplished with disposable pipettes or graduated Wiretrol micro pipettes.

10.2 Establishing Retention Time Windows

10.2.1 Make three injections of mid level Aroclor 1016/1260 standard over 72-hour period.

10.2.2 Calculate the multicomponent retention time windows based on five peaks of the Aroclor 1016/1260 mixture. The windows will apply to all multicomponents. Pattern recognition is still the primary means of identification.

10.2.3 The retention time window is defined as plus or minus 3 times the standard deviation from the retention time of the initial mid-level standards in the continuing calibration sequence. However, analyst experience should weigh heavily. Pattern recognition should primarily be used for multi-response products.

10.2.4 Retain this data so that it can be easily retrieved.

10.2.5 To facilitate analyte identification, the retention time windows are set as percentages ($\pm\%$ realtime of daily calibration) into the data system. These values are slightly wider than calculated windows.

10.3 Initial Calibration

10.3.1 Compound list and Quantitation Limits (Table 11-1).

10.3.2 Analyze an instrument blank (hexane) to verify the analytical system is clean (no target compounds are present greater than the quantitation limit) before Standards.

10.3.3 The initial calibration of PCBs are performed at the three levels identified with suffix L, M, and H (see Tables 8-3 and 8-4) See Table 10-1 for specific calibrations. Calibration standards are identified with a suffix L, M, and H.

10.3.4 Initial calibrations for PCBs only require three-point calibration for AR1660 and 1254.

10.3.5 Note: Hexane = Instrument blank

Table 10-1			
INITIAL CALIBRATION SEQUENCE			
Hexane			
AR1660L			
AR1660M			
AR1660H			
AR1254L			
AR1254M			
AR1254H			
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

10.3.6 Inject 2.0 μ L per column (i.e., 4 μ L total injection) of each calibration standard. Tabulate area responses against the mass injected. The results are used to prepare a calibration curve for each analyte.

10.3.7 If the linear correlation coefficient is ≥ 0.995 , linear curve may be used for quantification.

10.3.8 If < 0.995 , calculate the correlation coefficient of a second order curve. If the correlation coefficient is > 0.995 , use this second order curve for quantitation of the compound of interest. Additional concentration levels of standards are required for higher order curves. Refer to Method 8000 for guidance.

10.3.9 Alternatively, if the percent relative standard deviation is less than 20%, linearity through the origin is assumed and the mean calibration factor of the 5 point calibration curve can be used for quantitation of samples. The initial calibration may be acceptable if some analytes have an RSD greater than 20 percent so long as the mean of all the RSD values is less than 20 percent. If these conditions are met, then the compounds individual mean response factor may be used. Average response factor is the preferred method of quantitation.

10.3.10 Calculate the ratio of the response to the amount injected, defined as the calibration factor (CF), for each analyte at each standard concentration.

$$\text{Calibration Factor (CF)} = \frac{\text{Total Area of Peaks}^*}{\text{Mass Injected (in nanograms)}}$$

**Use the total area of the 5 largest peaks for quantitation. The number and specific peaks may need to be adjusted, depending if sample matrix interferences or pattern weathering exists (see Section 11.2).*

10.3.11 Calculate the % Relative Standard Deviation (%RSD) of the calibration factors for the 5-point initial calibration using the following equation:

$$\%RSD = \frac{\text{StandardDeviation}}{\text{MeanCalibrationFactor}} \cdot 100$$

10.3.12 Quantitation of samples must continue to be done using the procedure initially used.

10.3.13 Following each initial calibration, analyze a reference standard from a second source to verify the curve. The curve is deemed acceptable provided the reference standard calibration is within 15% difference of the mean calibration factor or 15% of the theoretical concentration, dependent on which means of quantitation will be used for analysis.

10.4 Calibration Verification

10.4.1 The working calibration curve or calibration factor must be verified at the beginning of the analytical sequence, and if a lapse in time >12 hours, has occurred from last continuing standard.

10.4.2 An instrument blank (hexane) is run to verify that the analytical system is clean (no target compounds are present > PQL).

10.4.3 A calibration check standard equivalent to the mid-level calibration standard must be analyzed at the beginning of the analytical sequence and after no more than every 20 samples. Use AR1016/1260 mid-level (AR1660M).

10.4.4 The quantitation method used must be the same throughout the analytical run.

10.4.4.1 If the mean calibration factor is used for quantitation, then the calibration factor must be $\leq 40\%$ difference (see Section 10.4.6) from the mean calibration factor.

10.4.4.2 If the regression curve is used for quantitating, then the concentration of the calibration check standard must be $\leq 40\%$ drift (see Section 10.4.6) from the theoretical concentration (i.e., 60 – 140% recovery).

10.4.5 Calculate % Drift and % Difference using the equations below.

When using a curve:

$$\% \text{ Drift} = \frac{\text{CalculatedConcentration} - \text{Theoretical Concentration}}{\text{TheoreticalConcentration}} \cdot 100$$

When using mean calibration factor:

$$\% \text{ Difference} = \frac{\text{CF Verification Standard} - \overline{\text{CF}}}{\overline{\text{CF}}} \cdot 100$$

10.5 Sample Analysis

10.5.1 Once a successful initial calibration is complete, the primary analytical daily or batch sequence may begin (see Table 10-2).

Table 10-2			
Daily Calibration Sequence			
Aroclor 1660 M or Aroclor 1254			
Samples not to exceed 20. Recommended – 10.			
Aroclor 1660 M or Aroclor 1254 (alternate)			
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

10.5.2 After every 20 samples or less, a 1660 mid level standard is analyzed.

If any PCB is detected in a sample at a level which exceeds the linear range of the calibration curve, the sample is diluted by a maximum of 200 times to extend the calibration range.

10.5.2.1 Instrument blanks (hexane) may be interspersed throughout the analytical run to check for carryover or when the system is run unattended (autosampler).

10.5.2 Additional instrument blanks may be run after suspect samples or before standards to help eliminate matrix carry over.

10.5.3 When peak detection is prevented by the presence of sulfur, the sample is treated and reanalyzed.

10.5.4 The copper cleanup of sample extracts is as follows:

Transfer an aliquot (1.0ml) of sample extract to a clean autosampler vial. Add ~ 0.5 to 1.5 grams of copper. Tighten the top on the vial and agitate the sample for 15 minutes, if a reaction occurs, re-agitate the sample for another 10-15 minutes. Centrifuge the extract if needed. Transfer the extract to another vial, leaving behind all solid precipitate and copper. All cleanup must be done in a fume hood.

10.5.5 Samples exhibiting matrix interferences can be further cleaned up using sulfuric acid.

10.5.5.1 Transfer 0.5-1 mL of extract into a clean vial. Add approximately 0.5 mL of concentrated sulfuric acid.

10.5.5.2 Vortex 10 seconds. Let settle, transfer portion of hexane extract to either autosampler vial for analysis or additional treatment with sulfuric acid if still highly colored.

10.6 Confirmation Analysis

NA

Instrument Maintenance

Table 10-3			
ROUTINE MAINTENANCE PROCEDURES			
Equipment/ Instrument	Symptom	Operation	Frequency
V3400/HP5890	Retention time shift	Change septum	Daily (or as needed)
V3400/HP5890	High baseline	Bake out column, detector	As needed
V3400/HP5890	Non-linear calibration	Replace detector; replace column	As needed
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

11.0 DATA REDUCTION/EVALUATION/REPORTING

11.1 If quantitating from a linear curve, the equation below is provided as a manual check.

$$\text{Concentration} = \text{mg/kg, } \mu\text{g/L} = \left[\frac{y-b}{m} \right] \frac{V_t}{S} \bullet \text{Df}$$

where:

- y = Area of target analyte from initial curve.
 b = Intercept (area).
 m = Slope (area / [$\mu\text{g/mL}$]).
 S = Mass of soil sample extracted in grams (g) or (volume of water sample extracted in liters [L]).
 V_t = Final volume of the extract in milliliters (mL).
 Df = Dilution factor. The dilution factor equals μL of extract used to make dilution + μL clean solvent used to make dilution divided by μL of extract used to make dilution.

11.2 Due to weathering effects or matrix interference, it is not always possible to quantitate samples using the same five peaks used in calibrating. All samples must be quantitated using a minimum of three peaks for each PCB and these same peaks from the calibration must be used to calculate concentrations. Peaks used for quantitation must be clearly identified on chromatograms of standards and samples.

Target Compounds and Reporting Limits

Table 11-1			
TARGET COMPOUNDS/ANALYTES AND QUANTITATION LIMITS			
Compound/Analyte	Type	PQL	
		Soil (mg/kg)	
Aroclor-1016	T	10	
Aroclor-1254	T	10	
Aroclor-1260	T	10	
TCMX	Q	NA	
DCB	Q	NA	
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

Key Type:

- NA = Not applicable.
 T = Compound/analyte is target compound routinely reported.
 M = Compound/analyte is listed in the method but is not routinely reported by E & E.
 C = Compound/analyte is specified by the client and can be analyzed under this method.
 S = Compound/analyte is routinely used as a matrix spike (MS).
 L = Compound/analyte is routinely used as a LCS spike (LCS).
 Q = Compound/analyte is used as a surrogate spike (SUR).

12.0 QUALITY CONTROL/QUALITY ASSURANCE/CORRECTIVE ACTION

12.1 Refer to the Quality Control Table below and the following sections for corrective actions.

12.2 Each sample is spiked with the surrogates DCB and TCMX. The DCB is the primary surrogate. Calculate its recovery. If peaks interfere with DCB, TCMX should be evaluated for acceptance. Proceed with corrective action when two surrogates are out of limits for a sample.

12.3 The sample is to be reextracted and reanalyzed unless it can be documented (chromatogram) that factors such as matrix effects are responsible. A corrective action report must be filed.

12.4 If any quality control criteria cannot be met, but the problem is correctable, the sample(s) affected must be reanalyzed.

12.5 Data that must be submitted with out of control events must be accompanied by a corrective action report.

12.6 If any criteria cannot be met, but the problem is correctable, the sample(s) affected must be reanalyzed.

Table 12-1			
ROUTINE QUALITY CONTROL SAMPLES			
QC Type	Frequency	Acceptance Criteria	Corrective Action
Method Blank	1 per preparation batch of 20 or fewer samples.	> PQL	Reanalyze samples having concentrations > Quantitation limits.
Matrix Spike (MS)	1 per preparation batch of 20 or fewer samples.	60 – 140%	Reanalyze QC sample if within hold times. Notify Project Manager immediately.
Laboratory Control Sample (LCS)	1 per extraction batch of 20 or fewer samples.	60 – 140%	Notify Project Manager immediately. If MS good, note in narrative. Reassess entire batch.
Surrogate (SUR)	Every sample, blanks and QC.	60 – 140%	Re-extract batch for blank or LCS failure. Re-extract affected sample(s) unless matrix effect is evident from chromatogram.
Revision: 0	Status: Final	Method: 8082	Minor Revision Date: None

13.0 SPECIAL PROJECT REQUIREMENTS

NA

14.0 SAMPLE DISPOSAL

14.1 See waste disposal SOP A.10.

15.0 EXAMPLE FORMS

NA

END OF SOP

C

Health and Safety Plan



C. Health and Safety Plan

ecology and environment, inc.

**SITE-SPECIFIC
HEALTH AND SAFETY PLAN**

Project: Luzerne Road Site

Project No.: 000699QQ08000100

TDD/PAN No.: _____

Project Location: Luzerne Road, Glens Falls, NY

Proposed Date of Field Activities: Summer 1999

Project Director: Jon Sundquist

Project Manager: Stephen Blair

Prepared by: Julie Barclay Date Prepared: 4/1/99

Approved by: Keith Horn Date Approved: 4/13/99

1. INTRODUCTION

1.1 POLICY

It is E & E's policy to ensure the health and safety of its employees, the public, and the environment during the performance of work it conducts. This site-specific health and safety plan (SHASP) establishes the procedures and requirements to ensure the health and safety of E & E employees for the above-named project. E & E's overall safety and health program is described in *Corporate Health and Safety Program for Toxic and Hazardous Substances* (CHSP). After reading this plan, applicable E & E employees shall read and sign E & E's Site-Specific Health and Safety Plan Acceptance form.

This SHASP has been developed for the sole use of E & E employees and is not intended for use by firms not participating in E & E's training and health and safety programs. Subcontractors are responsible for developing and providing their own safety plans.

This SHASP has been prepared to meet the following applicable regulatory requirements and guidance:

Applicable Regulation/Guidance
29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (HAZWOPER)
Other:

1.2 SCOPE OF WORK

Description of Work: Work will consist of: 1) the surveying of all sample points, geoprobe borehole locations, monitoring wells, etc., 2) monitoring well and geoprobe borehole installation, 3) subsurface soil, surface water and sediment sampling, 4) monitoring well development, purging, and sampling as well as groundwater and leachate level monitoring.

Equipment/Supplies: Attachment 1 contains a checklist of equipment and supplies that will be needed for this work.

The following is a description of each numbered task:

Task Number	Task Description
1	Surveying
2	Monitoring well and geoprobe borehole installation
3	Residential soil sampling
4	Surface water and sediment sampling
5	Monitoring well development and groundwater sampling
6	Aquifer testing
7	Groundwater and leachate level monitoring

1.3 SITE DESCRIPTION

Site Map: A site map or sketch is attached at the end of this plan. (Figures 1 and 2)

Site History/Description (see project work plan for detailed description): A soil remediation effort was conducted on the property in the early 1980s. This remediation appears to have failed, and PCB contamination has spread into the surrounding soil, and possibly the local groundwater.

Is the site currently in operation? ☐ Yes ☐ No

Locations of Contaminants/Wastes: _____

Types and Characteristics of Contaminants/Wastes:

- | | | | |
|--|--|--|---|
| <input checked="" type="checkbox"/> Liquid | <input checked="" type="checkbox"/> Solid | <input type="checkbox"/> Sludge | <input checked="" type="checkbox"/> Gas/Vapor |
| <input type="checkbox"/> Flammable/Ignitable | <input checked="" type="checkbox"/> Volatile | <input type="checkbox"/> Corrosive | <input type="checkbox"/> Acutely Toxic |
| <input type="checkbox"/> Explosive | <input type="checkbox"/> Reactive | <input checked="" type="checkbox"/> Carcinogenic | <input type="checkbox"/> Radioactive |
| <input type="checkbox"/> Medical/Pathogenic | Other: _____ | | |

2. ORGANIZATION AND RESPONSIBILITIES

E & E team personnel shall have on-site responsibilities as described in E & E's standard operating procedure (SOP) for Site Entry Procedures (GENTECH 2.2) The project team, including qualified alternates, is identified below.

Name	Site Role/Responsibility
Jon Nickerson	Project/Task Manager
Bob Meyers	Site Safety Officer
Bob Meyers	Field Team Leader
Greg Jones	Team Member

3. TRAINING

Prior to work, E & E team personnel shall have received training as indicated below. As applicable, personnel shall have read the project work plan, sampling and analysis plan, and/or quality assurance project plan prior to project work.

Training	Required
40-Hour OSHA HAZWOPER Initial Training and Annual Refresher (29 CFR 1910.120)	X
Annual First Aid/CPR	X
Hazard Communication (29 CFR 1910.1200)	X
40-Hour Radiation Protection Procedures and Investigative Methods	
8-Hour General Radiation Health and Safety	

Training	Required
Radiation Refresher	
DOT and Biannual Refresher	
Other:	

4. MEDICAL SURVEILLANCE

4.1 MEDICAL SURVEILLANCE PROGRAM

E & E field personnel shall actively participate in E & E's medical surveillance program as described in the CHSP and shall have received, within the past year, an appropriate physical examination and health rating.

E & E's health and safety record (HSR) form will be maintained on site by each E & E employee for the duration of his or her work. E & E employees should inform the site safety officer (SSO) of any allergies, medical conditions, or similar situations that are relevant to the safe conduct of the work to which this SHASP applies.

Is there a concern for radiation at the site? ☐ Yes ☒ No

If no, go to 5.1.

4.2 RADIATION EXPOSURE

4.2.1 External Dosimetry

Thermoluminescent Dosimeter (TLD) Badges: TLD badges are required to be worn by all E & E field personnel on all E & E sites.

Pocket Dosimeters: _____

Other: _____

4.2.2 Internal Dosimetry

☐ Whole body count ☐ Bioassay ☐ Other

Requirements: _____

4.2.3 Radiation Dose

Dose Limits: E & E's radiation dose limits are stated in the CHSP. Implementation of these dose limits may be designated on a site-specific basis.

Site-Specific Dose Limits: _____

ALARA Policy: Radiation doses to E & E personnel shall be maintained as low as reasonably achievable (ALARA), taking into account the work objective, state of technology available, economics of improvements in dose reduction with respect to overall health and safety, and other societal and socioeconomic considerations.

5. SITE CONTROL

5.1 SITE LAYOUT AND WORK ZONES

Site Work Zones: Refer to the map or site sketch, attached at the end of this plan, for designated work zones.

Site Access Requirements and Special Considerations: _____

Illumination Requirements: All work to be completed in daylight hours.

Sanitary Facilities (e.g., toilet, shower, potable water): Portable toilet and clean water will be available on site.

On-Site Communications: _____

Other Site-Control Requirements: _____

5.2 SAFE WORK PRACTICES

Daily Safety Meeting: A daily safety meeting will be conducted for all E & E personnel and documented on the Daily Safety Meeting Record form or in the field logbook. The information and data obtained from applicable site characterization and analysis will be addressed in the safety meetings and also used to update this SHASP, as necessary.

Work Limitations: Work shall be limited to a maximum of 12 hours per day. If 12 consecutive days are worked, at least one day off shall be provided before work is resumed. Work will be conducted in daylight hours unless prior approval is obtained and the illumination requirements in 29 CFR 1910.120(m) are satisfied.

Weather Limitations: Work shall not be conducted during electrical storms. Work conducted in other inclement weather (e.g., rain, snow) will be approved by project management and the regional safety coordinator or designee.

Other Work Limitations: None.

Buddy System: Field work will be conducted in pairs of team members according to the buddy system.

Line of Sight: Each field team member shall remain in the line of sight and within verbal communication of at least one other team member.

Eating, Drinking, and Smoking: Eating, drinking, smoking, and the use of tobacco products shall be prohibited in the exclusion and contamination reduction areas, at a minimum, and shall only be permitted in designated areas.

Contamination Avoidance: Field personnel shall avoid unnecessary contamination of personnel, equipment, and materials to the extent practicable.

Sample Handling: Protective gloves of a type designated in Section 7 will be worn when containerized samples are handled for

labeling, packaging, transportation, and other purposes.

Vermiculite Handling: Respiratory protection (i.e., high-efficiency particulate air filtration) is recommended when vermiculite is used to package samples into shipping containers (some vermiculite contains low concentrations of asbestos).

Other Safe Work Practices: _____

6. HAZARD EVALUATION AND CONTROL

6.1 PHYSICAL HAZARD EVALUATION AND CONTROL

Potential physical hazards and their applicable control measures are described in the following table for each task.

Hazard	Task Number	Hazard Control Measures
Biological (flora, fauna, etc.)	All	<ul style="list-style-type: none">• Potential hazard: <u>Ticks and poison ivy in wooded areas.</u>• Establish site-specific procedures for working around identified hazards.• Other: _____
Cold Stress	NA	<ul style="list-style-type: none">• Provide warm break area and adequate breaks.• Provide warm noncaffeinated beverages.• Promote cold stress awareness.• See <i>Cold Stress Prevention and Treatment</i> (attached at the end of this plan if cold stress is a potential hazard).
Compressed Gas Cylinders	2, 3, 4, 5, 7	<ul style="list-style-type: none">• Use caution when moving or storing cylinders.• A cylinder is a projectile hazard if it is damaged or its neck is broken.• Store cylinders upright and secure them by chains or other means.• Other: <u>OVA hydrogen tank</u>
Confined Space	NA	<ul style="list-style-type: none">• Ensure compliance with 29 CFR 1910.146.• See SOP for Confined Space Entry. Additional documentation is required.• Other: _____
Drilling	2, 3	<ul style="list-style-type: none">• See SOP for Health and Safety on Drilling Rig Operations. Additional documentation may be required.• Other: _____• Other: _____
Drums and Containers	2, 3, 5	<ul style="list-style-type: none">• Ensure compliance with 29 CFR 1910.120(j).• Consider unlabeled drums or containers to contain hazardous substances and handle accordingly until the contents are identified.• Inspect drums or containers and assure integrity prior to handling.• Move drums or containers only as necessary; use caution and warn nearby personnel of potential hazards.• Open, sample, and/or move drums or containers in accordance with established procedures; use approved drum/container-handling equipment.• Other: _____

Hazard	Task Number	Hazard Control Measures
Electrical	2, 3	<ul style="list-style-type: none"> • Ensure compliance with 29 CFR 1910 Subparts J and S. • Locate and mark energized lines. • De-energize lines as necessary. • Ground all electrical circuits. • Guard or isolate temporary wiring to prevent accidental contact. • Evaluate potential areas of high moisture or standing water and define special electrical needs. • Other: _____
Excavation and Trenching	NA	<ul style="list-style-type: none"> • Ensure that excavations comply with and personnel are informed of the requirements of 29 CFR 1926 Subpart P. • Ensure that any required sloping or shoring systems are approved as per 29 CFR 1926 Subpart P. • Identify special personal protective equipment (PPE) (see Section 7) and monitoring (see Section 8) needs if personnel are required to enter approved excavated areas or trenches. • Maintain line of sight between equipment operators and personnel in excavations/trenches. Such personnel are prohibited from working in close proximity to operating machinery. • Suspend or shut down operations at signs of cave in, excessive water, defective shoring, changing weather, or unacceptable monitoring results. • Other: _____ • Other: _____
Fire and Explosion	2, 3	<ul style="list-style-type: none"> • Inform personnel of the location(s) of potential fire/explosion hazards. • Establish site-specific procedures for working around flammables. • Ensure that appropriate fire suppression equipment and systems are available and in good working order. • Define requirements for intrinsically safe equipment. • Identify special monitoring needs (see Section 8). • Remove ignition sources from flammable atmospheres. • Coordinate with local fire-fighting groups regarding potential fire/explosion situations. • Establish contingency plans and review daily with team members. • Other: _____
Heat Stress	All	<ul style="list-style-type: none"> • Provide cool break area and adequate breaks. • Provide cool noncaffeinated beverages. • Promote heat stress awareness. • Use active cooling devices (e.g., cooling vests) where specified. • See <i>Heat Stress Prevention and Treatment</i> (attached at the end of this plan if heat stress is a potential hazard).
Heavy Equipment Operation	2, 3	<ul style="list-style-type: none"> • Define equipment routes, traffic patterns, and site-specific safety measures. • Ensure that operators are properly trained and equipment has been properly inspected and maintained. Verify back-up alarms. • Ensure that ground spotters are assigned and informed of proper hand signals and communication protocols. • Identify special PPE (Section 7) and monitoring (Section 8) needs.

Hazard	Task Number	Hazard Control Measures
		<ul style="list-style-type: none"> • Ensure that field personnel do not work in close proximity to operating equipment. • Ensure that lifting capacities, load limits, etc., are not exceeded. • Other: _____
Heights (Scaffolding, Ladders, etc.)	NA	<ul style="list-style-type: none"> • Ensure compliance with applicable subparts of 29 CFR 1910. • Identify special PPE needs (e.g., lanyards, safety nets, etc.) • Other: _____
Noise	2, 3	<ul style="list-style-type: none"> • Establish noise level standards for on-site equipment/operations. • Inform personnel of hearing protection requirements (Section 7). • Define site-specific requirements for noise monitoring (Section 8). • Other: _____
Overhead Obstructions	2, 3	<ul style="list-style-type: none"> • Wear hard hat. • Other: _____
Power Tools	NA	<ul style="list-style-type: none"> • Ensure compliance with 29 CFR 1910 Subpart P. • Other: _____
Sunburn	All	<ul style="list-style-type: none"> • Apply sunscreen. • Wear hats/caps and long sleeves. • Other: _____
Utility Lines	2, 3	<ul style="list-style-type: none"> • Identify/locate existing utilities prior to work. • Ensure that overhead utility lines are at least 25 feet away from project activities. • Contact utilities to confirm locations, as necessary. • Other: _____
Weather Extremes	All	<ul style="list-style-type: none"> • Potential hazards: _____ • Establish site-specific contingencies for severe weather situations. • Provide for frequent weather broadcasts. • Weatherize safety gear, as necessary (e.g., ensure eye wash units cannot freeze, etc.). • Identify special PPE (Section 7) needs. • Discontinue work during severe weather. • Other: _____
Other:		<ul style="list-style-type: none"> • _____ • _____
Other:		<ul style="list-style-type: none"> • _____ • _____

6.2 CHEMICAL HAZARD EVALUATION AND CONTROL

6.2.1 Chemical Hazard Evaluation

Potential chemical hazards are described by task number in Table 6-1. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

Table 6-1 CHEMICAL HAZARD EVALUATION										
Task Number	Compound	Exposure Limits (TWA)			Dermal Hazard (Y/N)	Route(s) of Exposure	Acute Symptoms	Odor Threshold/Description	FID/PID	
		REL	TLV	PEL					Relative Response	Ioniz. Poten. (eV)
1-7	Polychlorinated biphenyl 1242*	1 mg/m3 CL	0.001 mg/m3 CL	1 mg/m3 CL	Y	Inh, Ing, Eye, Skin	Irritation of eyes, chloracne, liver damage	---	---	---
1-7	Polychlorinated biphenyl 1254*	0.5 mg/m3 CL	0.001 mg/m3 CL	0.5 mg/m3 CL	Y	Inh, Ing, Eye, Skin	Irritation of eyes, chloracne, liver damage	---	---	---
1-7	Trichlorobenzene	---	---	---	Y	IIInh, Ing, Eye, Skin	Irritation of eyes/skin/mucous membranes	---	100%	---

KEY:

* = Chemical is a known or suspected carcinogen.

--- = Information not available

REL = Permissible Exposure Limit

TLV = Recommended Exposure Limit

C = Threshold Limit Value

CGH = Ceiling Limit

CNS = Cough

DIZZ = Central Nervous System Effects

DIZZ = Dizziness

E/N/I = Eyes/Nose/Throat

FA = Fatigue

F/CC = fibers per cubic centimeter

GD = Giddiness

GI = Gastrointestinal Tract

IIA = Headaches

INH = Inhalation

ING = Ingestion

IRR = Irritation

LFC = Lowest Feasible Concentration

LOC = Loss of Consciousness

MG/M3 = Milligrams per cubic meter

NAU = Nausea

PPM = Parts per million

PWP = Poor Warning Properties

URT = Upper Respiratory Tract

V = Vomiting

WK = Weakness

SK = Skin Notation

SP = Slow Pulse

STEL = Short Term Exposure Limit

6.2.2 Chemical Hazard Control

An appropriate combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below published exposure levels (see Section 6.2.1).

Applicable Engineering/Administrative Control Measures: None.

PPE: See Section 7.

6.3 RADIOLOGICAL HAZARD EVALUATION AND CONTROL

6.3.1 Radiological Hazard Evaluation

Potential radiological hazards are described below by task number. Hazard Evaluation Sheets for major known contaminants are attached at the end of this plan.

Task Number	Radionuclide	DAC (μCi/ml)	Route(s) of Exposure	Major Radiation(s)	Energy(s) (MeV)	Half-Life

6.3.2 Radiological Hazard Control

Engineering/administrative controls and work practices shall be instituted to reduce and maintain employee exposures to a level at or below the permissible exposure/dose limits (see sections 4.2.3 and 6.3.1). Whenever engineering/administrative controls and work practices are not feasible or effective, any reasonable combination of engineering/administrative controls, work practices, and PPE shall be used to reduce and maintain employee exposures to a level at or below permissible exposure/dose limits.

Applicable Engineering/Administrative Control Measures: _____

PPE: See Section 7.

7. LEVEL OF PROTECTION AND PERSONAL PROTECTIVE EQUIPMENT

7.1 LEVEL OF PROTECTION

The following levels of protection (LOPs) have been selected for each work task based on an evaluation of the potential or known hazards, the routes of potential hazard, and the performance specifications of the PPE. On-site monitoring results and other information obtained from on-site activities will be used to modify these LOPs and the PPE, as necessary, to ensure sufficient personnel protection. The authorized LOP and PPE shall only be changed with the approval of the regional safety coordinator or designee. Level A is not included below because Level A activities, which are performed infrequently, will require special planning and addenda to this SHASP.

Task Number	B	C	D	Modifications Allowed
1		(X)	X	
2		(X)	X	
3		(X)	X	
4		(X)	X	
5		(X)	X	
6		(X)	X	
7		(X)	X	

Note: Use "X" for initial levels of protection. Use "(X)" to indicate levels of protection that may be used as site conditions warrant.

7.2 PERSONAL PROTECTIVE EQUIPMENT

The PPE selected for each task is indicated below. E & E's PPE program complies with 29 CFR 1910.120 and 29 CFR 1910 Subpart I and is described in detail in the CHSP. Refer to 29 CFR 1910 for the minimum PPE required for each LOP.

PPE	Task Number/LOP						
	1	2	3	4	5	6	7
Full-face APR		(X)	(X)				
PAPR							
Cartridges:							
H							
GMC-H		(X)	(X)				
GMA-H							
Other:							
Positive-pressure, full-face SCBA							
Spare air tanks (Grade D air)							
Positive-pressure, full-face, supplied-air system							
Cascade system (Grade D air)							
Manifold system							
5-Minute escape mask							
Safety glasses		X	X	X	X	X	X
Monogoggles							
Coveralls/clothing	X	X	X				

PPE	Task Number/LOP						
	1	2	3	4	5	6	7
Protective clothing:							
Tyvek	(X)	(X)	(X)	(X)	(X)	(X)	(X)
Saranex							
Other:							
Splash apron							
Inner gloves:							
Cotton							
Nitrile							
Latex							
Other:							
Outer gloves:							
Viton							
Rubber							
Neoprene							
Nitrile		X	X	X	X	X	X
Other:							
Work gloves	X	X	X	X	X	X	X
Safety boots (as per ANSI Z41)	X	X	X	X	X	X	X
Neoprene safety boots (as per ANSI Z41)		(X)	(X)	(X)			
Boot covers (type: _____)							
Hearing protection (type: _____)		X	X				
Hard hat		X	X				
Face shield							
Other:							
Other:							

8. HEALTH AND SAFETY MONITORING

Health and safety monitoring will be conducted to ensure proper selection of engineering/administrative controls, work practices, and/or PPE so that employees are not exposed to hazardous substances at levels that exceed permissible exposure/dose limits or published exposure levels. Health and safety monitoring will be conducted using the instruments, frequency, and action levels described in Table 8-1. Health and safety monitoring instruments shall have been appropriately calibrated and/or performance-checked prior to use.

Table 8-1

HEALTH AND SAFETY MONITORING

Instrument	Task Number	Contaminant(s)	Monitoring Location	Monitoring Frequency	Action Levels ^a	
<input type="checkbox"/> PID (e.g., HNu IS-101) <input checked="" type="checkbox"/> FID (e.g., OVA 128-GC)	2, 3, 4, 5, 6	VOCs	Breathing zone	Continuous	Unknown Vapors Background to 1 ppm: Level D 1 to 5 ppm above background: Level C 5 to 500 ppm above background: Level B >500 ppm above background: Level A	Contaminant-Specific
Oxygen Meter/Explosimeter	2, 3	O ₂	Breathing zone	Continuous	Oxygen <19.5% or >22.0%: Evacuate area; eliminate ignition sources; reassess conditions. 19.5 to 22.0%: Continue work in accordance with action levels for other instruments.	Explosivity ≤10% LEL: Continue work in accordance with action levels for other instruments; monitor continuously for combustible atmospheres. >10% LEL: Evacuate area; eliminate ignition sources; reassess conditions.
Radiation Alert Monitor (Rad-mini or RAM-4)					<0.1 mR/hr: Continue work in accordance with action levels for other instruments. ≥0.1 mR/hr: Evacuate area; reassess work plan and contact radiation safety specialist.	
Mini-Ram Particulate Monitor					General/Unknown Evaluate health and safety measures when dust levels exceed 2.5 milligrams per cubic meter.	Contaminant-Specific
HCN/H ₂ S (Monitox)					≥4 ppm: Leave area and consult with SSO.	
Draeger Colorimetric Tubes					Tube	Action Level Action
Air Monitor/Sampler					Action Level	Action
Type: _____ Sampling medium: _____						

Table 8-1

HEALTH AND SAFETY MONITORING

Instrument	Task Number	Contaminant(s)	Monitoring Location	Monitoring Frequency	Action Level	Action Levels ^a	Action
Personal Sampling Pump Type: _____ Sampling medium: _____							
Micro R Meter						<2 mR/hr: Continue work in accordance with action levels for other instruments. 2 to 5 mR/hr: In conjunction with a radiation safety specialist, continue work and perform stay-time calculations to ensure compliance with dose limits and ALARA policy. >5 mR/hr: Evacuate area to reassess work plan and evaluate options to maintain personnel exposures ALARA and within dose limits.	
Ion Chamber						See micro R meter action levels above.	
Radiation Survey Rate meter/Scaler with External Detector(s)						Detector	Action Level
Noise Dosimeter (Sound Level Meter)						≤85 decibels as measured using the A-weighted network (dBA): Use hearing protection if exposure will be sustained throughout work shift. >85 dBA: Use hearing protection. >120 dBA: Leave area and consult with safety personnel.	Action
Other:							
Other:							

^a Unless stated otherwise, airborne contaminant concentrations are measured as a time-weighted average in the worker's breathing zone. Acceptable concentrations for known airborne contaminants will be determined based on OSHA/NIOSH/ACGIH and/or NRC exposure limits. As a guideline, 1/2 the PEL/REL/TLV, whichever is lower should be used.

9. DECONTAMINATION PROCEDURES

All equipment, materials, and personnel will be evaluated for contamination upon leaving the exclusion area. Equipment and materials will be decontaminated and/or disposed and personnel will be decontaminated, as necessary. Decontamination will be performed in the contamination reduction area or any designated area such that the exposure of uncontaminated employees, equipment, and materials will be minimized. Specific procedures are described below.

Equipment/Material Decontamination Procedures (specified by work plan): All down-hole drilling equipment will be decontaminated with a high pressure steam cleaner. All other equipment will be washed with an alconox-clean water solution and triple rinsed with dionized water. Dedicated equipment will be used whenever possible.

Ventilation: All decontamination procedures will be conducted in a well-ventilated area.

Personnel Decontamination Procedures: Remove outer gloves, booties (if worn), and Tyvek (if worn), then remove inner gloves (if worn). Hand wipes should be available on site.

PPE Requirements for Personnel Performing Decontamination: Surgical gloves, safety glasses.

Personnel Decontamination in General: Following appropriate decontamination procedures, all field personnel will wash their hands and face with soap and potable water. Personnel should shower at the end of each work shift.

Disposition of Disposable PPE: Disposable PPE must be rendered unusable and disposed as indicated in the work plan.

Disposition of Decontamination Wastes (e.g., dry wastes, decontamination fluids, etc.): All decontamination fluids are to be drummed. All dry wastes (PPE, etc.) to be double bagged and disposed of at a specified off-site location (TBD).

10. EMERGENCY RESPONSE

This section contains additional information pertaining to on-site emergency response and does not duplicate pertinent emergency response information contained in earlier sections of this plan (e.g., site layout, monitoring equipment, etc.). Emergency response procedures will be rehearsed regularly, as applicable, during project activities.

10.1 EMERGENCY RESPONSIBILITIES

All Personnel: All personnel shall be alert to the possibility of an on-site emergency; report potential or actual emergency situations to the team leader and SSO; and notify appropriate emergency resources, as necessary.

Team Leader: The team leader will determine the emergency actions to be performed by E & E personnel and will direct these actions. The team leader also will ensure that applicable incidents are reported to appropriate E & E and client project personnel and government agencies.

SSO: The SSO will recommend health/safety and protective measures appropriate to the emergency.

Other: _____

10.2 LOCAL AND SITE RESOURCES (including phone numbers)

Ambulance: 518/792-1119 (Empire Ambulance Svc., 46 Mohican St.)

Hospital: Glens Falls Hospital, 100 Park St. Gen. Info. Line 518/792-3151

Directions to Hospital (map attached at the end of this plan): Take Luzerne Road east, which merges with Broad Street (Main St.).

Continue east, turn right onto School St. Hospital in on Park St. located at end of school (see maps of area).

Poison Control: 1-800-336-6997

Police Department: 911

Fire Department: 911

Client Contact: _____

Site Contact: _____

On-Site Telephone Number: _____

Cellular Telephone Number: _____

Radios Available: _____

Other: _____

10.3 E & E EMERGENCY CONTACTS

E & E Emergency Response Center (24 Hours): 716/684-8940

Corporate Health and Safety Director, Dr. Paul Jonmaire: 716/684-8060 (office)
716/655-1260 (home)

Regional Office Contact: _____ (office)
_____ (home)
Other: _____ (office)

a. E & E Emergency Response Center: 716/684-8940

b. Corporate Health and Safety Director, Dr. Paul Jonmaire: 716/684-8060 (office)
716/655-1260 (home)

c. Corporate Safety Officer, Tom Siener 716/684-8060 (office)
716/662-4740 (home)

10.4 OTHER EMERGENCY RESPONSE PROCEDURES

On-Site Evacuation Signal/Alarm (must be audible and perceptible above ambient noise and light levels): _____

On-Site Assembly Area: TBD

Emergency Egress Route to Get Off Site: TBD

Off-Site Assembly Area: TBD

Preferred Means of Reporting Emergencies: Report to FTL; call 911, if necessary.

Site Security and Control: In an emergency situation, personnel will attempt to secure the affected area and control site access.

Emergency Decontamination Procedures: TBD

PPE: Personnel will don appropriate PPE when responding to an emergency situation. The SSO and Section 7 of this plan will provide guidance regarding appropriate PPE.

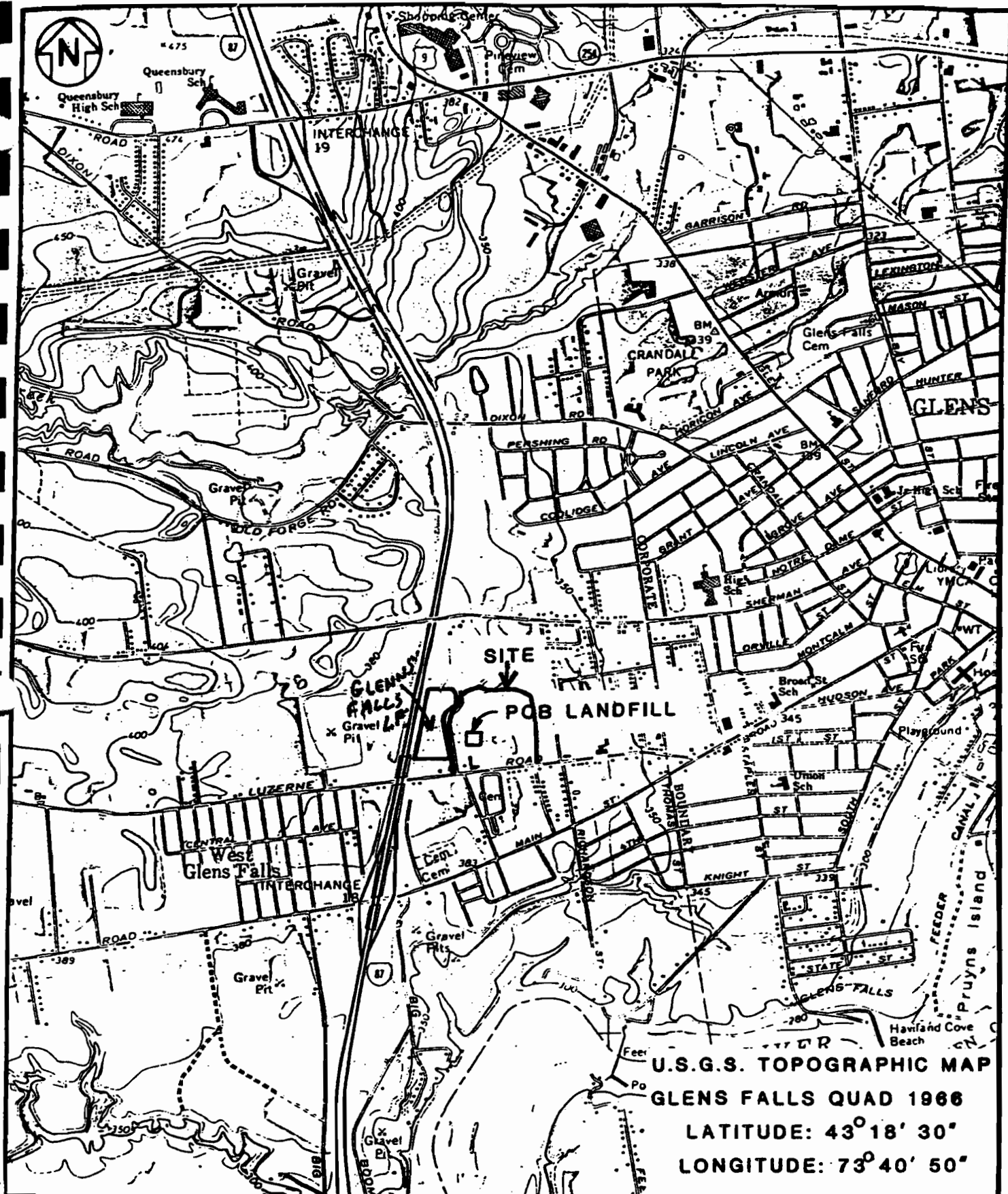
Emergency Equipment: Appropriate emergency equipment is listed in Attachment 1. Adequate supplies of this equipment shall be maintained in the support area or other approved work location.

Incident Reporting Procedures: Report to FTL and regional safety coordinator; complete incident report form.

**ATTACHMENT 1
EQUIPMENT/SUPPLIES CHECKLIST**

INSTRUMENTATION	No.	EMERGENCY EQUIPMENT	No.
OVA	1	First aid kit	1
Thermal desorber		Stretcher	
O ₂ /explosimeter w/cal. kit	1	Portable eye wash	1
Photovac tip		Blood pressure monitor	
HNu (probe: _____ eV)		Fire blanket	
Magnetometer		Fire extinguisher	1
Pipe locator		Thermometer (medical)	
Weather station		Spill kit	
Draeger tube kit (tubes: _____)			
Brunton compass			
Real-time cyanide monitor			
Real-time H ₂ S monitor			
Heat stress monitor			
Noise equipment		DECONTAMINATION EQUIPMENT	
Personal sampling pumps and supplies		Wash tubs	
MiniRam dust monitor		Buckets	1
Mercury monitor		Scrub brushes	1
Spare batteries (type: _____)		Pressurized sprayer	
		Spray bottle	1
		Detergent (type: <u>alconox</u> _____)	1
RADIATION EQUIPMENT/SUPPLIES		Solvent (type: _____)	
Documentation forms		Plastic sheeting	1
Portable ratemeter		Tarps and poles	
Scaler/ratemeter		Trash bags	1
1" NaI gamma probe		Trash cans	
2" NaI gamma probe		Masking tape	
ZnS alpha probe		Duct tape	1
GM pancake probe		Paper towels	1
Tungsten-shielded GM probe		Face mask	
Micro R meter		Face mask sanitizer	
Ion chamber		Step ladders	
Alert monitor		Distilled water	
Pocket dosimeter		Deionized water	1
Dosimeter charger			
Radiation warning tape			
Radiation decon supplies			
Spare batteries (type: _____)			

ATTACHMENT 1 EQUIPMENT/SUPPLIES CHECKLIST			
SAMPLING EQUIPMENT		MISCELLANEOUS (Cont.)	
8-oz. bottles	X	Gatorade or equivalent	X
Half-gallon bottles		Tables	
VOA bottles	X	Chairs	
String	X	Weather radio	
Hand bailers	X	Two-way radios	
Thieving rods with bulbs		Binoculars	
Spoons	X	Megaphone	
Knives		Cooling vest	
Filter paper			
Bottle labels	X		
		SHIPPING EQUIPMENT	
		Coolers	X
MISCELLANEOUS		Paint cans with lids, 7 clips each	
Pump	X	Vermiculite	
Surveyor's tape		Shipping labels	X
100' Fiberglass tape		DOT labels:	X
300' Nylon rope		"Up"	
Nylon string		"Danger"	
Surveying flags		"Inside Container Complies ..."	
Camera	X	Hazard Group	
Film		Strapping tape	X
Bung wrench	X	Baggies	X
Soil auger	X	Custody seals	X
Pick		Chain-of-custody forms	X
Shovel		Federal Express forms	X
Catalytic heater		Clear packing tape	X
Propane gas		Permanent markers	X
Banner tape			
Surveying meter stick			
Chaining pins and ring			
Logbooks (large, small)	X		
Required MSDSs	X		
Intrinsically safe flashlight			
Potable water			



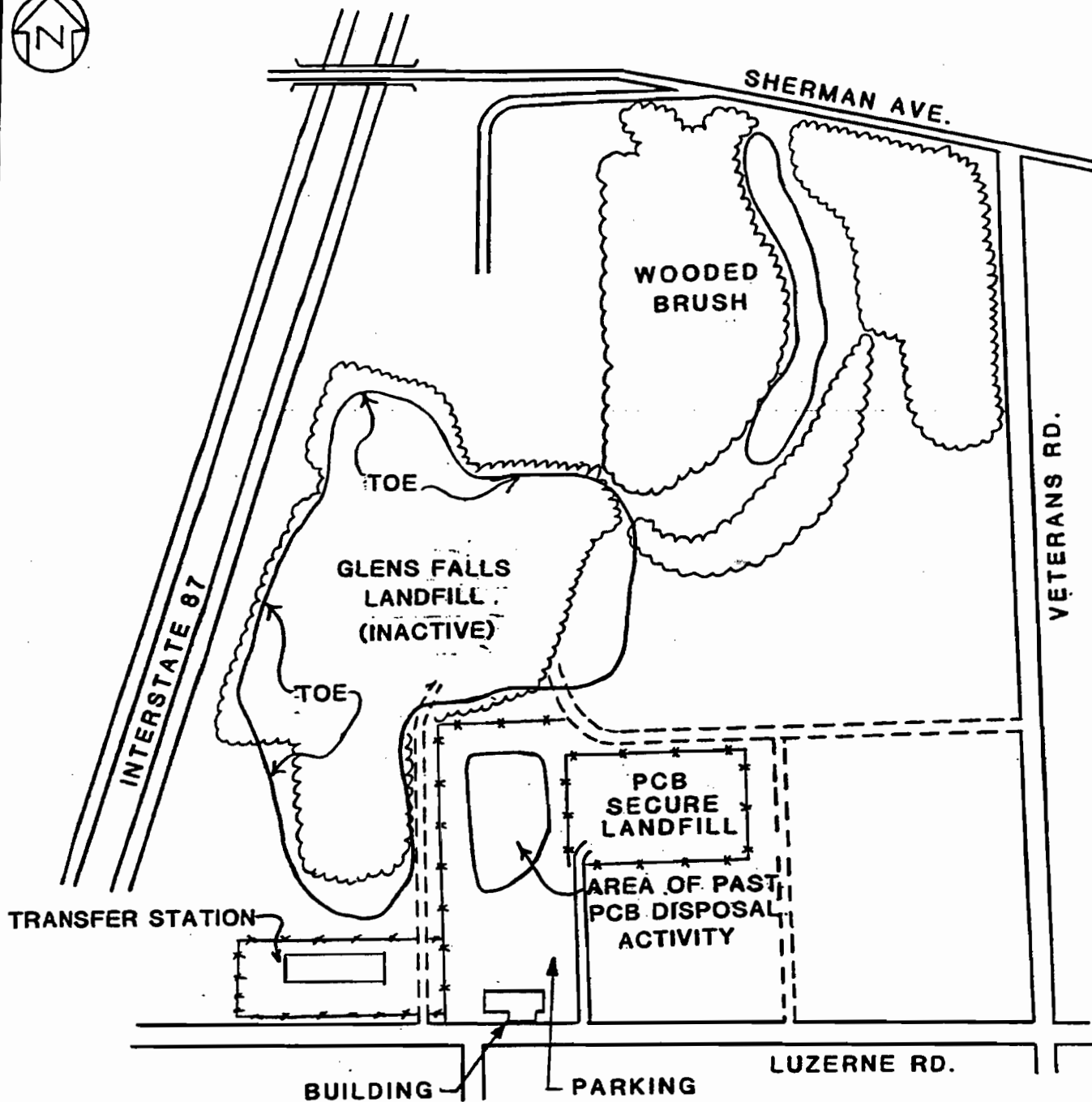
Scale: 1"=24000	By	Date
Dwn. DLS	3/86	
Ckd. SSN	3/87	
Ap'vd. PFA	3/87	
Rev.		

GLENS FALLS LANDFILL
GLENS FALLS, N.Y.
N.Y.S. SUPERFUND
PHASE II

Project No. 5C280101

VICINITY MAP

A **FIGURE 1**



BRUNING 61160-1



Scale: NTS

	By	Date
Dwn.	MJS	3/86
Ckd.	SSN	7/86
Ap'vd.	DFJ	7/86
Rev.	SSN	2/87

LANDFILL
GLEN FALLS N.Y.

SITE MAP

Project No. 5C280101

A FIGURE 2

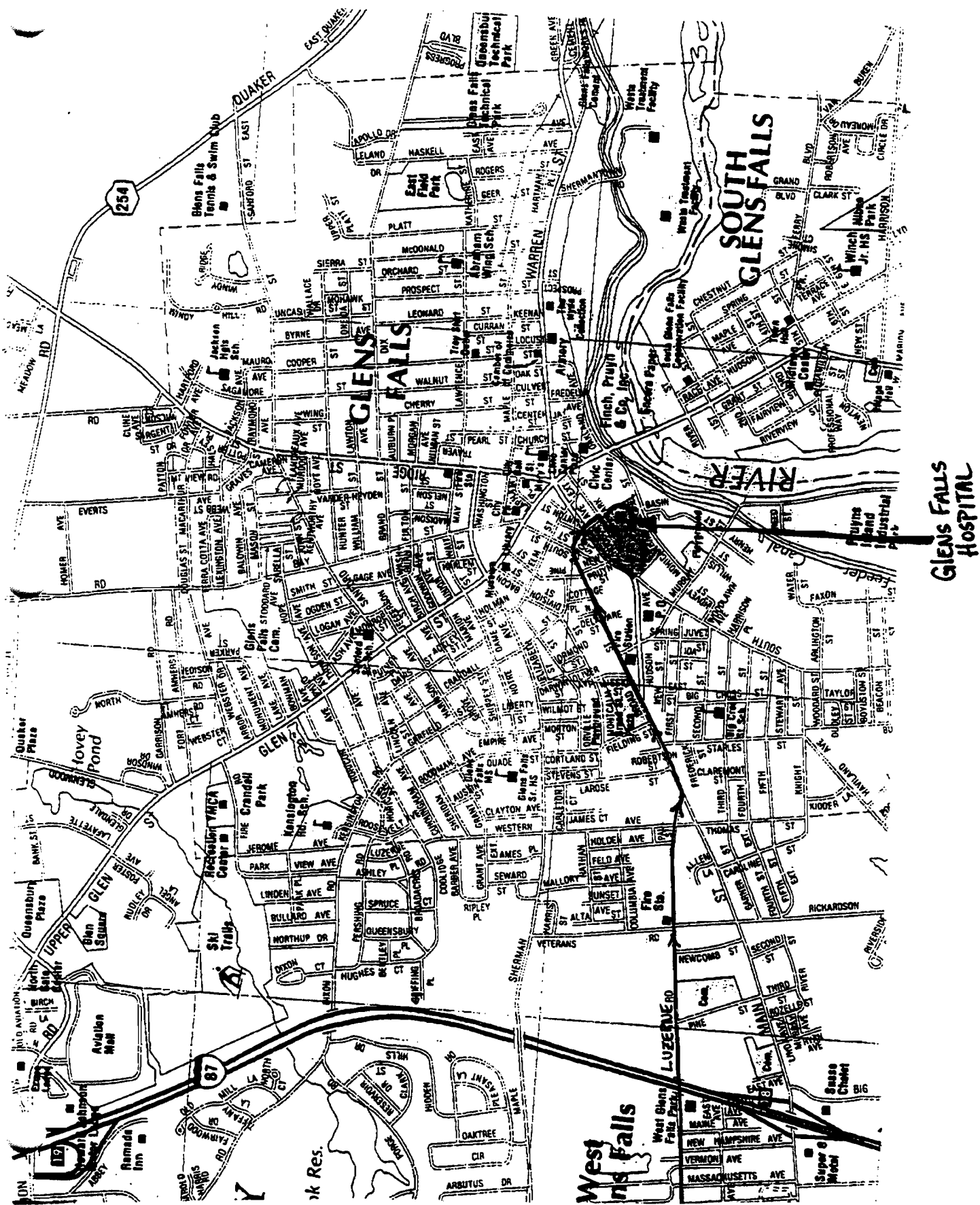


Figure 3 MAP TO HOSPITAL

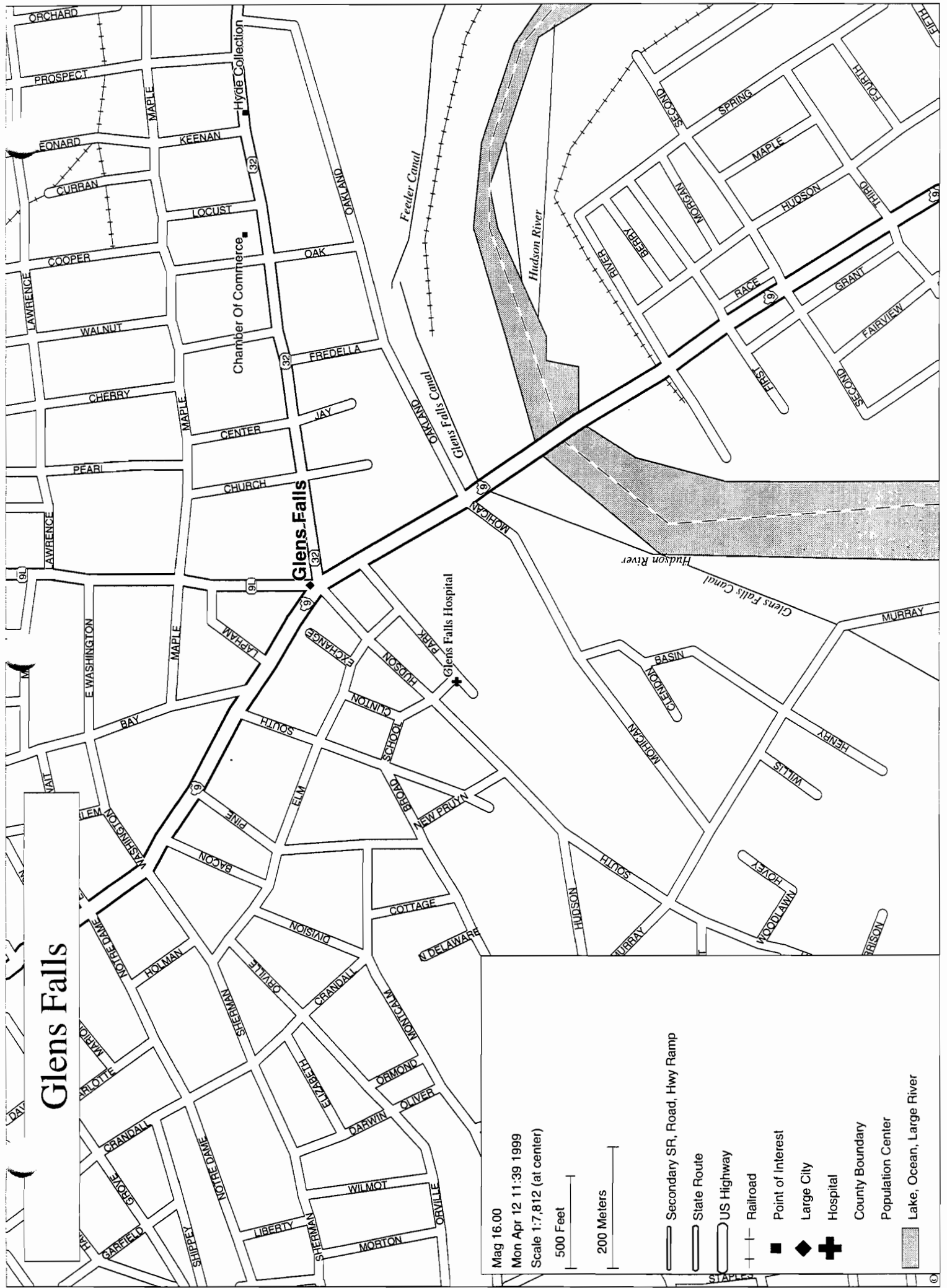


Figure 4 DETAILED MAP OF HOSPITAL AREA

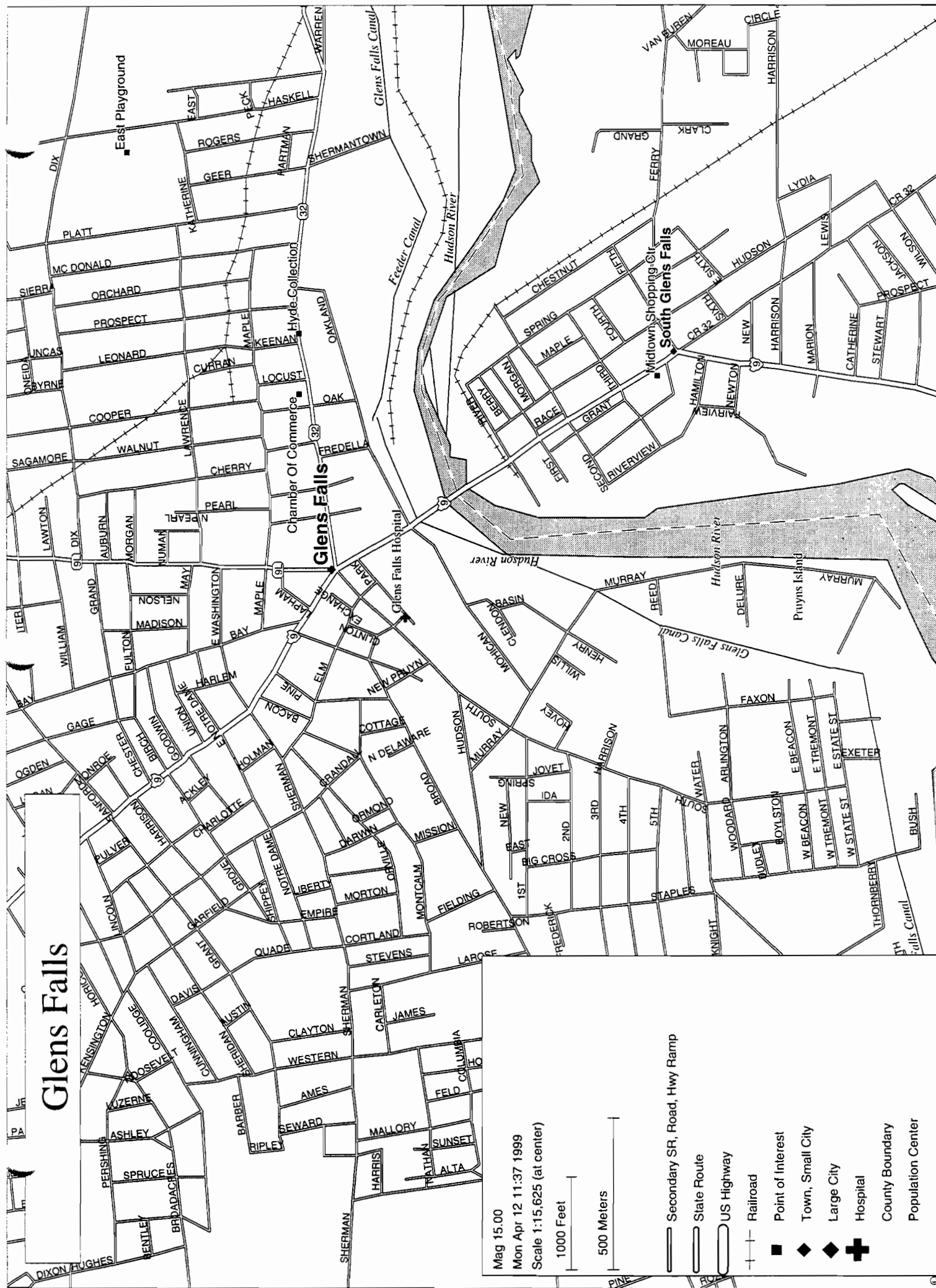


Figure 5 MAP OF HOSPITAL AREA

Job No: 000699.QQ08.00.01.00

HAZARD EVALUATION OF CHEMICALS

PREPARATION DATE: 4/11/95

CHEMICAL NAME: Polychlorinated biphenyl 1242*

CAS NUMBER: 53469-21-9

DOT NAME/ID NO:

SYNONYMS: PCB; POLYCHLORINATED BIPHENYL; AROCHLOR 1242; CHLORODIPHENYL; CHLORINAT

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA:

PHYSICAL STATE: Colorless to dark liquid

FLAMMABLE LIMITS: --

VAPOR PRESSURE: 0.001 mm Hg @ 20 C

ODOR CHARACTERISTIC: Butter-like

MOLECULAR WEIGHT:

SOLUBILITY: Insoluble in water

FREEZING POINT: -19 C

Incompatibilities: Oxidizers, chlorine, plastics, rubber, coatings

FLASH POINT:

BOILING POINT:

BIOLOGICAL PROPERTIES:

IDLH: 0.950 PPM

TLV-TWA : 1 mg/m3 Sk

PEL - TWA: 1 mg/m3 Sk

ODOR THRESHOLD: ---

HUMAN (LCLO): TCLO 10 mg/m3

RAT/MOUSE (LC50): LD50: 425 mg/kg

CARCINOGEN: Suspect

TERATOGEN: No

AQUATIC:

ROUTE OF EXPOSURE: Inh, Ing, Eye, Skin

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

Personal protection:

Gloves:

E = Excellent (> 8 hours); VG = Very Good (4 - 8 hrs); G = Good (1 - 4 hours); P = Poor (< 1 hour)

MONITORING RECOMMENDATIONS:

Monitoring:

HEALTH HAZARDS:

Acute Symptoms: Irritation of eyes, chloracne, liver damage

Chronic Symptoms: ---

FIRST AID:

FIRST AID-INHAL:

FIRST AID-EYE:

FIRST AID-SKIN:

DISPOSAL/WASTE TREATMENT:

DISPOSAL OF WASTE:

Job No: 000699.QQ08.00.01.00

HAZARD EVALUATION OF CHEMICALS

PREPARATION DATE: 4/11/95

CHEMICAL NAME: Polychlorinated biphenyl 1254*

CAS NUMBER: 11097-69-1

DOT NAME/ID NO:

SYNONYMS: PCB; POLYCHLORINATED BIPHENYL; AROCHLOR 1254; CHLORODIPHENYL; CHLORINAT

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA:

PHYSICAL STATE:

FLAMMABLE LIMITS:

VAPOR PRESSURE:

ODOR CHARACTERISTIC: Butter-like

MOLECULAR WEIGHT:

SOLUBILITY:

FREEZING POINT:

Incompatibilities:

BOILING POINT:

FLASH POINT:

BIOLOGICAL PROPERTIES:

IDLH: 0.380 PPM

TLV-TWA : 0.5 mg/m3 Sk

PEL - TWA: 0.5 mg/m3 Sk

ODOR THRESHOLD: ---

HUMAN (LCLO):

RAT/MOUSE (LC50):

CARCINOGEN:

TERATOGEN:

AQUATIC:

ROUTE OF EXPOSURE: Inh, Ing, Eye, Skin

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

Personal protection:

Gloves:

E = Excellent (> 8 hours); VG = Very Good (4 - 8 hrs); G = Good (1 - 4 hours); P = Poor (< 1 hour)

MONITORING RECOMMENDATIONS:

Monitoring:

HEALTH HAZARDS:

Acute Symptoms: Irritation of eyes, chloracne, liver damage

Chronic Symptoms: ---

FIRST AID:

FIRST AID-INHAL:

FIRST AID-EYE:

FIRST AID-SKIN:

DISPOSAL/WASTE TREATMENT:

DISPOSAL OF WASTE:

Job No: 000699 QQ08.00.01.00

HAZARD EVALUATION OF CHEMICALS

PREPARATION DATE: 4/11/95

CHEMICAL NAME: Trichlorobenzene

CAS NUMBER: 12002-48-1

DOT NAME/ID NO:

SYNONYMS: 1,2,3(solid) OR 1,2,4(liquid) OR 1,3,5 TRICHLOROBENZENE(solid)

CHEMICAL AND PHYSICAL PROPERTIES:

CHEMICAL FORMULA:

PHYSICAL STATE:

FLAMMABLE LIMITS:

VAPOR PRESSURE:

ODOR CHARACTERISTIC: Mothballs

MOLECULAR WEIGHT:

SOLUBILITY:

SPG/D:

FREEZING POINT:

Incompatibilities:

FLASH POINT:

BOILING POINT:

BIOLOGICAL PROPERTIES:

IDLH:

TLV-TWA : ---

PEL - TWA: ---

ODOR THRESHOLD: ---

HUMAN (LCLO):

RAT/MOUSE (LC50):

CARCINOGEN:

AQUATIC:

ROUTE OF EXPOSURE: Inh, Ing, Skin

HANDLING RECOMMENDATIONS (PERSONAL PROTECTIVE MEASURES):

Personal protection:

Gloves:

E = Excellent (> 8 hours); VG = Very Good (4 - 8 hrs); G = Good (1 - 4 hours), P = Poor (< 1 hour)

MONITORING RECOMMENDATIONS:

Monitoring:

HEALTH HAZARDS:

Acute Symptoms: Irritation of eyes/skin/mucous membranes

Chronic Symptoms: ---

FIRST AID:

FIRST AID-INHAL:

FIRST AID-EYE:

FIRST AID-SKIN:

DISPOSAL/WASTE TREATMENT:

DISPOSAL OF WASTE:

Heat Stress Prevention, Recognition, Treatment and Monitoring

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1 INTRODUCTION

Field operations during the summer months can create a variety of hazards to E&E personnel. Of main concern are heat related injuries, which may become health or life threatening if not properly treated. Therefore, it is important that all E&E personnel be knowledgeable in the preventive measures, symptom recognition, and effective treatment procedures for heat related injuries.

2. SCOPE

This standard operating procedure (SOP) describes the symptoms and treatment for the classical types of heat stress: heat cramps, heat exhaustion, and heat stroke. Field personnel should take immediate action to prevent a less severe form of heat stress from escalating into one requiring hospital treatment.

In addition, this SOP recommends ways to avoid heat stress, such as frequent rest periods, carefully timed excursions in protective clothing, and monitoring heart rate and body temperature. The site Safety Officer (SSO) has overall responsibility for seeing that these guidelines are followed in the field. However, each individual must be cautious when working in conditions where heat stress is possible.

3. OBJECTIVES

The prevention of heat stress is of paramount importance for field personnel particularly when they must wear heavy or confining protective clothing. The SSO must ensure that all personnel monitor themselves for possible heat stress, and know what to do in a heat emergency. For example, a person who recognizes the symptoms of heat stroke can provide lifesaving first-aid to another, while medical assistance is summoned.

4 EFFECTS OF HEAT

The body's complex thermoregulatory system, links the main organs, the blood supply, the central nervous system and the skin. The central nervous system regulates the requirement for cooling of the main organs; the organs are cooled by the flow of blood; the blood is cooled through it's routing through the skin; and the skin is cooled through the actions of the environment (temperature, humidity, and air movement). This system keeps the body temperature within a small operating range maintaining a delicate balance between heat gains and loss. An internal body "core" temperature of 99° F is considered normal. Depending on a person's individual body systems and their physical activity core temperatures may vary between 97° F and 101° F. *NOTE- A core temperature of more than 101° F in a healthy person is cause for concern, as temperatures nearing 105° F may be life threatening.*

Through the normal processes within the body, a predictable amount of heat is generated. When this heat is lost at a rate higher than its production, the body stays cool. As a person's activities increase, so too does the amount of heat generated by the body. As accumulated heat increases the body's temperature, various processes within the body speed up in an attempt to cool the body. This in turn, also increases the general temperature of the body. The results are that now; not only is there the normal heat to eliminate, but the additional heat created by the added work load **and** the heat created by heightened activity of the internal processes of the body. All of this heat must be reduced to allow the body to operate effectively. Unless the body is allowed to rest and cool, this vicious circle will inevitably lead to an over taxation of the body's cooling mechanisms to a point of exhaustion, and a complete shutdown.

Changes in any of the body's cooling system mechanism, such as loss of blood (injury), damage to the skin (sunburn), CNS damage (from chemical exposure) or environmental changes (heat, humidity, wind), will alter this system and at times over tax it to the point of injury.

5 HEAT INJURY PREVENTION

The most important prevention measures are information, knowledge and awareness. Through knowledge of heat stress injury symptoms, the conditions under which these injuries may occur, the preventative measures to be taken, and the treatment of these injuries, field personnel will be better prepared for dealing with these potentially life threatening injuries. Heat stress injury awareness is gained through information pertaining to:

- The environment in which work will be accomplished.
- The preventive measures that can be taken.
- The signs and symptoms of heat injuries.
- The treatment procedures for each type of injury.
- The condition and limitations of the working personnel (age, physical condition, health problems, past heat related injuries).
- The local EMS phone number (911 in effect?), and the location of the nearest medical treatment facility or first aid provider (fire department, police)

5.1 Preventative Measures

- Replenishment of lost fluids and salt.

Although water and a balanced diet should replace most lost fluids and salts, increased activity and stress requires increased replenishment of these constituents. "Gatorade", or it's equivalent are designed for this purpose. It is recommended that these types of drinks, along with drinking water (not deionized) be available.

- Allow for rest breaks.

Personnel working in hot climates should be allowed to remove themselves from direct sun exposure, or from any stressful environment (protection level) for a period of time to allow them to recuperate.

When protective clothing (level C and above) must be worn by E&E personnel, the suggested guidelines for maximum wearing times (**per excursion**) and the rest/work periods (by level of protection) are noted on Tables 2 & 3.

- Revise Work Schedule.

Take advantage of the cooler morning (5 to 10pm) and evening (6 to 9am) hours to perform work.

Table 1 indicates the apparent temperature felt by the body according to temperature and humidity. As noted, this figure does not take into account the effects brought by air movement (wind).

- Use of Cooling Vests.

There are a variety of cooling vest types. Some vests contain pockets, situated in strategic places, which hold packets of cooled fluids; other vests may circulate cooled fluids throughout the vest. The cooled fluids aid the body in reducing skin temperature.

6 HEAT RELATED INJURIES

Heat related injuries can be classified into three major categories:

- Heat Cramps, - includes Heat Syncope, Heat Rash, and Heat Fatigue - (Transient)
- Heat Exhaustion (stress), and
- Heat Stroke.

In addition to these injuries, sunburn may at times, (depending on the severity) be considered a heat injury. Even the slightest damage to the skin, through sunburn, will reduce its effective cooling properties and heighten the probability of other heat injuries occurring. Personnel should avoid as much direct exposure to the sun as they can. The use of long sleeve shirts, long pants, hats and sun blocks (depending on the duration of the task) is highly recommended.

6.1 Heat Cramps

Heat cramps will usually affect individuals when their normal rate of perspiration increases. This increase in perspiration leads to a large loss of water and salt creating an imbalance of electrolytes within muscle cells. The first muscles to be affected by this loss are usually the larger muscles of the body; the abdomen and legs. The result produces very painful, and at times debilitating, cramps of the legs and abdominal muscles. Another form of heat cramp, sometimes called a “side stitch”, may result from drinking iced water or other drinks too quickly or in too large a quantity prior to or immediately following increased activity.

6.1.1 Symptoms of Heat Cramps

- Muscle cramps in the legs and/or abdomen,
- Pain accompanying cramps,
- Profuse sweating, and
- Feeling faint.

6.1.2 Treatment of Heat Cramps

- Remove the patient from direct exposure to the sun.
- Administer small sips of liquid (water or equivalent replenishing fluid) if the patient is conscious.
- Apply light manual massaging to cramping muscles.
- Transport the patient to the hospital if the cramps persist or worsen.

6.2 Heat Syncope

This injury is normally experienced by those individuals required to stand immobile for long periods of time in hot environments. Heat Syncope is brought about by the lack of blood flow to the brain due to its pooling within dilated blood vessels and lower parts of the body. Heat syncope occurs quickly, and at most times without warning.

6.2.1 Symptoms of Heat Syncope

- Nausea,
- Dizziness, and
- Fainting.

Fainting (heat syncope), can be dangerous to those individuals controlling operations that require concentration, agility and coordination (i.e., heavy equipment).

6.1.2 Treatment of Heat Syncope

Heat syncope is treated in the same manner as heat cramps.

6.3 Heat Rash

Heat rash is brought about by an inflammatory reaction of sweat retained within the skin due to the plugging of sweat glands. Heat rash normally occurs in those areas of the body where an individual perspires the most (arm pits, legs, groin)

6.3.1 Symptoms of Heat Rash

- Profuse tiny raised red vesicles (blister-like)
- Prickly sensations in affected areas.

6.3.2 Treatment of Heat Rash

- Gently wash affected area with soap & water and blot dry.
- Keep affected areas of the body clean and dry (powder). Frequent cleaning throughout the work day may be required.
- Pay close attention to personal hygiene.
- If rash continues or worsens, seek medical attention.

6.4 Heat Exhaustion

Heat exhaustion is caused by over taxation of the cooling mechanism through the pooling of blood in the vessels of the skin. As heat is transported from the interior of the body to the skin, the blood vessels within the skin become dilated to hold and cool the increased amount of blood. This leads to a decrease in the amount of blood available for use throughout the rest of the body. The heart, reacting to the decrease in blood supply, increases its attempt (beat rate and pressure) to move available blood. The blood that can be moved by the heart is overheated, increasing the overall temperature of the body. In a continuing attempt to cool itself, the body increases the activity of other internal organs while decreasing the activity of still other “non-essential” organs. This condition, coupled with the loss of blood through its pooling in the skin, eventually leads to physical collapse.

6.4.1 Symptoms of Heat Exhaustion

- Weak pulse,
- Rapid and usually shallow breathing,
- Profuse perspiration,
- Fainting,
- Generalized weakness,
- Pale, clammy skin,
- Dizziness,
- Unconsciousness.

Fainting, caused by heat exhaustion, can be dangerous to those individuals operating machinery or controlling operations requiring concentration.

6.4.2 Treatment of Heat Exhaustion

- Remove the patient from direct exposure to the sun.
- Remove as much **outer** clothing as possible.
- Administer small sips of liquid (water or equivalent replenishing fluid) if the patient is conscious.
- Provide air movement to cool the patient (i.e., fan).
- Treat the patient for shock (cover, and raise legs).
- Transport the patient to the hospital if injury persists or worsens.

6.5 Heat Stroke

Heat stroke is a profound disturbance of the body's thermo-regulating mechanism, resulting in complete shutdown. It is usually associated with very high “core” temperature and collapse. At times heat stroke may result in convulsions, unconsciousness and even death. Direct exposure to sun, poor air circulation, poor physical conditioning, and advanced age (over forty) bear directly on the tendency of a person to suffer from heat stroke.

Heat stroke is a serious threat to life and carries a twenty-percent mortality rate.

6.5.1 Symptoms of Heat Stroke

- Dry, hot and flushed skin,
- Early loss of consciousness,
- Deep breathing at first, diminishing to shallow or absence,
- Body temperature reaching 105 to 106 degrees or higher, and
- Dilated pupils,
- Full and fast pulse,
- Muscle twitching, growing into convulsions,
- Sudden onset,

6.5.2 Treatment of Heat Stroke **THIS IS A MEDICAL EMERGENCY**

- Remove the patient from direct exposure to the sun.
- Remove as much clothing as possible.
- Reduce body temperature as fast as possible (water immersion, dousing and fanning). Cold packs may be placed under the armpits, in the groin area, around the neck, and/or around the ankles. The patient should **not** be immersed into ice water.
- Protect the patient from hurting themselves during any convulsions.
- Transport the patient to a medical treatment facility as soon as possible.

7 PREDISPOSING CONDITIONS

There are a number of predisposing conditions which heighten a person's susceptibility to heat injuries, that should be considered when personnel are required to work in hot environments. Some of these conditions are:

- **Job Requirement:**

Where, when, how and how long a person is performing their required task relates directly to their exposure to the elements and their susceptibility to heat injury.

- **Age:**

The older a person is, the more susceptible they are to suffering from a heat injury.

- **Weight:**

Extra weight will require the body to work harder to keep it cool. Fat layers acts as depositories for blood and negatively insulate the skin.

- **Physical Condition:**

The better physical condition a person is in, the less likely they are to suffer from a heat injury.

- **Health & Medications:**

There are many health conditions, such as respiratory and circulatory maladies, pregnancy; and medications (i.e., blood pressure medications and some antibiotics), which increase a persons susceptibility to heat injury. E&E personnel known to fall in this category are restricted from working in high heat environments. This restriction is noted in the individuals' medical record.

- **Region of Abode:**

Individuals who reside in a hot environment are less susceptible to heat injuries.

- **Acclimation:**

Full acclimation requires approximately 2 weeks to develop. When feasible, revised work schedules should be planned to allow for acclimation. When full acclimation is not feasible, a work - rest cycle, which gradually increases heat exposure, should be used.

- **Alcohol Use:**

Due to its effect on the circulatory system, the use of alcohol increases the risk of heat injury.

- **Tobacco Use:**

Due to its effect on the circulatory system, the use of tobacco increases the risk of heat injury.

- **Prior Heat Injury:**

A person who has suffered a heat injury is more prone to suffer another injury.

8 HEAT STRESS MONITORING

8.1 Personnel Monitoring

To fully understand the impact of the hot environment on the workers, and to prevent heat related injuries, monitoring of personnel should be accomplished. Two methods of measuring the effectiveness of an employee's rest-recovery regime follow the Brouha monitoring guidelines and the "modified" Brouha monitoring guidelines (see figure 1). The difference between the two is that in the "modified" guidelines the temperature of the individual is not used for monitoring heat stress. In situations of "severe" hot weather and physical activity, the Brouha monitoring guidelines will be followed. The SSO will decide on the proper guidelines to follow according to work schedule, PPE level, and weather conditions. The monitoring guidelines may be changed by the SSO if changes in work, PPE or weather conditions warrant.

8.1.1 Brouha Monitoring Guidelines

- Prior to beginning work each day, baseline measurements of body temperature (5-7 minutes) and pulse (1 minute) are taken, for each worker.
- A conservative work - rest cycle is established according to local weather conditions, tasks, and PPE being used.
- At the beginning of the first rest cycle, an individual's temperature is taken and their pulse rate is taken for the last 30 seconds of the first minute (P1), the last 30 seconds of the second minute (P2), and the last 30 seconds of the third minute (P3).
- Each pulse measurement is then doubled to find the full pulse rate (beats per minute).
- The pulse rate of the first minute (P1) is subtracted from the pulse rate of the second minute (P2). This is the first recovery measurement (R1).
- The pulse rate of the second minute (P2) is subtracted from the pulse rate of the third

minute (P3). This is the second recovery measurement (R2).

- If the individuals temperature ≤ 99.6 F the work-rest regime is acceptable.
- If $P1 \leq 110$ beats/min AND $R1$ and $R2 \geq 10$ beats/min the work-rest regime is acceptable.
- If the individuals temperature, pulse rate (P1), or recovery rate ($R1/R2$) do not meet the above criteria, the rest cycle of the work-rest regime will be lengthen by 10 minutes.
- Changes to the work - rest cycles are made in accordance with the findings of the temperature and pulse measurements.

8.1.2 Modified Brouha Monitoring Guidelines

Recovery rate compilation:

- Prior to beginning work each day, baseline pulse measurements (1 minute) are taken, for each worker.
- A conservative work - rest cycle is established according to local weather conditions, tasks, and PPE being used.
- At the beginning of the first rest cycle, an individuals pulse rate is taken for the last 30 seconds of the first minute (P1), the last 30 seconds of the second minute (P2), and the last 30 seconds of the third minute (P3).
- Each measurement is then doubled to find the full pulse rate (beats per minute).
- The pulse rate of the first minute (P1) is subtracted from the pulse rate of the second minute (P2). This is the first recovery measurement (R1).
- The pulse rate of the second minute (P2) is subtracted from the pulse rate of the third minute (P3). This is the second recovery measurement (R2).
- If $P1 \leq 110$ beats/min AND $R1$ and $R2 \geq 10$ beats/min the work-rest regime is acceptable.
- If $P1$ and/or $R1/R2$ do not meet the above criteria, the rest cycle of the work-rest regime will be lengthen by 10 minutes.

8.2 Return To Work Prerequisites

Prior to being allowed to return to work an individual's heat stress monitoring readings must indicate that:

- Body temperature (oral) is less than 99.6 (F)
- Pulse Rate is below 110 beats per minute, and
- Recovery rate is equal to or greater than 10 beats per minute.

Recovery rate is the rate at which the body recovers, measured by radial pulse rate, from exposure to and/or working in a hot environment.

If it is found that the individuals temperature, pulse rate, and/or recovery rate are above the return to work criteria, longer rest cycles will be scheduled. Rest cycles will be lengthen by approximately 10-15 minutes. This monitoring is accomplished at each rest cycle to find the individuals optimum work - rest cycle which will allow them complete recovery.

When protective clothing (level C and above) must be worn by E&E personnel, the suggested guidelines for maximum wearing times (**per excursion**) and the rest/work periods (by level of protection) are noted on Tables 2 & 3.

8.3 Work Area Monitoring

Air temperature and relative humidity measurements are used to monitor work areas for potential heat stress situations. The readings can be achieved using both dry and wet bulb thermometers. These readings are then compared to the established Apparent Temperature Chart (Table 1). Work-rest cycles and personnel monitoring will be established according to the potential for heat stress injuries to occur as indicated by Table 1.

9 DECONTAMINATION

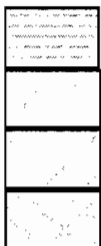
As in other medical emergencies, decontamination should proceed as normally as possible without contributing unduly to the victim's stress or injury. At a minimum, outer protective clothing should be removed as he or she is taken from the contaminated/hazard area. The buddy system is always in effect and backup personnel should be available at the decontamination station (PDS) to either suit up and assist in extraction, or to help decontaminate and undress the victim.

If other serious injuries or more life-threatening conditions exist, and the victim cannot be disrobed or decontaminated completely, the victim (or contaminated areas of their body) should be wrapped in a protective material (plastic) for his or her own safety as well as the safety of the ambulance and hospital personnel. Carefully avoid action that would result in the victim's being further overheated.

Table 1
Apparent Temperature Chart

	Air Temperature*										
	70	75	80	85	90	95	100	105	110	115	120
Humidity	Apparent Temperature*										
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	116
20%	66	72	77	82	87	93	99	105	112	120	130
30%	67	73	78	84	90	96	104	113	123	135	148
40%	68	74	79	86	93	101	110	123	137	151	
50%	69	75	81	88	96	107	120	135	150		
60%	70	76	82	90	100	114	132	149			
70%	70	77	85	93	106	124	144				
80%	71	78	86	97	113	136					
90%	71	79	88	102	122						
100%	72	80	91	108				* = Degrees Fahrenheit			

National Weather Service, U.S. News & World Report 7/83



= No Real Threat of Heat Injury

= Heat Injury Possible After Long Exposure and Physical Activity.

= Heat Injury Likely to Occur

= Heat Stroke Imminent

- The above chart does not take into account the cooling effects of air movement.
- Apparent temperature is that which the body senses from the combination of heat and humidity.
- The use of laminated personal protective clothing (i.e., Saranex) creates a 100% relative humidity environment for the wearer.

Table 2 Guidelines for the Use of Protective Clothing	
Ambient Temperature (F)	Maximum Wearing Time (per excursion)
Above 90	15 minutes
87.5 - 90	30 minutes*
82.5 - 87.5	1 hour
77.5 - 82.5	1.5 hours
72.5 - 77.5	2 hours

NIOSH - Occupational Health & Safety Guidance Manual for Hazardous Waste Site Workers

* = Approx. 1 SCBA air tank

Table 3 Recommended Rest and Work Percentages As a Function of Level of Protection and Weather Conditions								
PPE Level	Ambient Temperature (F)							
	70		74		78		≥82	
	% Rest	% Work	% Rest	% Work	% Rest	% Work	% Rest	% Work
A	50	50	75	25	75	25	75	25
B	50	50	50	50	75	25	75	25
C	Continuous		25	75	50	50	75	25
D	Continuous		25	75	25	75	50	50

> = Greater than

Weston.Sper



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STANDARD OPERATING PROCEDURE

HEALTH AND SAFETY ON DRILLING RIG OPERATIONS

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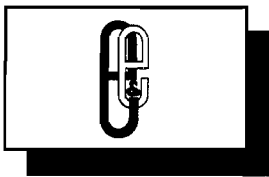
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1. Introduction

This document is meant to be used in conjunction with Ecology and Environment, Inc., (E & E) standard operating procedures (SOPs) for field operations and hazardous waste site operations, and incorporates by reference all safety precautions required therein. It specifically addresses the functions and responsibilities of personnel working on or around drilling operations.

E & E personnel are frequently required to oversee a subcontractor's work in the field using drill rigs to take soil and rock samples, and install piezometers and monitoring wells. This document discusses the supervision of subcontract drillers by E & E.

2. Responsibilities and Authority of Subcontract Driller

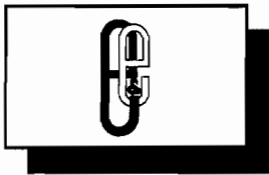
The subcontract driller has authority to direct its personnel within the area while drilling operations are in progress. Access to the hazardous area around the auger and borehole is restricted by a "super exclusion zone" delineated by a 4-foot by 8-foot sheet of plywood centered over the borehole before drilling. A large hole cut in the plywood allows penetration of the augers. No E & E personnel are allowed in this "super exclusion zone" at any time while drilling is underway.

Housekeeping around the rig is the responsibility of the driller, but all team members should, when necessary, participate in this effort.

2.1 Responsibility and Authority of E & E Personnel

E & E personnel working at a drilling site must act as support to the subcontract drilling team by providing any necessary support functions; however, it is important that E & E personnel are careful not to interfere with the drilling process. Personnel are restricted from approaching the "super exclusion zone" while drilling is underway. If an E & E crew member recognizes an unsafe condition in the work area or on the rig, he should bring it to the attention of the site safety officer (SSO) and team leader if it is not resolved in a timely manner by the subcontractor driller. If conditions are still deemed to be hazardous, team members have the option of contacting their regional safety coordinator (RSC) or Corporate Health and Safety Group in Buffalo.

It is the responsibility of all E & E personnel to have with them on site their issued nondisposable gear, including hard hat, face shield, respirator, steel-toed boots, eyepiece inserts, safety glasses, and appropriate outerwear for the expected weather. It is the E & E employee's responsibility to ensure that all of his/her equipment is in proper working order.



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All personnel should be aware of emergency facilities, egress routes, and special medical conditions of their team members. As with all E & E fieldwork, the buddy system is to be enforced.

3. Training Requirements for Site Personnel

3.1 E & E Site Safety Officer

In addition to basic health and safety training, annual health and safety refresher training, first aid, cardiopulmonary resuscitation (CPR), and necessary training in field monitoring of personnel, an SSO should have previous experience as a team member on field drilling projects in order to have a working knowledge of the drill rig and the extreme hazards that can occur with its operation. Where monitoring instrumentation is to be used, the SSO must be properly trained prior to fieldwork. The SSO must have an understanding of the hazards of heat and cold stress, their associated symptoms, and proper work modifications to protect field staff from potential injury.

3.2 Other E & E Personnel

All E & E personnel present on site shall have taken the basic 40-hour health and safety course and annual 8-hour refresher training course. Field personnel also must meet medical and respiratory fitness test requirements established by E & E and Occupational Safety and Health Agency (OSHA).

3.3 Subcontract Driller and Other Subcontract Drilling Personnel

Subcontract drillers and their support personnel on site must, at a minimum, have passed basic 40-hour health and safety training as prescribed by OSHA 29 Code of Federal Regulations (CFR)1910.120. They shall be medically approved and trained to use the level(s) of respiratory protection required on site. Certification of training by the subcontractor shall be required as a deliverable included in E & E's contractual documentation. This training shall be verbally verified and logged on site by the SSO or team leader before starting work.

4. Supervision of Subcontract Drillers

4.1 Responsibilities and Authority of Site Safety Officer

The responsibilities of the SSO at a drilling site where subcontracted drillers are used include the following: rig inspections, personnel monitoring, and personnel protection.

A rig inspection should begin by verifying the following:

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- The mast must be located at least 25 feet from any overhead or underground utility lines;
- The location and operation of operational and unencumbered kill switches must be reiterated to all site personnel;
- Outriggers, stabilizers, or jacks are in place, and the rig is level;
- A geophysical survey (e.g., electromagnetic or ground-penetrating radar) or a reliable site history must be obtained to verify the absence of underground utilities, buried obstacles, tanks, and drums;
- A first aid kit and filled eyewash bottle must be readily available;
- A fire extinguisher should be charged to the proper pressure and placed at the rear of the rig during drilling;
- The condition of ropes, chains, and cables must be checked;
- A lifeline or safety belt must be available if mast climbing is necessary;
- The Site Safety Plan (SSP) must be posted with emergency phone list and map of hospital route; and
- A "super exclusion zone" must be established around the borehole, using traffic cones or a 4-foot by 8-foot sheet of plywood. This defined area will be entered during active drilling only by the subcontract driller and his helper(s), except in emergency situations.

If, upon review, the SSO deems that any material item noted above requires replacement or repair, the SSO must make necessary the arrangements for that repair or replacement, and later verify that repair or replacement is sufficient before actual drilling begins. Similarly, if the conditions listed above are not met, the SSO must request that they be met to his satisfaction before allowing drilling to proceed. Working together, the SSO and the subcontract driller should verify that the rig has been checked against the operator's checklist.

The SSO's monitoring duties include calibration and setup of the appropriate monitoring devices, as specified in the SSP. At a minimum, this generally includes an O₂/explosimeter and real-time organic-vapor monitoring capabilities (e.g., HNU, organic vapor analyzer [OVA]). Noise and heat-stress monitoring are employed where appropriate. If the SSO believes additional monitoring devices beyond the directive of the SSP should be employed (e.g., Rad Mini, Mini Ram), it is his/her responsibility to obtain this equipment from the nearest E & E office through the cooperation of the RSC or the Corporate Health and Safety Group. The SSO is also responsible for ensuring that a trained operator for this additional equipment is on site.



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It is the responsibility of the SSO to ensure that all safety equipment is in good working order. Day-to-day operations, as well as calibration data, must be recorded in the equipment log or SSO log. Adequate supplies such as breathing air, drinking liquids, and calibration gas must be maintained.

E & E personnel are forbidden from entering the "super exclusion zone" around the borehole while drilling is underway. The SSO must not attempt to take air readings in or around the auger while it is in use, or from cutting samples while the auger is in motion. If possible, an O₂/explosimeter should be set up for unmanned (alarmed) operations at the rig, using an extension hose to continuously draw samples from the borehole area during drilling operations.

The SSO has ultimate authority over the subcontractor with regard to whether work practices meet the requirements of the SSP. Shutdown of work or restriction of personnel are options available to the SSO. The SSO should hold informal site safety briefings at the start of both fieldwork and daily work shifts throughout the course of the project. Although E & E contractually requires subcontractors to provide properly trained and outfitted staff, the SSO should verify verbally at the start-up meeting that the field staff has necessary respiratory approval and OSHA-mandated training, especially at hazardous waste sites. Site safety briefing topics, as well as the names of attendees, will be recorded in the site safety log.

If the SSO has reason to believe that either E & E or subcontractor personnel are under the influence of alcohol or drugs, or are otherwise ill before or during work on site, he or she should consider restricting those team members from site work. Personnel who are to perform work that requires Level C protection must be clean-shaven or they may be restricted at the discretion of the SSO.

The following is a list of basic topics to be discussed at site safety meetings:

- Personnel responsibilities;
- Planned investigation and presumed potential hazards;
- Levels of protection, monitoring plan, and equipment;
- Emergency scenario plans, including use of kill switches;
- Location and operation of kill switches, fire extinguisher, and first aid kits;
- Heat and cold stress hazards;
- "Super exclusion zone" around borehole; and
- Warnings to subcontractors about hazards of climbing the mast without proper safety equipment.

Because heat stress is a constant threat during warm weather, the SSO is responsible for determining whether conditions are unsuitable for work. If site conditions require the assistance



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of work modifications, cooling vests, and other cooling means, the SSO may decide that work should not continue. The need for worker monitoring through blood pressure and oral temperature checks will be determined by the SSO with assistance from the RSC and Corporate Health and Safety Group staff, if necessary.

The SSO will be responsible for shutting down the drilling operation if electrical storms occur in the site area.

No refueling operations will be performed until rig engines are shut down. Motor fuels should be stored and dispensed from spring-loaded, OSHA/Factory Mutual-approved metal or polyethylene gas cans.

The SSO should ensure and document that no boreholes are left open or unfilled after drilling equipment is moved. In instances where a hole must be left open and unattended, suitable barricades or the equivalent will be staged around the hole to prevent personnel and equipment from falling in.

4.2 Responsibilities and Authority of Other E & E Personnel

All E & E personnel on site are required to follow the terms of the SSP and the direction of the SSO. Because the SSO cannot be in all places at all times, the crew should observe the subcontractors and condition of their equipment at all times, and report immediately to the team leader and SSO any safety-related issues that are unresolved. Included are such details as dressout, site functions, and decontamination. It is important that the SSO be involved so that proper log entries can be made.

It is a policy of E & E not to provide safety equipment or monitoring instrumentation to subcontractors. Some projects, however, may be arranged in such a manner that allows E & E personnel and subcontractors to share the same expendable supplies.

E & E personnel are forbidden from approaching augers during drilling. Activities at the borehole, such as sampling, require that the operation of equipment be stopped.

5. Drilling Hazards

5.1 General Drilling Hazards

Drilling operations present numerous health and safety hazards to site personnel, subcontractor drillers, and members of the public who may approach the rigs. Drilling hazards that apply to all drilling methods and possible control methods include:

- Slip/trip/fall hazards;
- Ergonomic hazards;
- Moving objects;



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- Unguarded points of operation;
- Heat/cold stress;
- Noise;
- Buried or overhead utilities;
- Radiological hazards;
- Lightning;
- Chemical hazards; and
- Biological hazards.

5.2 Physical Hazards (Slip/Trip/Fall Hazards)

Personnel may be injured if they trip over tools or objects, walk on uneven terrain, fall from heights or into holes, or slip on surfaces.

Controls

- Store all tools and supplies away from the super exclusion zone;
- Personnel should use caution when walking on uneven surfaces so that they do not lose their balance;
- Subcontractor drillers must wear a lifeline or safety belt if mast climbing is necessary;
- Boreholes should be barricaded or marked with flags when drilling has been completed to prevent personnel from stepping in the hole; and
- Soil or sand should be applied to wet or slippery surfaces.

5.3 Ergonomic Hazards

Muscle strains, sprains, and injuries can occur when personnel use improper lifting methods, lift objects that are too heavy, improperly reach for objects, or work in awkward positions.



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Controls

- Lift with the back as straight as possible, bend the knees, and keep the object close to the body;
- Use two people to move heavy objects such as augers;
- Avoid excessive stretching of the arms when picking up objects; and
- Avoid sudden twisting of the back or working in awkward positions.

5.4 Moving Objects

Site personnel may be injured if they are struck by debris from the borehole or by drilling machinery or components.

Controls

- Wear the appropriate personal protective equipment such as safety boots, safety glasses, and a hard hat; and
- Adequate inspection and maintenance of the drill rig will reduce the likelihood of worn equipment or parts falling and causing accidents.

5.5 Unguarded Points of Operation

The spinning auger on a drill rig or the V-belt drive on a motor are unguarded points of operation that can pull site personnel into the machinery and cause serious injuries.

Controls

- Mechanical guards cannot be placed around the spinning auger on a drill rig. Site personnel must stay away from the spinning auger and avoid wearing loose clothing that could get caught in the auger; and
- Mechanical guards must be placed over V-belt drives.

5.6 Heat/Cold Stress

Drilling is a strenuous job, and heat stress is a major hazard in hot, humid environments, especially when personnel are wearing protective equipment such as coveralls, gloves, boots, and respirators. Cold injury can occur at low temperatures and when the wind-chill factor is low.



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Heat Stress

Controls

- Recognize the signs and symptoms of heat stress;
- Monitor workers who are wearing protective clothing; and
- Provide fluid replacement and schedule rest periods in cool locations.

Cold Stress

Controls

- Recognize the signs and symptoms of cold stress;
- Personnel must wear appropriate clothing during cold weather; and
- A warm rest location and fluid replacement should be provided.

5.7 Noise

Excessive noise can cause hearing damage, distract workers, and interfere with communications.

Controls

- In excessive noise areas, wear the hearing protection recommended by the SSO.

5.8 Buried or Overhead Utilities

Contact of drilling tools with electric, gas, steam, process, or other utility lines can result in fires, explosions, electric shock hazards, burns, etc.

Controls

- The boom on the drill rig must be kept at least 25 feet from overhead and buried utilities;
- After buried utilities have been located using an appropriate geophysical survey, the line locations should be marked with flags. Maps of underground utilities should also be checked, if available, to verify locations; and

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- Drilling operations should proceed slowly in areas near buried utilities, as the actual utility location may not exactly correspond to the area identified by a flag or as illustrated on a map.

5.9 Radiological Hazards

5.9.1 Nonionizing Radiation

Nonionizing radiation is radiation that emits photon energy that is not sufficient to produce ionization in biological systems. Radio frequencies (including radar and microwave), infrared, visible light, and ultraviolet regions of the electromagnetic spectrum are considered to be nonionizing. Ultraviolet radiation from the sun is usually the major nonionizing radiation hazard present during drilling operations. Ultraviolet radiation can damage the skin and eyes. Potential effects include, but are not limited to, sunburn, skin cancer, photosensitization, and cataracts.

Controls

- Wear sunscreen on all exposed skin areas; and
- Wear safety glasses that block ultraviolet radiation (or sunglasses worn over safety glasses).

5.9.2 Ionizing Radiation Hazards

Ionizing radiation is electromagnetic or particulate radiation with sufficient energy to ionize atoms. Ionizing radiation may be present on some drilling sites and includes:

- Electromagnetic radiation
 - Gamma rays
 - X-rays
- Particulate radiation
 - Alpha
 - Beta
 - Neutrons



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Controls

Site personnel can minimize their exposure to external radiation hazards by:

- Limiting exposure time;
- Increasing the distance from the radiation source; and
- Shielding the radiation source.

Some radiation sources can enter the body through inhalation, ingestion, and/or skin contact. Exposure can be controlled through the wearing of personal protective equipment and thorough washing of skin surfaces with soap and water.

5.10 Lightning Hazard

The elevated mast on a drill rig is a potential target of lightning.

Controls

- The SSO will halt drilling operations when electrical storms approach the drilling location.

5.11 Chemical Hazards

Chemical contaminants may be present in the form of gases, vapors, aerosols, fumes, liquids, or solids. Site personnel may be exposed to these contaminants through one or more of the following pathways: inhalation, ingestion, skin, and/or eye contact.

Controls

- Become familiar with the specific drilling operation being used to identify and avoid chemical discharge locations;
- Wear appropriate personal protective equipment;
- Practice contamination avoidance; and
- Stay upwind during grout mixing (silica inhalation hazard).

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5.12 Biological Hazards

Biological hazards that may be present during drilling operations include poisonous plants, animals, and insects, and infectious agents.

Controls

- Wear insect repellent at sites where biting insects are prevalent;
- Learn to identify poisonous plants that cause dermatitis, such as poison ivy and poison oak;
- Wear impervious personal protective clothing (e.g., saranex coveralls, latex booties, nitrile surgical gloves) if work must be conducted in areas where site personnel will contact poisonous plants; and
- Avoid potential animal nesting areas and animal carcasses.

6. Drilling Methods and Hazards

6.1 Solid Flight and Bucket Augers

Solid-flight augers (also referred to as solid-stem augers, continuous flight augers, and disk augers) use solid-stem auger sections, with the flighting (curved corkscrew-like blades) connected end-to-end to the cutting head (see Figure 1). Soil cuttings are moved upward to the ground surface by the flighting as the auger penetrates into the soil. Samples are typically collected by removing an auger section, attaching a split-spoon or thin-wall sampler to the end of a drill rod, and placing this arrangement into the borehole. Split-spoon samples are collected by using a hammer connected to the drill rod and split-spoon. The hammer is operated by wrapping sections of rope around a rotating cathead hoist (a wide metal cylinder). A disk auger is similar to a solid-flight auger except that it is larger in diameter and the flighting goes around the stem once. Bucket augers have a cutting edge on the bottom. Once the bucket auger fills with soil cuttings, it is brought to the surface to be emptied. Figure 1 shows various types of bucket augers.

Auger drill methods are used in unconsolidated material for sampling subsurface media, installing groundwater monitoring wells, and identifying depth to bedrock.

6.2 Hollow-Stem Auger

A drill rig rotates a hollow-stem auger (see Figure 2) and moves it vertically into the soil. The hollow stem allows use of continuous or intermittent soil sampling techniques. Once the required depth has been reached, screens and casing for monitoring wells can be placed in the



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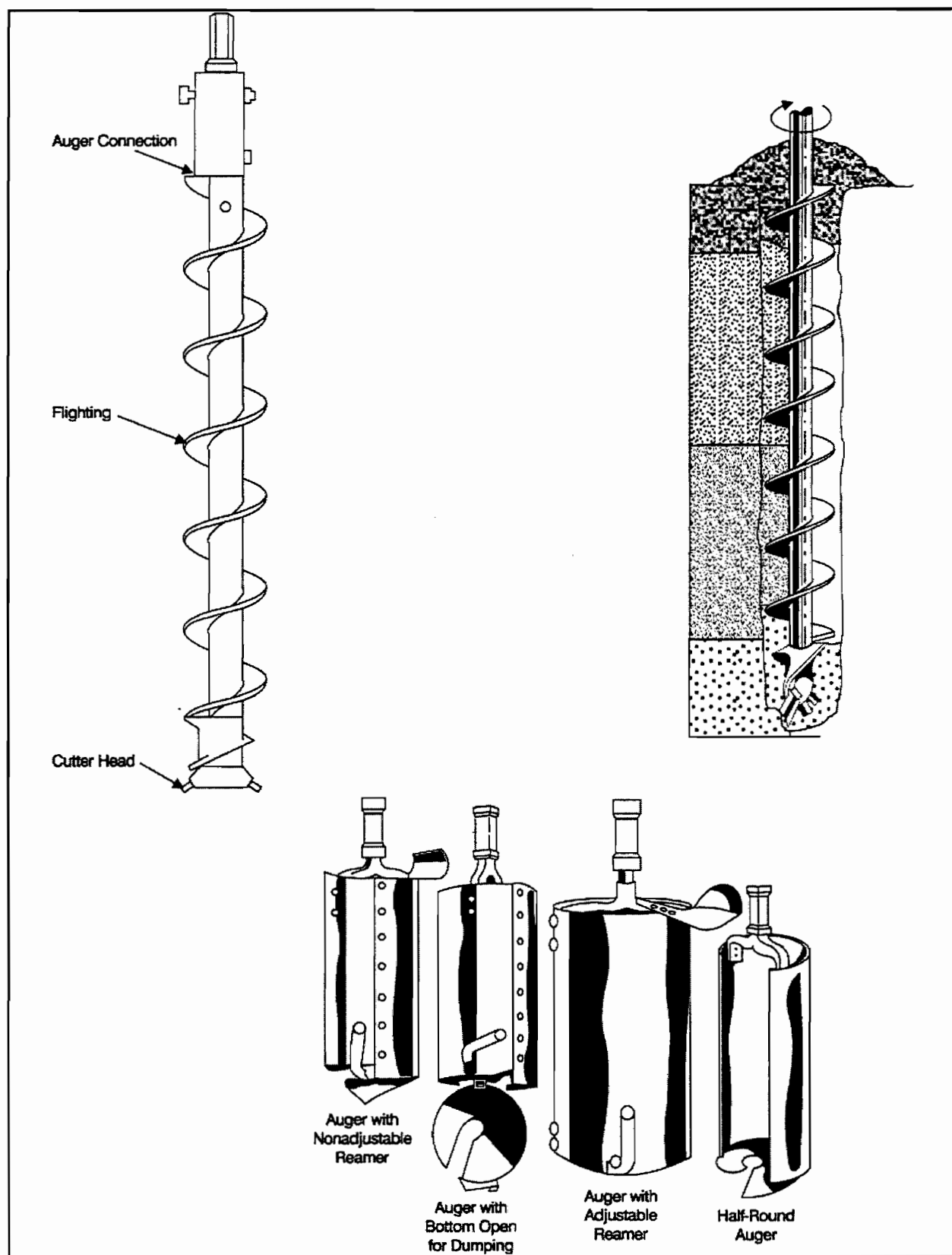


Figure 1 Solid Flight and Bucket Augers

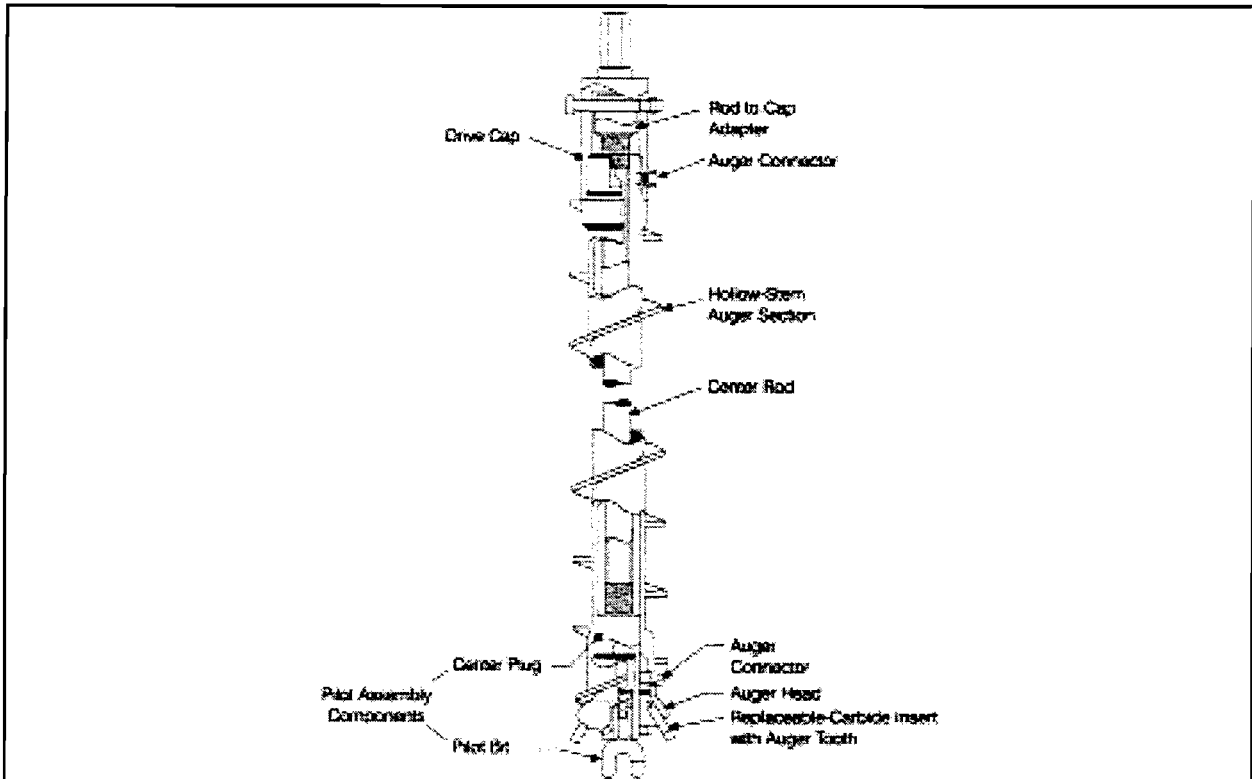
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Figure 2 Hollow-Stem Auger

hollow-stem gravel pack and grout is added as the auger is pulled out of the borehole. Hollow-stem auger drilling is a common method of monitoring well installation.

6.2.1 Auger Drilling Hazards

Physical Hazards

Spinning Auger. The spinning auger is not equipped with a metal guard; therefore, it is imperative that personnel use extreme caution when working near spinning augers, as contact with the auger can cause personnel to be pulled into the auger and crushed between the auger and the drill rig. Only approved drillers will remain in proximity to the borehole during drilling, and an approximate 4- by 8-foot "super exclusion area" will be established around the moving auger at all times. The "super exclusion zone" may be established by placing a 4- by 8-foot sheet of plywood over the borehole, or by placing flagging or traffic cones around a 4- by 8-foot perimeter. No personnel, except the driller and the driller's helper, will enter this zone during drilling. The SSO will issue warnings to those personnel not authorized to enter this zone.

Overhead Equipment. If wire line core sampling is conducted, drill steel and sampling gear will be lifted overhead. Site personnel must conduct the necessary equipment inspections to ensure it is in good condition prior to the start of drilling operations. In addition, drillers must

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make sure that proper hoisting procedures are used to reduce the likelihood of dropping drill steel or sampling gear.

Drill Rig Lurching. The drill rig has a tendency to lurch and shake when the auger comes into contact with harder materials. This is especially true when hollow-stem auger drilling methods are utilized. The rig can also lurch seriously in hearing sands. Site personnel should be aware of possible drill rig movement and move away from the rig if lurching or shaking occurs.

Noise. If split-spoon sampling is conducted, a hammer is used to drive the spoon into the soil. The hammer generates a loud noise when it contacts a metal surface. Site personnel are required to wear appropriate hearing protection during hammering operations.

6.3 Open-Hole Rotary Methods

A direct mud rotary drilling system (also direct [liquid] rotary, hydraulic rotary, or reverse [circulation] rotary) is shown in Figure 3. Drilling fluid (mud) is pumped through drill rods to a bit. The mud flows back to the surface through the space between the drill rods and the borehole and is discharged at the surface through a pipe into a tank, tub, pond, or pit. After the cuttings settle, a pump recirculates the liquid back through the drill rods. The mud serves to:

- Cool and lubricate the bit;
- Stabilize the borehole well; and
- Prevent the inflow of fluids from formations.

A shale shaker can collect a sample from the circulated fluid by placing it in the discharge flow before the settling pit. In addition, the drilling fluid flow can be shut off and split-spoon, thin-wall, or consolidated-core samplers can be used to collect a sample by inserting a sampler through the drill rods. Reverse circulation rotary drilling is a variation of mud rotary drilling in that the mud flows from the mud pit down the borehole outside the drill rods, passes up through the bit carrying cuttings into the drill rods, and is then discharged into the mud pit. The equipment used is similar to the direct mud rotary method, except most of the equipment is larger.

Equipment Breaks. A break in support equipment for drill steel could cause equipment to fall and injure site personnel. Equipment inspection is required to ensure it is in good condition prior to the start of drilling operations.

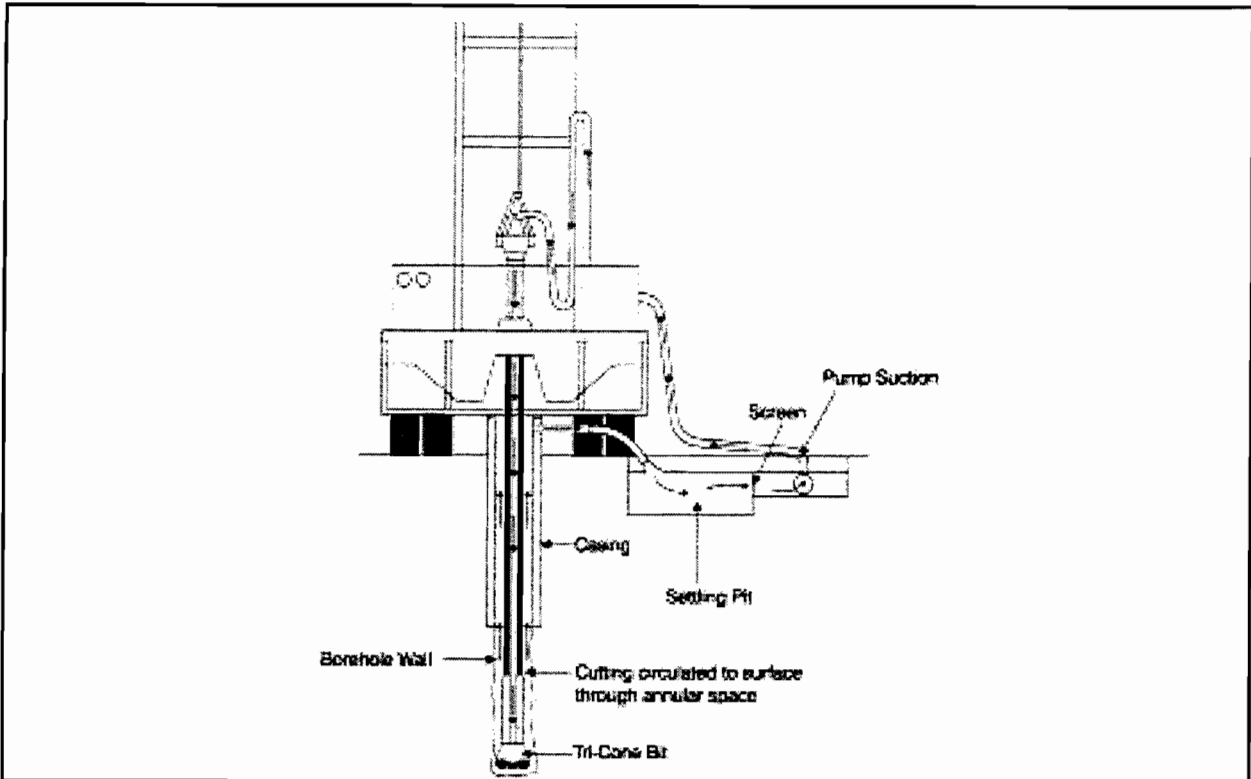
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Figure 3 Open-Hole Rotary Method

Slippery Conditions. Because the use of drilling mud will create slippery conditions around the drill rig and support area, mud should be contained to the immediate work area. Slippery spots should be dried with sand/dirt to reduce slipping hazards. Gloves should be changed when they become coated with mud.

6.4 Direct Air Rotary with Rotary Bit/Downhole Hammer

Also called an air rotary with roller-cone (tri-cone) bit, down-the-hole hammer, or air percussion rotary, the rig setup for air rotary with a tri-cone or roller-cone bit is similar to direct mud rotary (see Figure 3), except the method uses air instead of water and drilling mud. The main components of a drill string using a tri-cone bit are illustrated in Figure 4. Compressed air is forced down through the drill rods to cool the bit, and cuttings are carried up the open hole to the surface. A cyclone slows down the air velocity, forcing the cuttings into the container. A roller-cone drill bit is used for hard-to-soft consolidated rock and unconsolidated formations. When a downhole hammer is utilized, it replaces the roller-cone bit (see Figure 4). The hammer produces a pounding action as it rotates. Other features are similar to the rotary bit, except small amounts of surfactant and water are used for dust and bit temperature control.

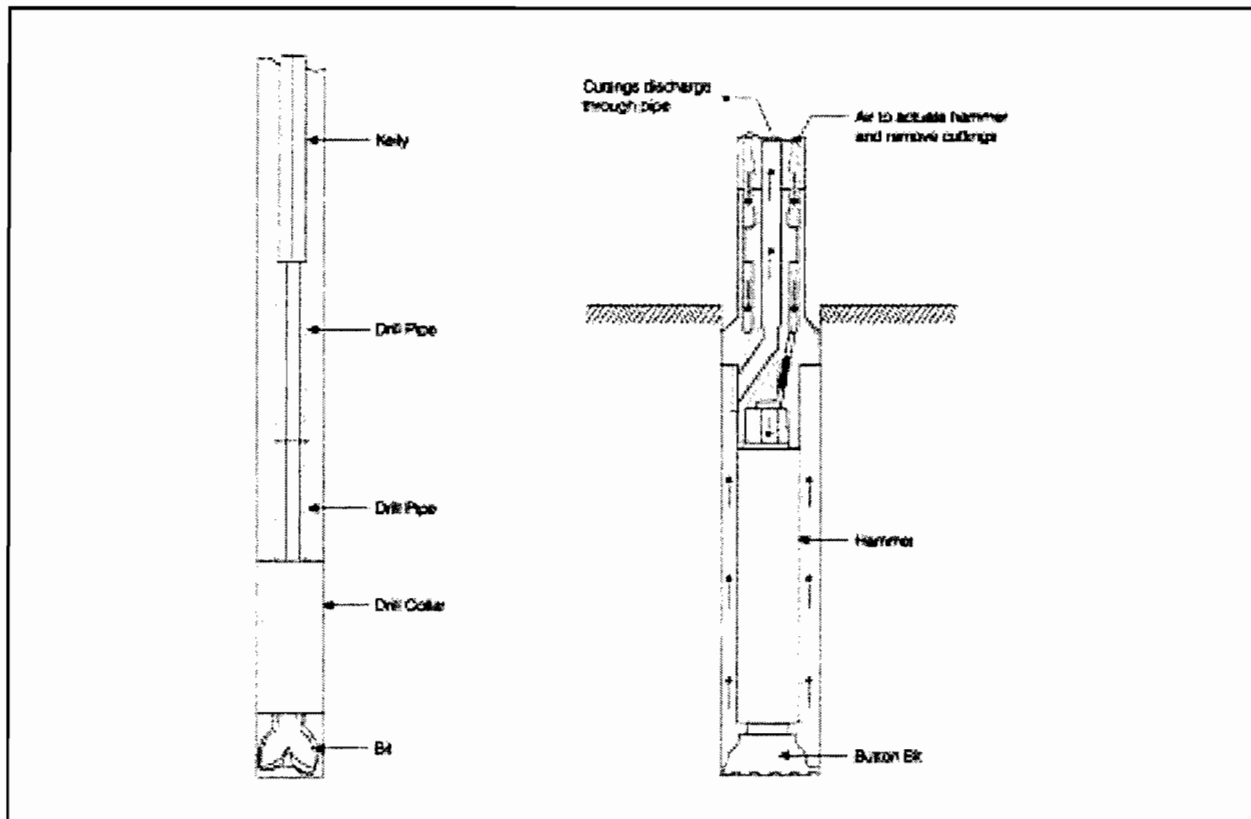
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Figure 4 Direct Air Rotary

Physical Hazards

Noise. Excessive noise is generated from the use of air compressors, casing drivers, and downhole hammers. Site personnel are required to wear hearing protection during drilling operations.

Cuttings and Water. Cuttings and water blown from the hole can strike and injure site personnel. Site personnel must stay away from this discharge location and wear appropriate personal protective equipment.

Overhead Equipment. If wire line core sampling is conducted, drill steel and sampling gear will be lifted overhead. Site personnel must conduct the necessary equipment inspections to ensure it is in good condition prior to the start of drilling operations. In addition, drillers must make sure that proper hoisting procedures are followed to reduce the likelihood of falling drill steel or sampling gear.

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6.5 Cable Tool

A cable tool drill rig operates by repeatedly lifting and dropping tools attached to a cable into a borehole. Figure 6-5 shows the components of a cable tool rig. This drilling method crushes rock and a spudding beam mixes the crushed particles with water. The water and debris is removed by a bailer or pump. In unconsolidated formations, a casing is driven into the ground. In consolidated formations, drilling is conducted without the use of a casing.

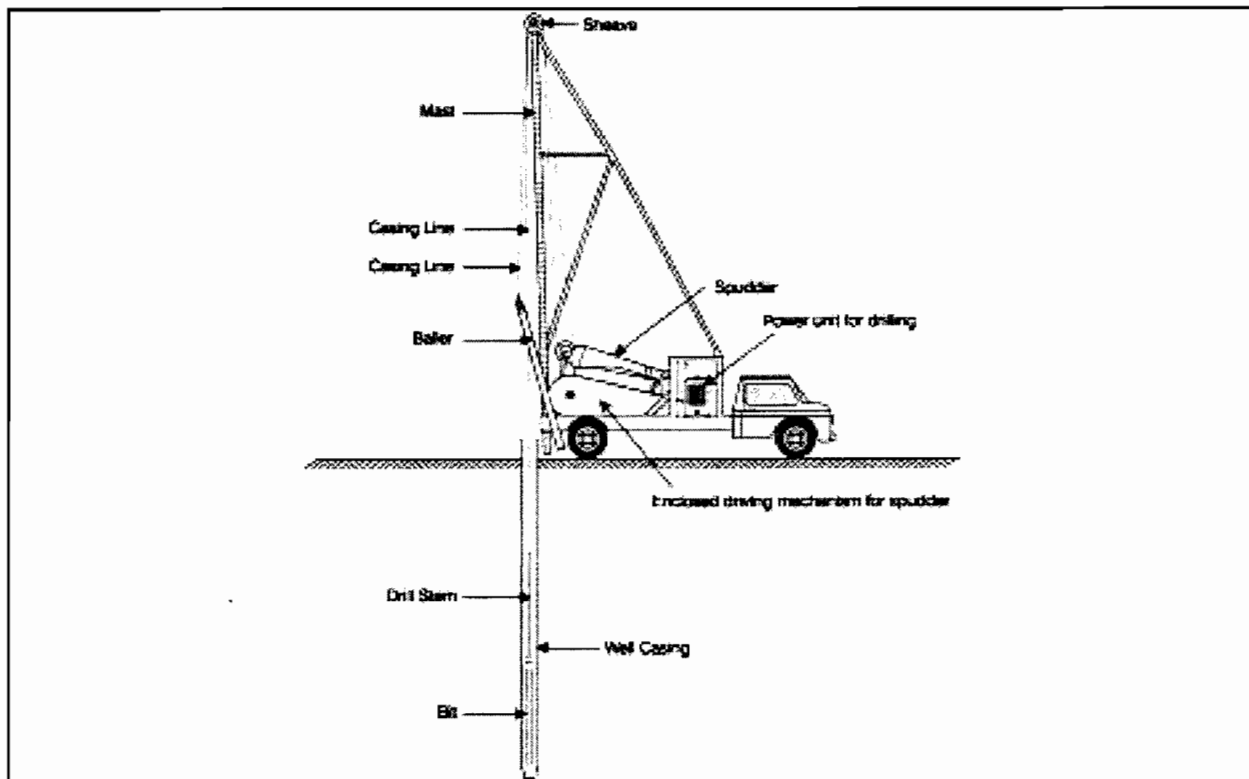


Figure 5 Cable Tool Drill Rig

Physical Hazards

Noise. The spudding beam generates excessive noise. All personnel must wear appropriate hearing protection during drilling operations.

Rig Movement. The drill rig tends to lurch as the drill string is raised and lowered. Site personnel must maintain an adequate distance from the rig during drilling operations.

Overhead Equipment. Drill string and bailers are hoisted during drilling operations and present an overhead hazard to site personnel if a tool falls from a height.



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6.6 Casing Advancement: Rotary Drill-Through Methods

6.6.1 Drill-Through Casing Driver and Dual Rotary Method

Casing driver advancement (also referred to as air (mud) rotary drill or downhole hammer with casing drivers, air rotary casing hammer, and air drilling with casing hammer) involves a driver that moves the casing as drilling occurs (see Figure 6) during the use of conventional direct air (mud) or downhole hammer equipment. Drill cuttings move upward in the space between the drill pipe and the casing. The diameter of the casing is slightly larger than the bit so it can be easily removed.

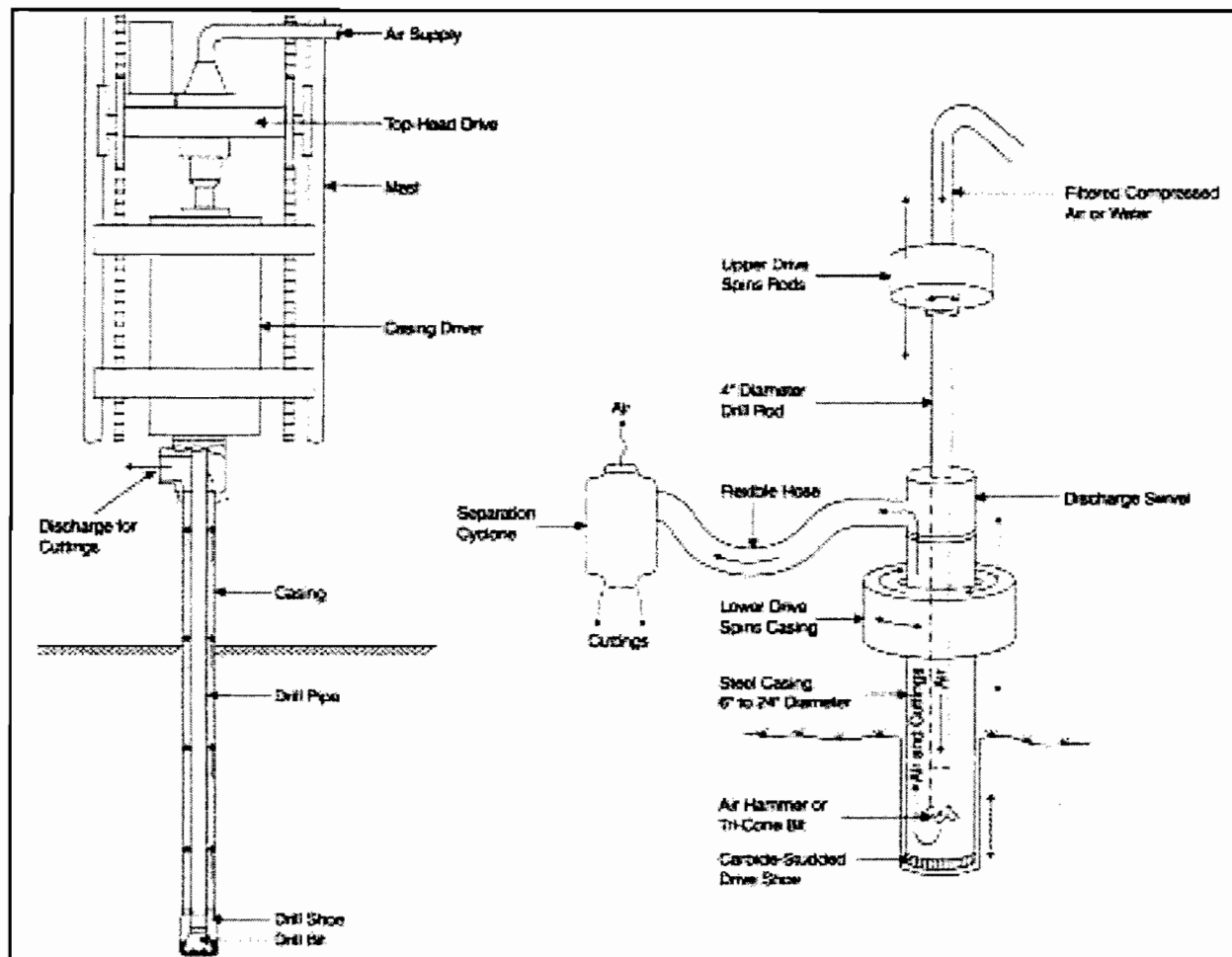


Figure 6 Casings

In dual rotary advancement, the casing is moved by using a rotating steel casing provided with a carbide-studded drive shoe. The carbide ring cuts through the overburden material. Rotary drilling (usually air) takes place at the same time using a downhole hammer or tri-cone bit. Drilling can be conducted either inside or ahead of the casing.

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This type of drilling is used to install monitoring wells in unconsolidated formations, where loss of circulation of drilling fluids is a problem, and/or where prevention of cross-contamination of aquifers is important.

6.6.2 Reverse Circulation (Rotary, Percussion Hammer, and Hydraulic Percussion)

The reverse-circulation rotary drilling method can utilize air rotary with a downhole hammer or bit or mud rotary. Two or three casings can be used.

Reverse circulation dual-wall rotary. This method is similar to downhole hammers with a casing driver or air rotary-cone bit, except air is moved down the space between the casing and the drill pipe to the bit, and soil cuttings are pushed to the surface through the drill pipe (see Figure 7).

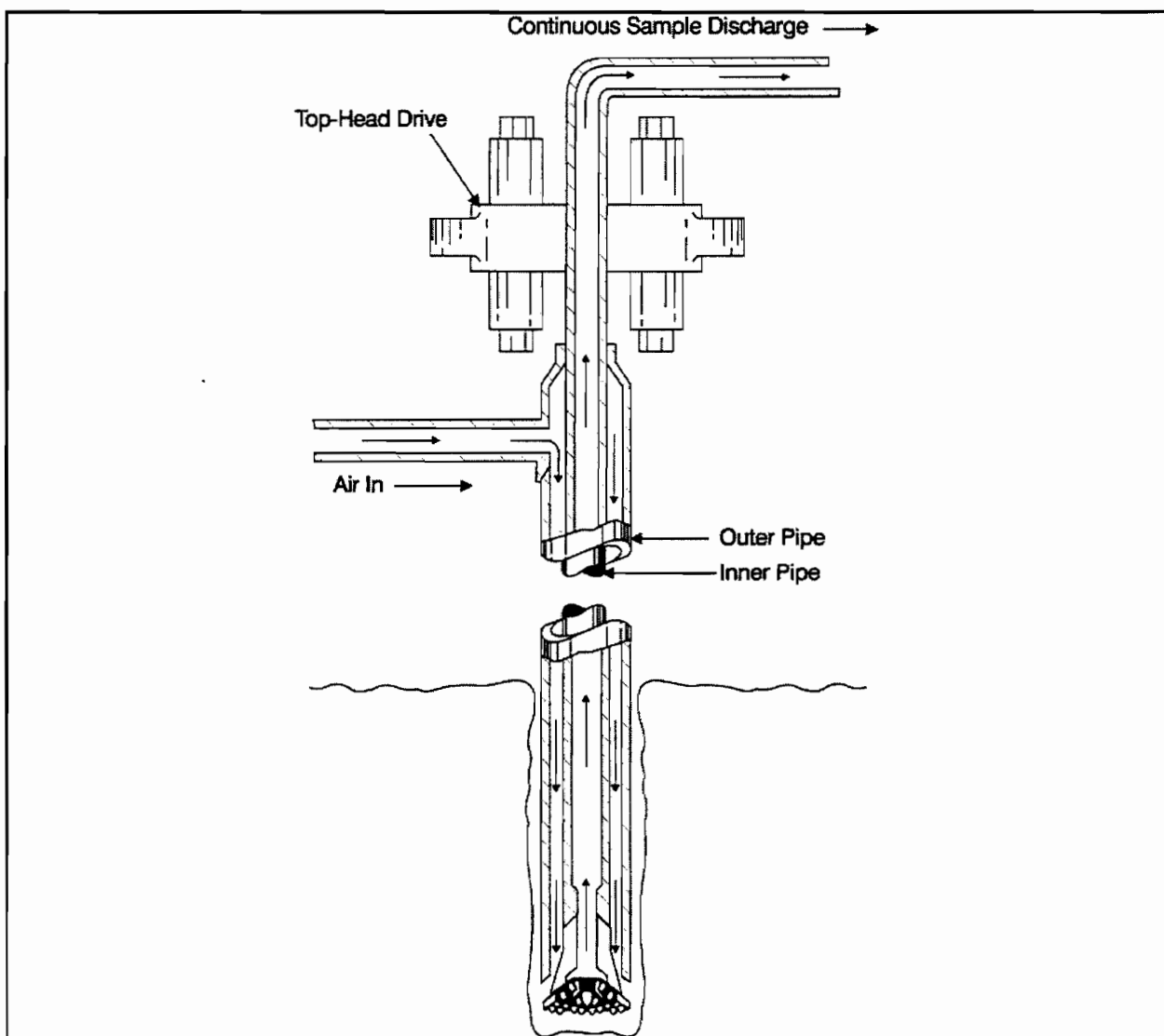


Figure 7 Reverse Circulation Rotary Method

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Reverse circulation dual-wall percussion hammer. The percussion hammer operates in a similar manner of reverse circulation as the dual-wall rotary method, except the drive method is different. Either two or three casings are used. Compressed air is moved into the space between the outer and inner pipes, and soil cuttings are discharged from the inner pipe to a cyclone. A percussion hammer on the most of the drill rig strikes an anvil on the top of the drive assembly. Two or three casings are driven, and the bit does not rotate.

Hydraulic percussion. This method is similar to the jet-percussion method, except a check valve is located between the bit and the lower part of the drill pipe. Water fills the space between the drill rods and well casing and the drill rods are lifted and dropped. A reciprocating motion moves the water and drill cuttings to the surface where they enter a tank. Water is returned to the hole from the tank. Casing is driven as drilling proceeds.

Physical Hazards—Reverse Circulation Dual-Wall Rotary

Noise. Excessive noise is generated from the use of air compressors, casing drivers, and downhole hammers. Site personnel are required to wear hearing protection during drilling operations.

Cuttings. Cuttings and debris discharged from the hole can strike and injure site personnel. Site personnel must stay away from the discharge point and wear appropriate personal protective equipment.

Overhead Equipment. If wire line core sampling is conducted, drill steel and sampling gear will be lifted overhead. Site personnel must conduct the necessary equipment inspections to ensure it is good condition prior to the start of drilling operations. In addition, drillers must make sure that proper hoisting procedures are followed to reduce the likelihood of dropping drill steel or sampling gear.

Physical Hazards—Hydraulic Percussion

Slips/Falls. Site personnel can slip on wet ground around the drill rig or fall into the water tank. Site personnel must keep the drilling location clear of debris and contain spillage prior to and during drilling operation.