New York State Department of Environmental Conservation
625 Broadway • Albany, New York 12233-7011

Modock Road Springs/DLS Sand and Gravel, Inc. Site (HW 8-35-013) Victor, New York

Work Assignment # D-004439-1

Immediate Investigation Work Plan

February 2007

Work Plan Prepared By:

Malcolm Pirnie, Inc.

43 British American Blvd.
Latham, New York 12110
518-782-2100

0266353

MALCOLM PIRNIE

Contents

List of Figures

List of Attachments

Appendices

1. Introduction

The New York State Department of Environmental Conservation (NYSDEC) tasked Malcolm Pirnie, Inc. (Malcolm Pirnie) to perform an Immediate Investigation Work Assignment (IIWA) at the Modock Road Springs/DLS Sand and Gravel, Inc. Site (HW 8-35-013), in the Town of Victor, New York (Figure 1).

The IIWA will be conducted under the NYSDEC State Superfund Standby Contract No. D004439. This IIWA consists of the following three tasks:

- Task 1 – Work plan development
- Task 2 – Indoor air sampling
- Task 3 – Reporting.

A brief summary of Task 1 is discussed below. Tasks 2 and 3 are discussed in Sections 2 and 3.

1.1. Work Plan Development

In accordance with the IIWA, this Work Plan includes:

- A Field Activities Plan (FAP).
- Site-Specific Health and Safety Plan (HASP).
- Site-Specific Quality Assurance Project Plan (QAPP).
- Final Budget (2.11 forms) and supporting documentation of bids.

The Field Activities Plan, which describes the anticipated field activities, is provided in Appendix A. The site-specific HASP (Appendix B) was developed to address site specific health and safety issues for the proposed IIWA activities. The QAPP, which is provided in Appendix C, describes site-specific quality assurance/quality control issues including sampling, analysis, testing, and monitoring procedures that could potentially be conducted during the IIWA. The 2.11 schedules are provided in Appendix D.

1.2. Site Information

The Modock Road Springs site is located in a rural/suburban area in the Town of Victor, Ontario County, New York. In advance of a Remedial Investigation/Feasibility Study (RI/FS) at the Modock Road Springs site, an indoor air monitoring program will be completed as part of this IIWA during the 2006/2007 heating season. Data collected during previous investigations document the presence of trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), and dichloroethene (DCE) in groundwater beneath a rural and suburban residential area of the Town of Victor. The groundwater plume appears to originate on the DLS Sand & Gravel, Inc. property and extends approximately one mile to the north where it discharges via a series of springs (Figure 1). The springs were historically used as a drinking water source for the Town of Victor. Over the length of the groundwater plume, total chlorinated volatile organic compound (CVOC) concentrations range from approximately 16 parts per million (ppm) near the southern portion of the plume to approximately 250 parts per billion (ppb) at the springs. Currently, little data exists to assess the potential for vapors to enter into the overlying homes.

2. Indoor Air and Sub-slab Soil Vapor Sampling

The IIWA will focus on indoor air and sub-slab vapor sampling and analysis at approximately 18 to 20 residences that overlie, or are in the vicinity of the CVOC groundwater plume at the Modock Road Springs site. The NYSDEC will select the properties on which samples will be collected. Sampling at these structures is pending approval by property owners. For adjoining residences in the sampling program, one residence may be selected as a representative sampling location. The results of the IIWA activities will be used to evaluate the need for additional monitoring. If vapor intrusion monitoring is required beyond the initial 18 to 20 residences, a budget amendment will be requested or the additional monitoring will be completed during subsequent remedial investigations.

One indoor air sample will be collected from both the first floor living space and basement (if applicable) of each residence. Sub-slab vapor sampling will be conducted in structures with competent floors or slabs. If the floor is primarily unfinished (e.g., dirt floors) no sub-slab soil vapor sample will be collected. Sampling locations will be finalized in consultation with NYSDEC or NYSDOH following a building inspection to select that appropriate locations to evaluate the potential for vapor intrusion. Indoor air samples will be collected at the same time the sub-slab sample is collected.

A minimum of one outdoor ambient air sample will be collected per day of sampling concurrently with the indoor air samples. The ambient air sampling locations will be selected in consultation with NYSDEC or NYSDOH and will be located in the vicinity of the residences in which indoor air samples are being collected.

All air and sub-slab soil vapor samples will be analyzed for a NYSDEC-specified list of volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method TO-15. The analytical laboratory will be certified under the Environmental Laboratory Approval Program (ELAP).

Details of each field activity are provided in the Field Activities Plan (Appendix A).

3. Reporting

The laboratory will provide analytical results within 30 days of receipt of the samples and a third-party data validator will provide a Data Usability Summary Report (DUSR) within 30 days of receipt of the laboratory data package. Preliminary, unvalidated data will be provided to NYSDEC within 30 days of completion of the sampling activities. A letter report, which will include a table with validated data, will be submitted to NYSDEC within 70 days of completion of the sampling activities.

3.1. Data Validation

The collection and reporting of reliable laboratory and field data is the primary focus of the sampling and analytical activities. Data will be reviewed to determine the limitations, if any, of the data. The review will also be used to assure that the procedures are effective and that the data generated provide sufficient information to achieve the project objectives. An independent, qualified third-party will evaluate the analytical data according to the NYSDEC Division of Environmental Remediation Data Usability Summary Report guidelines. A DUSR will be included in the Final Air Sampling Report.

3.2. Letter Report

A letter report summarizing the IIWA activities will be submitted to the NYSDEC. The letter report will consist of a brief summary of the field activities, a table with analytical results compared to NYSDOH soil vapor/indoor air matrices (with cross-referenced table showing homeowner information), daily observation reports and field notes. The field notes will include the building questionnaire, product inventory, and relevant sampling information (canister pressures, equipment identification numbers, and sample times, types, and locations). A second letter report, for possible public release, will not contain the daily observation reports or any information that could identify property owners or properties. A more detailed discussion of field sampling and data analysis will be provided in the subsequent RI/FS report.

4. Estimated Budget

The estimated project budget is shown in the attached 2.11 series of schedules (Appendix D), prepared in accordance with Malcolm Pirnie's Contract for Remedial Investigation Services with the NYSDEC. Schedule 2.11(a), Summary of Work Assignment Price, shows the estimated total price for the work described in this Work Plan.

5. Project Staffing Plan

The IIWA will be managed through organized efforts of scientific and engineering personnel, and technical resources. These efforts will employ pre-approved field procedures, sampling techniques, and analytical methods to accomplish the project objectives. Effective program organization will accommodate these requirements while maintaining a manageable degree of control over these activities.

The organizational structure proposed for the IIWA is presented on Figure 3. In addition to the personnel identified on Figure 3, support for the project will be provided by additional personnel from Malcolm Pirnie as required. Coordination of project activities and a majority of the work on this project will be performed by staff from Malcolm Pirnie's Latham, New York office. The responsibilities of key staff positions are summarized below.

5.1. Proposed Project Staff

Malcolm Pirnie will provide oversight, coordination, health and safety, field support, and evaluation of analytical data. Malcolm Pirnie will also be responsible for evaluation of analytical test results, which will be submitted to NYSDEC. The Malcolm Pirnie staff members involved in this project are detailed below:

Daniel Loewenstein, P.E., Project Officer, will have the final responsibility for the quality of work performed and the allocation of resources and personnel for the IIWA.

Shi Ng, the Quality Assurance Officer, will perform project review independently of project management and will oversee Malcolm Pirnie's QA/QC program for the project.

Bruce Nelson, P.G., the Project Manager, will be responsible for the day-to-day management of the project including the allocation of technical resources, development of work plans, and coordination of project activities and personnel. Mr. Nelson will be responsible for maintaining a clear definition of, and adherence to, the NYSDEC-approved scope, schedule, and budget.

Daniel Lang, P.H.G., Deputy Project Manager, will manage the field investigations and reporting during the IIWA. He will interact with the Project Manager and other team members and support staff to complete and document the scope of work.

5.2. Proposed Subcontractors

Subcontractors to Malcolm Pirnie will be required in the following areas to conduct work necessary to support the IIWA:

- Environmental Laboratory
- Data Validation/Data Usability Reviewer
- Field Technical Support

In accordance with the NYSDEC's Handbook for Standby Consultant Contracts, Malcolm Pirnie has established a standby subcontract agreement with analytical laboratories to perform analysis of air samples. Malcolm Pirnie proposes that Columbia Analytical Services, which is certified under the ELAP, perform the laboratory analyses. Data Validation Services, Inc., a New York State Department of Economic Development certified WBE, is proposed to perform the data validation services for this IIWA. Aztech Technologies, Inc. is also a certified WBE and will provide field technical support.

The proposed Subcontractors identified to participate in the project are shown on Figure 3.

6. Proposed Project Schedule

The Work Assignment for this project included a project milestone schedule. According to the NYSDEC's project representatives, key milestones include:

1. Completion of Work Plan
2. Initiation of Field Work
3. Completion of Field Work; and
4. Reporting of results to NYSDEC.

Achievement of each of these milestone objectives represents an important intermediate step toward beginning the RI/FS in 2007.

Other project milestones are provided in the following project milestone schedule:

Project Milestone	**Day(s)**
Work Assignment Authorization	0
Prepare WP	2 – 14
Revise WP	30-40
Notice to Proceed	45
Field Studies	52 – 112
Receive Analytical Results	142
Preliminary Data to NYSDEC	142
Receive DUSR	172
Submit Field Studies Letter Report	182

The schedule does not account for delays due to unforeseen site conditions (e.g., inclement weather, access to residences). Every attempt will be made to adhere to the schedule presented. Unexpected delays will be documented and reported to the NYSDEC in a timely fashion. In the event that the schedule needs to be modified, Malcolm Pirnie will contact the NYSDEC for approval of the updated schedule.

7. Proposed Minority-Owned and Women-Owned Business Enterprise Proposed (MBE/WBE) Participation

This MBE/WBE Utilization Plan provides the good faith efforts to be undertaken by Malcolm Pirnie to comply with the requirements of the NYSDEC established in Contract D004443 to subcontract with minority-owned and women-owned business enterprises, and to employ minorities and women. The purpose of the MBE/WBE Plan is to demonstrate and document Malcolm Pirnie's intention to make a good faith effort to meet the goals as stated in the contract. These goals are as follows:

- The Contractor agrees to make good faith efforts to subcontract at least 15 percent of the dollar value of this contract to Minority-Owned Business Enterprises and at least 5 percent of such value to Women-Owned Business Enterprises.
- The Contractor agrees to make good faith efforts to employ or contractually require any Subcontractor with whom it contracts to make good faith efforts to employ minority group members for at least 10 percent of, and women for at least 10 percent of, the work force hours required to perform the work under this Contract.

This MBE/WBE Plan has been prepared to address MBE/WBE involvement in the tasks under NYSDEC Standby Contract No. D004443 for the Modock Road Springs site in the Town of Victor, New York. This specific plan incorporates the provisions of Malcolm Pirnie's corporate plan for Affirmative Action.

7.1. Malcolm Pirnie Affirmative Action Statement

Malcolm Pirnie supports the NYSDECs commitment to minority- and women owned business enterprises. The firm will make good faith efforts to meet or exceed the 15 percent MBE and 5 percent WBE goals for this contract. Malcolm Pirnie is in compliance with Title VII of the Civil Rights Acts of 1964, as amended by the Equal Employment Opportunity Act of 1972.

It is our policy to provide equal opportunity to all qualified persons without regard to race, color, religion, sex, age, national origin, physical handicaps, sexual or affectional preference or marital status, and to promote the full realization of equal opportunity through a positive continuing affirmative action program. The firm assures applicants and staff members that equal opportunity and equal consideration is afforded in personnel

actions with respect to recruiting and hiring, development programs, job assignments, promotion, compensation, transfer, and other status changes.

It is the objective of the firm to provide full employment opportunities for members of minority groups and to employ meaningful numbers at all job levels through effective upgrading and recruiting. Toward this end, the firm's Manager of Human Resources has the responsibility for ensuring that Malcolm Pirnie is in compliance with all aspects of federal and State civil rights laws.

It is the policy of Malcolm Pirnie to consider applicants for employment, training and upward mobility programs that may be necessary without regard to race, religion, color, sex, age, physical handicap or any other factor unrelated to job performance. Malcolm Pirnie also supports career counseling, and training and development for all employees. Minorities and women are encouraged and afforded every opportunity to participate in all company-sponsored educational, training, recreational, professional and social activities.

7.2. Areas of Potential MBE/WBE Participation

The tasks identified under this Work Assignment are as follows:

- Task 2: Indoor Air Sampling

Subcontractors and suppliers are anticipated to be needed to assist or provide supplemental services to Malcolm Pirnie in a number of areas. It is Malcolm Pirnie's intent to solicit MBE/WBEs during the procurement of subcontractors for this project.

One or more MBE/WBE firms will be included in the list of firms solicited for each of the following subcontract areas of work:

- Environmental Laboratory Analysis
- Data Validation/Data Usability Review
- Field Technical Support

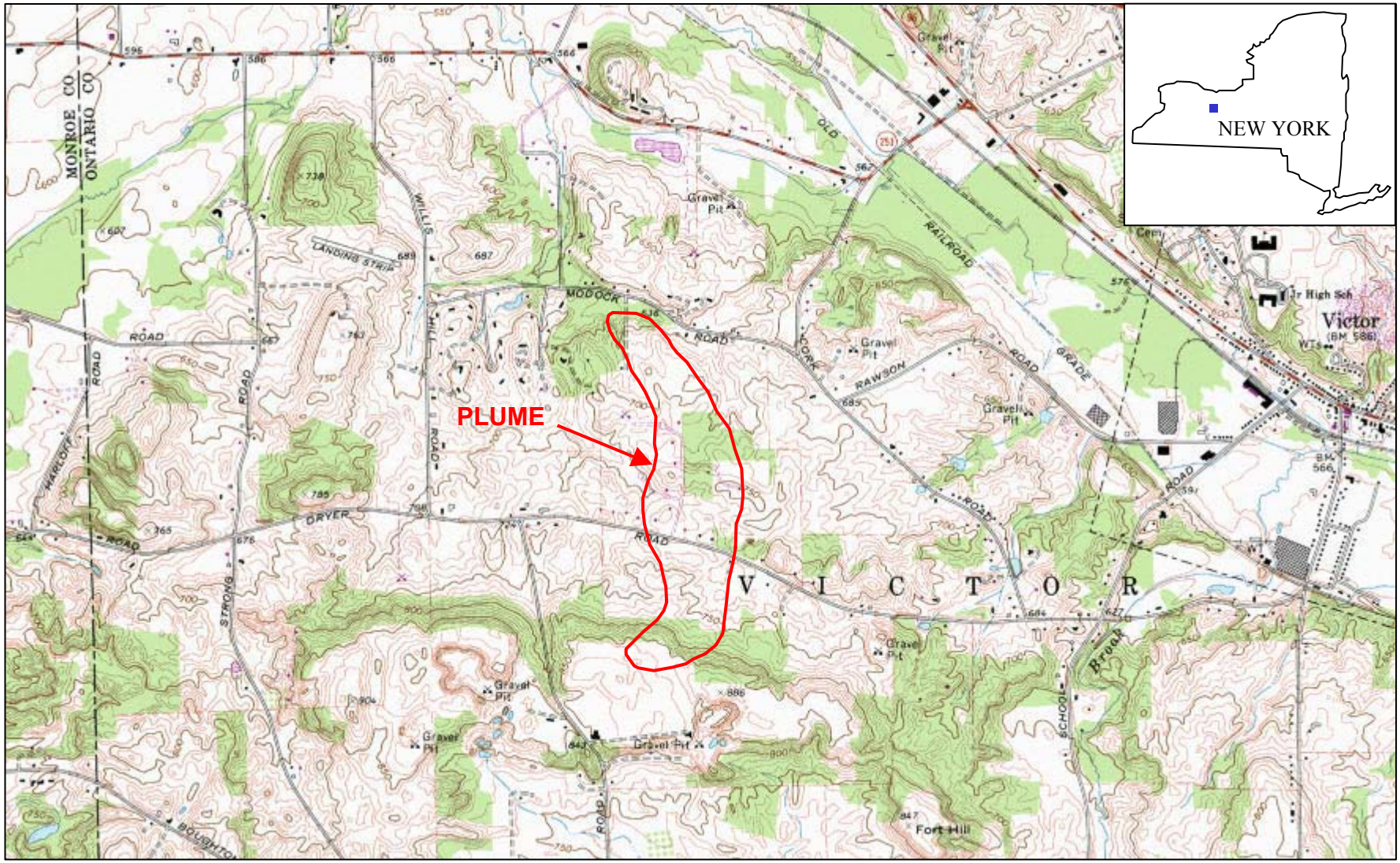
A summary table of bids received for the work, including the MBE/WBE status of each firm is included in Appendix D.

New York State Department of Environmental Conservation
Immediate Investigation Work Plan

Figures

0266353

MALCOLM PIRNIE



MAP SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC SERIES, VICTOR QUADRANGLE (PHOTOREVISED 1978)

APPROXIMATE SCALE IN FEET

0 1200 2400 4800

MALCOLM PIRNIE

MODOCK ROAD SPRINGS/DLS SAND AND GRAVEL, INC. SITE (HW 8-35-013)
VICTOR, NEW YORK

APPROXIMATE PLUME EXTENT

FIGURE 1

F:\PROJECT\0266353\FILE\IIWA Work Plan\Figures 1&2.ppt

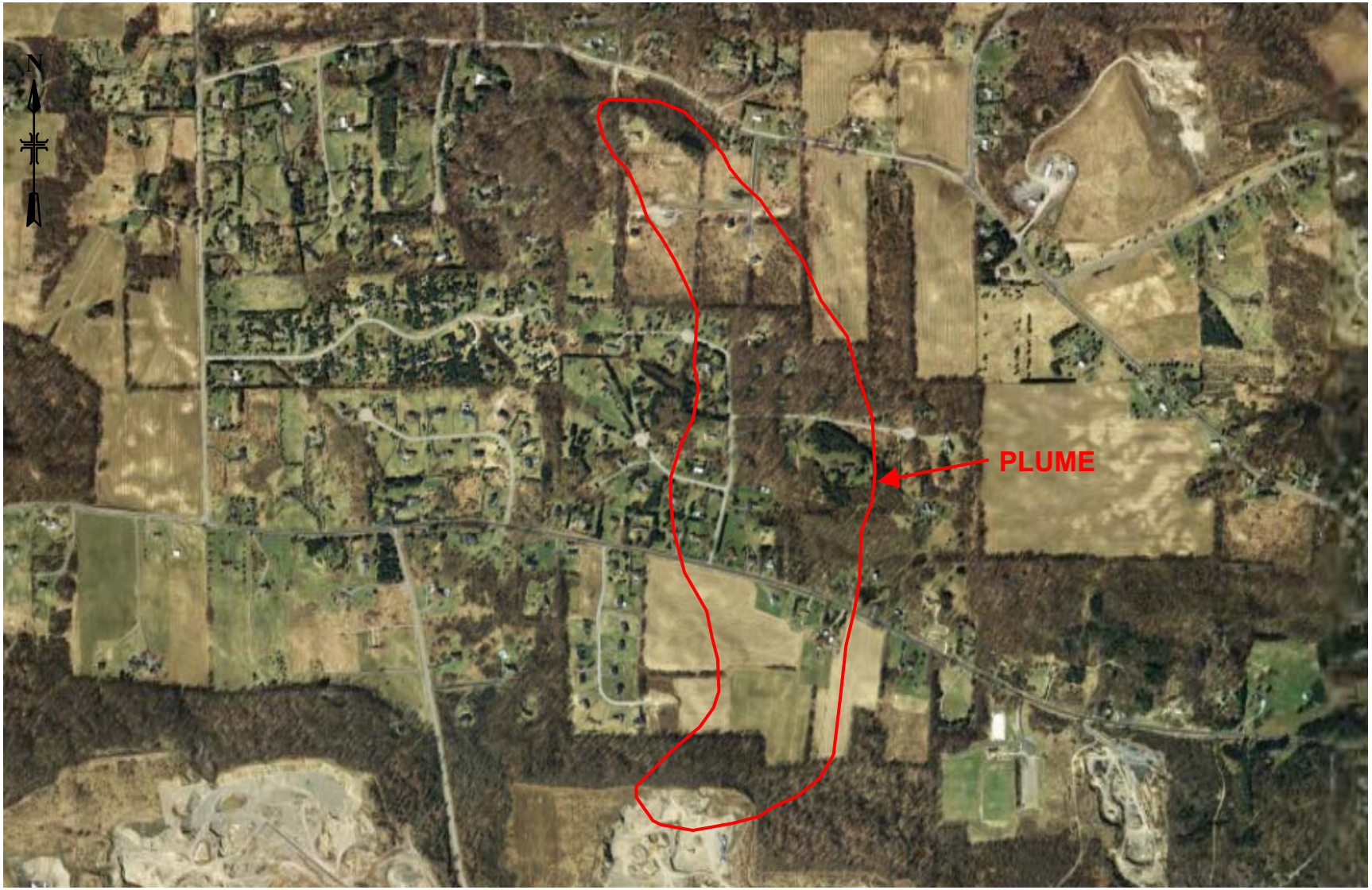


PHOTO SOURCE: http://www.nysgis.state.ny.us/gateway/mg/

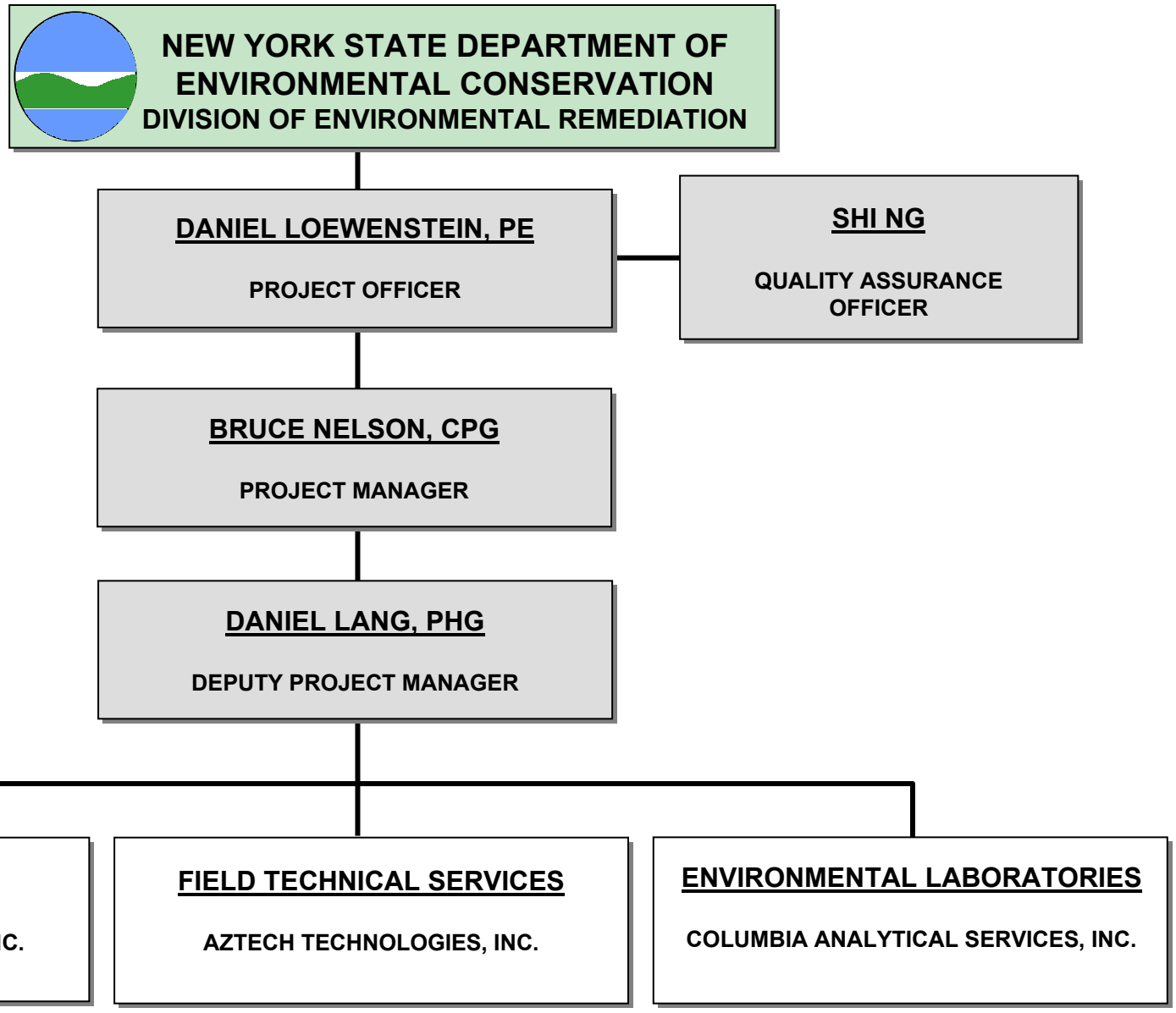
MALCOLM PIRNIE

MODOCK ROAD SPRINGS/DLS SAND AND GRAVEL, INC. SITE (HW 8-35-013)
VICTOR, NEW YORK

AERIAL PHOTOGRAPH

FIGURE 2

F:\PROJECT\0266353\FILE\IIWA Work Plan\Figures 1&2.ppt



MALCOLM PIRNIE

MODOCK ROAD SPRINGS/DLS SAND AND GRAVEL, INC. SITE (HW 8-35-013)
VICTOR, NEW YORK

PROPOSED PROJECT TEAM

FIGURE 3

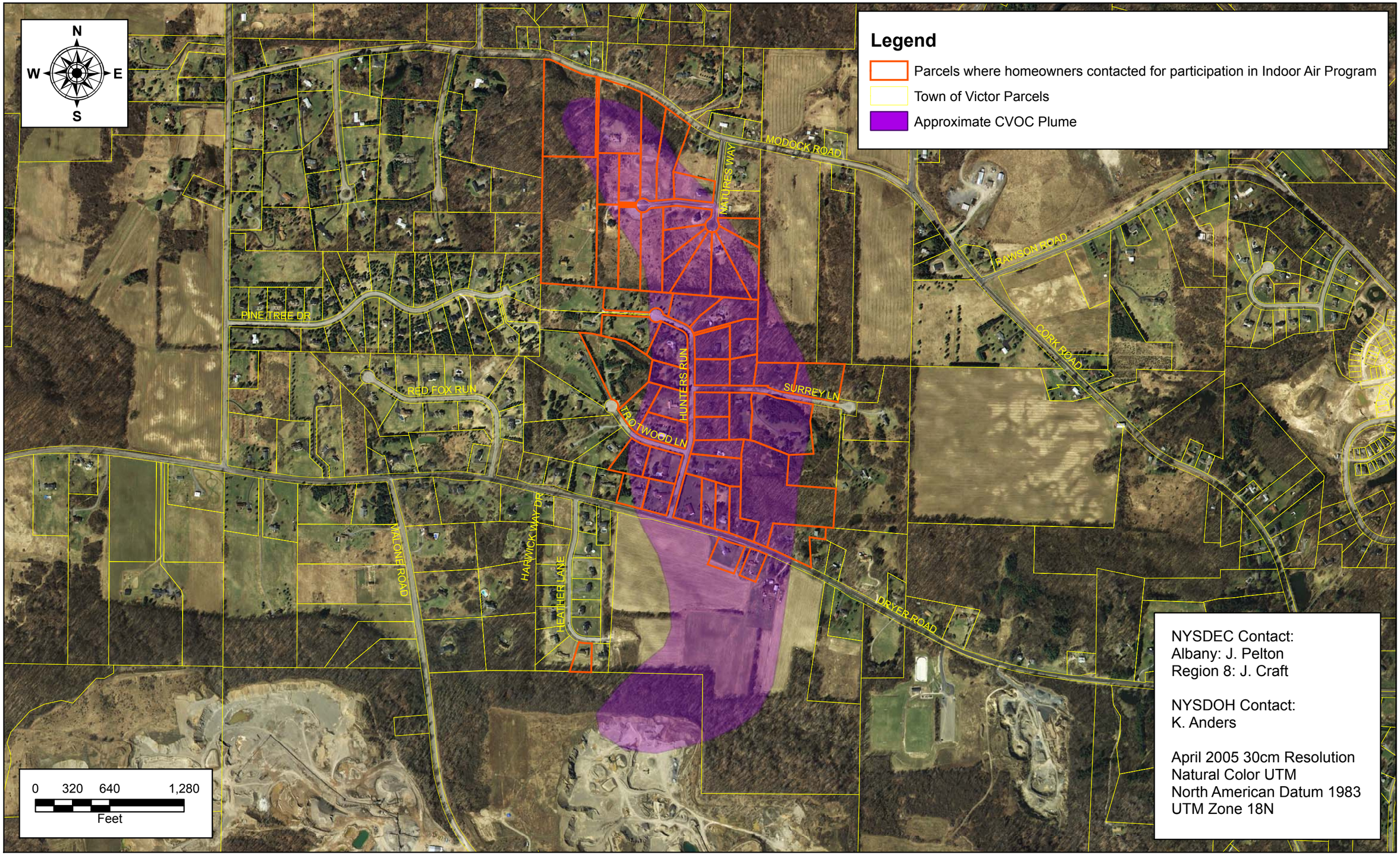
F:\PROJECT\026353\FILE\IWA Work Plan\Figure 3 - ORG CHART.ppt

New York State Department of Environmental Conservation
Immediate Investigation Work Plan

Attachment

0266353

MALCOLM PIRNIE



\\Albany\m\GIS\MOD\0266353\Modock Road Springs.mxd

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

IMMEDIATE INVESTIGATION WORK PLAN

WORK ASSIGNMENT # D-004439-2

MODOCK ROAD SPRINGS/DLS SAND AND GRAVEL, INC. SITE (HW 8-35-013)
TOWN OF VICTOR, ONTARIO COUNTY, NEW YORK

ATTACHMENT 1
PARCELS FOR CONSIDERATION IN INDOOR AIR PROGRAM

MALCOLM PIRNIE

New York State Department of Environmental Conservation
625 Broadway • Albany, New York 12233-7011

Modock Road Springs/DLS Sand and Gravel, Inc. Site (HW 8-35-013) Victor, New York Work Assignment # D-004439-1

Immediate Investigation Work Plan Appendix A: Field Activities Plan

February 2007

Plan Prepared By:

Malcolm Pirnie, Inc.

43 British American Blvd.
Latham, New York 12110
518-782-2100

0266353

MALCOLM PIRNIE

Contents

List of Tables

Attachment

1. Project Background

The New York State Department of Environmental Conservation (NYSDEC) tasked Malcolm Pirnie, Inc. (Malcolm Pirnie) to perform an Immediate Investigation Work Assignment (IIWA) at the Modock Road Springs/DLS Sand and Gravel, Inc. Site (HW 8-35-013), in Victor, New York (Figure 1).

The IIWA will be conducted under the NYSDEC State Superfund Standby Contract No. D004439. An initial step in the IIWA is preparation of this Field Activities Plan, which describes the anticipated field activities. The elements of this Field Activities Plan were prepared in accordance with the most recent and applicable guidelines and requirements of NYSDEC and the New York State Department of Health (NYSDOH).

The Modock Road Springs site is located in a rural/suburban area in the Town of Victor, Ontario County, New York. In advance of a Remedial Investigation/Feasibility Study (RI/FS) at the Modock Road Springs site, an indoor air monitoring program will be completed as part of this IIWA during the 2006/2007 heating season. Data collected during previous investigations indicate the presence of trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), and dichloroethene (DCE) in groundwater beneath a rural and suburban residential area of the Town of Victor. The groundwater plume appears to originate on the DLS Sand & Gravel, Inc. property and extends approximately one mile to the north where it discharges to a series of springs (Figure 1). The springs were historically used as a drinking water source for the Town of Victor. Over the length of the groundwater plume, total chlorinated volatile organic compound (CVOC) concentrations range from approximately 16 parts per million (ppm) near the southern portion of the plume to approximately 250 parts per billion (ppb) at the springs. Currently, little data exists to assess the potential for vapors to enter into the overlying residential homes.

2. Field Activities

The purpose of this IIWA is to assess the nature and extent of concentrations of CVOCs in the indoor air and sub-slab soil vapors of residential structures in the vicinity of a groundwater plume that underlies the residential area at the Modock Road Springs site. The overall goal of the indoor air sampling program is to evaluate the potential for vapor intrusion into these residences and potential human exposure to VOCs (TCE, 1,1,1-TCA, and DCE) known to occur in the CVOC plume. The information developed from the sampling and analysis is expected to be used for future planning efforts, and potential design and installation of mitigation systems. The indoor air sampling program will be conducted in accordance with the October 2006 Final NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The work described herein involves indoor air sampling and/or sub-slab soil vapor sampling at residences in the vicinity of the CVOC plume. It is anticipated that the sampling activities will be conducted over a three-week period and NYSDEC and/or NYSDOH personnel will provide field assistance and guidance.

Indoor air and sub-slab vapor sampling will be performed at approximately 18 to 20 properties at the Modock Road Springs Site. The NYSDEC will select the properties at which samples will be collected. Sampling at these structures is contingent on approval by property owners. Land parcels where sampling is proposed are shown on Attachment 1 of the Immediate Investigation Work Plan (IIWA).

Prior to sampling at each of the selected residences, an inspection will be conducted to inventory household products that could interfere with sampling results and document heating, ventilation, and air conditioning (HVAC) systems. An active approach utilizing laboratory-certified Summa canisters will be used to evaluate the indoor air and sub-slab soil vapor quality. During the inspection, sampling locations will be selected in consultation with the NYSDEC or NYSDOH. Samples will be collected over a 24-hour period.

One indoor air sample will be collected from both the first floor living space and basement (if applicable) of each residence. Sub-slab vapor sampling will be conducted in structures with competent floors or slabs. If the floor is primarily unfinished (e.g., dirt floor), no sub-slab sample will be collected.

A minimum of one outdoor ambient air sample will be collected per day of sampling concurrently with the indoor air samples in the vicinity of the residences where indoor air

samples are being collected. Field notes describing each day's activities will be recorded on a Daily Observation Log, which is provided in Attachment A.

Air and sub-slab soil vapor samples will be analyzed for a NYSDEC-specified list of VOCs utilizing the United States Environmental Protection Agency (USEPA) Method TO-15. The NYSDEC-specified list of VOCs is provided in the Quality Assurance Project Plan (QAPP). Table 1 summarizes the number of air samples anticipated to be collected during the IIWA effort:

Table 1.
Air Sampling by USEPA Method TO-15[(a)]

	Sub-Slab	Indoor Air	Ambient Air
Number of Samples	18 to 20	36 to 40	10 to 15
Duplicates	1	2	1
Total Number of Analyses	19 to 21	38 to 42	11 to 16

(a) The minimum reporting limits for analyzing all samples with EPA Method TO-15 are 0.25 $\mu g/m^3$ for trichloroethene and carbon tetrachloride, 5 $\mu g/m^3$ for ethanol, and 1.0 $\mu g/m^3$ for all other compounds..

NOTE: Laboratory quality control samples will be collected at a rate of 1 per 20 samples.

Duplicate samples will be collected at the rate of 1 duplicate sample per 20 original samples. For duplicate sub-slab samples, the samples will be collected by installing an in-line "tee," which will split the flow coming from the sample tubing penetrating the floor to two canisters set up adjacent to each other and each collecting vapors at identical flow rates.

Prior to initiating the air sampling, the property owners will be contacted through a telephone call and then through a 10-day written notice consistent with NYSDEC TAGM 4053. The NYSDEC Project Manager will contact the property owners, discuss the sampling program, and schedule the sampling. The NYSDEC Project Manager will provide the consultant with a copy of the correspondence and indoor air sampling schedule.

Daily meteorological information (barometric pressure, wind speed and direction, etc.) will be obtained from the Rochester International Airport, which is located approximately 20 miles northwest of the site, to assist in the selection of representative outdoor air sampling locations.

2.1. Building Inspection

An inspection of general site conditions will be performed at each property prior to the air sampling. The inspection will include the following activities:

- Completion of the NYSDOH Indoor Air Quality Questionnaire and Building Inventory included in the October 2006 Final NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York. The questionnaire is provided in Attachment B. NYSDEC personnel will complete the questionnaire with the homeowners. As part of the questionnaire, a basement and first floor product inventory will be prepared. An inventory of the first floor would be intrusive and will not be completed unless sampling results indicate the need for such an inventory. Sections 1 through 13 of the questionnaire will be completed with the exception of Section 4, which is an evaluation of air flow using air current tubes or tracer smoke.
- Documentation of weather conditions outside and temperature inside.
- Ambient air (indoor and outdoor) screening using field equipment (i.e., photoionization detector).
- Evaluation of HVAC systems and other ventilation (windows, etc.).
- Selection of air sampling locations.

2.2. Indoor Air Sampling Procedures

Indoor air samples will be collected in accordance with the October 2006 Final NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York and the following procedures:

1. Place canister in desired sampling location. Canister will be a 1- or 6-Liter (L) canister with a vacuum gauge and flow controller. The canister must be batch certified clean (in accordance with EPA Method TO-15) and under a vacuum pressure of no more than -25 inches of mercury (in Hg). Flow controllers will be set for a 24-hour collection period.
2. Make sure all valves, gauges, and filters are properly attached.
3. Open valve ½ turn or as indicated in the laboratory specifications. Manufacturer or laboratory protocols will be followed when operating the valve on the sample containers.
4. Record initial vacuum pressure, time, and date on field data form.

2.3. Sub-Slab Sampling Procedures

The collection of sub-slab samples will be in accordance with the following procedures:

1. Visually assess the condition of the floor. Select an area for sampling that is out of the line of traffic and away from major cracks and other floor penetrations (sumps, pipes, etc.). Take a digital photograph of the area before drilling or sampling for use as a reference when the area is being restored to pre-sampling conditions. Photographs will not be taken if the homeowner objects.
2. Drill a 1-inch diameter hole 1-inch into the concrete floor slab using an electric hammer drill.
3. Drill a 3/8-inch diameter hole through the 1-inch hole completely through the concrete floor slab.
4. Sweep concrete dust away from the drill hole and wipe the floor with a dampened towel. Concrete dust can be cleaned up with a dust brush and pan or vacuum equipped with a HEPA filter only after sample collection has been completed.
5. Insert inert tubing, such as Teflon or Teflon-lined polyethylene tubing (¼-inch outside diameter [OD]), approximately 3 feet long; into the hole drilled in the floor, extending no further than 2 inches below the bottom of the floor slab.
6. Pour melted bees wax around the tubing at the floor penetration ensuring that an effective seal has been established.
7. Attach a syringe to the sampling tube and purge approximately 100 mL of air/vapor at a consistent flow rate that is less than or equal to 0.2 liters per minute. The syringe will be capped and the air released outside the building or into a Tedlar® bag as to not influence the indoor air quality.
8. Place canister on a stable surface (floor) adjacent to the sample tube. Canister will be a 1- or 6-Liter (L) canister with a vacuum gauge and flow controller. The canister must be batch certified clean (in accordance with EPA Method TO-15) and under a vacuum pressure of no more than -25 inches of mercury (in Hg). Flow controllers will be set for a 24-hour collection period. Samples will be collected at a consistent flow rate that is less than 0.2 liters per minute.
9. Record the canister's serial number on the chain of custody (COC) and field notebook/sample form. Assign sample identification on canister ID tag and record on COC and field notebook/sample form. For property owner privacy, do not use a sample identifier containing the name or address of the property or property owner.
10. Record gauge pressure; vacuum gauge pressure must read -25 in Hg or less or the canister cannot be used. Connect the sample tubing to the canister inlet fitting. Open canister valve in accordance with manufacturer and laboratory protocols to initiate sample collection at the laboratory's preset flow rate.
11. Record the start time on the COC in the field notebook/sample form and take a digital photograph of canister setup and surrounding area. Photographs will not be taken if the homeowner objects.

2.4. Termination of Sample Collection

1. Close the canister valve and record the stop time on the COC and in the field notebook/sample form.
2. Record the final gauge pressure and disconnect the sample tubing and pressure gauge/flow controller from canister, if applicable.
3. Install plug on canister inlet fitting and place the sample container in the original box.
4. Complete the sample collection log with the appropriate information and log each sample on the COC form.
5. Remove temporary subsurface probe and properly seal hole in the slab with cement.
6. All canisters will be returned at the completion of the field sampling to the laboratory by overnight shipment or courier and in accordance with any laboratory specifications (i.e. holding time requirements). No work or shipment of samples will be expected on weekends or holidays.

3. Laboratory Analysis and Data Validation

Analysis will be performed by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory for VOCs using USEPA Method TO-15. In accordance with the October 2006 Final NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, the analysis for indoor air samples will achieve minimum reporting limits of 0.5 $\mu g/m^3$ for each compound except for trichloroethene and carbon tetrachloride, which will have a minimum reporting limit of 0.1 $\mu g/m^3$, and ethanol and acetone, which will have a minimum reporting limit of 2.5 $\mu g/m^3$. Analysis of all other samples will achieve the same minimum reporting limit as for the indoor air samples. The analytical turnaround time will be 30 days from receipt of sample containers. Malcolm Pirnie will forward the analytical results to the Department Project Manager as an electronic data deliverable (EDD) in portable document format (PDF).

The collection and reporting of reliable data is a primary focus of the sampling and analytical activities. Laboratory and field data will be reviewed to ensure that the procedures are effective and that the data generated provides sufficient information to achieve the project objectives. Limitations of the data will also be noted. A qualified independent third party will evaluate the analytical data according to NYSDEC-Division of Environmental Remediation Data Usability Summary Report guidelines.

New York State Department of Environmental Conservation
Immediate Investigation Work Plan

Field Activities Plan
Attachment A:
Daily Observation Report

0266353

MALCOLM PIRNIE

DAILY OBSERVATION REPORT **Day:_____ Date:_____**

NYSDEC

Division of Environmental Remediation
Modock Road Springs
NYSDEC Site # HW 8-35-013

Contract # D-004439-2

Victor, New York

Temperature: (F) (am) (pm)

Wind Direction: (am) (pm)

Weather: (am)

(pm)

Arrive at site (am)

Leave site: (pm)

HEALTH & SAFETY:

Are there any changes to the Health & Safety Plan? Yes ( ) No ( )
(If yes, list the deviation under items for concern)

Are monitoring results at acceptable levels?

Soil	Yes ( )	n/a ( )	* No ( )
Waters	Yes ( )	n/a ( )	* No ( )
Air	Yes ( )	n/a ( )	* No ( )

- *If No, provide comments*

OTHER ITEMS:

Site Sketch Attached: Yes ( ) No ( )
Photos Taken: Yes ( ) No ( )

DESCRIPTION OF DAILY WORK PERFORMED:

PROJECT TOTALS:

SAMPLING (Soil/Water/Air)

Contractor Sample ID:	DEC Sample ID:	Description:

DAILY OBSERVATION REPORT Day:_____ Date:_____

CONTRACTOR/SUBCONTRACTOR EQUIPMENT AND PERSONNEL ON SITE:

(Name of contractor) personnel:

(Name of Subcontractor) personnel:

(Name of contractor) equipment:

(*Indicates active equipment)

Other Subcontractors:

VISITORS TO SITE:

1.

PROJECT SCHEDULE ISSUES:

PROJECT BUDGET ISSUES:

ITEMS OF CONCERN:

COMMENTS:

ATTACHMENT(S) TO THIS REPORT:

SITE REPRESENTATIVE:

Name: (*signature*)
cc:

DAILY PHOTOLOG

New York State Department of Environmental Conservation
Immediate Investigation Work Plan

Field Activities Plan
Attachment B:
NYSDOH Indoor Air Quality Questionnaire and Building Inventory

0266353

MALCOLM PIRNIE

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name _____ Date/Time Prepared _____

Preparer's Affiliation _____ Phone No._____

Purpose of Investigation_____

1. OCCUPANT:

Interviewed: Y / N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y / N

Last Name: _____First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
Industrial	Church	Other: _____

If the property is residential, type? (Circle appropriate response)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? _____

If the property is commercial, type?

Business Type(s) _____

Does it include residences (i.e., multi-use)? Y / N If yes, how many? _____

Other characteristics:

Number of floors_____ Building age_____

Is the building insulated? Y / N How air tight? Tight / Average / Not Tight

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

_____

_____

_____

Airflow near source

_____

_____

_____

Outdoor air infiltration

_____

_____

_____

Infiltration into air ducts

_____

_____

_____

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply)

a. Above grade construction:	wood frame	concrete	stone	brick
b. Basement type:	full	crawlspace	slab	other _____
c. Basement floor:	concrete	dirt	stone	other _____
d. Basement floor:	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	sealed	sealed with _____	
f. Foundation walls:	poured	block	stone	other _____
g. Foundation walls:	unsealed	sealed	sealed with _____	
h. The basement is:	wet	damp	dry	moldy
i. The basement is:	finished	unfinished	partially finished	
j. Sump present?	Y / N			
k. Water in sump?	Y / N / not applicable			

Basement/Lowest level depth below grade: _____(feet)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

_____

_____

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	Heat pump	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: _____

Boiler/furnace located in:	Basement	Outdoors	Main Floor	Other_____
Air conditioning:	Central Air	Window units	Open Windows	None

Are there air distribution ducts present? Y / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

_____

_____

_____

_____

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	_____
1st Floor	_____
2nd Floor	_____
3rd Floor	_____
4th Floor	_____

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? Y / N

b. Does the garage have a separate heating unit? Y / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) Y / N / NA Please specify_____

d. Has the building ever had a fire? Y / N When?_____

e. Is a kerosene or unvented gas space heater present? Y / N Where? _____

f. Is there a workshop or hobby/craft area? Y / N Where & Type? _____

g. Is there smoking in the building? Y / N How frequently? _____

h. Have cleaning products been used recently? Y / N When & Type? _____

i. Have cosmetic products been used recently? Y / N When & Type? _____

j. Has painting/staining been done in the last 6 months? Y / N Where & When? _____

k. Is there new carpet, drapes or other textiles? Y / N Where & When? _____

l. Have air fresheners been used recently? Y / N When & Type? _____

m. Is there a kitchen exhaust fan? Y / N If yes, where vented?_____

n. Is there a bathroom exhaust fan? Y / N If yes, where vented?_____

o. Is there a clothes dryer? Y / N If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / N When & Type?_____

Are there odors in the building? Y / N
If yes, please describe: _____

Do any of the building occupants use solvents at work? Y / N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? _____

If yes, are their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) No
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y / N Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply:	Public Water	Drilled Well	Driven Well	Dug Well	Other: _____
Sewage Disposal:	Public Sewer	Septic Tank	Leach Field	Dry Well	Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency)

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

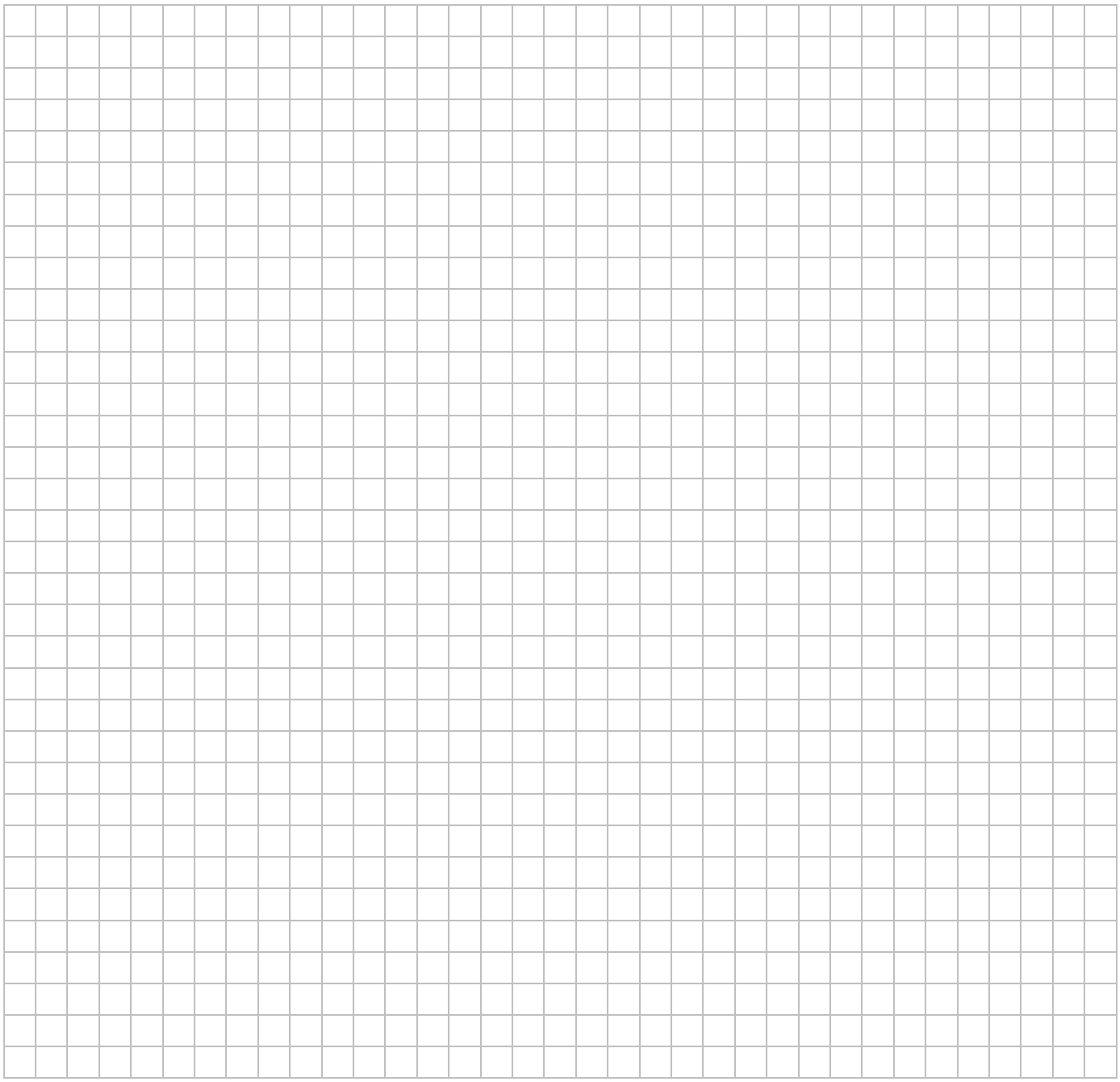
Basement:

First Floor:

12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units)	Condition*	Chemical Ingredients	Field Instrument Reading (units)	Photo ** Y / N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

New York State Department of Environmental Conservation
Immediate Investigation Work Plan

Appendix B:
Health and Safety Plan

0266353

MALCOLM PIRNIE

SITE SPECIFIC HEALTH AND SAFETY PLAN

MALCOLM PIRNIE

SECTION 1: GENERAL INFORMATION AND DISCLAIMER		PROJECT NUMBER:	0266353
PROJECT NAME:	Modock Road Springs	CLIENT NAME:	New York State DEC
PROJECT MANAGER:	Bruce Nelson	DEPUTY PROJECT MANAGER:	Daniel Lang
PREPARED BY:	Mark Flusche	DATE:	12/8/06

NOTE: This site specific Health and Safety Plan - Short Form (HASP-SF) has been prepared for use by **Malcolm Pirnie, Inc.** employees for work at this site / facility. **The plan is written for the specific site / facility conditions, purposes, tasks, dates and personnel specified, and must be amended and reviewed by those personnel named in Section 4 if these conditions change.** Malcolm Pirnie, Inc. is not responsible for its use by others.

Subcontractors shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations. In accordance with 1910.120(b)(1)(iv) and (v), Malcolm Pirnie, Inc. will inform subcontractors of the site / facility emergency response procedures, and any potential fire, explosion, health, safety or other hazards by making this Site Specific Health and Safety Plan and site information obtained by others available during regular business hours. All contractors and subcontractors are responsible for: (1) developing their own Health and Safety Plan, including a written Hazard Communication Program and any other written hazard specific or safety programs required by federal, state and local laws and regulations, that details subcontractor tasks, potential or actual hazards identified as a result of a risk analysis of those tasks, and the engineering controls, work practices and personal protective equipment to be utilized to minimize or eliminate employee exposure to the hazard; (2) providing their own personal protective equipment; (3) providing documentation that their employees have been health and safety trained in accordance with applicable federal, state and local laws and regulations; (4) providing evidence of medical surveillance and medical approvals for their employees; and (5) designating their own site safety officer responsible for ensuring that their employees comply with their own Health and Safety plan and taking any other additional measures required by their site activities.

Providing a copy of this Malcolm Pirnie plan to subcontractors, does not establish, nor is it intended to establish a "joint employer" relationship between the Contractor and Malcolm Pirnie. This allowance does not establish, nor is it intended to establish, a direct or indirect employer/employee relationship with subcontractor's employees.

THIS SITE SPECIFIC HASP MUST BE REVIEWED AND APPROVED BY CORPORATE HEALTH AND SAFETY FOR ONE OR MORE OF THE FOLLOWING CONDITIONS: IF AN UPGRADE TO "LEVEL C" OR ABOVE IS ANTICIPATED; A PERMIT REQUIRED CONFINED SPACE ENTRY OR ENTRY INTO AN EXCAVATION IS ANTICIPATED; SAMPLING OF UNKNOWN DRUMS AND/OR IN UNKNOWN CONDITIONS IS ANTICIPATED, OR IF THERE MAY BE RADIATION LEVELS GREATER THAN 0.5 mR (500μR)/HOUR.

SECTION 2: EMERGENCY INFORMATION

(A) LOCAL RESOURCES	SERVICE NAME	TELEPHONE NUMBER
EMERGENCY MEDICAL SERVICES	Victor Farmington Volunteer Ambulance Corps	585-924-3959 or 911
HOSPITAL (Map attached)	Strong Memorial Hospital	585-275-2100 or 911
FIRE DEPARTMENT	Victor Fire Department	911
POLICE / SECURITY	State Police, Victor Office	911
HAZMAT/ SPILL / OTHER RESPONSE	911	911

(B) CORPORATE RESOURCES

MALCOLM PIRNIE 24 / 7 EMERGENCY / INCIDENT TELEPHONE NUMBERS		(800) 478-6870 (24 HOURS)
CORPORATE HEALTH AND SAFETY **	JOSEPH GOLDEN, EMT-P, CET, CHMM	(914) 641-2978 WHI
FIER PROJECTS	JANE WEBER, CET	(914) 641-2559 WHI
MUNI/WEG/CMRT PROJECTS	LAURA LEE-CASEY,	(914) 641-2707 WHI
CORPORATE HEALTH PHYSICIST	LES SKOSKI	(201) 398-4377 NNJ
WORKERS COMP / OSHA LOG	LAURA LEE-CASEY, CHST, CET, EMT-P	(914) 641-2707 WHI
LEGAL DEPARTMENT **	JERRY CAVALUZZI	(914) 641-2950 WHI

**** TO BE NOTIFIED IN CASE OF ACCIDENT**

SECTION 3: PROJECT INFORMATION

(A) SITE / FACILITY INFORMATION:

SITE NAME: Modock Road Springs (Site#8-35-013)

ADDRESS: Modock Road

TOWNSHIP/ COUNTY: Victor, Ontario County, NY

☐ FEDERAL ☐ STATE

SITE CLIENT CONTACT: Jason Pelton

PHONE NUMBER: 518-402-9814

SITE SAFETY CONTACT: N/A

☐ MUNICIPAL / REGIONAL ☒ PRIVATE

(B) SITE CLASSIFICATION: (check all that apply)

☐ HAZARDOUS (RCRA)	☐ UST / LUST	☐ REFINERY
☐ HAZARDOUS (CERCLA / STATE)	☐ BROWNFIELD	☐ WTP / WWTP
☐ CONSTRUCTION	☐ CHEMICAL PLANT	☒ OTHER:
☐ LANDFILL (NON-HAZARDOUS)	☐ MANUFACTURING	Residential Neighborhood
☐ ACTIVE	☐ INACTIVE	

(C) TYPE OF FIELD ACTIVITY

☐ HAZARDOUS WASTE	☐ SOLID WASTE	☐ CONSTRUCTION
☐ HYDROGEOLOGY	☒ ENVIRONMENTAL	☒ AIR / ODOR
☐ WASTE WATER	☐ WATER	☐ OTHER:

(D) FIELD OBJECTIVES (Check all that apply)

		SAMPLING:	
☐ PRE-JOB VISIT	☐ AUDIT	☒ AIR	☐ SEDIMENT
☐ CONTRACTOR OVERSIGHT	☐ OTHER:	☐ SURFACE WATER	☐ SURFACE SOIL
☐ CONSTRUCTION MGMT		☐ GROUND WATER	☐ LANDFILL
☒ INSPECTION		☐ WASTE WATER	☐ OTHER
☐ INVESTIGATION SURVEY		☐ WASTE STREAM	

DATE(S) OF FIELD ACTIVITIES: Winter 2006/2007

(E) FIELD TASKS

MALCOLM PIRNIE TASKS

M1. Air and soil vapor sampling

M2.

M3.

M4.

TASKS PERFORMED BY OTHERS

01.

02.

03.

04.

SECTION 4: PROJECT SAFETY ORGANIZATION, HEALTH AND SAFETY TRAINING, AND MEDICAL MONITORING

(A) PROJECT HEALTH AND SAFETY ROLES, RESPONSIBILITIES AND COORDINATION

PROJECT OFFICER	The Project Officer (PO) is ultimately responsible for project performance. The PO seeks and gets appropriate approvals for risk management decisions (e.g. from Regional/Practice Director(s), Legal Council, Corporate Health and Safety), and selects and effective and qualified project team. The PO supports the Project Manager or Deputy Project Manager with appropriate resources.
PROJECT MANAGER DEPUTY PROJECT MANAGER	The Project Manager (PM) has the responsibility for executing the project in accordance with the scope of work and good engineering practice. The PM will supervise the allocation of resources and staff to implement specific aspects of this HASP and may delegate authority to expedite and facilitate any application of the program. The PM implements and executes an effective program of site-specific personnel protection and accident prevention. The Project Manager reports to the Project Officer. Deputy Project Managers (DPM) are assigned all duties and responsibilities of the Site Safety Officer in his/her absence.
CORPORATE HEALTH & SAFETY	Corporate Health and Safety is responsible for Malcolm Pirnie's overall Health and Safety Program and provides project guidance on air monitoring methodology, data interpretation and assistance in determining appropriate project engineering controls, work practices, and personal protective equipment. Corporate Health and Safety also reviews and approve HASPs in accordance with Section 1.
SITE SAFETY OFFICER ALTERNATE SITE SAFETY OFFICER (S)	The Site Safety Officer (SSO) is responsible for interpreting and implementing the site health and safety provisions set out in this HASP, and will guide the efforts of field team personnel in their day-to-day compliance with this HASP. The SSO has the ability and authority to make necessary changes or additions to this HASP and provide technical assistance to field team personnel on problems relating to worksite safety. The SSO has the authority to correct safety-related deficiencies in materials or practice and to call a Project STOP in the most serious cases. Alternate Site Safety Officer (ASSO) is assigned all duties and responsibilities of the Site Safety Officer in his/her absence.
PUBLIC INFORMATION OFFICER:	The Public Information Officer (PIO) is responsible for all public, press and other news media request for information, and is the only person authorized to provide such information
SITE RECORDKEEPER:	The Site Recordkeeper is responsible for the documentation of all related heath and safety data documentation, including but not limited to metrological data, instrument calibration, accident and injury reports, and air monitoring data.
FIELD TEAM LEADER:	The Field Team Leader (FTL) is responsible for leading "on-site" activities of field team personnel, and to ensure field team personnel perform only those tasks that have been identified in this HASP.
FIELD TEAM PERSONNEL	Field personnel have the following health and safety responsibilities: • Implement the procedures set forth in the HASP; • Take all reasonable precautions to prevent injury to themselves and their fellow employees; and • Perform only those tasks that they believe they can do safely, and immediately report any accidents and/or unsafe conditions in accordance with Section 1.

(B) PROJECT TEAM - The following Malcolm Pirnie personnel are designated to carry out the stated project job functions on site. THE SITE SAFETY OFFICER, OR A DESIGNATED ALTERNATE WILL BE ON-SITE DURING **ALL** SITE ACTIVITIES. (NOTE: One person may carry out more than one job function.)

PROJECT MANAGER: Bruce Nelson

PROJECT OFFICER: Daniel Loewenstein

SITE SAFETY OFFICER: Mark Flusche

ALTERNATE SAFETY OFFICER(S): Kelley Roe

PUBLIC INFORMATION OFFICER: Bruce Nelson

SITE RECORDKEEPER: Mark Flusche

FIELD TEAM LEADER: Mark Flusche

FIELD TEAM PERSONNEL: Brad Walker

Kelley Roe

Diane Zehrfuhs

The following subcontractors and governmental agencies have been informed by Malcolm Pirnie of emergency response procedures, and any potential fire, explosion, health, safety or other hazards of the site / facility by making this Site Specific Health and Safety Plan and site information obtained by others available during regular business hours. Subcontractors and governmental agencies shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations as described in **Section 1** of this plan.

SUBCONTRACTOR(S):

FEDERAL AND STATE AGENCY REPS: Jason Pelton (NYSDEC)

OTHER AGENCY REPS:

(C) HEALTH AND SAFETY TRAINING, MEDICAL MONITORING, AND FIT TESTING PROGRAM

The following project staff is included in the Malcolm Pirnie Health and Safety Training and Medical Monitoring programs. The details of these programs can be found in the Health and Safety Policies and Written Programs. (NOTE: At least one CPR/First Aid Trained person must be on-site during HAZWOPER and confined space entry activities.)

	HAZWOPER TRAINING				OTHER TRAINING								
NAME	INITIAL (DATE)	8HR (DATE)	MGR (DATE)	DOT (DATE)	CSE (DATE)	CPR / First Aid / (DATE)		BBP	MEDICAL (DATE)	FIT TEST MAKE	SIZE	TYPE	(DATE)
Mark Flusche	1/24/03	03/06	03/19/03			03/06	03/06	03/06	02/05	MSA	S	FF	0306
Aaron Bobar	08/99	03/06	03/19/03			09/06	09/06	09/06	08/06	MSA	M	FF	10/06
Diane Zehrfuhs	10/01	03/06	03/19/03			12/05	12/05		09/05	MSA	M	FF	10/01
Kelley Roe	07/89	03/06	03/19/06	3/25/04		03/06	03/06	03/06	04/06	MSA	M	FF	03/06
Brad Walker	05/00	05/06	06/03			12/04	07/05	06/02	11/07	NOR	M-L	FF	

SECTION 5: HAZARD ANALYSIS

(A) **ACTUAL OR POTENTIAL PHYSICAL HAZARDS** – (Check all that apply to Malcolm Pirnie activities)

- ☐ ANIMALS / PLANTS
- ☐ ASBESTOS / LEAD
- ☐ CHEMICAL EXPOSURE (See Section 5B/5C)
- ☐ CONFINED SPACE (See Section 12)
- ☐ DEMOLITION
- ☒ DRILLING
- ☐ DRUM HANDLING
- ☐ DUST, HARMFUL
- ☐ DUST, NUISANCE
- ☐ ELECTRICAL
- ☐ EXCAVATIONS (See Section 13)
- ☐ EXTREME COLD (See Section 10)
- ☐ FALL, >6' VERTICAL
- ☐ FALLING OBJECTS
- ☐ HEAT STRESS
- ☐ HEAVY EQUIPMT
- ☐ HEAVY LIFTING
- ☐ HOT WORK
- ☐ HUNTING SEASON
- ☐ IMMERSION
- ☐ IONIZING RADIATION
- ☐ LIGHT RADIATION (i.e., Welding, High Intensity)
- ☐ LIMITED CONTACT
- ☐ MOVING PARTS (LO / TO)
- ☐ NOISE (> 85 dB)
- ☐ NON-IONIZING RADIATION
- ☐ OVERHEAD OBJECTS
- ☐ POWERED PLATFORMS
- ☐ POOR VISIBILITY
- ☐ ROLLING OBJECTS
- ☐ SCAFFOLDING
- ☐ SHARP OBJECTS
- ☐ STEEP / UNEVEN
- ☐ TERRAIN
- ☐ TRAFFIC (STRUCK BY)
- ☐ OTHER: _____

(B) **PRESENCE OF HAZARDOUS MATERIALS STORED OR USED ON SITE** (CHECK ALL THAT APPLY)

☐ YES By Client / Owner ☐ YES By Malcolm Pirnie (See Section 11) ☒ NO

TYPE

- ☐ EXPLOSIVES
- ☐ COMPRESSED GASES
- ☐ FLAMMABLE / COMBUSTIBLE LIQUIDS
- ☐ FLAMMABLE / REACTIVE SOLIDS
- ☐ OXIDIZERS
- ☐ TOXIC / INFECTIOUS
- ☐ RADIOACTIVE
- ☐ CORROSIVE
- ☐ MISCELLANEOUS
- ☐ HAZARDOUS WASTE (Stored)

(C) **CHEMICAL HAZARDS OF CONTAMINANTS INFORMATION**

(1) IDENTIFIED CONTAMINANTS - Known or suspected hazardous/toxic materials (attach historical information, physical description, map of contamination and tabulated data, if available)

SUBSTANCES INVOLVED	CHARACTERISTICS	MEDIA	ESTIMATED CONCENTRATIONS	LOWEST PEL, or TLV
TCE	VO, TO	AIR	<1ug/m^3	269 mg/m^3 TVL
DCE	VO, TO	AIR	<1ug/m^3	790 mg/m^3 PEL
1,1,1-TCA	VO, TO	AIR	<1 ug/m^3	1900 mg/m^3 PEL

Media types: GW (ground water), SW (surface water), WW (wastewater), AIR (air), SL (soil), SD (sediment), WL (waste, liquid), WS (waste, solid), WD (waste, sludge), WG (waste, gas), OT (other).

Characteristics: CA (corrosive, acid), CC (corrosive, caustic), IG (ignitable), RA (radioactive), VO (volatile), TO (toxic), RE (reactive), BIO (infectious), UN (unknown), OT (other, describe

(2) DESCRIBE POTENTIAL FOR CONTACT WITH EACH MEDIA TYPE FOR EACH OF THE MPI TASKS LISTED IN SEC 3 (E):

MPI TASK	ROUTE OF EXPOSURE (INHAL/INGEST/CONTACT/ABSORB)	POTENTIAL FOR CONTACT (HIGH / MEDIUM / LOW)	METHOD OF CONTROL
1	Inhal	Low	WORK PRACTICES/PPE

The Site Safety Officer will brief the MPI field team on symptoms and signs of overexposure to chemical hazards

SECTION 6: SITE CONTROL MEASURES

(A) WORK ZONES - EXCAVATIONS, DRILLING OPERATIONS, AND HEAVY EQUIPMENT

MARK FLUSCHE has been designated to coordinate access control and security for Malcolm Pirnie operations on site. It is a Malcolm Pirnie policy that Malcolm Pirnie personnel will not enter trench or excavated areas without approval of Corporate Health and Safety. A safe perimeter has been established at the boundary of any excavation and/or a safe distance from excavators, drill rigs and other heavy equipment.

These boundaries are identified by: CAUTION TAPE/ CONES FORMING PERIMETER 15 FEET FROM WORK AREA

No unauthorized person should be within this area.

(B) WORK ZONES - CONTAMINATION

The prevailing wind conditions are WESTERLY A wind direction indicator is used to determine daily wind direction. The Command Post is located upwind from the Exclusion Zone or at a sufficient distance to prevent exposure should a release occur.

Control boundaries have been established and Exclusion Zone(s) (the contaminated area) have been identified. (Attach site map)

These boundaries are identified by: CONTAMINATION IS IN THE SUB-SURFACE – EXCLUSION ZONE WILL BE IMMEDIATE WORK AREA.

No unauthorized person should be within this area.

SECTION 7: SAFETY PROCEDURES / EQUIPMENT REQUIRED

Identify all procedures and equipment needed to eliminate or minimize exposure to hazards identified in Section 5.

- ☒ AIR MONITORING EQUIPMENT (See Section 9)
- ☒ BARRIER TAPE
- ☐ COMMUNICATIONS - ONSITE
- ☒ COMMUNICATIONS - OFFSITE (i.e., cell/digital phones if no other means)
- ☐ CONFINED SPACE PROGRAM & EQUIPMENT (See Section 12)
- ☐ EYE WASH
- ☐ EMERGENCY SHOWERS
- ☐ EMERGENCY AIR HORN
- ☐ FALL PROTECTION PROGRAM & EQUIPMENT
- ☒ FIRE EXTINGUISHER(S) - ABC
- ☒ FIRST AID KIT / BBP KIT
- ☐ FLOTATION DEVICE (USCG)
- ☐ GFCI EXTENSION CORDS
- ☐ HARNESS(S) / LIFELINE(S)
- ☐ INSECT / TICK REPELLANT
- ☐ HUNTING SEASON
- ☐ LADDER(S)
- ☐ LIGHTING - HAND HELD
- ☐ LIGHTING - FIXED / EMERGENCY
- ☐ LOCKOUT/TAGOUT PROGRAM & EQUIPMENT
- ☐ MSDSs – ATTACHED (See Section 11)
- ☐ MSDSs - FACILITY / OTHERS
- ☒ PPE - PHYSICAL HAZARDS (See Section 15)
- ☐ PPE - CHEMICAL HAZARDS (See Section 15)
- ☐ RESPIRATORY PROTECTION PROGRAM & EQUIPMENT (APR) (See Section 15)
- ☐ RESPIRATORY PROTECTION PROGRAM & EQUIPMENT (SAR) (See Section 15)
- ☐ TRAFFIC CONES
- ☐ VENTILATION EQUIPMENT
- ☐ OTHER:

SECTION 8: COMMUNICATIONS AND SAFE WORK PRACTICES

(A) COMMUNICATIONS - ONSITE

Whenever possible, communications between site personnel should be face-to-face. When verbal communications is not possible, radio communications shall be established.

In case of radio communications failure, or when respiratory protection is in use, the following hand signals will be used:

OK; I AM ALL RIGHT; I UNDERSTAND	THUMBS UP
NO; NEGATIVE	THUMBS DOWN
NEED ASSISTANCE	BOTH HANDS ON TOP OF HEAD
DANGER - NEED TO LEAVE AREA, NO QUESTIONS	GRIP PARTNERS WRIST WITH BOTH HANDS
HAVING DIFFICULTY BREATHING	HANDS TO THROAT

(B) COMMUNICATIONS - OFF SITE

If applicable, telephone communication to the Command Post should be established as soon as practical.

Telephone numbers that can be used to reach the command post are: 518-782-2100 and _____

(C) SAFE WORK PRACTICES

1. A "BUDDY SYSTEM" IN WHICH ANOTHER WORKER IS CLOSE ENOUGH TO RENDER IMMEDIATE AID WILL BE IN EFFECT. CLIENTS AND/OR CONTRACTORS MAY SERVE AS A "DESIGNATED BUDDY."
2. WHERE THE EYES OR BODY MAY BE EXPOSED TO CORROSIVE MATERIALS, SUITABLE FACILITIES FOR QUICK DRENCHING OR FLUSHING SHALL BE AVAILABLE FOR IMMEDIATE USE (SEE SECTION 7).
3. DO NOT KNEEL ON THE GROUND WHEN CHEMICAL PROTECTIVE CLOTHING IS BEING USED.
4. IF DRILLING EQUIPMENT IS INVOLVED, HAVE A CURRENT UTILITY SURVEY, AND KNOW WHERE THE 'KILL SWITCH' IS.
5. CONTACT WITH SAMPLES, EXCAVATED MATERIALS, OR OTHER CONTAMINATED MATERIALS MUST BE MINIMIZED.
6. ALL ELECTRICAL EQUIPMENT USED IN OUTSIDE LOCATIONS, WET AREAS OR NEAR WATER MUST BE PLUGGED INTO GROUND FAULT CIRCUIT INTERRUPTER (GFCI) PROTECTED OUTLETS (SEE SECTION 7).
7. IN THE EVENT OF TREACHEROUS WEATHER-RELATED WORKING CONDITIONS (I.E., THUNDERSTORM, LIMITED VISIBILITY, EXTREME COLD OR HEAT) FIELD TASKS WILL BE SUSPENDED UNTIL CONDITIONS IMPROVE OR APPROPRIATE PROTECTION FROM THE ELEMENTS IS PROVIDED.
8. SMOKING, EATING, CHEWING GUM OR TOBACCO, OR DRINKING ARE FORBIDDEN EXCEPT IN CLEAN OR DESIGNATED AREAS.
9. USE OF CONTACT LENSES NEAR CHEMICALS OR DURING USE OF RESPIRATORY PROTECTION IS PROHIBITED AT ALL TIMES.
10. GOOD HOUSEKEEPING PRACTICES ARE TO BE MAINTAINED.
11. SITE / FACILITY SPECIFIC SAFE WORK PRACTICES:

NOT APPLICABLE

SECTION 9: ENVIRONMENTAL MONITORING ☐ THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

(A) The following environmental monitoring instruments shall be used on site at the specified intervals and recorded in the site logbook. (NOTE: If monitoring period is "OTHER", monitoring schedule will be attached to this plan.)

EQUIPMENT	MONITORING PERIOD				ACTION LEVEL
☐ Combustible Gas Indicator	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ O_2 Meter	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Toxics: ☐ CO ☐ H_2S	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Other: _____	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☒ PID (Lamp 10.6 eV)	☐ Continuous	☐ Hourly	☐ x Day	☒ Other	25 ppm
☐ FID					
☐ Colorimetric tubes:					
_____	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
_____	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Radiation: ☐ α ☐ β ☐ gamma	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Respirable Dust Meter	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Noise Meter	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Other:	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
_____	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
_____	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	

(B) Monitoring equipment is to calibrated according to manufacturers' instructions. Record calibration data and air concentrations in the Health and Safety on-site log book.

(C) Recommended Action Levels for Upgrade or Downgrade of Respiratory Protection, or Site Shutdown and Evacuation. These are average values. Consideration should be given to the potential for release of highly toxic compounds from the waste or from reaction by-products. Levels are for persistent (> 10 min) breathing zone measurements in non-confined spaces. **For unexpected conditions, stop all work and contact Corporate Health and Safety.**

<u>Oxygen Levels</u>

Less than 19.5%	Level B necessary for work to start / continue. Consider toxicity potential.
19.5% to 23.5%	Work may start / continue. Investigate changes. Continuous monitoring.
Greater than 23.5%	PROHIBITED WORK CONDITION

<u>Flammability / Explosive Hazards</u>

Less than 10% of LEL	Work may start / continue. Consider toxicity potential.
10% to 25% of LEL	Work may start / continue. Continuous monitoring.
Greater than 25% of LEL	PROHIBITED WORK CONDITION.

<u>Uncharacterized Airborne Organic Vapors or Gases</u>

Background*	Work may start / continue. Continue to monitor conditions.
Up to 5 meter units (m.u. or "ppm") above background	Level C necessary for work to start / continue. Continuous monitoring. Use Colorimetric tubes to characterize vapors.
Up to 50 m.u. above background	Level B necessary for work to start / continue. Continuous monitoring.
Greater than 50 m.u.	PROHIBITED WORK CONDITION.

*** Off-site clean air measurement**

<u>Characterized Airborne Organic Vapors or Gases</u>**

Up to 50% of TLV, or PEL or REL	Work may start / continue. Continue to monitor conditions.
Up to 25 times the TLV, or PEL or REL	Level C necessary for work to start / continue. Continuous monitoring.
Up to 500 times the TLV, or PEL or REL	Level B necessary for work to start / continue. Continuous monitoring.
Greater than 500 times the TLV, or PEL or REL	PROHIBITED WORK CONDITION.

** **Use mixture calculations (% allowed = $3C_NEL_N$) if more than one contaminant is present.**

<u>Radiation</u>

Less than 0.5 mR/Hour (500 μR)	Work may start / continue. Continue to monitor conditions.
Up to 1 mR/Hour above background	Work may start / continue with Radiation Safety Officer present on site.
Greater than 1 mR/Hour above background	PROHIBITED WORK CONDITION.

SECTION 10: PERSONAL MONITORING ☐ THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

(A) PERSONAL EXPOSURE SAMPLING (Consider if high levels of noise or high concentrations of lead, mercury or arsenic are present)

The following personal monitoring will be in effect on site: SIGNIFICANT NOISE IS NOT EXPECTED – NO PERSONAL MONITORING WILL BE IMPLEMENTED.

A copy of personal monitoring results is to be sent to Corporate Health and Safety for inclusion in the Employee's Confidential Exposure Record File.

(B) HEAT / COLD STRESS MONITORING

The expected air temperature will be 30-60 ºF. If it is determined that heat stress or cold stress monitoring is required (mandatory for heavy exertion in PPE at temperatures over 70ºF, or at temperatures under 40ºF or wind chill equivalent), the following procedures shall be followed (describe procedures in effect, for heat stress i.e., monitoring body temperature, body weight, pulse rate; for cold stress i.e., appropriate clothing, shelter breaks):

HEAT AND COLD STRESS MONITORING BY PERSONAL OBSERVATION WILL BE PERFORMED.

SECTION 11: HAZARD COMMUNICATION PROGRAM ☒ THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

If chemicals are introduced to the site by Malcolm Pirnie (e.g., decontamination liquids, preservatives, etc.), a copy of the Malcolm Pirnie Hazard Communication Program and Material Safety Data Sheets (MSDSs) of chemicals introduced by Malcolm Pirnie to the site is attached to this plan. The Site Safety Officer will review this information with all field personnel prior to the start of the project, and will inform other employers (e.g., Owner, Contractor and Subcontractors) the availability and location of this information. The Comprehensive List of Chemicals introduced by Malcolm Pirnie to this site is:

All chemicals being introduced to the site, hazardous/potentially hazardous samples prepared at the site, and/or any hazardous materials previously sent to the site, **that will be stored at the site or will be transported from the site by common carrier**, will be packaged, labeled and identified as hazardous materials in accordance with U.S. Department of Transportation (DOT) and/or International Air Transport Association (IATA) regulations by a trained HazMat employee.

(NOTE: At multi-employer sites, the Site Safety Officer will obtain information, if applicable, on hazardous chemicals other employers may produce or introduce to the job site to which Malcolm Pirnie employees may be exposed, including the location of their written hazard communication program(s), labeling program(s), and Material Safety Data Sheet(s).

SECTION 12: CONFINED SPACE ENTRY ☒ THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

If a permit-required confined space entry will be made on site, a copy of the Malcolm Pirnie Confined Space Entry Program, and a completed Malcolm Pirnie Confined Space Pre-Entry Inspection Check List will be attached to this plan. A Confined Space Entry Permit must be completed and posted outside the confined space prior to entry, and the entry will follow the Malcolm Pirnie Confined Space Entry written program. Permits are to be saved and logged with project documentation.

SECTION 13: EXCAVATION SAFETY ☒ THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

Excavations being created in order to accomplish Malcolm Pirnie tasks or in progress during Malcolm Pirnie inspection of other activities or tasks, shall be shored or slopped or otherwise protected to prevent accidental collapse prior to entry, in accordance with Subpart F of 29 CFR 1926. It is Malcolm Pirnie policy that Malcolm Pirnie personnel will not enter trench or excavated areas without approval of Corporate Health and Safety. If an entry into an excavation by Malcolm Pirnie personnel is necessary, a Excavation Plan identifying the Competent Person and the protective measure to be used (i.e., sloping, shoring, trench box) will be attached to this plan.

SECTION 14: DECONTAMINATION PROCEDURES ☒ THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

Personnel and equipment leaving the Exclusion Zone shall be thoroughly decontaminated. The Site Safety Officer is responsible for monitoring adherence with this decontamination plan.

A _____ decontamination protocol shall be used with the following decontamination stations:

(1) _____

(2) _____

(3) _____

(4) _____

(5) _____

(6) _____

(7) _____

(8) _____

(Other) _____

The following decontamination equipment is required: _____

☐ Decon Pad (Plastic Sheet) ☐ Dry Brushes ☐ Buckets Other _____

☐ Trash Cans/Bags ☐ Wet Brushes ☐ Hose / Spray _____

_____ Will be used as the decontamination solution

SECTION 15: PERSONAL PROTECTIVE EQUIPMENT

TASK *	RESPIRATORS & CARTRIDGE[1]	USE ** (See Section 16)	CLOTHING ***	GLOVES	BOOTS	OTHER
1	N/A	N/A	N/S	N	SL	N/A

* Same as Section 3E

**UP = Upgrade
CONT = Continuous

*** **NOTE:** PPE use will be in accordance with Malcolm Pirnie's Health and Safety Policy and Written Programs.

CODES:

RESPIRATORS[1]	CARTRIDGES[1]	CLOTHING	GLOVES[2]	BOOTS	OTHER
HF = Half Face APR	P = Particulate	N/S = No Special	Co = Cotton	SL = Leather Safety	HH = Hard Hat [3]
FF = Full Face APR	OV = Organic Vapors	C = Coveralls	Le = Leather [3]	H = Hip (Fireman)	G = Safety Glasses [3]
ESCBA = Escape Bottle	AG = Acid Gas	T = Tyvek	L = Latex	O = Latex overboots	GP = Glare Protection
SAR = Airline	Mult = Multi-Gas/Vapor	Sx = Saranex	N = Nitrile		GI = Goggles - Impact
SCBA = SCBA	Other	PT = PE Tyvek	B = Butyl		GS = Goggles - Splash
			Neo = Neoprene		FS = Face Shield
			V = Viton		HP = Hearing Protection [3]
			PVC = Polyvinyl Chloride		RV = Reflective Vests [3]
			PVA = Polyvinyl Alcohol		**[3] Should be considered for all field jobs**
			Other:		

[1] - List all that apply, i.e., FF w/ OV/AG/P

[2] - Use same codes for clothing and boots of same material

Respiratory protection will be upgraded under the following conditions: NO UPGRADE ANTICIPATED BASED ON SITE CONDITIONS

IF SITE CONDITIONS CHANGE, WORK WILL BE HALTED AND HASP AMENDED TO INCLUDE RESPIRATORY PROTECTION.

The following cartridge change out schedule is to be followed onsite (attach any calculations to plan):

N/A

SECTION 16: EMERGENCY ACTION PLAN

The following standard emergency response procedures will be used by onsite personnel. The Site Safety Officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedure are followed.

(A) EVACUATION

All work activities are suspended and the site is to be EVACUATED IMMEDIATELY, when there is a threat to life or health as determined by individual good judgment, i.e. fire, hazardous chemical spill, dangerous gas leak, severe weather (i.e., tornado); or when notified by other site / facility staff and local fire or police officials.

If an evacuation is called for, the emergency alarm system for weather-related, medical, fire and other evacuation emergencies is:

PERSONAL NOTIFICATION OR HAND SIGNALS

Evacuation from the Exclusion Zone should whenever possible occur through the decontamination line. In those situations where egress in this manner cannot occur, the following emergency escape routes have been designated (document on map if possible):

N/A

Once evacuated off site, all staff should gather at Nearest Cross Street which is a minimum of 250 feet away from the incident

(B) FIRE OR EXPLOSION

Upon discovery of a fire or an explosion, the above-designated emergency signal shall be sounded and all personnel shall assemble at the decontamination line. The fire department is to be notified and all personnel moved to a safe distance (minimum 250') from the involved area.

If a person's clothing should catch fire, burning clothing may be extinguished by having the individual drop to the floor and roll. If necessary, physically restrain the person and roll them around on the floor to smother the flames. Use a fire blanket or extinguisher if one is readily available and you have been trained in its use. Call emergency medical services if not already done so.

If a person's clothing should become saturated with a chemical, douse the individual with water from the nearest safety shower if available. Consult the chemical Material Safety Data Sheets (MSDSs) for further information. Call emergency medical services if indicated by the MSDSs.

NEVER RE-ENTER THE SITE / FACILITY until the emergency has been declared over and permission to re-enter has been given by site / facility health and safety staff or local fire or police officials. If any staff is unaccounted for, notify an individual in charge.

(C) MEDICAL EMERGENCY

If you discover a medical emergency and are by yourself, CALL OUT FOR HELP. When someone arrives, tell them to call for help. If no one comes or you know you are alone, provide whatever care you can for 1 minute, then make the call yourself. (See Section 2)

Upon notification of an injury in the Exclusion Zone, the designated emergency signal shall be sounded. All site personnel shall assemble at the decontamination line. The SSO or alternate should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement to the Support Zone. The onsite CPR/FA personnel shall initiate the appropriate first aid, and contact should be made for an ambulance (and other emergency services as needed) and with the designated medical facility (if required). No persons shall reenter the Exclusion Zone until the cause of the injury or symptoms is determined.

The hospital is 20 minutes from the site. Ambulance response time is 10 minutes. N/A of N/A was contacted on _____ and briefed on the situation, the potential hazards, and the substances involved. When IDLH conditions exist, arrangements should be made for onsite standby of emergency services.

A map for directions to the nearest hospital is attached to this plan. If not, the directions are: SEE ATTACHED MAP

(D) SAFETY EQUIPMENT FAILURE

If any other equipment (i.e., air monitoring) on site fails to operate properly, the FTL and/or SSO shall be notified to determine the effect of this failure on continuing operations on site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the work area until the situation is evaluated and appropriate actions taken.

(E) FOLLOW UP

In all situations, when an on site / facility emergency results in evacuation of the work area, or a “large spill” has occurred, staff shall not resume work until:

- The conditions resulting in the emergency have been corrected;
- The hazards reassessed by the SSO and Corporate Health and Safety;
- The HASP has been reviewed by the SSO and Corporate Health and Safety; and
- Site personnel have been briefed on any changes in the HASP by the SSO.

SECTION 17: SPILL CONTAINMENT / CONTROL ☒ THIS SECTION NOT APPLICABLE TO SITE ACTIVITIES

For most chemicals introduced to the worksite, or under control of Malcolm Pirnie employees, spills of chemicals would be considered incidental and would be controlled in the immediate area of the spill. Such spills shall be handled utilizing precautions appropriate for the chemical characteristics specified in the MSDS for the chemical including spill control methods and selection and use of minimum personal protective equipment.

For chemicals introduced to the worksite, or under control of Malcolm Pirnie employees, that would cause a "large spill" (greater than 55 gallons), a copy of the appropriate Emergency Response Guidebook (ERG) guide shall be attached to this plan, and a spill response contractor shall be identified in Section 2.

SECTION 18: EMPLOYEE ACKNOWLEDGEMENTS

PLAN REVIEWED BY:		DATE
Project Manager:		12/11/06
Project Leader:		12/11/06
Local H&S Coordinator:		12/8/2006
Corporate H & S		

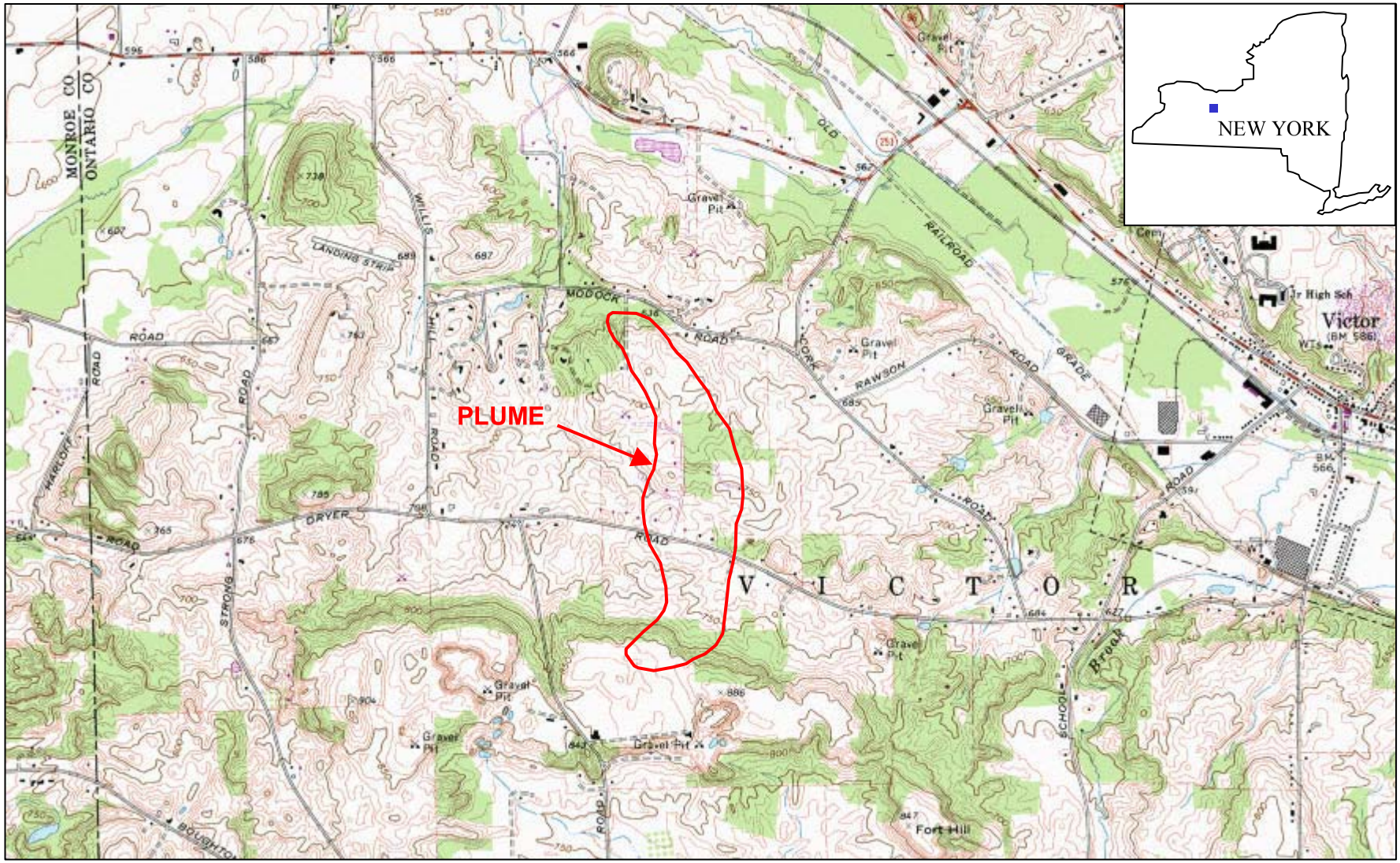
I acknowledge that I have read the information on this HASP, attached Material Safety Data Sheets (MSDSs), DOT Emergency Response Guides, and Health and Safety Programs.
I understand the site / facility hazards as described and agree to comply with the contents of the plan.

EMPLOYEE (Print Name)		
MARK FLUSCHE		12/8/06
Mark de Jong	Mark de Jong	2/8/07

VISITOR (Print Name)		

ATTACHED DOCUMENTS

☐ MSDS(s)	☐ Hazard Communication Written Program	☐ Confined Space Entry Written Program	☐ DOT ERG Guides
☒ Site Map	☒ Personal Protective Equipment Written Program	☐ Excavation Safety Plan	☐ Respiratory Protection Program
☒ Hospital Directions	☐ Emergency Action Plan	☐ Evacuation Routes	☐ Cartridge Change Out Calculations
☐ Other			



MAP SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC SERIES, VICTOR QUADRANGLE (PHOTOREVISED 1978)

APPROXIMATE SCALE IN FEET

0 1200 2400 4800

MALCOLM PIRNIE

MODOCK ROAD SPRINGS/DLS SAND AND GRAVEL, INC. SITE (HW 8-35-013)
VICTOR, NEW YORK

APPROXIMATE PLUME EXTENT

FIGURE 1

F:\PROJECT\0266353\FILE\IIWA Work Plan\Figures 1&2.ppt

Google Maps

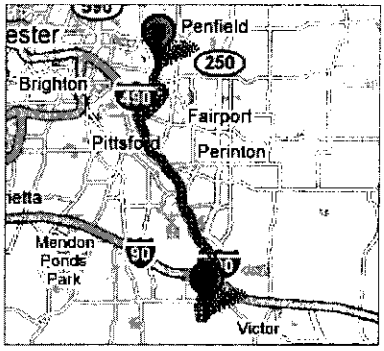
Start **Modock Rd**
Victor, NY 14564
End **Strong Memorial Hospital**
625 Panorama Trl # 3, Rochester, NY 14625
Travel **13.1 mi (about 20 mins)**

Directions

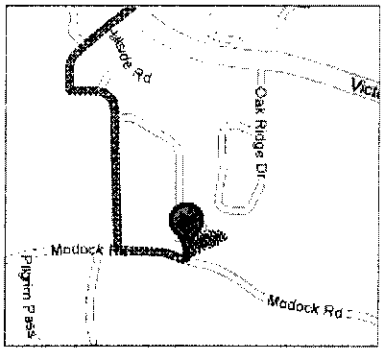
	1. Head **west** from **Modock Rd**	**0.2 mi**
➡	2. Turn **right** at **Raccoon Run**	**0.3 mi** 1 min
	3. Continue on **Deer Xing**	**0.4 mi** 1 min
⬅	4. Turn **left** at **Victor Mendon Rd**	**0.1 mi**
➡	5. Turn **right** at **Phillips Rd**	**0.8 mi** 2 mins
➡	6. Turn **right** at **Main St Fishers**	**0.4 mi**
⬅	7. Turn **left** at **RT-96 N**	**0.3 mi**
	8. Take the **I-490 W** ramp	**7.6 mi** 7 mins
	9. Take the **RT-31F** exit **25** to **Fairport/East Rochester**	**0.3 mi**
➡	10. Turn **right** at **Fairport Rd**	**0.4 mi**
⬅	11. Turn **left** at **S Washington St**	**0.8 mi** 1 min
	12. Continue on **N Washington St**	**0.5 mi** 1 min
⬅	13. Bear **left** at **Panorama Trl S**	**1.1 mi** 2 mins
	14. Arrive at **Strong Memorial Hospital** 625 Panorama Trl # 3, Rochester, NY 14625	

These directions are for planning purposes only. You may find that construction projects, traffic, or other events may cause road conditions to differ from the map results.

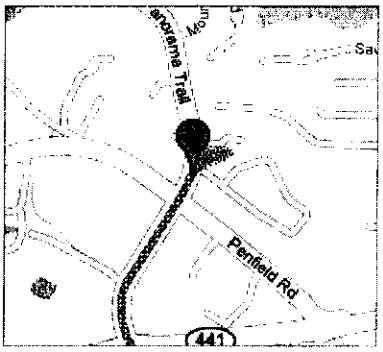
Overview



Start



End



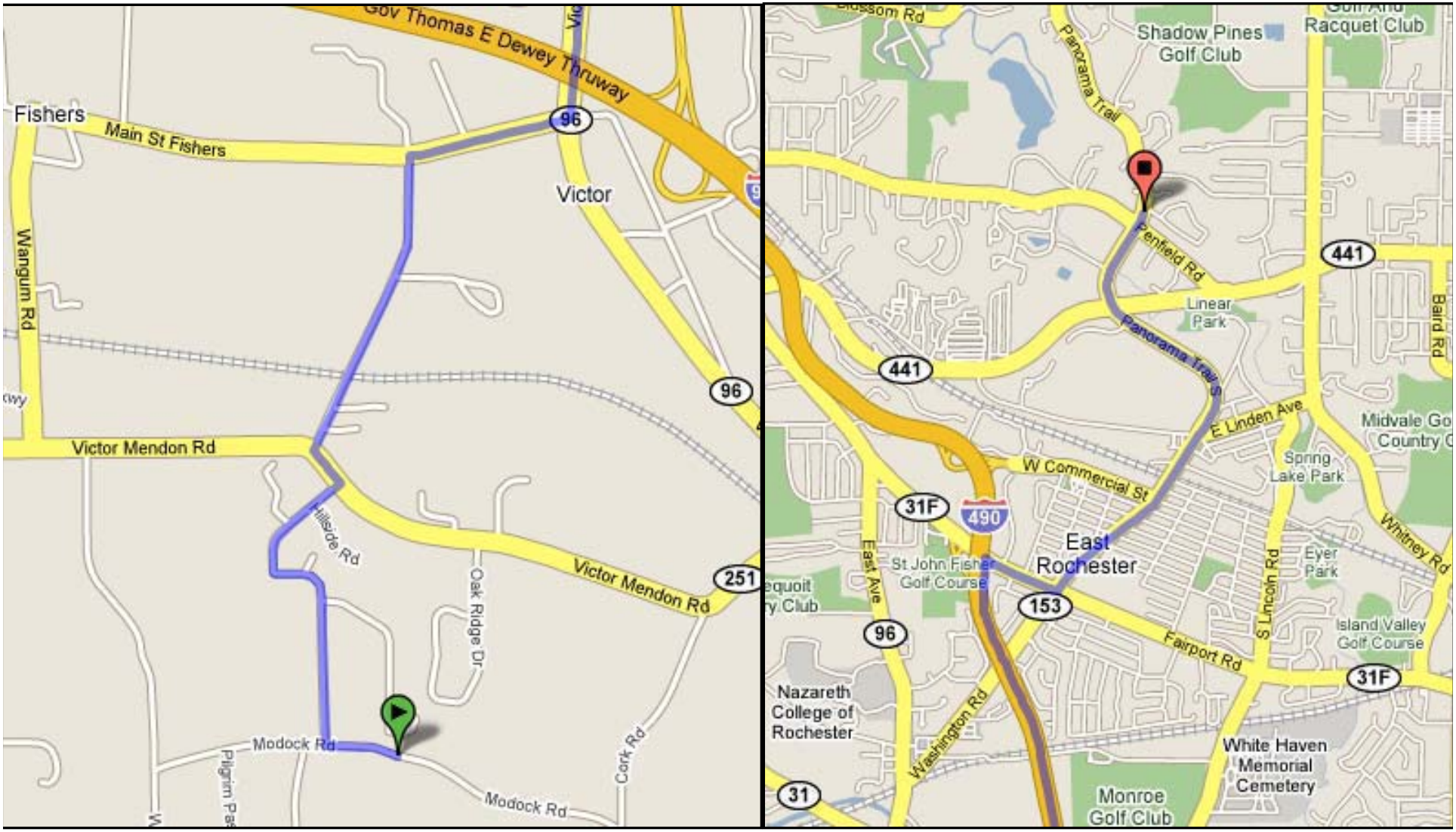

Gov Thomas E Dewey Thruway
Fishers
Main St Fishers
96
Victor
Wangum Rd
96
Victor Mendon Rd
Hillside Rd
Oak Ridge Dr
Victor Mendon Rd
251
Modock Rd
Pilgrim Pa
Modock Rd
Cork Rd
Shadow Pines Golf Club
Racquet Club
Panorama Trail
Penfield Rd
441
Linear Park
Baird Rd
441
Panorama Trail S
E Linden Ave
Midvale Go
Country C
W Commercial St
Spring Lake Park
31F
490
East Rochester
Whitney Rd
East Ave
St John Fisher Golf Course
S Lincoln Rd
Eyer Park
153
96
Fairport Rd
Island Valley Golf Course
31F
Nazareth College of Rochester
Washington Rd
White Haven Memorial Cemetery
31
Monroe Golf Club

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

The purpose of this section is to assist employees in the proper selection and use of personal protective equipment (PPE). Malcolm Pirnie staff shall use PPE when engaged in activities where there is a potential for exposure to chemical, biological, physical or mechanical hazards, or as otherwise required by applicable laws and regulations.

The occupational use of PPE is governed by a series of standards promulgated by the Occupational Safety and Health Administration (OSHA) and found in Title 29 CFR 1910, Subpart I, *Personal Protective Equipment*. These include 29 CFR 1910. 133, *Eye and Face Protection*; 29 CFR 1910.135, *Occupational Head Protection*; and, 29 CFR 1910.136, *Occupational Foot Protection*. PPE required by the OSHA *Respiratory Protection Standard*, 29 CFR 1910.134, and the *Noise Standard* including the *Hearing Conservation Amendment*, 29 CFR 1910.95, are addressed separately in this Manual.

The OSHA standards dealing with personal protective equipment consist of three types of requirements. Section 1910.132 is a set of general requirements covering all types of equipment and all situations where it is needed. Section 1910.132 requirements do not cover section 1910.134, *Respiratory Protection*, or section 1910.137, *Electrical Protective Devices*, which are subjects of separate rule making. The other sections of Subpart I each give requirements for one particular type of equipment; and certain paragraphs in standards not primarily concerned with PPE call for protective equipment to be used under working conditions regulated by that section. In deciding on protective equipment for a project, project managers may find that provisions of all three apply.

OSHA does not recommend PPE if administrative or engineering controls will eliminate a hazard. Such controls are always preferred over reliance on personal protection to shield an employee from chemicals, processes or machinery known to be dangerous.

2.0 POLICY

A written hazard evaluation will be conducted for all Malcolm Pirnie worksites, **on all field projects**, other than work in office environments, to:

- Determine potential hazards to the health and safety of Malcolm Pirnie.
- Evaluate the need for and the feasibility of engineering and/or administrative controls of the hazards.
- Specify effective types of personal protective equipment to reduce potential exposures.

Individual articles of a PPE ensemble will be chosen by a qualified employee, Project Safety Officer (PSO) or Corporate Health & Safety, to provide the best available protection against known or reasonably anticipated chemical and physical hazards.

Individual articles of a PPE ensemble will be sized to fit the individual wearing it.

Compromised PPE will not be worn by Malcolm Pirnie employees or employees of Malcolm Pirnie subcontractors.

Contaminated PPE materials will be left at the work site if this can be done in a **responsible** manner.

3.0 RESPONSIBILITIES

OSHA requires that Malcolm Pirnie initiate engineering and work practice controls, to the extent feasible, to minimize the potential for employee exposure to chemical, biological, physical, or mechanical hazards. If recognized health and safety hazards cannot be practically removed from the work environment, and if employee exposures cannot be significantly reduced by administrative means, Malcolm Pirnie must provide employees with appropriate PPE and ensure that it is used properly.

3.1. Non-Hazardous Waste Projects

Project Managers: Project Managers are responsible for providing the project resources necessary to determine the appropriate level of PPE for employees working on their projects. To this end, Project Managers and/or PSOs will conduct a preliminary hazard assessment of the worksite and tasks to be performed and specify the appropriate PPE ensemble for each task and location. The Hazard Assessment Checklist, found in Appendix A, should be used to conduct the preliminary hazard assessment. Based upon the information generated in the assessment, and good safety practices, the Project Manager or the PSO can:

- Evaluate, design or purchase feasible engineering controls to isolate the hazard.
- Develop procedures and work practices to control the hazard.
- Evaluate and specify PPE required for the safe completion of the project.

3.2. Hazardous Waste Projects

For hazardous waste projects, a hazard analysis is conducted when developing a Site Safety Plan (SSP) for field activities. The SSP writer and reviewers evaluate the potential safety and health hazards posed by the project tasks. Then, in the SSP, they specify levels of protection, the specific PPE in each level, and action level ranges that govern the selection of each level.

Any questions regarding hazard evaluations should be addressed to the SBU Health & Safety Leader or to the Manager, Health & Safety, COR.

Qualified Employee: As a practical matter, the Project Manager is likely to delegate the task and hazard evaluation to a junior member of the project team who will often serve as the PSO. Evaluating hazards and selecting appropriate engineering, work practice and PPE control methods for a project is an important responsibility. To promote the effective completion of this task, the Project Manager will delegate this task to an individual who meets certain education and training qualifications. Employees are considered qualified to select PPE if they meet either of these criteria:

- The employee has received formal training in industrial hygiene or safety practices.
- The employee has received training in the selection, use, maintenance and limitations of PPE (e.g., 40-Hour Hazardous Waste Operations, Construction Site Safety training, or PPE Training), is familiar with the site, the tasks to be completed and the known or reasonably anticipated site and task hazards.

Project Safety Officer: The Project Safety Officer (PSO) on hazardous waste projects has the responsibility and authority to see that the provisions of the approved SSP are implemented during site activities. The person selected to be PSO must meet the minimum qualifications above.

At the site, the PSO evaluates air-monitoring data, work tasks and site conditions and then specifies a pre-approved level of protection PPE ensemble to be used by Malcolm Pirnie employees. If site conditions change, the PSO may only upgrade or downgrade the level of protection in accordance with the action levels and PPE ensembles specified in the approved SSP. Modifications to the PPE ensembles, the task evaluations or the action levels as a result of unforeseen circumstances must be approved by the SBU Health & Safety Leader (HSL) and/or the Manager, Health & Safety, COR.

Equipment Coordinators: The office Equipment Coordinator (E.C.) is responsible for procuring and dispensing expendable PPE for that office.

Employees: Employees are responsible for using the PPE in accordance with both the training they receive, and instructions provided. Employees should alert the PSO or team leader if proper PPE has not been assigned, if they have not been trained in the use and limitations of assigned PPE, and if the PPE is damaged, compromised, or does not appear to be working.

4.0 HAZARD ASSESSMENT

Malcolm Pirnie prepares written hazard assessments in order to identify the appropriate PPE ensemble(s) for project work activities. The PPE ensemble(s) for hazardous waste projects are specified in the SSP. A particular ensemble is chosen based upon:

- Proposed work tasks.
- Potential routes of entry and points of contact.
- Airborne contaminant action levels specified in the SSP.

For projects that do not require a SSP, the Preliminary Hazard Assessment form (Appendix A) is used to develop PPE requirements. The written Hazard Assessment form provides the certifier's name, signature, date(s), and identification of assessment documents. Contact the HSL or the Manager, Health & Safety, COR for further assistance.

When new processes are implemented or when existing processes change, the PSO should be notified by the project staff so that the existing Hazard Assessment may be reviewed and updated as necessary.

5.0 PPE SELECTION

On projects defined by OSHA's *Hazardous Waste Operations and Emergency Response* standard (29 CFR 1910.120), and on other projects as determined by the hazard assessment, PPE ensembles (Levels of Protection) are selected based upon:

- The toxic materials, physical agents, or waste contaminants known to be present.
- Contaminant concentrations in the waste media.
- The toxicology and the probable routes of entry into the body exhibited by the contaminants.
- Known or expected airborne contaminant concentrations.
- Potential for exposure to physical agents (e.g., electrical, mechanical, hydraulic, pneumatic, chemical, thermal, nuclear, or non-ionizing radiation energy) based upon the type and strength of the energy source and the proximity of the employee to the source.

Individual articles of a PPE ensemble are chosen by a "qualified employee" (previously defined) to provide the best available protection against known or reasonably anticipated chemical and physical hazards. Multiple articles of PPE may be "layered" to provide multi-contaminant and full protection. The various elements of PPE will only protect a worker if the following conditions are met:

- The individual article of PPE must be effective against the hazard (see Appendix B).
- The individual article of PPE must be sized, fitted, worn and secured correctly.

- The functioning surface of the PPE must be intact and not compromised by holes, rips, tears, or split seams.
- The PPE ensemble (see Appendix C) chosen must be effective against all the hazards in the specific situation.

Non-specific action levels have been developed by the U.S. EPA and others as guidelines for determining respiratory and other PPE requirements when exposure air monitoring is conducted by non-specific response field instrumentation. Specific action levels may be used when a site is well characterized, the type and relative concentrations of air contaminants are well known, and appropriate field instrumentation is used to provide real-time exposure data. Malcolm Pirnie has adopted both sets of action levels. These can be found in Appendix C and in the current Malcolm Pirnie Short Form Site Safety Plan form. Airborne Contaminant Action Levels for Selection of PPE Ensembles is provided in Appendix D.

6.0 PPE USE

Individual articles of a PPE ensemble will be sized to fit the individual wearing it. To provide effective protection during removal and decontamination, PPE will be donned in the reverse order presented in the appropriate decontamination table. Duct tape will be used to seal overlaps between gloves /boots and the protective clothing, and to reinforce weak seams or tighten the waist of the garment. PPE will be cleaned and maintained in accordance with manufacturer specifications.

6.1. Fitting PPE

Proper fit of PPE is critical to providing adequate protection. Proper fit is also associated with comfort and comfort is essential if the employees are to wear the PPE provided. Malcolm Pirnie provides employees with a choice of PPE from several different vendors in a selection of sizes. In training, Malcolm Pirnie discusses and practices proper fitting, use and wear of the PPE.

OSHA believes fit is a critical factor in the overall effectiveness of PPE. PPE that fits poorly will not afford the necessary protection. PPE that is too small will bind and tear; PPE that is too large is harder to manage and can become tangled in equipment presenting additional hazards. Care should be taken to ensure the right size is selected. The user should be fit with the protective device and given instructions on care and use of the PPE. It is very important that employees be made aware of all warning labels for, and limitations of, their PPE.

Adjustment of the PPE should be made on an individual basis, with the goal of achieving a comfortable fit that will maintain the protective device in the proper position. Particular care should be taken in fitting devices for eye protection used against dust and chemical splashes, to ensure that the devices are sealed to the face. In addition, proper

fitting of helmets is important to ensure that no helmet will fall off during work operations. When manufacturer's instructions are available, they should be followed carefully.

6.2. Damaged PPE

Compromised PPE will not be worn by Malcolm Pirnie employees. When a PPE wearer or their buddy notices that an article of PPE has been compromised, the two will quickly move to the decontamination/support zone to replace or repair the defective article(s).

6.3. Employee-Owned PPE

Malcolm Pirnie provides all required PPE at no or little cost to its employees. When employees plan to use personally owned PPE, the employee must present it to the PSO for inspection prior to use at the work site. If the PSO finds that the employee-owned PPE is adequate and has been properly maintained, the employee may use their personal PPE.

7.0 IN-USE PPE MONITORING

When wearing PPE at sites, Malcolm Pirnie personnel shall report any perceived problems or difficulties to the PSO. Likely concerns are:

- Perception of odors while wearing APR/SAR.
- Skin, eye, or nasal irritation.
- Unusual residues on PPE.
- Suspected degradation of PPE ensemble.
- Excessive discomfort or fatigue.
- Sudden increases in breathing resistance.
- Personal responses such as rapid pulse, nausea, and chest pain.

Should personnel experience any of these problems while wearing PPE, the PSO will temporarily shut down both Malcolm Pirnie and subcontractors operations on the site and all personnel will move to the support zone until the cause of the problem is identified and corrected.

8.0 PPE INSPECTION

PPE shall be inspected by employees before donning and periodically while in use. Protective clothing should be visually inspected before its use for imperfect seams, uneven coatings, tears, and malfunctioning closures. Gloves should be checked for pinholes by entrapping air in the glove, then rolling the cuff toward the fingers, or by inflating the glove and holding it under water. In either case, no air should escape. If a defect is observed in

protective clothing or in gloves, the defective item should not be worn onsite. Clean defective apparel shall be disposed of in the trash. Contaminated defective apparel shall be left on-site in appropriate containers if possible.

During field activities, protective clothing should be periodically inspected by the employee and his/her assigned buddy for rips and punctures. Small rips or punctures observed in

garments may be taped over, or the garment may be exchanged for a new one. Large rips or punctures require exchange.

9.0 PPE DECONTAMINATION

Any site where hazardous waste operations occur must have a written plan that outlines decontamination procedures (see 29 CFR 1910.120 [k]). Employees must be trained on these procedures and the decontamination line must be operational when anyone enters areas on-site where there is suspected contamination.

9.1. The Decontamination Plan

The written decontamination plan addresses:

- The number and placement of decontamination stations.
- Decontamination equipment and methods.
- Methods for disposing of clothing and equipment that may not be completely decontaminated.
- Methods of cleaning decon equipment and disposing of decon wastes.

The decontamination plan shall be based on the assumption that all equipment and personnel leaving the Exclusion Zone ("hot zone") will be grossly contaminated. A personnel decontamination system will be established to wash and rinse (at least once) all reusable PPE worn in contaminated areas. This should be done in combination with a sequential doffing of protective equipment, starting at the first decontamination station with the most heavily contaminated item and progressing to the last decontamination station with the least contaminated article.

The decontamination plan developed should address the following factors:

- ***Type of Contaminant***. The extent of personnel decontamination is a function of the amount of the contaminant, its toxicity and its interaction with the PPE articles.

-

- ***Amount of Contamination***. Gross contamination increases the probability of personal contact or the degradation and permeation. Swipe tests may help determine the type and quantity of surface contaminants, or clear articles for disposal as non-hazardous trash.

- ***Type and Level of PPE***. Clothing variations and different levels of protection may require adding or deleting stations to the decontamination line.

- ***Work Function***. Those who are performing tasks that will not bring them into contact with contaminants may not need to have their garments washed and rinsed while others in the Exclusion Zone, with potential direct contact with the hazardous material, will require a more thorough decontamination.

- ***Location of the Contamination***. Contamination on the upper areas of protective clothing poses a greater risk to workers because volatile compounds may generate a hazardous breathing concentration for both the worker and the decontamination personnel. There is also an increased probability of skin contact when doffing the upper part of the clothing.

9.2. Decontamination Procedures and Equipment

Decontamination activities should be confined to a designed area within the Contamination Reduction Zone, known as the Contamination Reduction Corridor. The Corridor controls access into and out of the Exclusion Zone and confines decontamination activities to a limited area. The size of the Corridor varies depending on the number of stations in the decontamination procedure, overall dimensions of the work control zones, and the amount of space available at the site. On smaller sites or sites with limited contamination potential, the size of the decontamination area and the number of decontamination stations will be severely reduced.

Within the Corridor, distinct areas should be set aside for decontamination of personnel, portable field equipment, discarded clothing, etc. Step-by-step procedures for decontamination of personnel wearing PPE Levels B and C are found in Appendix E at the end of this section.

10.0 PPE DISPOSAL

There are few reference guidelines for disposal of contaminated or used PPE garments. Sites requiring Decontamination Corridors will also be equipped to drum, bag, or otherwise dispose of large volumes of PPE wastes generated by site operations. On smaller sites such as well drilling and sampling, or soils sampling projects, field teams are required to bring an adequate supply of heavy gauge opaque plastic garbage bags to hold disposable PPE garments after use.

Contaminated PPE materials will be left at the work site if this can be done in a **responsible** manner. This activity **must** be negotiated with the client / owner / operator / subcontractor in advance of the fieldwork. If this cannot be done, decontaminate contaminated PPE, conduct a swipe test on a representative sample, and bring it back, in clean plastic bags, to the office. PPE that is used but "clean" or was contaminated but tests "clean" may be disposed of in the office dumpster. PPE, which cannot be decontaminated or is contaminated by materials containing mercury, lead, solvents, petroleum, PCBs or dioxin, will be disposed of as hazardous waste.

11.0 TRAINING

Malcolm Pirnie personnel provided with PPE shall be trained in its use, care, capabilities, and limitations prior to using it in a hazardous work environment. Personnel engaged in hazardous waste operations site activities shall receive the initial 40-hour training, of which PPE instruction is an integral part. Subsequent refresher training will include an annual review in the use, limitations, inspection, and care of PPE. A combined refresher/PPE certificate will be issued documenting this training.

11.1. Initial Training

Initial training is provided to all employees that are required to wear PPE. Employees receive initial training in the proper use and care of PPE prior to wearing the PPE in the work place. This training is most effective when the employee understands the hazards that are present, how the PPE provides protection, and the limitations of the PPE.

At a minimum, the training portion of the PPE program should delineate the user's responsibilities utilizing both classroom and hands-on training when necessary to explain the following:

- When PPE is necessary to be worn.
- What PPE is necessary and the selection criteria used for this determination.
- The operation of the selected PPE, including capabilities and limitations.
- The nature of the hazards and the consequences of not using the PPE.
- The human factors influencing PPE performance.
- Instruction in inspecting, donning, doffing, checking, fitting, and using PPE.
- The user's responsibility for decontamination, cleaning, maintenance and repair of PPE.
- Limitations of the PPE.
- Useful life and disposal of the PPE.
- How to recognize emergencies.
- Emergency procedures and self-rescue in the event of PPE failure.
- The buddy system.
-

- Emergency action planning, and the user's responsibilities and duties in an emergency.

Employees are required to demonstrate their understanding in each of the subject areas listed above. Special emphasis should be placed on proper wear, fit, and limitations of the PPE. If the employee cannot demonstrate a full understanding of the material provided in the training, that employee shall be retrained and must exhibit complete understanding of the material presented before they are allowed to wear the PPE in the work place.

11.2. Additional Training

Refresher training is provided when an employee cannot demonstrate a good understanding of the five required OSHA training topics (see above). Employees that are observed using PPE improperly are retrained.

Additional training is provided whenever processes change and new hazards require the use of additional or different PPE.

Staff provided with ancillary PPE (e.g., safety belts, floatation gear) should be trained in its use and care by the PSO before actual use onsite.

Staff requesting PPE who are not in the hazardous waste Health and Safety Training Program and have not received PPE training should be trained in the use and care of the PPE by their PSO before actual use onsite. The PSO will provide the Administrator, Health and Safety, WHI, with an attendance list and a brief summary of the training material covered to document the training and to issue certificates.

Since PPE use often causes discomfort and inconvenience, there is a natural resistance toward wearing it conscientiously. The major thrust of training must be to make the user aware of the need for PPE and to instill the motivation to properly wear and maintain the necessary PPE.

12.0 RECORDKEEPING

PPE training should be documented in the site health and safety logbook. The Manager, Health and Safety, COR, will maintain a copy of all corporate PPE training records. A summary record will be maintained by Health and Safety, COR, in the PeopleSoft database, and will be updated according to the schedule established in the Health and Safety Training section of this manual.

The training records maintained in the local office file will include the following information:

- The dates of the training sessions.
- The contents or a summary of the training sessions.
- The names and qualifications of persons conducting the training.
- The names and job titles of persons attending the training sessions.

Training records shall be maintained for three years from the date on which the training occurred. Upon request, employees will have access to any of his/her training records maintained by the local office, the Manager, Health and Safety, COR.

APPENDIX A

PRELIMINARY HAZARD ASSESSMENT CHECKLIST

MALCOLM PIRNIE

PERSONAL PROTECTIVE EQUIPMENT

PART A
TASK(S)
WORK AREA(S)

PART B	
HEAD PROTECTION	
Hazards/Operations	*PPE/Options*
☐ **Construction**	☐ **Hard Hat**
☐ **Cold Weather**	**ANSI Z89.1-1986**
☐ **Confined Space**	**Class A and B**
☐ **Electrical**	☐ **Chin Strap**
☐ **Frequent Bending or Leaning**	☐ **Liner**
☐ **Heavy Equipment**	☐ **Hood**
☐ **Hot Weather**	☐ **Protective Hair Covering**
☐ **Low Ceilings/Piping**	☐ **Bump Cap**
☐ **Moving Machinery**	
☐ **Overhead Activity**	
PROTECTIVE BODY CLOTHING	
Hazards/Operations	*PPE/Options*
☐ **Chemical Transfer**	☐ **Fully Encapsulating Suit**
☐ **Cold Weather**	☐ **Non-Encapsulating Suit**
☐ **Confined Space**	☐ **Aprons, Leggings, and Sleeve Protectors**
☐ **Dirty Area**	☐ **Anti-Radiation Suit**
☐ **Fire Potential**	☐ **Flotation Gear**
☐ **Hot Weather**	☐ **Cooling Garment**
☐ **Laboratory**	☐ **Tyvek**
☐ **Sampling**	☐ **Warm Weather Clothing (Carhartt's, etc.)**
☐ **Wet Area**	☐ **Rain Gear**
EYE PROTECTION	
Hazards/Operations	*PPE/Options*
☐ **Acids/Caustics**	☐ **Safety Glasses with Side Shields**
☐ **Chemical Splashes**	☐ **Goggles**
☐ **Chemical Transfer**	☐ **Face Shields**
☐ **Confined Space**	☐ **Optical Inserts for Full Face Respirators**
☐ **Construction**	
☐ **Flying Particles**	
☐ **Gases and Vapors**	
☐ **Light (UV, Laser)**	

☐ Liquid Chemicals	
☐ Liquid Sampling	
☐ Molten Metal	
☐ Scraping	
☐ Waste Water/Sludge	
☐ Wire Wheel/Chipping	

HAND PROTECTION

Hazards/Operations	*PPE/Options*
☐ Acids/Caustics	☐ Gloves to Match Hazard(s)
☐ Chemical Transfer	☐ Inner linings
☐ Confined Space	☐ Mittens
☐ Cold Weather	☐ A combination of gloves, liners and mittens may be best
☐ Construction	
☐ Cutting Snips	
☐ Hammering	
☐ Hazardous Waste	
☐ Hot Surfaces	
☐ Laboratory	
☐ Liquid Chemicals	
☐ Pinch Points	
☐ Rough or Sharp Objects	
☐ Sample Handling	
☐ Sampling	
☐ Shoveling	
☐ Waste Water/Sludge	

FOOT PROTECTION

Hazards/Operations	*PPE/Options*
☐ Biological Decay	☐ Work Shoes
☐ Broken Ground	☐ Safety Shoes
☐ Confined Space	☐ Overboots
☐ Cold Weather	☐ Waders
☐ Construction	☐ Hip Boots
☐ Demolition	☐ A combination of foot protectors may be best
☐ Dirty Area	
☐ Drum Movement	
☐ Electrical Hazards	
☐ Falling or Rolling Objects	
☐ Heavy Equipment	
☐ Inclement Weather	
☐ Laboratory	
☐ Moving Machinery	
☐ Shallow Water (to 2 Feet)	
☐ Shallow Water (to 4 Feet)	
☐ Waste Water/Sludge	
☐ Wet Soil	
☐ Uneven Ground	

FALL PROTECTION

Hazards/Operations	*PPE/Options*
☐ Confined Space	☐ Full Body Harness w/Shock-absorbing Lanyard

☐ Floor Openings (Above 6')	☐ Retractable Life Line
☐ Ladders (Above 28')	☐ Safety Line and Rope Grab
☐ Platforms (Above 6')	
☐ Roofs	
☐ Scaffolds	

RESPIRATORY PROTECTION

Potential Hazards/Operations	*PPE/Options*
☐ Acids/Caustics	☐ Half Face Air Purifying Respirator
☐ Chemical Transfer	☐ Full Face Air Purifying Respirator
☐ Confined Space	☐ Self Contained Breathing Apparatus (SCBA)
☐ Dusts and Mists	
☐ Gases and Vapors	
☐ Hazardous Waste	
☐ Laboratory	
☐ Liquid Chemicals	
☐ Sample Handling	
☐ Sampling	
☐ Waste Water/Sludge	

Respiratory Protection Addendum--Partial List of Available Cartridges:

Multi-Gas/Vapor Super Cartridge
Organic Vapors Cartridge
Organic Vapors/Acid Gases Cartridge
Acid Gases Cartridge
Formaldehyde Cartridge
Organic Vapors Cartridge/P100 Filter Cartridge
P100 Filter Cartridge
Multi-Gas/Vapor Super Cartridge/P100 Filter Cartridge
Acid Gases Cartridge/P100 Filter Cartridge
Organic Vapors Cartridge/Acid Gases Cartridge/P100 Filter Cartridge
Ammonia/Methylamine Cartridge
Ammonia/Methylamine Cartridge/P100 Filter Cartridge
N95 Filter/Prefilter

Hearing Protection Addendum--Available Hearing Protection

Ear Plugs, Many Types and Styles
Ear Muffs
Combination of Ear Muffs and Plugs

Evaluator: _____ **Date:** _____

Department Head: _____ **Date:** _____

APPENDIX B

PPE SPECIFICATIONS, CAPABILITIES AND LIMITATIONS

- Introduction
- Protective Clothing
- Types of Protective Clothing
- Head Protection
- Eye and Face Protection
- Hearing Protection
- Hand Protection
- Foot Protection
- Ancillary PPE
- Reference

PPE SPECIFICATIONS, CAPABILITIES AND LIMITATIONS

1) INTRODUCTION

This appendix provides information on the technical specifications, capabilities and limitations of various types of PPE typically used by Malcolm Pirnie employees. This information is by no means exhaustive and may become rapidly dated by new research findings and product development. If you have any questions regarding the applicability of a particular piece of PPE, contact your SBU Health and Safety Leader or the Manager, Health and Safety, COR.

2) PROTECTIVE CLOTHING

Protective clothing is a type of PPE that provides protection against dermal contact with dirt, hazardous chemicals or waste. Protective clothing is made of various fabrics and fabric treatments, which impart the desired physical and chemical resistive properties. Protective clothing may be limited-use or repetitive use and is usually worn over street clothes, underwear, or bathing suits.

Protective clothing has two critical components: the fabric and the tailoring. The fabric imparts the physical and chemical properties of the garment. Fabric manufacturers conduct tests using American Society of Testing Materials (ASTM), American National Standards Institute (ANSI), and National Fire Protection Association (NFPA) protocols to determine and rate the protective characteristics of their products.

Protective fabrics are sold to safety clothing manufacturers who produce the final garment. The manufacturer's design or manufacturing (tailoring) processes may make superior protective clothing; or garments entirely unsuitable for their intended use. Common failure points are the seams, stitching and the zippers. Chemicals, which may not be able to permeate through the fabric, may easily pass through split seams, stitch holes or zipper teeth. Seams should be sewn, heat-sealed or taped.

a) Selection Criteria

Protective clothing shall be selected to protect employees from occupational hazards while considering the hazards presented by the garments themselves. When selecting protective clothing;

- Consider the hazardous chemicals present, the task(s) to be performed, and the ambient site conditions.
- Match the physical and chemical resistance characteristics of the garment against the requirements and limitations of the site and task-specific conditions.

- Choose the garment with the widest range of protection for a site that has a variety of chemical hazards.

Multiple layers of protection may be needed when more than one contaminant is present or when the hazards are unknown. Disposable boots, gloves, and splash suits are used to provide an extra layer of protection.

Evaluate the physical performance characteristics of each garment under consideration. These performance characteristics may increase the hazards associated with using the garment. The cost of certain types of protective clothing and the affect of the clothing on employee productivity are secondary but valid concerns.

b) Performance Characteristics

Heat Transfer - A garment with a low rate of heat transfer increases heat stress of the person wearing it.

Durability - is the degree to which the protective clothing resists tears, punctures, abrasions, and repeated decontamination.

Flexibility - The garment should be flexible to allow mobility.

Temperature effects - The garment should be able to maintain its protective integrity and flexibility in the temperature ranges expected at the work site.

Decontamination - If reusable protective clothing cannot be decontaminated easily, use a disposable garment with the same resistive properties.

Compatibility - The selected garment should not make it difficult or impossible to use other required protective equipment (e.g., a hard hat).

Lifetime - Lifetime is determined by the length of time a reusable garment can resist aging, especially under severe conditions.

Protective clothing comes in various sizes. The larger sizes (large, XL or XXL) are preferable during cold weather because they allow the garment to be worn over layered winter clothing. Pay particular attention to project team members who have special sizing requirements.

While protective clothing is useful to protect personal clothing from becoming soiled, there may be hazards involved in using protective garments. Therefore, using unnecessary PPE is discouraged.

The project or task evaluation in Appendix A, EPA's *Guidelines for the Selection of Chemical Protective Clothing* (Ref. 1), the *Quick Selection Guide to Chemical Protective Clothing* (Ref. 2), are useful in selecting appropriate protective clothing.

3) TYPES OF PROTECTIVE CLOTHING

a) Repetitive-Use Rainwear / Splash Protection

Rainwear garments are used alone or in combination with chemical protective clothing to prevent exposure to inclement weather and incidental mud or chemical splashes. When choosing these garments consider:

- Whether the garment will be subject to limited use or continuous exposure.
- What will be the specific physical or chemical hazards?
- What are the flexibility and thermal requirements?

b) Available Materials:

Vinyl - extremely lightweight PVC material that offers a reasonable initial barrier to liquid penetration. Good flexibility through changing temperatures. Best for short-term use with water-based liquids, mild acids, solvents, oils and salts.

PVC-Coated Fabrics - a broad class of synthetic thermoplastic polymers that protects against many liquids and chemicals. The degree of protection varies depending upon the specific formulation and the thickness of the coating. Resists salts, alkalies, oils, ketones, aldehydes, alcohols, some acids and organic esters.

Rubber-Coated Fabrics - A very flexible heavy fabric for heavy-duty use in extreme cold or heat. Abrasion and tear resistant and offers general protection against solvents and chemicals.

Neoprene-Coated Fabrics - A very flexible heavy fabric for heavy-duty use in extreme cold or heat. Abrasion and tear resistant and offers general protection against acids, hydrocarbons and oils.

Nitrile-Coated Fabrics - Thin-gauge material resistant to cuts and punctures. Resistant to grease, acids and solvents.

Polyurethane-Coated Fabrics - Light weight and sheds liquids easily. Breath ability depends upon thickness of coating and material additives. Good abrasion resistance. General protection against many liquids.

c) Laboratory Wear

Lab coats or splash aprons are required when using chemicals in a laboratory setting. Lab coats will be of cotton or cotton/polyester blend, have long sleeves and extend to the knee. Standard lab coats are not especially fire resistive nor do they provide protection against chemical splashes. Care should be exercised near open flames or hot surfaces. Splash aprons and over-sleeves made of the appropriate material (see Rainwear/Splash Protection) should be used in laboratory situations where chemical, sample or waste splashing is likely.

d) Limited-Use General Protection Clothing

Economical choice for protection against limited hazards such as lead and asbestos dusts, radionuclides, light chemical splashes and biohazards. When choosing these garments consider:

- Whether the garment will be stand up to the rigors of the work environment.
- The degree of protection offered by the garment against the contaminants (and concentrations) present.
- What are the flexibility and thermal requirements?

e) Available Materials

Tyvek - registered trademark of the E.I. DuPont Company. Tyvek is a spun-bonded olefin fiber, which delivers high tear resistance and a high level of protection against particulate materials. Available in a variety of styles and colors.

Kleenguard - registered trademark of the Kimberly-Clark Corporation. Kleenguard is a non-woven polypropylene fabric, usually layered, which effectively repels most non-hazardous liquids, oils and greases and but allows air to pass through reduce the potential for heat stress. Available in a variety of styles and colors.

f) Limited-Use Chemical Protective Clothing

Chemical Protective Clothing (CPC) is used prevent exposure to chemical contact or splashes. For protection from significant chemical or vapor hazards, choose garments that prevent hazardous liquid breakthrough for at least 240 minutes and prevent hazardous vapor breakthrough for at least 1440 minutes as tested by the ASTM F739 protocol. When choosing these garments consider:

4) HEAD PROTECTION

Head protection shall be worn when working in areas where there is danger of head injury from impacts, falling and flying objects, electrical shock and burns, and contact with hazardous chemicals.

Hard hats shall be worn on all construction sites, in the immediate vicinity of drilling operations, in industrial facilities where there are overhead activities, during confined space entry tasks, and in posted hardhat areas. Hardhat suspensions must always be in place, properly adjusted and free from defects. The hard hat selected shall be compatible with any other type of PPE in use including suits, respirators, face shields, and hearing protection.

a) Available Equipment

Hard Hats - hard hats that comply with ANSI Z89.1-1986, Class A and B, and are SEI certified, provide appropriate head protection from overhead impact and electrical hazards. Bump caps are not acceptable. Employees shall not deface, drill holes, or other wise tamper with hard hats in any way that might compromise their effectiveness.

Chin Straps - employees shall use chin straps when tasks involve strenuous bending, downward movements or in any circumstance, for instance, confined space entry, that may result in the hard hat falling off the employee's head.

– Liners - Hardhat liners can be worn inside the hard hat to provide thermal protection during cold weather.

Hoods - hoods can be worn with hard hats, and are usually attached to a whole-body CPC. Hoods protect the head and neck from hazardous chemicals. Hoods can be used to protect the hair when wearing respirators.

Visitor's Hardhats - project offices and trailers should be equipped with an adequate number of spare hard hats for the use of visitors to the project site.

b) Inspection and Maintenance

Hardhats and suspensions systems will be inspected before each use. Cracking, signs of excessive wear, or frayed webbing is cause for replacement. Contact your Equipment Coordinator for parts or hardhat replacement.

2) EYE AND FACE PROTECTION

Appropriate eye and face protection shall be worn by employee when exposed to hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Employees shall use eye protection that provides side protection when there is a hazard from flying objects.

Employees who wear prescription lenses while engaged in operations involving eye hazards shall wear eye protection that incorporates the prescription in its design, or shall wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Contact lens shall not be worn in the presence of particulate, chemical, or gaseous eye hazards.

Employees working near sources of injurious light radiation including welding arc, cutting flame, class III and IV lasers, etc., shall use equipment with filter lenses that have a shade number that will protect the eyes from injury.

a) Available Equipment

Safety Glasses with Side Shields - safety glasses with full side shields (prescription to 20/40 vision if required) complying with ANSI Z87.1-1989 shall be worn during drilling operations, and when working near impact tools or equipment. The glasses protect the eyes from large particles

Goggles - goggles complying with ANSI Z87.1-1989 are available in two types: chemical-splash (indirectly vented) and non-vented. Both are available with polycarbonate lenses to protect the eyes from impact injury, chemical splashes, large particles, and projectiles. Non-vented goggles provide additional protection against vapors and gases. Goggles may be worn over prescription eyeglasses.

Face shields - face shields complying with ANSI Z87.1-1989 and at least 8" long protect the face and neck from chemical splashes but do not protect against projectiles. Face shields provide only limited eye protection. Goggles or safety glasses should be worn in conjunction with face shields. Face shields that attach directly to the hard hat are sealed to prevent overhead splashes from running down the inside of the face shield.

Full-face Respirators - because the lens of the full-face respirator is constructed of polycarbonate material meeting the impact resistance standards specified in 30 CFR 11, additional eye and face protection is not required when wearing a full-face respirator.

Optical Inserts - spectacle kits are provided by Malcolm Pirnie to users of full-face respiratory protection who wear corrective eye wear. Each eligible employee may take a spectacle kit to his or her personal eyewear provider to have prescription lens ground and fitted to the kit. The inserts should correct visual acuity to at least 20/40. Reasonable costs, excluding eye exams, are reimbursable as an group Health & Safety expense (Chart of Accounts 7931). The cost of associated eye examinations can be covered by VSP with

any balance submitted for reimbursement from your Flexible Spending Account (Medical).

b) Visitor's Safety Glasses

Project offices and trailers should be equipped with an adequate number of spare safety glasses and goggles for the use of visitors to the project site.

3) HEARING PROTECTION

Hearing protection shall be worn by employees who are exposed to noise levels in excess of those defined in OSHA standard 29 CFR 1910.95. See the Section on Hearing Conservation for additional information.

Two basic types of hearing protectors are available: ear plugs and earmuffs. The use of earplugs shall be considered with caution because earplugs can introduce chemical contaminants into the ear. The selection of hearing protectors shall be based on the attenuation requirements of 29 CFR 1910.95, and on the comfort of the wearer. Employees may require hearing protection when working near drilling and heavy equipment operations, high impact tools, or when working in the vicinity of generators, air compressors or other noisy machinery. Earmuffs are not a stock item since they need to be sized to the individual.

4) HAND PROTECTION

Employees shall use appropriate hand protection when exposed to hazards such as those from skin absorption of harmful substances; severe cuts and lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes.

A qualified employee shall select gloves designed to provide protection against specific chemicals and physical demands of the site. Use flexibility, resistance to tearing and puncturing, and resistance to specific chemicals as criteria for selection.

If roughened-surface, chemical-resistant gloves are not available wear heavy leather gloves or disposable studded cotton gloves over chemical-resistant gloves to provide better gripping during manual labor.

Combinations or layers of chemical-resistant gloves are used to protect against multiple chemical contaminants. For example, a mixture of acids, caustics, and aromatic hydrocarbons may require the use of outer neoprene gloves for protection against acids and caustics, and inner PVA gloves for protection against the aromatics.

Disposable latex or vinyl (surgical) gloves are a general-purpose disposable inner glove and are routinely discarded after each use. Permeation-resistant outer gloves such as Viton and butyl rubber are selected based on the chemicals involved. Neoprene is a general-purpose

outer glove. Cotton liners are used inside chemical-resistant gloves to provide warmth during cold weather, or to absorb sweat during summer.

The qualified employee shall consider the glove's thickness and cuff length. Thick gloves with long cuffs (gauntlet type) provide more protection than thin, short gloves. However, the material should not be so thick that it interferes with the dexterity required by the task.

a) Available Materials

Natural Rubber (Polyisoprene). Resists degradation by alcohols and caustics. Not recommended for organics.

Butyl Rubber (Synthetic Rubber). Resists degradation by many contaminants including ketones and esters. Especially resistant to permeation by gases and water vapors. Not recommended for halogenated hydrocarbons and petroleum compounds.

Polyvinyl Alcohol (PVA). Resists degradation and permeation by aromatic and chlorinated hydrocarbons and petroleum compounds. Not recommended for water-based solutions, acids, bases, ethers and esters.

Neoprene (Chloroprene). Resists degradation by caustics acids, alcohols, and oils. Not recommended for halogenated and aromatic hydrocarbons, PCBs and ketones.

Nitrile (Acrylonitrile Polymers / Butadiene). Resists degradation by petroleum compounds, gasoline, alcohols, acids, caustics, and peroxides. Not recommended for aromatic or halogenated hydrocarbons, amines, ketones, and esters. Can be used for some chlorinated compounds.

Viton. Resists degradation and permeation by aromatic and chlorinated hydrocarbons and petroleum compounds, oxidizers, acids, and water-based solutions. Not recommended for aldehydes, esters, ketones, amines, and acetone.

Latex Surgical Vinyl (disposable). Poor chemical resistance. Not recommended as an outer glove. This type of glove rips and tears easily. Remember to remove large rings or rings with protrusions or sharp points to prevent tearing. Use only when dexterity and flexibility are needed in non-hazardous chemical situations.

Silver Shield. Resists degradation and permeation by aromatic and chlorinated hydrocarbons and petroleum compounds, oxidizers, acids, and most water-based solutions. Not recommended for amides.

5) FOOT PROTECTION

Footwear worn at field sites shall comply with the ANSI Z41-1991 and shall be chemically resistant. Proper footwear protects the foot from crushing, puncture, electrical, and chemical hazards.

a) Available Materials

Leather safety boots with steel toe and shank - resists punctures and crushing. Employees are responsible for purchasing their own boots and this expense may be reimbursed up to $120.00 per year with their manager's approval. These boots are generally not chemical or water-resistant without the use of disposable latex/butyl/"Tyvek" boot covers or neoprene overboots.

Overboots - made of PVC, latex, butyl, natural rubber, polyethylene, neoprene or vinyl provide protection from a wide range of chemicals. Some overboots have an integrated steel toe and puncture resistant insert.

Waders - waders are one-piece waterproof garments with boots and coveralls that protect the lower body (up to the hip/chest) from water immersion. Employees sampling water from ponds, streams or sewers at locations that are no more than waist deep are to wear waders.

Hip boots - are useful for water sampling or sewer inspections when the water level is below the thighs. Hip boots are less expensive and provide more mobility than chest-high waders.

6) ANCILLARY PPE

Ancillary PPE is used for protection against specific health and safety hazards.

a) Available Equipment

Belts, Harnesses, Lanyards and Lifelines - body harnesses, lanyards, and lifelines are used to prevent falls from elevated areas or into water, and to make possible the emergency retrieval of employees who have entered confined spaces. Fall protection belts are no longer allowable. Employees working on or moving across unguarded platforms or catwalks at elevations **greater than 6 feet** are required to tie off to some type of effective fall protection.

Safety belts used at sites shall comply with 29 CFR 1926.104 and also shall be constructed of spark-free hardware and chemical- resistant materials. Lifelines and fall protection devices must use double-action snap hooks. Safety restraints are selected on the basis of applicability to the task(s) for which they will be used.

Cooling Vests - cooling vests are used to remove excess heat generated by worker activity, protective clothing, or extremely hot environments. The most commonly used units resemble vests with cold pack pockets, and are used when personnel are wearing level B or C protection in warm weather, usually above 80°F. To use the vests, ice-making equipment and cold pack storage must be available on-site. The availability of this equipment must be addressed in planning for the work.

Other cooling devices use forced air or circulation of a refrigerant through caps and vests. Maintenance problems and the increased weight (up to 25 pounds) borne by workers shall be evaluated when selecting these units.

Floatation Gear - floatation gear such as life jackets, work vests and cold water survival suites that meet United States Coast Guard (USGS) standards (46 CFR Part 160) shall be worn when working in or on surface waters e.g., ponds, lagoons, and streams, at chest high depths (four feet) or greater. Floatation gear is commonly worn over protective clothing. Floatation vests add bulk to the wearer and may restrict mobility. Floatation vests may be difficult to decontaminate.

Reflectorized Vests - reflectorized vests are to be worn be all employees when working near vehicular traffic and in situations where visibility is essential.

Tool Pouches and Belts - equipment pouches and belts may be worn by site personnel who use portable equipment and tools during field activities. Pouches and belts are worn around the waist, outside of the protective clothing.

Infection Control Kits - an infection control kit (ICK KIT) shall be available in each office, field office, field trailer, and field vehicle for use in the event of an injury resulting in contact with blood or other bodily fluids.

Protective Leggings - leggings are worn to protect against snakebites or other hazards to the lower extremities.

7) REFERENCES

- *EPA. Guidelines for the Selection of Chemical Protective Clothing. -1987.*
- *Forsberg, K. and S.Z. Mansdorf. Quick Selection Guide to Chemical Protective Clothing. Van Nostrum Reinhold, New York, 1989.*

APPENDIX C

PPE ENSEMBLES FOR HAZARDOUS WASTE OPERATIONS

Levels of Protection for Levels A - D

1) ENSEMBLES FOR HAZARDOUS WASTE OPERATIONS

Various types of personal protective clothing, respirators, and ancillary protective equipment are combined into ensembles that provide a sufficient level of protection from site-specific hazards. Using excessive levels of PPE is discouraged.

Four distinct levels -- A, B, C, and D -- have been defined by EPA, each providing protection against varying degrees of respiratory, dermal, and safety hazards. A specific level of protection shall be selected based on:

- The type, concentration, and toxicity of airborne contaminants.
- The potential for personal exposures, liquid splashes, or direct contact with hazardous materials in relation to site tasks /activities.

The main factor in selecting a level of protection is the magnitude of the respiratory and dermal hazards present or potentially present on- site. Levels A and B specify the same respiratory protection (self- contained or air-line breathing apparatus), but Level A includes specific dermal protection (fully encapsulating suit). Levels B and C generally specify the same dermal protection (chemical-resistant coveralls or partially encapsulating suit) but Level B includes a higher degree of respiratory protection. Level D, essentially an ordinary work uniform ensemble, is used only when there is minimal potential for exposure to hazardous materials or waste on-site.

Each standard level of protection may be modified in the Site Safety Plan (SSP) to account for varying degrees of respiratory and dermal hazard. For instance, a Level C ensemble may be modified for a task involving surface soil sampling for a semi-volatile compound in wet conditions by making the use of the respirator contingent upon air monitoring results but mandating full body protective clothing for dermal exposure control.

The SSP specifies the level of protection required for various site tasks and work zones. Upgrades or downgrades of protective levels are based on the action levels specified in the air-monitoring procedures of the SSP. An increase or decrease in the potential for exposure to hazardous materials necessitating a level of protection not specified in the SSP requires a written amendment to the SSP approved by the Project Safety Officer (PSO), the SBU Health and Safety Leader, and/or the Manager, Health and Safety, COR.

The four levels of protection that may be used by Malcolm Pirnie personnel are described below. Selection criteria are presented for general guidance only: protection shall be tailored to the site-specific contaminants and conditions.

a) Level A Protection

Level A shall be selected when the highest level of respiratory, skin, and eye protection is required due to the presence in the air of high concentrations of hazardous materials, or

the presence of contaminants highly toxic to the skin. Level A is also used when the hazards are unknown, inadequately defined, or when Level B protection is not adequate. Level A protection is extremely cumbersome and may be life- threatening due to heat stress. Level A is generally appropriate in emergency response and rescue circumstances not normally performed by Malcolm Pirnie personnel. For example, workers would use Level A protection when entering a confined area to repair a leaking chlorine gas valve.

Selection Criteria - Use Level A when:

- Hazardous materials have been identified on-site that require the highest level of respiratory, skin, and eye protection based on measured (or potentially) high concentrations of hazardous vapors, gases, or particulate atmospheres that are greater than levels determined to be "immediately dangerous to life or health" (IDLH).
- Site operations or tasks present a high potential for splashing of, contact with, or airborne exposure to substances highly toxic by skin absorption.
- Site operations or tasks to be conducted in confined or poorly ventilated areas where there is potential for encountering highly toxic substances.

Personal Protective Equipment at Level A consists of:

- Pressure-demand, full-face, self-contained breathing apparatus (SCBA) or a pressure-demand, supplied-air respirator / SCBA combination i.e., a dual-purpose breathing apparatus (DPBA).
- Fully encapsulating suit with intrinsic gloves, booties, and polycarbonate lens.
- Inner chemical-resistant gloves (latex or vinyl surgical type).
- Overboots of appropriate chemical - resistant materials with steel toe and shank. (The boots are worn over the intrinsic booties of the rubber suit, and the boots themselves may be covered by disposable booties.)

Additional Equipment that may be required for a Level A entry:

- Cooling vest/jacket
- Disposable chemical-resistant booties (latex/butyl)
- Coveralls
- Cotton long underwear
- Hard hat
- Hearing Protection
- Two-way radio communications (rated intrinsically safe)

b) Level B Protection

Level B shall be selected when the highest level of respiratory protection is required but a degree of dermal protection lower than that afforded by Level A is acceptable. The specific type of dermal protection may vary from site to site. A good quality, chemical-

resistant, one-piece garment with taped wrists, ankles, and hood often provides adequate dermal protection for splash or contact hazards on-site.

Level B is generally used in situations where respiratory hazards are difficult to evaluate. Level B protection is cumbersome and may cause heat stress. Level B protection shall be the minimum used during initial response or reconnaissance except when the respiratory hazard has been evaluated and it is determined that a lower level of respiratory protection is acceptable.

Selection Criteria: Use Level B when:

- The type and concentration of airborne contaminants have been identified as those requiring a high level of respiratory protection, but a lower level of skin protection, for example, when specific airborne substances, present in IDLH concentrations, do not present a severe skin contact/absorption hazard. Also when atmospheres do not meet the criteria that would permit use of air-purifying respirators.
- Atmospheres contain less than 19.5 percent oxygen.
- Site activities generate high concentrations of substances highly toxic by skin absorption but skin contact with toxic substances is not likely.
- When the air contaminants of concern do not have adequate warning properties of breakthrough or there are no approved filter cartridges for Level C respiratory protection.
- When significant time will be spent in areas with contaminant concentrations at or above occupational exposure limits.

Personal Protective Equipment at Level B consists of:

- Pressure-demand, full-face SCBA or DPBA.
- Chemical-resistant clothing, including disposable "Tyvek" coveralls, with or without various coatings. Also, butyl rubber aprons, or neoprene, acid-resistant, full body coveralls.
- Inner chemical-resistant gloves (latex or vinyl surgical type.)
- Outer chemical-resistant gloves (butyl, neoprene, Viton, or other appropriate material.)
- Neoprene rubber boots with steel toe and shank.
- Emergency escape bottle with 5 - 15-minute air supply.

Additional Equipment that may be required for a Level B entry:

- Cotton coveralls worn beneath CPC.
- Cotton long underwear.
- Disposable chemical-resistant booties (latex/butyl).
- Hard hat

- Hearing protection
- Two-way radio communications
- Cooling vest/jacket.

c) Level C Protection

Level C protection is composed of dermal protection and an air- purifying respirator (APR). Level C shall be used only when the types and concentrations of airborne substances are known, when the criteria for using APRs are met, and when skin exposure is unlikely.

Use of this level is limited by the restrictions placed on the use of APRs in 29 CFR 1910.134 and ANSI Z88.2-1992. Air contaminants shall be measured and compared to action levels specified in the SSP. Level C may be sufficiently cumbersome to cause heat stress.

Selection Criteria: Use Level C when:

- The type and concentration of airborne contaminants are known, an approved respirator cartridge/canister is available that will remove the contaminants, and the following criteria for use of APRs are met:
- Oxygen content is equal to or greater than 19.5 percent.
- Concentrations do not exceed the NIOSH-approved use levels for the respirator and cartridge/canister.
- Contaminants have obvious warning properties (e.g., contaminant can be detected by odor, taste, or irritation at concentrations below its exposure limit).
- Atmospheres are not IDLH.
- Airborne contaminants are known and will be monitored throughout site activities.

Site activities will not generate high airborne concentrations or liquid splashes or other means of contact with substances highly toxic to the skin.

Personal Protective Equipment at Level C consists of:

- Full-face APR or full-face powered APR with cart ridge/canister appropriate for the airborne contaminant present.
- Chemical-resistant clothing (same alternatives as for Level B, determined by site).
- Inner chemical-resistant gloves (latex or vinyl surgical type).
- Outer chemical-resistant gloves (butyl, neoprene, Viton, or other appropriate material).
- Work boot with neoprene rubber sole, and steel toe and shank.

Additional Equipment that may be required for a Level C entry:

- Coveralls.
- Disposable chemical-resistant latex or butyl booties.
- Cotton long underwear.
- Hardhat.
- Hearing protection.
- Two-way radio communications.

d) Level D Protection

A work uniform providing minimal protection constitutes Level D protection. Level D shall not be used in a hazardous atmosphere or environment. Level D will be used only when there is no indication of a hazardous atmosphere, and the work tasks preclude splashes, immersion, or other bodily contact with hazardous substances.

In situations where the possibility of a hazardous atmosphere exists, Level D is permissible when prescribed by the SSP as long as monitoring indicates the continued absence of a hazardous atmosphere. When hazardous atmospheres are detected, workers in Level D shall upgrade their protection in accordance with instructions in the SSP.

Selection Criteria: Use Level D on:

- Sites where the SSP writer and reviewer have made a reasonable determination that exposure to hazardous materials is unlikely.
- Sites where there is limited potential for exposure to hazardous materials, but procedures for monitoring onsite air and upgrading the protection level or evacuating the site have been established, and are being followed.

Personal Protective Equipment at Level D consists of:

- Coveralls (cotton or "Tyvek").
- Work boots with steel toe and shank.
- Safety glasses with side shields.

Additional Equipment that may be required for a Level D entry:

- Inner and outer gloves.
- Hardhat.
- Hearing protection.
- Emergency escape respirator (readily available onsite.)
- Air-purifying respirator (readily available onsite.)
- Aprons, boot covers.

APPENDIX D

AIRBORNE CONTAMINANT ACTION LEVELS FOR SELECTION OF PPE ENSEMBLES

Appendix D Airborne Contaminant Action Levels for Selection of PPE Ensembles

Action Levels

Uncharacterized Airborne Vapors or Gases		Characterized Gases, Vapors, Particulates**
Level D	Background*	Up to 50% of PEL, REL or TLV
Level C	Up to 5 ppm above background	Up to 25 times PEL, REL or TLV
Level B	5 ppm to 500 ppm above background	UP to 500 times PEL, REL or TLV
Level A	500 ppm to 1000 ppm above background	Up to 1000 times PEL, REL or TLV
	* Off-site "clean" air measurement.	** Use mixture calculations (% allowed = ΣC_n PEL_n) if more than one contaminant is present

Oxygen Deficiency

Concentration	Action Taken
< 19.5% O_2	Leave area. Reenter only with supplied-air respirators.
19.5% to 23.5% O_2	Work may continue. Investigate changes from 21%.
> 23.5% O_2	Work must stop. Ventilate area before returning.

Flammability

Concentration	Action Taken
< 10% of LEL	Work may continue. Consider toxicity potential.
> 10% LEL	Work must stop. Ventilate area before returning.

Radiation

Intensity	Action Taken
< 0.5 mR/hr	Work may continue.
< 1 mR/hr	Work may continue. Continue to Monitor. Notify Corporate Health and Safety and Corporate Health Physicist.
5 mR/hr	Radiation work zone. Work must stop.

APPENDIX E

MINIMUM AND MAXIMUM DECONTAMINATION STATIONS AND EQUIPMENT FOR PPE ENSEMBLE LEVELS B AND C

E-1 *MAXIMUM* DECONTAMINATION PROCEDURES FOR *LEVEL B*

Equipment Worn

This decontamination procedure outlined is the **maximum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece, hooded chemical-resistant splash suit
- SCBA
- hard hat
- chemical-resistant boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

DECONTAMINATION PROCEDURES

Station 1: Segregated Equipment Dump

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each piece of equipment may be contaminated to a different degree; therefore, segregation at the drop reduces the potential for contamination. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Suit, Boot Covers, and Glove Wash

Thoroughly wash and scrub fully encapsulating suit, outer boot covers, and gloves with a decontamination solution or detergent-waste solution. Equipment needed:

- container (20 to 30 gallon)
- decontamination solution
- detergent-water solution
- two or three long-handled, soft-bristled scrub brushes

Station 3: Suit, Boot Covers, and Glove Rinse

Rinse off the decontamination solution from Station 2 using copious amounts of water. Repeat as many times as necessary. Equipment needed:

- container (30 to 50 gallon)
- high-pressure spray unit and splash guard
- water
- two or three long-handled, soft-bristled scrub brushes

Station 4: Tape Removal

Remove tape around boots and gloves and deposit it in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 5: Boot Cover Removal

Remove boot covers and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 40 gallon)
- plastic liners
- bench or stool

Station 6: Outer Glove

Remove outer gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 7: Suit, SCBA, Boot, and Glove Wash

If design does not include *Station 2*, wash suit at this station. Thoroughly wash suit, SCBA, boots, and gloves with a long-handled, soft-bristled scrub brush and copious amounts of decontamination solution or detergent-water solution. Wrap SCBA regulator (if belt-mounted type) with plastic to keep out water. Wash backpack assembly with sponges or cloth. Equipment needed:

- container (30 to 50 gallon)
- decontamination solution
- detergent-water solution
- two or three long-handled bristled scrub brushes
- small buckets
- sponges or cloths

Station 8: Suit, SCBA, Boot, and Glove Rinse

If design does not include *Station 3*, rinse suit at this station. Rinse off the decontamination solution or detergent-water solution using copious amounts of water. Repeat as many times as necessary. Equipment needed:

- container (30 to 50 gallon)
- high-pressure spray unit and splash guard
- water
- small buckets
- two or three long-handled, soft-bristled scrub brushes
- sponges or cloths

Station 9: Tank Change

If a worker leaves the exclusion zone to change their air tank, this is the last step in the decontamination procedure. They exchange the tank, don new outer gloves and boots, and have the joints taped. They then return to duty. Equipment needed:

- air tanks
- tape
- boot covers
- gloves

Station 10: Chemical-resistant Boot Removal

Remove chemical-resistant boots and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 50 gallon)
- plastic liners
- bench or stool
- bootjack

Station 11: SCBA Backpack Removal

While still wearing face piece, remove backpack and place it on a table. Disconnect hose from regulator valve and proceed to next station. Equipment needed:

- table

Station 12: Splash Suit Removal

With assistance, remove splash suit. Deposit it in a container with a plastic liner. Equipment needed:

- container (30 to 50 gallon)
- plastic liners
- bench or stool

Station 13: Inner Glove Wash

Wash with decontamination solution or detergent-water solution that will not harm skin. Repeat as many times as necessary. Equipment needed:

- basin or bucket
- decontamination solution
- detergent-water solution
- small table

Station 14: Inner Glove Rinse
Rinse with water. Repeat as many times as necessary. Equipment needed:

- water
- basin or bucket
- small table

Station 15: Face Piece Removal
Remove face piece. Deposit it in a container with a plastic liner. Avoid touching face with fingers. Equipment needed:

- container (30 to 50 gallon)
- plastic liners

Station 16: Inner Glove Removal
Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 17: Inner Clothing Removal
Remove inner clothing. Place it in a container with a plastic liner. Do not wear inner clothing off the site, since small amounts of contaminants may have been transferred in removing fully encapsulating suit. Equipment needed:

- container (30 to 50 gallon)
- plastic liners

Station 18: Field Wash
Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- water
- soap
- small table
- basin or bucket
- field showers
- towels

Station 19: Redress
Put on clean clothes. A dressing trailer is needed in inclement weather. Equipment needed:

- table
- chairs
- lockers
- clothes

E-2 *MINIMUM* DECONTAMINATION PROCEDURES FOR *LEVEL B*

Equipment Worn

This decontamination procedure outlined is the **minimum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece, hooded chemical-resistant splash suit
- SCBA
- hard hat
- chemical-resistant boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

DECONTAMINATION PROCEDURES

Station 1: Segregated Equipment Dump

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability for cross-contamination. During hot weather operations, cool-down station may be set up within this area. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Suit, Boot Covers, and Glove Wash and Rinse

Thoroughly wash and scrub chemical-resistant splash suit, outer boots, and gloves with a decontamination solution or detergent-waste solution. Rinse off using copious amounts of water. Equipment needed:

- containers (20 to 30 gallon)
- decontamination solution
- detergent-water solution
- rinse water
- high-pressure spray unit and splash guard
- two or three long-handled, soft-bristled scrub brushes

Station 3: Outer Boot and Glove Removal

Remove outer boots and gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 40 gallon)
- plastic liners
- bench or stool
- water
- two or three long-handled, soft-bristled scrub brushes

Station 4: Tank Change

If a worker leaves the exclusion zone to change their air tank, this is the last step in the decontamination procedure. They exchange the tank, don new outer gloves and boots, and have the joints taped. They then return to duty. Equipment needed:

- air tanks
- tape
- boot covers
- gloves

Station 5: Outer Garment Removal

Chemical-resistant splash suit, if worn outside the SCBA, is removed and deposited in separate containers with plastic liners. If the suit is worn underneath the SCBA, see station 5A. Equipment needed:

- containers (20 to 30 gallon)
- plastic liners

Station 5A: Suit Removal When Worn Underneath the SCBA

If the chemical-resistant splash suit is worn beneath the SCBA, remove SCBA backpack, but not the face piece, and hand to a buddy or lay down on plastic sheeting and remove suit. Equipment needed:

- plastic sheeting

Station 6: SCBA Removal and Decontamination

Wrap SCBA regulator (if belt-mounted type) with plastic to keep out water. Wash backpack assembly with sponges or cloth. Remove face piece while avoiding facial contact by fingers. SCBA is deposited on a clean plastic sheet. Equipment needed:

- water
- small buckets
- sponges or cloths
- plastic sheeting
- two or three long-handled, soft-bristled scrub brushes

Station 7: Inner Glove Removal

Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 8: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- water
- soap
- small table
- basin or bucket
- field showers
- towels

E-3 *MAXIMUM* DECONTAMINATION PROCEDURES FOR *LEVEL C*

Equipment Worn

This decontamination procedure outlined is the **maximum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece coverall
- full-face respirator
- hard hat
- safety boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

DECONTAMINATION PROCEDURES

Station 1: Segregated Equipment Dump

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Each piece of equipment may be contaminated to a different degree; therefore, segregation at the drop reduces the potential for contamination. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Boot Covers, and Glove Wash

Thoroughly wash and scrub outer boot covers, and gloves with a decontamination solution or detergent-waste solution. Equipment needed:

- container (20 to 30 gallon)
- decontamination solution
- detergent-water solution
- two or three long-handled, soft-bristled scrub brushes

Station 3: Boot Covers, and Glove Rinse

Rinse off the decontamination solution from Station 2 using copious amounts of water. Repeat as many times as necessary. Equipment needed:

- container (30 to 50 gallon)
- high-pressure spray unit and splash guard
- water
- two or three long-handled, soft-bristled scrub brushes

Station 4: Tape Removal
Remove tape around boots and gloves and deposit it in a container with a plastic liner.
Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 5: Boot Cover Removal
Remove boot covers and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 40 gallon)
- plastic liners
- bench or stool

Station 6: Outer Glove Removal Remove outer gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 7: Canister or Mask Change
If a worker leaves the exclusion zone to change their canister (or mask), this is the last step in the decontamination procedure. The worker's canister is exchanged, new outer gloves and boot covers are donned, joints are taped, and the worker returns to duty. Equipment needed:

- respirator canisters appropriate to the field hazard
- extra respirators
- tape
- boot covers
- gloves

Station 8: Outer Garment Removal
One-piece coverall is removed and deposited in containers with plastic liners. Equipment needed:

- containers (20 to 30 gallon)
- plastic liners

Station 9: Inner Glove Wash
Wash with decontamination solution or detergent-water solution that will not harm skin. Repeat as many times as necessary. Equipment needed:

- basin or bucket
- decontamination solution
- detergent-water solution
- small table

Station 10: Inner Glove Rinse

Rinse with water. Repeat as many times as necessary. Equipment needed:

- water
- basin or bucket
- small table

Station 11: Face Piece Removal and Decontamination

Remove face piece while avoiding facial contact by fingers. Face-piece is deposited on a clean plastic sheet. Canisters are removed and deposited in containers with plastic liners. Respirators are scrubbed with soap and water and rinsed with copious amounts of clean water. Equipment needed:

- water
- soap
- small buckets
- small brushes
- sponges or cloths
- plastic sheeting

Station 12: Inner Glove Removal

Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 13: Inner Clothing Removal

Remove inner clothing. Place it in a container with a plastic liner. Do not wear inner clothing off the site, since small amounts of contaminants may have been transferred in removing outer suit. Equipment needed:

- container (30 to 50 gallon)
- plastic liners

Station 14: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- water
- soap
- small table
- basin or bucket
- field showers
- towel

Station 15: Redress

Put on clean clothes. A dressing trailer is needed in inclement weather. Equipment needed:

- table
- chairs
- lockers
- clothes

E-4 *MINIMUM* DECONTAMINATION PROCEDURES FOR *LEVEL C*

Equipment Worn

This decontamination procedure outlined is the **minimum** number of decontamination stations necessary for Malcolm Pirnie workers wearing the following protective clothing and equipment:

- one-piece coverall
- full-face respirator
- hard hat
- safety boots with steel toe and shank
- boot covers
- inner and outer gloves
- taped joints between gloves, boots, and suit

Station 1: Segregated Equipment Dump

Deposit equipment used on the site (tools, sampling devices and containers, monitoring instruments, radios, clipboards, etc.) on plastic drop cloths or in different containers with plastic liners. Segregation at the drop reduces the probability for cross-contamination. During hot weather operations, cool-down station may be set up within this area. Equipment needed:

- containers of various sizes
- plastic liners
- plastic drop cloths

Station 2: Boot Covers, and Glove Wash and Rinse

Thoroughly wash and scrub outer boots, and gloves with a decontamination solution or detergent-waste solution. Rinse off using copious amounts of water. Equipment needed:

- containers (20 to 30 gallon)
- decontamination solution
- detergent-water solution
- rinse water
- high-pressure spray unit and splash guard
- two or three long-handled, soft-bristled scrub brushes

Station 3: Outer Boot and Glove Removal

Remove outer boots and gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (30 to 40 gallon)
- plastic liners
- bench or stool
- water
- two or three long-handled, soft-bristled scrub brushes

Station 4: Canister or Mask Change

If a worker leaves the exclusion zone to change their canister (or mask), this is the last step in the decontamination procedure. The worker's canister is exchanged, new outer gloves and boot covers are donned, joints are taped, and the worker returns to duty. Equipment needed:

- respirator canisters appropriate to the field hazard
- extra respirators
- tape
- boot covers
- gloves

Station 5: Outer Garment Removal

One-piece coverall is removed and deposited in containers with plastic liners. Equipment needed:

- containers (20 to 30 gallon)
- plastic liners

Station 6: Face Piece Removal and Decontamination

Remove face piece while avoiding facial contact by fingers. Face-piece is deposited on a clean plastic sheet. Canisters are removed and deposited in containers with plastic liners. Respirators are scrubbed with soap and water and rinsed with copious amounts of clean water. Equipment needed:

- water
- soap
- small buckets
- small brushes
- sponges or cloths
- plastic sheeting

Station 7: Inner Glove Removal

Remove inner gloves and deposit them in a container with a plastic liner. Equipment needed:

- container (20 to 30 gallon)
- plastic liners

Station 8: Field Wash

Shower if highly toxic, skin-corrosive, or skin-absorbable materials are known or suspected to be present. Wash hands and face if shower is not available. Equipment needed:

- water
- soap
- small table
- basin or bucket
- field showers
- towels

New York State Department of Environmental Conservation
625 Broadway • Albany, New York 12233-7011

Modock Road Springs/DLS Sand and Gravel, Inc. Site (HW 8-35-013)
Victor, New York
Work Assignment # D-004439-1

Immediate Investigation Work Plan Appendix C: Quality Assurance Project Plan

February 2007

Plan Prepared By:

Malcolm Pirnie, Inc.

43 British American Blvd.
Latham, New York 12110
518-782-2100

0266353

MALCOLM PIRNIE

Contents

List of Figures

List of Tables

ACRONYMS AND ABBREVIATIONS

ASP	Analytical Services Protocol
CRQLs	Contract Required Quantitation Limits
DCA	Dichloroethane
DCE	Dichloroethene
FSP	Field Sampling Plan
GW	Groundwater
gpm	gallons per minute
HASP	Site Specific Health and Safety Plan
IDL	Instrument Detection Limit
MDL	Minimum Detection Limit
MPI	Malcolm Pirnie, Inc.
MS	Matrix spikes
MSD	Matrix spike duplicate
NBS	National Bureau of Standards
NYSDEC	New York State Department of Environmental Conservation
OSWER	Office of Solid Waste and Emergency Response
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PCE	Perchloroethene (Tetrachloroethene)
RCRA	Resource Conservation and Recovery Act
PID	Photoionization Detector
PPE	Personal protective equipment
RFI	RCRA Facility Investigation
RPD	Relative percent difference
SOPs	Standard Operating Procedures
SVOCs	Semi-volatile organic compounds
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TCA	Trichloroethane
TCE	Trichloroethene
VC	Vinyl chloride
VOA	Volatile Organic Analysis
VOCs	Volatile Organic Compounds
QA	Quality Assurance
QC	Quality Control
QAPP	Quality Assurance Project Plan
EPA	United States Environmental Protection Agency

1. Project Management

1.1. Introduction

The objective of this Quality Assurance Project Plan (QAPP) is to ensure that data produced from this investigation are of sufficient quality and quantity to evaluate potential soil vapor intrusion pathways at the Modock Road Springs Site in the Town of Victor, New York. To meet this objective, the following topics are presented and discussed in this QAPP:

- Project organization and responsibilities
- Data quality objectives and analytical requirements
- Sample collection procedures
- Sample integrity
- Field data collection procedures
- Analytical method requirements
- Data validation requirements

This investigation will include the collection of air and soil vapor samples, which will be analyzed for volatile organic compounds (VOCs).

This QAPP has been prepared to address field sample collection procedures, laboratory analysis of samples, and data evaluation of the laboratory sample results. In addition, this QAPP addresses components that influence these processes and provides a detailed plan to ensure that decisions being made from the analytical data are valid, accurate, and usable in support of subsequent recommendations.

1.2. Project/Task Organization

Malcolm Pirnie will provide oversight, coordination, health and safety, field support, and evaluation of analytical data. Malcolm Pirnie will also be responsible for evaluation of analytical test results, which will be submitted to NYSDEC. The Malcolm Pirnie staff members involved in this project are detailed below:

Daniel Loewenstein, P.E., Project Officer, will have the final responsibility for the quality of work performed and the allocation of resources and personnel for the IIWA.

Shi Ng, the Quality Assurance Officer, will perform project review independently of project management and will oversee Malcolm Pirnie's QA/QC program for the project. Certain QA/QC tasks may be delegated to a QA/QC Task Manager.

Bruce Nelson, P.G., the Project Manager, will be responsible for the day-to-day management of the project including the allocation of technical resources, development of work plans, and coordination of project activities and personnel. Mr. Nelson will be responsible for maintaining a clear definition of and adherence to the NYSDEC approved scope, schedule, and budget.

Daniel Lang, P.H.G., Deputy Project Manager, will manage the field investigations and reporting during the IIWA. He will interact with the Project Manager and other team members and support staff to complete and document the scope of work.

1.3. Problem Definition/Background

The Modock Road Springs site is located in a rural/suburban area in the Town of Victor, Ontario County, New York. In advance of a Remedial Investigation/Feasibility Study (RI/FS) at the Modock Road Springs site, an indoor air sampling program will be completed as part of this IIWA during the 2006/2007 heating season. Data collected during previous investigations document the presence of trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), and dichloroethene (DCE) in groundwater beneath a rural suburban residential area of the Town of Victor. The groundwater plume appears to originate on the DLS Sand & Gravel, Inc. property and extends approximately one mile to the north where it discharges as a series of springs (Figure 1). The springs were historically used as a drinking water source for the Town of Victor. Over the length of the groundwater plume, total chlorinated volatile organic compound (CVOC) concentrations range from approximately 16 ppm near the southern portion of the plume to approximately 250 ppb at the springs. Currently, little data exists to assess the potential for vapors to enter into the overlying residential homes.

NYSDEC is evaluating the potential for migration of VOCs in subsurface soils to indoor air at the site. The data generated by this investigation may be used to evaluate vapor intrusion into the residences. This QAPP was prepared to support the sampling effort but may also be used if similar, subsequent air sampling activities are conducted for this project.

1.4. Project/Task Description

The indoor air sampling will be conducted at approximately 25 to 30 residences. The primary goal of the monitoring effort is to document the indoor air quality and evaluate the potential for soil vapor intrusion. Deliverables for this project include a Work Plan and a report detailing the monitoring results. Field activities for this project are discussed

in the Immediate Investigation Work Plan and Field Activities Plan. In addition, analytical methods are also outlined below and shall be requested and documented on the chain-of-custody record. In the event that the analytical laboratory selected cannot perform the methods identified, or, subcontract the samples to another analytical laboratory, alternate methods may be selected as long as they are first approved by the Agencies and the laboratory QA/QC is performed in accordance with published EPA methodologies.

1.5. Data Quality Objectives

This section defines the data quality objectives (DQOs) for the measurement data and the criteria for measuring performance within these objectives. DQOs are qualitative and quantitative statements that specify the quality of the data to support decisions, and are developed to address specific procedures for collecting, analyzing, and evaluating results to meet overall project objectives.

1.5.1. Project Quality Objectives

For any monitoring effort to be successful, specific quality objectives must be stated. The monitoring and quality control results can then be assessed against these objectives to demonstrate that the quality of the measurement data is such that it meets the needs of the project. Data quality indicators typically evaluated during an air quality monitoring project include precision, accuracy, completeness, representativeness, and comparability. These parameters are discussed further below as they pertain to this program. Additionally, minimum reporting limits for this program will meet potential indoor air criteria when reasonably achievable by the laboratory.

1.5.2. Measurement Performance Criteria

Specific performance criteria must be identified so that the project team can measure progress and success in attaining the quality goals for the monitoring effort. The primary areas for which specific performance criteria can be stated are precision, accuracy, and completeness. Table 1-1 presents a summary of measurement performance criteria for the project.

Representativeness and comparability are also used to evaluate quality, although the evaluation is typically qualitative in nature. Representativeness is ensured through selection of appropriate sample locations within the buildings. Comparability is accomplished through the use of standard measurement methods approved by EPA, NIOSH, or the ACGIH and by reporting measurement data in common units to facilitate comparison with other data sets generated by regulatory and private agencies.

Table 1-1.
Measurement Performance Criteria

Measurement Parameter	Measurement Method	Precision Criteria	Accuracy Criteria	Completeness Criteria
VOC Analysis of Indoor Air Samples	SUMMA Canister with subsequent Analysis by Method TO-15 (GC/MS)	25% RPD[a]	Lab derived criteria[b]	>90%[c]

[a] Assessed through the evaluation of collocated (duplicate) samples that are ≥ five times the method detection limit.
[b] Assessed through the use of laboratory control samples.
[c] Completeness of the entire data set.

1.6. Documentation And Records

Thorough documentation of project activities will be conducted during this monitoring effort. Three main areas of documentation are field operation records, laboratory records, and data management records.

Field operation records will include field logbooks and the sample chain-of-custody forms. These records will be maintained by the field sampling task leader and archived in the project file at the end of the monitoring program. The laboratory will maintain records for the various aspects of the indoor and outdoor air and soil vapor analyses. This will include sample custody, raw data from the analysis, QC check data, analysis reports, and electronic data files. The laboratory will submit an analytical data package along with the analytical data to support the analytical results. Level 4 data packages will be developed for the initial air and soil vapor sampling events. The laboratory will be responsible for maintaining these analytical records and transmitting the analytical results to a QA/QC Task Manager as hardcopy and electronic files.

Data management records will include the organization and review of the laboratory files and the on-site data records. A QA/QC Task Manager will work with the laboratory to ensure that the data files are received as scheduled and will request supporting documentation from the laboratory as needed. The reporting task leader will ensure that field and laboratory records are included in the project files.

For all documentation in written form, indelible ink will be used with any hand corrections being made by a single line through the incorrect entry with the author's initials immediately following the correction. All work performed during the data collection, review, and validation process will be traceable to the author. All data products will have the ability to be reversed to their original result if required.

Corrective actions, whether taken in the field, laboratory, or data management center must be documented. Documentation of any corrective action should show the nature of the deficiency, actions taken, and evidence gathered to verify resolution of the deficiency. Corrective actions may be documented as:

- Field calibration or trip report forms;
- Laboratory narratives accompanying the analytical data;
- Instructions or notes included in the original data validation package; or
- Project e-mails copied to the task leaders impacted by the situation (with a copy always to the project manager).

2. Measurement Data Acquisition

QA/QC checks will be utilized to ensure the data collected are scientifically sound, defensible, and of known acceptable documented quality. The field QC procedures will include canister measurements and collection of duplicate samples. QA samples will be collected to compare analytical results from collecting a duplicate sample (soil vapor, ambient air, and/or indoor air). The results from the duplicate samples will be compared by calculating the Relative Percent Difference (RPD) for the samples. Accuracy in the field will be determined through the use of field blanks and through adherence to all sample handling, preservation, and holding times as specified in the Work Plan. Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plan is followed and that proper sampling techniques are used.

QC procedures employed in the laboratory will include calibration checks, method blanks, duplicates, matrix spike/matrix spike duplicates, and laboratory control spikes. The field samples will be accompanied to the laboratory by travel blank samples supplied by the laboratory. Travel blank sample results will be used to monitor cross-contamination during sample shipment.

QC activities for the field and the laboratory functions on this project are discussed in more detail in the following sections. Data management QC is discussed as part of the data validation activities.

2.1. Field Quality Control

QA/QC procedures will be followed to help demonstrate the quality of the data that are generated during the field program. These will include the following tasks:

- Equipment calibration – The flowmeter used to set and control flow into the canisters will be calibrated using a NIST traceable flow standard.
- Documentation – The field sampler will be responsible for maintaining Site information, including field books and sample chain-of-custody forms. Copies of this documentation will be forwarded to the project files at the end of the monitoring effort.
- Chain-of-Custody – A chain-of-custody record, indicating sample identification number, sampling location, and any comments particular to the sample will accompany each VOC sample during shipment from the field.

- Determining background VOCs – The background samples will assess what VOCs are present in the ambient air not affected by diffusion of vapors from below ground and confounding indoor sources.
- QC Sample Collection – Duplicate field samples (or collocated samples) will be collected during each sampling event. Duplicate samples will be collected at a rate of 1 in 20 per event. From these samples, an estimate of precision can be calculated as the upper and lower 95% probability statistic.

2.1.1. Sampling Process Design

The sampling effort is designed to evaluate the potential for migration of VOCs in the subsurface to indoor air. During the initial sampling program, indoor air samples will be collected over an approximately 24-hour period. The sampling will be conducted on days that are representative of normal conditions. In addition, outdoor background samples will be collected to determine the concentration of VOCs in the ambient air not affected by indoor activities. Soil vapor samples will be collected from beneath the building floor slab. The number of samples to be collected is outlined in the Field Activities Plan.

2.1.2. Sampling Methods Requirements

All of the samples collected during this program will be manually collected using SUMMA canisters. Considerations for collection of samples include:

- Canisters will be located so there is unobstructed air flow around the sampler;
- Air flow through the buildings will be considered when choosing sampling locations;
- Canisters will be located to ensure that samples are representative of the conditions inside the residences;
- The background samples will be located to ensure that local conditions (i.e., specific emission sources) do not impact the background;
-

2.1.3. Sampling Collection Methods

All of the air samples for the determination of VOCs will be collected using evacuated 1- or 6-liter SUMMA passivated, stainless-steel canisters. A diagram of the sampling system is shown in Figure 2-1. The sample inlet will be placed approximately 36 inches above the ground to collect samples in the breathing zone. In addition, each sampler will contain a 7 micron particulate filter, a vacuum gauge, and a flow controller to collect the time-integrated samples. Milliflow®, Veriflow®, or an equivalent regulator will be used.

Soil vapor samples will be collected using temporary probes installed beneath the floor slab. The soil vapor probes will be attached to the SUMMA canister sampling train consistent with the indoor/outdoor air samples, using 1- or 6-liter canisters. Purging and

sampling activities associated with sub-slab vapor sampling will be performed at a consistent flow rate that is less than or equal to 0.2 liters per minute.

Prior to sampling, each canister will be cleaned and blanked by the laboratory. Following cleaning and blanking, the canisters will be evacuated, leak-checked, their vacuum measured, and prepared for field deployment. The sampling should be coordinated with the laboratory so that the canisters are used within approximately two weeks from the time they are cleaned, blanked, and pressure checked.

2.1.4. Sample Documentation And Control Requirements

Sample custody during the field investigations will be completed in two phases. The first phase encompasses sample collection, pre-laboratory treatment procedures (preservation), packaging, and field custody procedures. The second custody phase involves sample shipment, method of shipment, and date and time documentation. Both phases of sample custody will be conducted to provide that:

- All samples are uniquely identified;
- The correct samples are tested and traceable to their source;
- Vital sample characteristics are preserved;
- Samples are protected from loss or damage; and
- A record of sample custody and integrity is established and maintained through the entire custody process.

Field operation records include field logs and chain-of-custody records. The chain-of-custody forms are returned with the samples to the subcontract laboratory. Copies of these records are subsequently forwarded by the laboratory to the project team with the hardcopy report of analytical results. An example of the sample chain-of-custody form is shown in Figure 2-2.

2.1.5. Field Documentation

A bound field logbook will be maintained to record daily activities. Entries will be made in indelible ink and the pages will be consecutively numbered. Incorrect entries will be corrected by a single stroke through the error and will be verified with the recorder's initials and date of correction. Entries to the logbook will include:

- Date
- Start and finish times
- Summary of work performed (included samples collected)

- Names of personnel present
- Names of visitors
- Testing integrity of each Summa canister before and after sampling
- Observations and remarks

The following information will be recorded in the field logbook at the time of sampling:

- Sample designation
- Name of sampler
- Method of collection
- Time and date of sampling
- Type of sample
- Analyses
- Field measurements and canister integrity (if applicable)
- Canister number
- Flow controller number
- Observed conditions which may impact the chemistry of the sample

2.1.6. Photo Documentation

Progress photographs will be taken during the investigation. These photographs may include the sampling apparatus, collection activities, and surrounding areas. Photographs taken to document sampling points should include two or more reference points to facilitate relocating the sample location at a later date.

2.1.7. Field Custody Procedures

All samples collected from the Site must be identified with a sample label or tag and recorded on a chain-of-custody form. Indelible ink will be used to complete sample labels and labels will then be covered with clear plastic waterproof tape.

If an error is made on an accountable document, corrections will be made simply by crossing out the error and entering the correct information. Any error discovered on a document should be corrected by the person who made the entry. All corrections must be initialed and dated.

2.1.8. Sample Labels

Sample labels are required to include the following information:

- Site Name
- Sample Number
- Sample Type
- Sample Canister Identification (ID)
- Date of Collection
- Time of Collection
- Sampler(s) Name

2.1.9. Sample Numbering

Each sample shall be identified using a unique sample number. A sample numbering system shall be developed subsequent to the initial Site survey, which will be designed to reflect the sample location, sample type, and date of sample collection.

If conditions require resampling of a sample location (i.e., sample is not retrieved properly), the sample shall be labeled as described above with a "RESP" placed at the end of the sample number, indicating resampling had occurred.

Identification for the samples will follow the protocols below:

MRS-XX-###-MMDDYY

Where:	MRS	Identifies the Site as the Modock Road Springs	
	XX	Identifies the sample type	
		Outdoor air sample:	OA
		First floor air sample:	FA
		Basement air sample:	BA
		Crawl space air sample:	CS
		Sub-slab soil vapor sample:	SS
	###	Sequential sample number starting at 1 and continuing through the project.	
	MMDDYY	Month, Day, Year	

2.1.10. Chain-Of-Custody Record

The chain-of-custody provides an accurate written record that can be used to trace the possession and handling of the sample from the time of collection to analysis. The chain-of-custody form will be completed for each sample at the time of collection and will be maintained while shipping the sample to the laboratory. The laboratory shall supply chain-of-custody records to the field sampling crew. The following information must be entered on the chain of custody form.

- Project number - enter the alpha-numeric designation that uniquely identifies the project Site (e.g., 0266353);
- Project name – Modock Road Springs;
- Signature of sampler(s);
- Sample number - enter the sample identification number for each sample in the shipment;
- Date - enter a six-digit number indicating the month, day and year of sample collection (MM-DD-YY, e.g., 02-25-2002);
- Time - enter a four digit number indicating the time of collection based on the 24-hour clock (e.g., 1300);
- Sample matrix - enter the matrix (e.g., air versus soil vapor) of the sample;
- Parameters for analysis - enter the analytical method number for each sample collected;
- Remarks - enter any appropriate remarks.

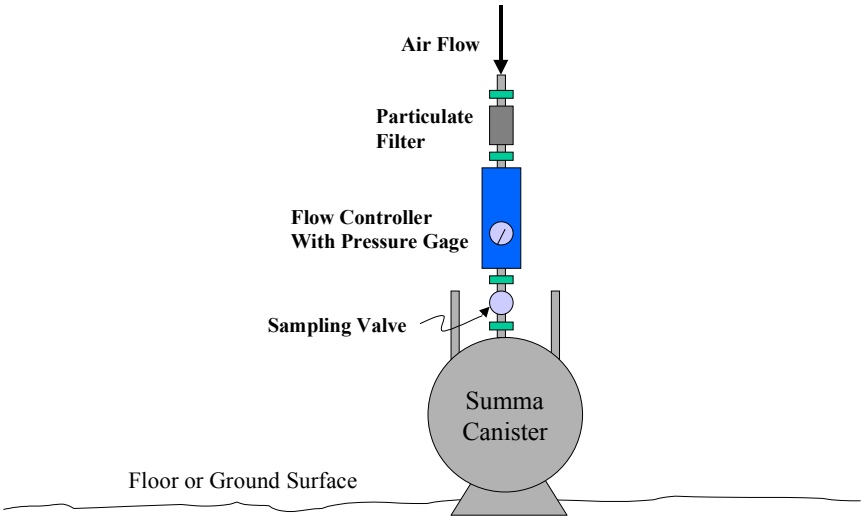


Figure 2-1. Diagram of Summa Canister Sampling Train

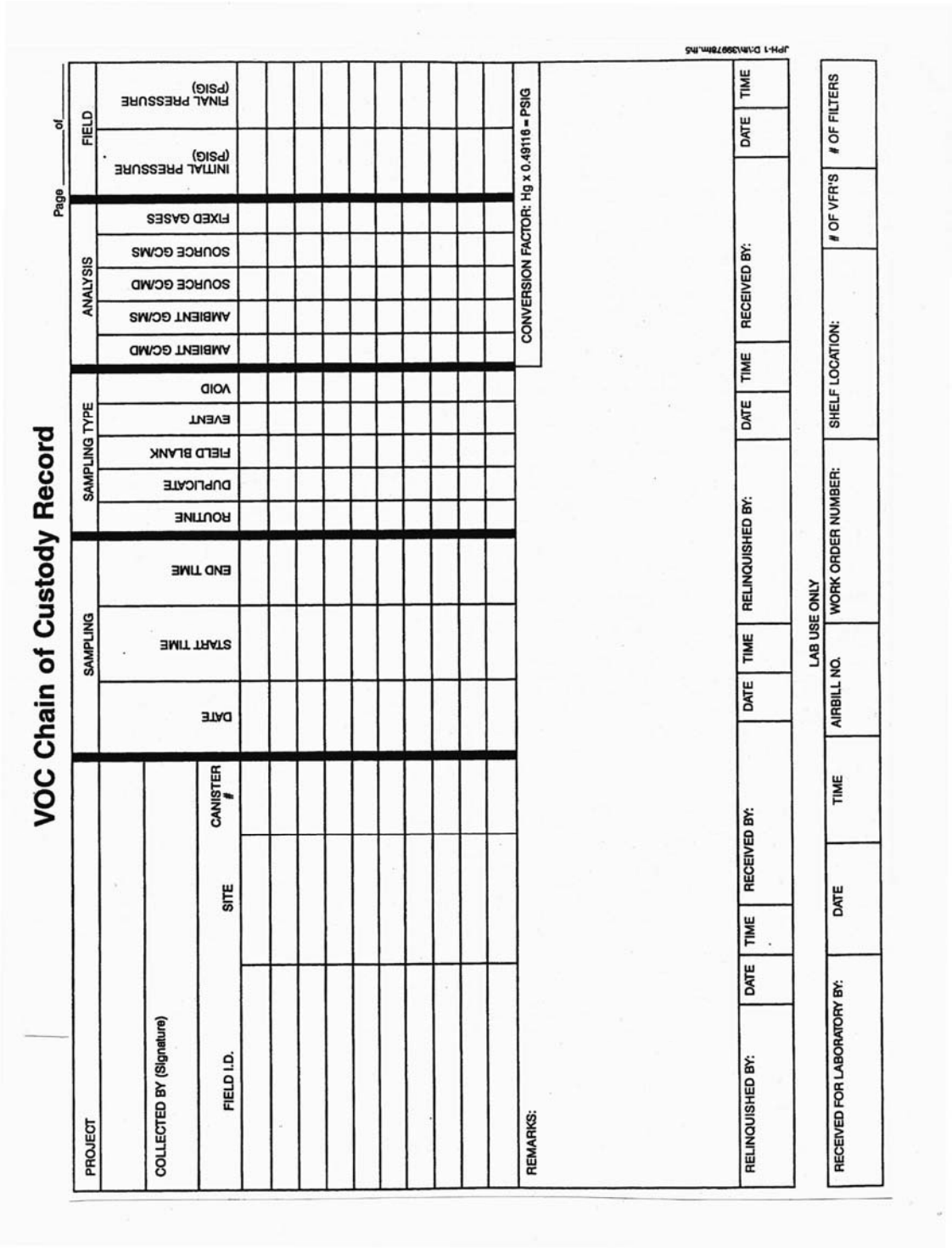


Figure 2-2. Canister Chain-of-Custody Form

2.2. Laboratory Quality Control

2.2.1. Canister Cleaning And Certification Requirements

The laboratory must adhere to their in-house Canister Cleaning and Certification Procedures. For this project, the following is required:

- All canisters must be clean and batch-certified to be free of any contaminants before sample collection.
- All canisters must be leak tested by pressurizing them to approximately 206 kPa (approximately 30 psig) with zero air.
- The canisters must be used in the field within 2 weeks.

2.3. Canister Receipt In The Field

- Upon receipt of the Summa canister from the laboratory, the integrity of the canister will be checked by attaching a pressure gauge to the Summa canister and measuring the vacuum. The vacuum must read less than 25 in. Hg; if the canister vacuum does not meet this criterion, discard the canister and return the canister to the laboratory.
- Note the integrity and measurement on the Sample Collection Report Form.

2.3.1. Canister Receipt To The Laboratory

The laboratory must perform and document the following procedures:

- The overall condition of each sample canister must be observed. Verify that each canister is accompanied with a sample identification tag. Complete the canister chain-of-custody record.
- Each canister is recorded in a dedicated laboratory notebook. Also, noted in the identification tag are date received and initials of recipient.
- The pressure of the canister must be checked by attaching a pressure gauge to the canister inlet. The canister valve is opened briefly and the pressure (in Hg) is recorded.
- Note the final cylinder pressure in the dedicated logbook.

2.3.2. Flow Controller And Gauge Cleanliness

Specific flow controllers and gauges will be assigned to individual canisters. The flow controllers and gauges will be cleaned prior to leaving the laboratory in accordance with the laboratories Standard Operating Procedures.

2.3.3. Non-Analytical Instrument Calibration

The only non-analytical instrument requiring calibration for this project will be the flowmeter used to control sample flow into the canisters. The low-flow flowmeter used to measure canister flow will be calibrated against a NIST certified primary flow standard. This may be either a dry cell or an electronic soap bubble meter, such as a Gilibrator or Mini-Buck. At least five points over the flowmeter's range will be checked and the flowmeter must have a linearity, as measured by a least squares fit correlation coefficient, of greater than 0.995.

2.3.4. Analytical Methods

The air and soil vapor samples will be analyzed for target VOCs using a gas chromatograph equipped with a mass spectrometer detector (GC/MS), using guidance outlined in EPA Method TO-15. The New York State draft. TO-15 vapor intrusion analyte list is included in Table 2-1.

A sample of air or vapor is drawn through a sampling train comprised of components that regulate the rate and duration of sampling into a pre-evacuated specially prepared passivated canister. Once air sampling is complete, the ID tag and chain-of-custody record are completed, and the canister is transported to the laboratory for analysis. Upon receipt at the laboratory, the canister tag data is recorded, the chain-of-custody record completed, and the canister is attached to the analytical system.

To analyze the sample, a known volume of sample is directed from the canister through a solid multisorbent concentrator. During analysis, water vapor is reduced in the gas stream by a dryer (Nafion, if applicable), and the VOCs are then concentrated by collection in a cryogenically-cooled trap. The cryogen is then removed and the temperature of the trap is raised. The VOCs originally collected in the trap are revolatilized, separated on a GC column, and then detected using a MS. The MS is located at the end of the GC column and is utilized to 1) detect a chemical compound and 2) identify the chemical compound. Detection by MS is a destructive process that involves bombardment of a chemical compound with energy, which results in fragmentation of the chemical compound. Identification by MS occurs by comparing the fragmentation pattern of known chemical compounds that are stored in a computer database, or library, within the computer driven software.

The GC/MS allows positive compound identification, thus lending itself to more certain identifications than any other method. The MS may be operated in either the selected ion monitoring (SIM) mode or the SCAN mode. In the SIM mode, the GC is coupled to a MS programmed to acquire data for only specified ions and to disregard all others. This is performed using SIM coupled to retention time discriminators. In the SCAN mode, the GC is coupled to a MS programmed in the SCAN mode to scan all ions repeatedly during

the GC run; this procedure serves as a qualitative identification and characterization of the sample.

For SIM operation, the MS is programmed to acquire data for a limited number of targeted compounds while disregarding other acquired information, however, while operating in the SIM mode, the MS provides lower detections limits, but its flexibility is limited. In the SCAN mode, however, the MS becomes a universal detector, often identifying compounds which cannot be defensibly identified by any other approach. The GC/MS/SCAN provides positive identification, while the GC/MS/SIM procedure provides a more sensitive quantitation of a restricted "target compound" list. The selection of SIM versus SCAN mode will be based on the laboratory reporting limits.

Table 2-1 shows the New York State draft TO-15 vapor intrusion analyte list and the associated Columbia Analytical Services, Inc. method reporting limits. Table 2-2 shows the acceptance criteria and corrective actions for the Method TO-15 analysis.

Table 2-1.
TO-15 Analyte List and Method Reporting Limits

Columbia Analytical Services, Inc. Air Quality Laboratory
Volatile Organic Compounds (VOCs)
EPA Method TO-15
Method Detection Limits (MDLs) and Method Reporting Limits (MRLs)

Method Reporting Limits (MRLs) assume a 1 L sample volume.
Actual reporting limits will be higher depending on the canister dilution factor and sample matrix effects.

		ug/m3	
	Compound	**MRL**	**MDL**
1	1,1,1-Trichloroethane	0.5	0.14
2	1,1,2,2-Tetrachloroethane	0.5	0.11
3	1,1,2-Trichloroethane	0.5	0.15
4	1,1-Dichloroethane	0.5	0.11
5	1,1-Dichloroethene	0.5	0.19
6	1,2,4-Trichlorobenzene	0.5	0.19
7	1,2,4-Trimethylbenzene	0.5	0.048
8	1,2-Dibromoethane	0.5	0.057
9	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	0.5	0.37
10	1,2-Dichlorobenzene	0.5	0.075
11	1,2-Dichloroethane	0.5	0.081
12	1,2-Dichloropropane	0.5	0.048
13	1,3,5-Trimethylbenzene	0.5	0.045
14	1,3-Dichlorobenzene	0.5	0.11
15	1,4-Dichlorobenzene	0.5	0.075
16	1,4-Dioxane	0.5	0.084
17	2-Butanone	0.5	0.14
18	2-Hexanone	0.5	0.078
19	Acetone	2.5	0.62
20	Benzene	0.5	0.076
21	Benzyl Chloride	0.5	0.059
22	Bromodichloromethane	0.5	0.13
23	Bromoform	0.5	0.17
24	Bromomethane	0.5	0.21
25	Carbon Tetrachloride	0.1	0.12
26	Chlorobenzene	0.5	0.11
27	Chloroethane	0.5	0.14
28	Chloroform	0.5	0.075
29	Chloromethane	0.5	0.15
30	cis-1,2-Dichloroethene	0.5	0.077
31	cis-1,3-Dichloropropene	0.5	0.057
32	Cyclohexane	0.5	0.081
33	Dibromochloromethane	0.5	0.18
34	Dichlorodifluoromethane (Freon 12)	0.5	0.1
35	Ethanol	2.5	0.13
36	Ethylbenzene	0.5	0.051
37	Hexachloro-1,3-Butadiene	0.5	0.083
38	Isooctane	0.5	0.073
39	m,p-Xylene	0.5	0.13
40	Methyl tert-Butyl Ether	0.5	0.11
41	Methylene Chloride	0.5	0.14
42	n-Hexane	0.5	0.11
43	o-Xylene	0.5	0.11
44	Styrene	0.5	0.08
45	t-Butanol	0.5	0.14
46	Tetrachloroethene	0.5	0.17
47	Toluene	0.5	0.034
48	trans-1,2-Dichloroethene	0.5	0.076
49	trans-1,3-Dichloropropene	0.5	0.083
50	Trichloroethene	0.1	0.13
51	Trichlorofluoromethane (Freon 11)	0.5	0.075
52	Trichlorotrifluoroethane (Freon 113)	0.5	0.19
53	Vinyl Chloride	0.5	0.11

Table 2-2.
Summary of Internal QC Procedures for VOC Analyses (Method TO-15)

Calibration and QC Analyses	Description	Frequency	Acceptance Criteria	Corrective Action
Initial Calibration	Calibration at 1.0, 2.5, 5.0, 7.5, and 10 ppbV.	Biannually or when daily calibration check fails to meet acceptance criteria	Relative Standard Deviation (RSD) for calibration check compounds: <30%. Linear regression for analytes outside RSD criteria, $R \geq 0.995$.	1. Reanalyze load volume not meeting criteria. 2. Troubleshoot. 3. Repeat calibration. 4. Issue QCER and notify Lab Manager.
Calibration Verification	Midrange calibration standard containing calibration verification compounds	Daily prior to sample analysis	Recovery: 70-130% for all compounds, except: 1,2,4-Trichlorobenzene: 50-150% Hexachloro-1,3-butadiene: 50-150%	1. Repeat analysis. 2. Perform instrument maintenance. 3. Recalibrate. 4. Issue QCER (Level 2) and notify Lab Manager.
BFB Tuning Check	Evaluation of 4-Bromo-1-fluorobenzene (BFB) peak in the calibration verification.	At the beginning of each analytical sequence.	Must meet: Ion abundance criteria specified in Method.	If ion abundance criteria are not met: 1. Evaluate BFB in method blank. 2. Re-tune and reanalyze BFB. 3. Troubleshoot, retune if necessary and repeat BFB analysis.

Calibration and QC Analyses	Description	Frequency	Acceptance Criteria	Corrective Action
LCS/LCSD	Second source standard containing analytes of interest at 2-5 ppbv	Once daily for each analytical batch.	LCS and the paired LCS must meet accuracy and precision tolerances. Accuracy and precision will follow lab derived criteria.	1. Accuracy: a. If any analyte is out of tolerance for the LCS and/or LCSD, check the calibration verification b. If calibration verification is ok, then write a Level 2 QCER and proceed with analyses. c. If the recovery for the calibration verification is not acceptable, stop and correct the problem. d. If CSC approval is obtained to proceed, write QCER (Level 2). 2. Precision: a. Demonstrate acceptable RPDs for analytes that failed by analyzing a third LCS. b. If RPDs between the third LCS and either the LCS or LCSD meet tolerances, proceed with analysis. c. If RPDs are still out of tolerance, stop and correct problem. d. If CSC approval is obtained to proceed, write QCER (Level 2).

Calibration and QC Analyses	Description	Frequency	Acceptance Criteria	Corrective Action
Method Blank	Canister containing humidified UHP nitrogen	Daily – prior to sample analysis	Measured concentrations for all analytes must be less than PRDL.	1. If contamination is >PRDL, then the concentration of the affected analytes in the associated samples must be >10 times the concentration in the method blank. 2. Repeat blank analysis. 3. If contamination is still present, determine source. a. If instrument contamination indicated, correct problem, reanalyze blank and proceed with analysis. 4. Issue QCER (Level 2) and notify Lab Manager.
Internal Standards	Two internal standards added to each sample, standard, and blank at 2 ppbv.	All samples, standards, and blanks.	Extracted ion area counts must be within a factor of 2 from Calibration Verification.	1. Reanalyze sample if out of specification. 2. If still out, identify and correct the problem or issue a QCER if an interference is suspected. 3. Write QCER (Level 2) if necessary and notify Lab Manager.
Analytical Surrogate	Five surrogate compounds are added to each sample, standard and blank at 2 ppbv.	All samples, standards, and blanks.	Accuracy: Use lab derived criteria	QC Samples: 1. Reanalyze if outside tolerance. 2. If still out for QC samples, correct the problem. 3. If still out for field samples, write QCER (Level 2).
Analytical Duplicate Precision	Field sample analyzed in duplication.	One analytical duplicate pair for each analytical batch.	1. Surrogates RPD $\leq$ 25%. 2. Four largest target analytes present RPD $\leq$ 25%.	1. Repeat analysis. 2. Perform system maintenance. 3. Issue QCER and notify Lab Manager.

2.3.5. Laboratory Instrument Calibration And Frequency

The GC/MS system will be calibrated initially at five standard concentrations (three for some compounds) that span the monitoring range of interest in an initial calibration sequence to determine instrument sensitivity and the linearity of GC/MS response for the target compounds. An instrument performance check standard and continuing calibration check shall be performed every 24 hours of operation. Mass calibration and resolution of the GC/MS system are verified by the analysis of the instrument performance check standard, 4-bromo 1-fluorobenzene (BFB).

Prior to the analysis of any samples and blanks, but after tuning criteria have been met, the initial calibration of each GC/MS system must be routinely checked by analyzing a daily calibration standard to ensure that the instrument continues to remain under control. The daily calibration standard, which is the nominal 5 ppbv level calibration standard, should contain all the target analytes. The percent difference for each target compound in a daily calibration sequence must be within method criteria in order to proceed with the analysis of samples and blanks. Those compounds that exceed the criteria shall be flagged accordingly.

Laboratory records include chain-of-custody forms, raw data files from the analysis, QC check data, analysis reports, and electronic data files. The laboratory is responsible for maintaining these records, and long-term archival of records is accomplished using a well-defined laboratory procedure. Following analysis, the electronic data, a printout of the analysis data, QC checks, and copies of the sample chains of custody will be forwarded to the data management team.

The following type and grade of materials must be used during analysis of the project samples:

- Gas cylinders of helium, hydrogen, nitrogen, and zero air must be ultrahigh purity grade, best source, and tested before use.
- Gas calibration standards – cylinders containing approximately 1 ppmv of each of the compounds must be prepared by dilution for NIST, traceable mixes.
- Cryogen – liquid nitrogen (boiling point = 196.0C).
- Gas purifiers – connected in-line to remove moisture and organic impurities from gas streams (Alltech Associates, 2051 Waukegan Road, Deerfield, IL, 60015, or equivalent).
- Ultrahigh purity water (for humidifier), boiled immediately before use.
- 4-Bromo 1-fluorobenzene (BFB) – used for verification of instrument performance, GC/MS (Matheson, or prepared from neat).
- Hexane/pentane – for cleaning sampling system components, reagent grade, best source.

- Methanol – for cleaning sampling system components, purge & trap grade, best source.

2.4. Analytical Quality Assurance And Quality Control (QA/QC) Requirements

The total number, types of matrices, and sample locations are cited within the Work Plan document. The proposed number and frequency of QA/QC samples designed to address the overall quality of the sampling and analysis program are noted below.

- Field Sample - The total sample collected at a specific Site location. This sample may be any matrix and may be divided to provide material for QA/QC analysis.
- Quality Control (QC) Samples - Samples analyzed to help identify potential problems related to sample collection or analysis. QC samples include duplicate and travel blank samples.
- Quality Assurance (QA) Samples – QA samples represent approximately 10 percent of all field samples collected.
- Matrix Spike/Matrix Spike Duplicates – A 6-liter Summa canister will provide a sufficient volume of air to be spiked in the analytical laboratory with a known quantity of target compounds, and analyzed. The percent recovery will be used to calculate accuracy. The relative percent difference (RPD) for each component will be used to calculate precision. MS/MSDs represent approximately 10% of all field samples collected.
- Duplicate Samples – Duplicate samples are collected and data are used to perform a comparison study between the two sets of data by evaluating the data quality element of precision. Precision is a means to determine the agreement between a set of replicate measurements without assumption of knowledge of the true value, and is calculated by the absolute value of the Relative Percent Difference (RPD) between sets of laboratory data using the equation presented in Section 4.2.

The laboratory shall adhere to the QA/QC criteria cited with the published method (TO-15). In addition, the laboratory must also adhere to the GC/MS system performance criteria prior to sample analysis. Method TO-15 will be consulted for specific information regarding the QA/QC and system performance requirements.

2.4.1. Laboratory Data Reporting Requirements

All analytical data generated from laboratory analyses are to be reported in accordance with contract laboratory program requirements, with modifications to those requirements to integrate statistically-derived laboratory specific control limits, detection limits, reporting limits (practical quantitation limits), and additional analytical dilutions.

In addition, the laboratory shall be required to store the electronic files for a minimum of 5 years.

2.4.2. Laboratory Data Packages

Data packages submitted must include the following information:

1. Preparation and analysis methods. They should be noted for each analytical fraction.

2. Case narratives. Case narratives should include the following pertinent information:

(a) Comments on holding times;

(b) Comments on blank contamination

(c) A description of the percent recoveries for laboratory QC samples, noting any deviations from the laboratory established control limits;

(d) A summary of the upper and lower control limits established by the laboratory for each QC sample within each analytical fraction;

(e) An explanation for any biases to the data (this should be noted in the form of a data flag);

(f) A statement from the Quality Assurance Officer, Laboratory Director or equal, verifying that the data has been reviewed and determined to be accurate; and,

(g) A statement indicating the conditions of the samples upon receipt.

3. Chains of custody.

4. Results of QA/QC samples, including instrument blank and method blank results, Laboratory Control Sample (LCS) recoveries, MS/MSD recoveries, and duplicate analyses (in the form of RPD values), specific to each sample batch within each analytical fraction, where applicable.

5. Reporting limits. The laboratory will report all positive detections between the practical quantitation limits and minimum detection limit as an estimated value. The laboratory will flag all reported results indicating QC is outside of the laboratory-established criteria.

3. Assessment/Oversight

3.1. Assessment And Response Actions

Due to the limited activities conducted under of this program, there are no scheduled independent technical or systems audits planned. The Malcolm Pirnie project team includes a QA/QC Technical Advisor who will oversee the monitoring and review the work plans. The QAPP will be strictly followed, and all activities that may impact the data quality will be documented.

4. Data Validation And Usability

Data validation identifies invalid data and qualifies the usability of the remaining data. The output of data validation is qualitative or quantitative statements of data quality. Once the quality of individual measurements is known, a compilation of all data points into a cohesive statement can be made. The confidence associated with a statement incorporates both the confidence in individual measurements as well as in the decision.

The data review process shall consist of a contractual review that shall include an evaluation of the analysis and specific requirements of the published method in addition to the laboratory SOP. Data qualification shall be performed following the intent of the National Functional Guidelines in conjunction with the data validator's professional judgment, where applicable, since there are no formal validation guidelines written for this analysis.

Data will be declared invalid whenever documented evidence exists demonstrating that a VOC sample was not collected under representative conditions, such as a canister leaking to ambient pressure during shipment.

The laboratory will provide a data reporting package. The QA/QC Task Leader will coordinate the validation of the data set based on information from the field team and information supplied from the laboratory on the analysis. In general, the activities involved in validation of the data include the following:

- Reviewing the field logbook for information on the sample collection;
- Reviewing the chain-of-custody forms for any information about canister integrity (i.e., leakage) after sampling; and
- Reviewing the data package from the subcontract laboratory with respect to laboratory QC, exemption reports, sample duplicates (both analytical and field), and laboratory contamination.

Data are never declared invalid solely because they are unlikely to occur in nature, but may be flagged as suspect and be subjected to further review until the cause for the apparent anomaly is determined. The results from all QC and QA checks are evaluated to determine if the DQOs for each measurement are being met. Evidence of overwhelming measurement bias, external influences on the representativeness of the data, or lack of reproducibility of the measurement data may be cause for the data to be judged invalid.

4.1. Reconciliation With Data Quality Objectives

After review of the data, a review will be conducted to evaluate the project's progress in meeting the goals for the measurement data. This evaluation will occur, after data validation, but before the final report is submitted. The reviewers will consist of the field team, the QA/QC Technical Advisor, the QA/QC Task Leader, and the project manager, or their designee. Two areas will be reviewed: the performance of the project in respect to the quality goals specified in the QAPP, and the limitations (if any) on the measurement data for their intended use.

4.2. Assessment Of Measurement Performance

If any of the data quality measures indicate performance outside the desired objective, the data associated with that result are not considered useless. The burden is on the project team to determine the extent to which a quality issue affects the related data, and ultimately how the issue impacts the fitness for use of the data.

Most often a single isolated incident in which the performance objective is not met does not automatically render the data useless, but rather slightly reduces the confidence that the measurement is reliable, and indicates that increased quality control measures are needed. Any potential limitations of the data set will be identified and communicated. The project team will present all known or potential limitations on the data in the final report.

Data quality is measured by how well the data meet the QA/QC goals for the project. QC elements include precision, accuracy, representativeness, completeness, comparability, and sensitivity:

- Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed conditions. Assessing precision measures the random error component of the data collection process. Precision is determined by measuring the agreement among individual measurements of the same property, under similar conditions. The degree of agreement, expressed as the RPD, is calculated using the formula below.

$$\text{RPD} = \frac{(V_1 - V_2)}{\frac{(V_1 + V_2)}{2}} \times 100$$

where:
V1 = value 1
V2 = value 2

Analytical precision is assessed by analyzing MS/MSD pairs and laboratory duplicate samples. Field precision is assessed by measurement of field duplicate samples. The objective for precision is to equal or exceed the precision demonstrated for similar samples and should be with the established control limits for the methods. Precision control limits and QC RPD limits are noted within the laboratory SOP.

- Accuracy is the degree of agreement of a measurement with an accepted reference or true value. Accuracy measures the bias or systematic error of the entire data collection process. Sources of these errors include the sampling process, field and laboratory contamination, sample preservation and handling, sample matrix interferences, sample preparation methods, and calibration and analytical procedures. To determine accuracy, a reference material of known concentration is analyzed or a sample which has been spiked with a known concentration is reanalyzed. Accuracy is expressed as a percent recovery and is calculated using the following formula:
- Completeness is calculated as follows:

$$\%\ \text{Completeness} = 100 \times \frac{V}{n}$$

where: V = number of measurements judged valid
n = total number of measurements

The objective is to generate a sufficient database with which to make informed decisions. To help meet the completeness objective, every effort must be made to avoid sample loss through accidents or inadvertence. The completeness goal for this project is 100%.

- Comparability expresses the confidence with which one data set can be compared to another. Comparability shall be performed as described in Section 1.5.2.
- Sensitivity is the capability of a method or instrument to discriminate between small differences in analyte concentration.

New York State Department of Environmental Conservation
Immediate Investigation Work Plan

Appendix D:
2.11 Schedules

0266353

MALCOLM PIRNIE

Subcontractor Bid Summary – Modock Road Springs Site

Item:	Quote:
Analytical Laboratory (See note 1)	
Columbia – Indoor and Ambient Air	$ 17,784.00
Data Validation	
Data Validation Services (WBE)	$ 2,000.00
Field Technical Services (See note 2)	
Aztech Technologies, Inc. (WBE)	$ 9,103.00

Note 1: These costs are for sampling in 19 residences over a three week period (40 indoor air and 16 ambient air and 20 sub-slab soil vapor samples).

Note 2: This cost assumes 11 ten-hour working days plus associated per diem and vehicle costs (in accordance with attached estimate #493A).

EXPERTISE YOU CAN COUNT ON

Aztech Technologies, Inc.

5 McCrea Hill Road
Ballston Spa
New York 12020

Phone: (518) 885-5383
Fax: (518) 885-5385
www.aztechtech.com

Estimate

DATE	ESTIMATE #
1/15/2007	493A

A WOMEN OWNED BUSINESS: NYS WBE # 49360

NAME / ADDRESS

Malcolm Pirnie, Inc.
43 British American Boulevard
Latham, NY 12110

PROJECT
Victor

DESCRIPTION	QTY	COST	TOTAL
Field support for Victor, NY site			
SENIOR TECHNICIAN - Daily rate	1	550.00	550.00
Light Duty Vehicles (less than 1 ton) Daily Rate	1	117.50	117.50
Heavy Duty Vehicles (1 ton or more) Daily Rate - Option for towing or transporting additional gear	0	143.30	0.00
Per diem	1	160.00	160.00
SENIOR TECHNICIAN - Time beyond 10 hr per day	0	72.50	0.00

The above pricing is valid for 45 days.

TOTAL $827.50

BBB MEMBER

Flusche, Mark A.

From: Judy Harry [harry@frontiernet.net]
Sent: Thursday, November 30, 2006 3:29 PM
To: Flusche, Mark A.
Subject: Re: Quote Request

Hi Mark,

The cost for doing a DUSR on a full list of TO-15 targets is $25 for indoor air (or any rather clean samples) and $30 for soil vapor. The soil vapor are higher because the labs seem to have to consistently run multiple dilutions to bring all analytes into target range. The soil vapors tend to have alot of hydrocarbons that produce numerous target detections and create matrix effects--they can take alot of review. Billable units are field samples, field duplicates, matrix spikes (if done), and trip blanks.

Judy

Schedule 2.11 (a)

SUMMARY OF WORK ASSIGNMENT PRICE

D - 004439 - 1
Modock Road Springs

1.	Direct Salary Costs [Schedule 2.11(b)]	$5,586
2.	Indirect Costs (1.753)	$9,792
3.	Direct Non-Salary Costs [Schedule 2.11(c)(d)]	$2,735

Subcontract Costs:

Lump Sum Subcontracts [Schedule 2.11 (e)]

	Name of Subcontractor	Services To Be Performed	Subcontractor Price
A.	0	0	$0.00
B.	0	0	$0.00
4.	**Subtotal Lump Sum Subcontracts**		**$0.00**

Unit Price Subcontracts [Schedule 2.11(f)]

	Name of Subcontractor	Services To Be Performed	Subcontractor Price
A.	Laboratory - Columbia Analytical	Analytical	$17,784.00
B.	Data Validation - Data Validation Services	Air Analytical	$2,000.00
C.	Field Crew - Aztech Technologies	Field Assistance	$9,103.00
D.	Vendor	Services	$0.00
E.	Vendor	Services	$0.00
5.	**Total Unit Price Subcontracts**		**$28,887**

6.	Subcontract Management Fee	$1,444	
7.	Total Subcontract Costs (lines 4+5+6)		$30,331
8.	Fixed Fee		$1,538
9.	**Total Work Assignment Price (lines 1+2+3+7+8)**		**$49,982**

SCHEDULE 2.11 (b) - Tasks 1 through 4

SUMMARY TOTAL OF DIRECT LABOR HOURS[1]

D - 004439 - 1

Modock Road Springs

NSPE Labor Classification / Task #	Task Name	9	8	7	6	5	4	3	2	1	Tech	Total No. Direct Labor Hours Budgeted
Task 1	Work Plan Preparation	0	6	0	8	0	0	27	0	0	2	43
Task 2	Indoor Air Sampling	0	2	0	4	0	0	85	0	0	0	91
Task 3	Reporting	0	3	0	10	0	0	26	0	0	6	45
Task xx	Unassigned	0	0	0	0	0	0	0	0	0	0	0
	Subtotal 2006 hours	0	5	0	6	0	0	23	0	0	0	34
	Subtotal 2007 hours	0	6	0	16	0	0	115	0	0	6	143
	Subtotal 2008 hours	0	0	0	0	0	0	0	0	0	0	0
Total hours		**0**	**11**	**0**	**22**	**0**	**0**	**138**	**0**	**0**	**8**	**179**
	Average 2006 Rate	$64.06	$64.06	$54.18	$41.07	$34.96	$31.88	$27.32	$23.84	$19.51	$13.29	$1,195.08
	Average 2007 Rate	$65.98	$65.98	$55.81	$42.30	$36.01	$32.84	$28.14	$24.56	$20.10	$13.69	$4,390.91
	Average 2008 Rate	$67.96	$67.96	$57.48	$43.57	$37.09	$33.82	$28.98	$25.29	$20.70	$14.10	$0.00
	Total Direct Labor Cost	$0.00	$716.19	$0.00	$923.25	$0.00	$0.00	$3,864.41	$0.00	$0.00	$82.13	
Total Direct Labor Cost												**$5,585.99**

SCHEDULE 2.11 (b-1) - Tasks 1 through 4

SUMMARY TOTAL OF DIRECT ADMINISTRATIVE LABOR HOURS

D - 004439 - 1

Modock Road Springs

NSPE Labor Classification	9	8	7	6	5	4	3	2	1	Word Proc. Hours	Total No. Direct Labor Hours Budgeted
Task 1	0	1	0	0	0	0	0	0	0	0	1
Task 2	0	1	0	0	0	0	0	0	0	0	1
Task 3	0	3	0	0	0	0	0	0	0	0	3
Task xx	0	0	0	0	0	0	0	0	0	0	0
Total hours	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**
Average 2007 Rate	$65.98	$65.98	$55.81	$42.30	$36.01	$32.84	$28.14	$24.56	$20.10	$13.69	
Total Labor Cost	$0.00	$329.91	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	

Schedule 2.11 (c)

DIRECT NON-SALARY COSTS

D - 004439 - 1

Modock Road Springs

Item	Maximum Reimbursement Rate	Estimated Number of Units	Estimated Cost	Total Estimated Cost
Miscellaneous				
Per diem (full day)	$131.00 /day	2 days	$262.00	$262.00
Per diem (first day w/ lodging)	$120.00 /day	2 days	$240.00	$240.00
Per diem (last day - no lodging - 75% meals)	$33.00 /day	2 days	$66.00	$66.00
Shipping	At Cost	At Cost	$250.00	$250.00
Mileage	$0.485 /mile	1,000 miles	$485.00	$485.00
TOTAL			**$1,303.00**	**$1,303.00**

Shedule 2.11 (d)

SUMMARY OF EQUIPMENT ACTIVITY

D - 004439 - 1

Modock Road Springs

SCHEDULE	Estimated Quantity	Unit Cost	Total Budgeted Cost
Schedule 2.11(d)1 - Purchased Equipment			$0
Schedule 2.11(d)2 - Malcolm Pirnie Rental			$743
Schedule 2.11(d)3 - Rented Equipment			$0
Schedule 2.11(d)4 - Site Dedicated Equipment			$0
Schedule 2.11(d)5 - Consumable Supplies			$689
TOTAL			**$1,432**

Table 2.11 (d) 2

MAXIMUM REIMBURSEMENT RATES - CONSULTANT OWNED EQUIPMENT

D - 004439 - 1

Modock Road Springs

Item	O&M Rate	Estimated Usage	Estimated Usage Cost
Low Value Equipment	$0.80 /person/ field hour	85 hours	$68.00
MiniRae 2000 PID	$45 /day	15 days	$675.00
Total			**$743.00**

Table 2.11 (d) 3

MAXIMUM REIMBURSEMENT RATES - VENDER RENTED EQUIPMENT*

D - 004439 - 1
Modock Road Springs

Item	Unit Price	Quantity	Total Budgeted Cost
	/week	week	$0.00
	lump sum	lump sum	$0.00
			$0.00
Total			**$0.00**

**** Reimbursement will be paid at the actual receipted rental cost***

Table 2.11 (d) 4

MAXIMUM REIMBURSEMENT RATES - SITE-DEDICATED EQUIPMENT

D - 004439 - 1
Modock Road Springs

Item	Unit Price	Estimated Quantity	Total Estimated Cost
	/ea.		$0.00
	/ea.		$0.00
	/ea.		$0.00
	/ea.		$0.00
Total			**$0.00**

Table 2.11 (d) 5

DETAILED BREAKDOWN OF CONSUMABLE SUPPLIES*

D - 004439 - 1

Modock Road Springs

Item	Unit Price	Quantity	Total Budgeted Cost
Miscellaneous Supplies (Up to $1,000 total)**	$200.00 Lump Sum	1 Lump Sum	$200.00
Teflon Tubing	$2.50 /ft.	100 ft	$250.00
60 mL Syringe (box of 40)	$55.00 /ea.	1 boxes	$55.00
Bees Wax	$10.00 /pound	7 pounds	$70.00
PPE Level B	$76.00 /man - day	0 /man - day	$0.00
PPE Level C	$36.00 /man - day	0 /man - day	$0.00
PPE Level D	$19.00 /man - day	6 /man - day	$114.00
Total - Task 2			**$689.00**
TOTAL			**$689.00**

Notes:

* Each item costing over $100 should be identified on a separate line.

** Miscellaneous supplies include: bailer cord and tubing, buckets, paper towels, polyethylene sheets, logbooks, clear tape, zip lock bags, disposable cameras, film developing, liquinox, maps

Note: Consumable supplies such as gas, diesel fuel, oil, film, stakes, ice, distilled water, rope shall be direct billed with appropriate receipts.

Schedule 2.11 (e)

SUMMARY OF LUMP SUM SUBCONTRACTORS

D - 004439 - 1

Modock Road Springs

Item		Services To Be Performed	Subcontract Price		
			Task 2	other tasks	Total
1.			$0.00	$0.00	$0.00
2.			$0.00	$0.00	$0.00
SUBTOTAL			**$0.00**	**$0.00**	**$0.00**
Management Fee					
1.			$0.00	$0.00	$0.00
2.			$0.00	$0.00	$0.00
MANAGEMENT FEE SUBTOTAL			**$0.00**	**$0.00**	**$0.00**
TOTAL			**$0.00**	**$0.00**	**$0.00**

Schedule 2.11 (f)

SUMMARY OF UNIT PRICE SUBCONTRACTORS

D - 004439 - 1

Modock Road Springs

	Item	Services To Be Performed	Subcontract Price			Management Fee (5%)		
			Task 2	Task 3	Total	Task 2	Task 3	Total
1.	Laboratory - Columbia Analytical	Analytical	$17,784.00	$0.00	$17,784.00	$889.20	$0.00	$889.20
2.	Data Validation - Data Validation Services	Air Analytical	$2,000.00	$0.00	$2,000.00	$100.00	$0.00	$100.00
3.	Field Crew - Aztech Technologies	Field Assistance	$9,103.00	$0.00	$9,103.00	$455.15	$0.00	$455.15
4	Vendor	Services	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
5	Vendor	Services	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
	TOTAL		**$28,887.00**	**$0.00**	**$28,887.00**	**$1,444.35**	**$0.00**	**$1,444.35**

Table 2.11 (f-1)

DETAILED BREAKDOWN OF UNIT PRICE SUBCONTRACTORS

D - 004439 - 1

Modock Road Springs

Laboratory - Columbia Analytical

Task	Subtask	Parameter	Method	Matrix	No. of Tests	Unit Rate ($) (1)	Total ($)
Task 2		VOC	TO-15	Indoor, Ambient Air, & Soil Vapor	76	234.00	$17,784.00
SUTOTAL - Task 2							**$17,784.00**
TOTAL ALL TASKS							**$17,784.00**

Table 2.11 (f-2)

DETAILED BREAKDOWN OF UNIT PRICE SUBCONTRACTORS

D - 004439 - 1

Modock Road Springs

Field Crew - Aztech Technologies

Item	Unit Cost	No. of Items	Total Cost
Task 2-Pre-Design Studies			
Data Validation - Air	$25.00 /sample	56 samples	$1,400.00
Data Validation - Soil Vapor	$30.00 /sample	20 samples	$600.00
TOTAL - Task 2			**$2,000.00**
TOTAL			**$2,000.00**

Table 2.11 (f-3)

DETAILED BREAKDOWN OF UNIT PRICE SUBCONTRACTORS

D - 004443

Modock Road Springs

Field Crew - Aztech Technologies

Item	Unit Cost	No. of Items	Total Cost
Task 2			
Field Assistance	$827.50 day	11 days	$9,103.00
TOTAL - Task 2			**$9,103.00**
TOTAL			**$9,103.00**

ENGINEER: MALCOLM PIRNIE, INC

NYSDEC CONTRACT/WA #: D - 004439 - 1

PROJECT NAME: Modock Road Springs

MPI PROJECT #: 0266-353

NYSDEC TASK #/NAME: SUMMARY

SCHEDULE 2.11 (g)

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22-Jan-07

BILLING PERIOD: 00/00/00 - 00/00/00

MPI STATEMENT #: n

DEC VOUCHER #: n

% of BUDGET COMPLETE: 0%

EXPENDITURE CATEGORY	A COSTS CLAIMED THIS PERIOD (CAP #n-month)	B PAID TO DATE (thru CAP #n-month)	C TOTAL COSTS INCURRED TO DATE (A + B)	D ESTIMATED COSTS TO COMPLETION (F-C)	E ESTIMATED TOTAL CONTRACT PRICE (A+B+D)	F APPROVED BUDGET (Date)	G ESTIMATED UNDER/OVER (F-E)
1. DIRECT SALARY COST						$5,586	
1a. INDIRECT COST - 1.753 %						$9,792	
2. SUBTOTAL: Billabe Labor Cost (1+1a)						$15,378	
2a. OVER-TIME SALARY						$0	
3. SUBTOTAL: Direct Salary, Indirect Cost and Over-time Cost. (2+2a)						$15,378	
4. TRAVEL & SUBSISTENCE						$1,053	
5. OTHER NON-SALARY COST						$1,682	
6. SUBTOTAL: Direct Non-Salary Cost (4+5)						$2,735	
7. SUBCONTRACTORS Management Fee included above						$30,331 $1,444	
8. TOTAL CONTRACT COST (3+6+7)						$48,445	
9. FIXED FEE - 10.0 %						$1,538	
10. TOTAL CONTRACT PRICE (8+9)						$49,982	
11. RETAINAGE - 0 %						$0	
12. CAP FORM SUBMISSION						$49,982	

PROJECT MANAGER ENGINEER _____ **DATE** _____

ENGINEER: MALCOLM PIRNIE, INC

NYSDEC CONTRACT/WA #: D - 004439 - 1

PROJECT NAME: Modock Road Springs

MPI PROJECT #: 0266-353

NYSDEC TASK #/NAME: 1 - Work Plan

SCHEDULE 2.11 (g)

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22-Jan-07

BILLING PERIOD: 00/00/00 - 00/00/00

MPI STATEMENT #: n

DEC VOUCHER #: n

% of BUDGET COMPLETE: 0%

EXPENDITURE CATEGORY	A COSTS CLAIMED THIS PERIOD (CAP #n-month)	B PAID TO DATE (thru CAP #n-month)	C TOTAL COSTS INCURRED TO DATE (A + B)	D ESTIMATED COSTS TO COMPLETION (F-C)	E ESTIMATED TOTAL CONTRACT PRICE (A+B+D)	F APPROVED BUDGET (Date)	G ESTIMATED UNDER/OVER (F-E)
1. DIRECT SALARY COST						$1,458	
1a. INDIRECT COST - 1.753 %						$2,556	
2. SUBTOTAL: Billabe Labor Cost (1+1a)						$4,014	
2a. OVER-TIME SALARY						$0	
3. SUBTOTAL: Direct Salary, Indirect Cost and Over-time Cost (2+2a)						**$4,014**	
4. TRAVEL & SUBSISTENCE						$0	
5. OTHER NON-SALARY COST						$0	
6. SUBTOTAL: Direct Non-Salary Cost (4+5)						**$0**	
7 SUBCONTRACTORS Management Fee included above						$0 $0	
8. TOTAL CONTRACT COST (3+6+7)						**$4,014**	
9. FIXED FEE - 10.0 %						$401	
10. TOTAL CONTRACT PRICE (8+9)						**$4,416**	

PROJECT MANAGER ENGINEER _____ **DATE** _____

ENGINEER: MALCOLM PIRNIE, INC

NYSDEC CONTRACT/WA #: D - 004439 - 1

PROJECT NAME: Modock Road Springs

MPI PROJECT #: 0266-353

NYSDEC TASK #/NAME: 2 - Indoor Air Sampling

SCHEDULE 2.11 (g)

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22-Jan-07

BILLING PERIOD: 00/00/00 - 00/00/00

MPI STATEMENT #: n

DEC VOUCHER #: n

% of BUDGET COMPLETE: 0%

EXPENDITURE CATEGORY	A COSTS CLAIMED THIS PERIOD (CAP #n-month)	B PAID TO DATE (thru CAP #n-month)	C TOTAL COSTS INCURRED TO DATE (A + B)	D ESTIMATED COSTS TO COMPLETION (F-C)	E ESTIMATED TOTAL CONTRACT PRICE (A+B+D)	F APPROVED BUDGET (Date)	G ESTIMATED UNDER/OVER (F-E)
1 DIRECT SALARY COST						$2,693	
1a. INDIRECT COST - 1.753 %						$4,721	
2. SUBTOTAL: Billabe Labor Cost (1+1a)						$7,414	
2a. OVER-TIME SALARY						$0	
3. SUBTOTAL: Direct Salary, Indirect Cost and Over-time Cost (2+2a)						**$7,414**	
4. TRAVEL & SUBSISTENCE						$1,053	
5. OTHER NON-SALARY COST						$1,682	
6. SUBTOTAL: Direct Non-Salary Cost (4+5)						**$2,735**	
7. SUBCONTRACTORS						$30,331	
Management Fee included above						$1,444	
8. TOTAL CONTRACT COST (3+6+7)						**$40,480**	
9. FIXED FEE - 10.0 %						$741	
10. TOTAL CONTRACT PRICE (8+9)						**$41,222**	

PROJECT MANAGER ENGINEER _____ **DATE** _____

ENGINEER: MALCOLM PIRNIE, INC

NYSDEC CONTRACT/WA #: D - 004439 - 1

PROJECT NAME: Modock Road Springs

MPI PROJECT #: 0266-353

NYSDEC TASK #/NAME: 3 - Reporting

% of BUDGET COMPLETE: 0%

SCHEDULE 2.11 (g)

MONTHLY COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION

DATE PREPARED: 22-Jan-07

BILLING PERIOD: 00/00/00 - 00/00/00

MPI STATEMENT #: n

DEC VOUCHER #: n

EXPENDITURE CATEGORY	A COSTS CLAIMED THIS PERIOD (CAP #n-month)	B PAID TO DATE (thru CAP #n-month)	C TOTAL COSTS INCURRED TO DATE (A + B)	D ESTIMATED COSTS TO COMPLETION (F-C)	E ESTIMATED TOTAL CONTRACT PRICE (A+B+D)	F APPROVED BUDGET (Date)	G ESTIMATED UNDER/OVER (F-E)
1. DIRECT SALARY COST						$1,435	
1a. INDIRECT COST - 1.753 %						$2,515	
2. SUBTOTAL: Billabe Labor Cost (1+1a)						$3,950	
2a. OVER-TIME SALARY						$0	
3. SUBTOTAL: Direct Salary, Indirect Cost and Over-time Cost (2+2a)						**$3,950**	
4. TRAVEL & SUBSISTENCE						$0	
5. OTHER NON-SALARY COST						$0	
6. SUBTOTAL: Direct Non-Salary Cost (4+5)						**$0**	
7 SUBCONTRACTORS Management Fee included above						$0 $0	
8. TOTAL CONTRACT COST (3+6+7)						**$3,950**	
9. FIXED FEE - 10.0 %						$395	
10. TOTAL CONTRACT PRICE (8+9)						**$4,345**	

PROJECT MANAGER ENGINEER _____ **DATE** _____

ENGINEER: MALCOLM PIRNIE, INC

NYSDEC CONTRACT #: D - 004443

NYSDEC WA #: WA # 0X

MPI PROJECT #: 0266-353

PROJECT NAME: Modock Road Springs

SCHEDULE 2.11 (g) - Supplemental

SUBCONTRACTOR COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION
Unit Price Subcontractors

DATE PREPARED: 22-Jan-07

BILLING PERIOD: mm/dd/yy - mm/dd/yy

MPI STATEMENT #: n

DEC VOUCHER #: n

	A	B	C	D	E	F	G	H	I
	SUBCONTRACTOR COSTS				MANAGEMENT FEE				
SUBCONTRACT NAME	CURRENT COSTS, INCLUDES RESUBMITTALS	PAID TO DATE	TOTAL COSTS TO DATE (A + B)	APPROVED BUDGET	MNGT FEE BUDGET Subs >= $10,000	FEE THIS PERIOD	PENDING FEES	FEE PAID TO DATE	TOTAL COSTS TO DATE (C + F + H)
1 Laboratory - Columbia Analytical Analytical				$17,784.00	$889.20				
2. Data Validation - Data Validation Services Air Analytical				$2,000.00	$100.00				
3 Field Crew - Aztech Technologies Field Assistance				$9,103.00	$455.15				
4 Vendor Services				$0.00	$0.00				
5 Vendor Services				$0.00	$0.00				
6 Vendor Services				$0.00	$0.00				
7 Vendor Services				$0.00	$0.00				
TOTAL				$28,887.00	$1,444.35				

PROJECT MANAGER ENGINEER _____ **DATE** _____

NOTES: (1) Costs listed in Columns A, B, C & D do not include any management fee cos
(2) Management fee is applicable to only properly procured, satisfactorily completed, unit price subcontracts over $10,0(
(3) 'TOTAL' line, Column I should equal Line 7 (subcontracts), Column C of Summary of Fiscal Information Cost Control Repo

ENGINEER: MALCOLM PIRNIE, INC
NYSDEC CONTRACT #: D - 004443
NYSDEC WA #: WA # 0X
MPI PROJECT #: 0266-353
PROJECT NAME: Modock Road Springs

SCHEDULE 2.11 (g) - Supplemental

SUBCONTRACTOR COST CONTROL REPORT
SUMMARY OF FISCAL INFORMATION
Lump Sum and Unit Price Subcontractors

DATE PREPARED: 22-Jan-07
BILLING PERIOD: mm/dd/yy - mm/dd/yy
MPI STATEMENT #: n
DEC VOUCHER #: n

	A	B	C	D	E	F	G	H	I
	SUBCONTRACTOR COSTS				MANAGEMENT FEE				
SUBCONTRACT NAME	CURRENT COSTS, INCLUDES RESUBMITTALS	PAID TO DATE	TOTAL COSTS TO DATE (A + B)	APPROVED BUDGET	MNGT FEE BUDGET (Subs >= $10,000)	FEE THIS PERIOD	PENDING FEES	FEE PAID TO DATE	TOTAL COSTS TO DATE (C + F + H)
Cost - Plus - Fixed - Fee Subcontactors									
1. 0 0				$0.00	$0.00				
2. 0 0				$0.00	$0.00				
Subtotal - CPFF Subs:				$0.00	$0.00				
Unit Price Subcontactors									
1. Laboratory - Columbia Analytical Analytical				$17,784.00	$889.20				
2. Data Validation - Data Validation Services Air Analytical				$2,000.00	$100.00				
3. Field Crew - Aztech Technologies Field Assistance				$9,103.00	$455.15				
4. Vendor Services				$0.00	$0.00				
5. Vendor Services				$0.00	$0.00				
6. Vendor Services				$0.00	$0.00				
7. Vendor Services				$0.00	$0.00				
Subtotal - Unit Price Subs:				$28,887.00	$1,444.35				
TOTAL				$28,887.00	$1,444.35				

PROJECT MANAGER ENGINEER _____ **DATE** _____

NOTES: (1) Costs listed in Columns A, B, C & D do not include any management fee cos

(2) 'TOTAL' line, Column I should equal Line 7 (subcontracts), Column C of Summary of Fiscal Information Cost Control Repo