New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Technical Support, 11th Floor
625 Broadway, Albany, New York 12233-7020
Phone: (518) 402-9553 • FAX: (518) 402-9577
Website: www.dec state.ny.us

Erin M. Crotty
Commissioner

file

MEMORANDUM

TO: See Distribution List Below

FROM: Kelly A. Lewandowski, NYSDEC - DER Bureau of Technical Support

SUBJECT: Environmental Restoration Projects Applicaticn
Ridge Road - Six Vacant Lots, E915188

DATE: SEP 20 2004

The attached Environmental Restoration Projects (ERP) Application for remedial work at the subject site has been forwarded to you for your records and/or processing according to the esrablished Environmental Restoration Projects procedures. If you require additional copies or the complete series of the related application's attzchments, please contact me at 518-402-9553.

T&A Code for the subject site: F895

Attachment(s)

Distribution

Original (with all attachments) to:
Edward Belmore, NYSDEC - DER Remedial Bureau D
Copy (with all attachments) to:
Gary Litwin, NYSDOH - DEHI Bureau of Environmental Exposure Investigation
Martin Doster / Daniel King, NYSDEC - Region 9
Copy (without attachments) to:
Anthony Quartararo, NYSDEC - DEE Superfund and Voluntary Cleanup Bureau
Christina Dowd, NYSDEC - DFWMR Bureau of Habitat
Joseph Ryan, NYSDEC - Region 9

OFFICE OF THE MAYOR
CITY OF LACKAWANNA

NORMAN L. POLANSKI, JR.
Mayor

August 27,2004

Chief, Site Control Section
NYSDEC
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, N.Y. 12233-7020

RE: NYSDEC ERP APPLICATION

Dear Sir or Madam:

Attached please find an original and two copies of our Application to the New York State Department Of Environmental Conservation, 1996 Clean Water / Clean Air Bond Act Environmental Restoration Projects – Title 5, for a Site Investigation and Remedial Alternatives Report at 113-135 Ridge Road, Lackawanna, New York. The "Six Vacant Lots Site" at 113-135 Ridge Road was identified as one of the City's highest priority brownfield sites through our USEPA Brownfields Assessment Pilot Program. The site is strategically located on a main arterial into our City, but at the same time abuts a neighborhood that is challenged by many socio-economic conditions at this time. Clearly the "Six Vacant Lots Site" holds great potential that to act as a cornerstone of our efforts to revitalize the commercial and residential 1st Ward of the City of Lackawanna. The funds we are requesting from the NYSDEC ERP will be of great help to our City by allowing us to investigate and remediate the suspected contamination on the site. Please do not hesitate to contact me at 716-827-6464 if you have any questions or concerns.

Sincerely,

Norman L. Polanski Jr.

Norman L. Polanski, Jr.
Mayor

xc: Martin Doster, P.E. - NYSDEC Region 9

APPLICATION TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION 1996 CLEAN WATER / CLEAN AIR BOND ACT ENVIRONMENTAL RESTORATION PROJECTS – TITLE 5

For a
Site Investigation and Remedial Alternatives Report
at 113-135 Ridge Road
Lackawanna, New York

Submitted by:
Norman L. Polanski, Jr., Mayor
City of Lackawanna
714 Ridge Road
Lackawanna, New York 14218

August 27, 2004

Table of Contents

1.0 Application Form

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ENVIRONMENTAL RESTORATION PROGRAM (ERP) APPLICATION

1996 CLEAN WATER/CLEAN AIR BOND ACT

ECL ARTICLE 56 - 6NYCRR 375-4

10/9/03

KAME OF MUNICIPALITY	City of Lackawanna	
NAME OF INDIVIDUAL AUTHORIZED TO SIGN APPLICATION	Norman L. Polanski, Jr.	
TITLE OF AUTHORIZED INDIVIDUAL	Mayor	
ADDRESS	714 Ridge Road, Room 301	
CITY/TOWN	Lackawanna	ZIP CODE 14218
PHONE 716-827-6464	FAX 716-827-6678	E-MAIL mogambino@yahoo.com
LAME OF COMMUNITY BASED ORGANIZATION (IF APPLICABLE)	N/A	
COMMUNITY BASED ORGANIZATION'S REPRESENTATIVE		
ADDRESS		
CITY/TOWN		ZIP CODE
PHONE	FAX	E-MAIL

SITE NAME	"Six Vacant Lots on Ridge Road"	
SITE ADDRESS	113-135 Ridge Road	
CITY/TOWN	Lackawanna	ZIP CODE 14218
COUNTY	Erie	SIZE (ACRES) .77 A total
LATITUDE +42.827366°N		LONGITUDE -078.847126°W

PLEASE ATTACH A COUNTY TAX MAP WITH IDENTIFIER NUMBERS. ALONG WITH ANY FIGURES NEEDED TO SHOW THE LOCATION AND BOUNDARIES OF THE SITE. ALSO INCLUDE A USGS 7.5 MINUTE QUAD MAP IN WHICH THE SITE IS LOCATED.

1. DO THE SITE BOUNDARIES CORRESPOND TO TAX MAP METES AND BOUNDS? ☒YES ☐NO
   IF NO. PLEASE ATTACH A METES AND BOUNDS DESCRIPTION OF THE SITE.
2. IS THE SITE PART OF A DESIGNATED BROWNFIELD OPPORTUNITY AREA PURSUANT TO GML970-R? IF YES, IDENTIFY AREA (NAME)_____ DYES ☒NO
3. IS THE SITE LISTED ON THE NYS REGISTRY OF INACTIVE HAZARDOUS WASTE DISPOSAL SITES? ☐YES ☒NO
   IF YES. FILL IN CURRENT REGISTRY SITE NUMBER AND CLASSIFICATION.

   REGISTRY SITE NUMBER:_____CLASSIFICATION: _____

1. HAS THE APPLICANT GENERATED. TRANSPORTED OR DISPOSED OF. OR ARRANGED FOR OR CAUSED THE GENERATION. TRANSPORTATION OR DISPOSAL OF, HAZARDOUS WASTE OR PETROLEUM ON THE SITE? ☐YES ☒NO

2. HAS THE APPLICANT UNDERTAKEN. OR INTEND TO UNDERTAKE. ANY INDEMNIFICATION OBLIGATION RESPECTING A PARTY RESPONSIBLE UNDER LAW FOR THE REMEDIATION OF THE SITE:' DYES ☒NO

3. HAS THE APPLICANT LEASED THE SITE TO ANOTHER PARTY THAT GENERATED, TRANSPORTED OR DISPOSED OF. OR THAT ARRANGED FOR OR CAUSED THE GENERATION, TRANSPORTATION OR DISPOSAL OF HAZARDOUS WASTE OR PETROLEUM ON THE SITE? IF YES, CHECK ONE OF THEFOLLOWING: ☐YES ☒NO

   ☐ A. THE APPLICANT DID NOT KNOW THAT SUCH OTHER PARTY GENERATED, TRANSPORTED OR DISPOSED OF, OR ARRANGED FOR OR CAUSED THE GENERATION. TRANSPORTATIOX OR DISPOSAL OF SUCH HAZARDOUS WASTE OR PETROLEUM.

   q B. THE APPLICANT KNEW THAT SUCH OTHER PARTY GENERATED, TRANSPORTED OR DISPOSED OF. OK ARRANGED FOR OR CAUSED THE GENERATION, TRANSPORTATION OR DISPOSAL OF SUCH HAZARDOUS WASTE OR PETROLEUM AND DID NOT TAKE ACTION TO REMEDIATE OR CAUSE THE REMEDIATION OF SUCH HAZARDOUS WASTE OR PETROLEUM.

   ☐ C. THE APPLICAST KNEW THAT SUCH OTHER PARTY GENERATED. TRAKSPORTED OR DISPOSED OF. OR ARRANGED FOR OR CAUSED THE GENERATION. TRANSPORTATION OR DISPOSAL OF SUCH HAZARDOUS WASTE OR PETROLEUM AND TOOK ACTION TO REMEDIATE OR CAUSE THE REMEDIATION OF SUCH HAZARDOUS WASTE OR PETROLEUM.

DOES THE APPLICANT CURRENTLY OWN THE SITE OR HAS IT OBTAINED TEMPORARY INCIDENTS OF OWNERSHIP FOR AN INVESTIGATION PURSUANT TO ECL 56-0508? ☒YES ☐NO

ILEASE ATTACH 4 DESCRIPTION OF THE PROJECT WHICH INCLUDES THE FOLLOWING INFORMATION (REFER TO THE ENVIRONMENTAL RESTORATION PROGRAM PROCEDLRES HANDBOOK FOR DETAILED ISSTRUCTIONS).

- PURPOSE AND SCOPE OF THE PROJECT:
- CURRENT AND PROPOSED FUTURE USE OF THE SITE (RESIDENTIAL, COMMERCIAL, INDUSTRIAL);
  ESTIMATED PROJECT COST (INCLUDE ANY RESPONSIBLE PARTY COST RECOVERY PAYMENTS RECEIVED OR ANTICIPATED. AS WELL AS ANY OTHER ACTUAL OR POTENTIAL FUNDING SOURCES FOR THE PROJECT):
- HOW THE PROJECT WOULD SATISFY THE CRITERIA OF ECL 56-0505; AND
- ESTIMATED PROJECT SCHEDULE (FIELD WORK MUST BEGIN WITHIN 12 MONTHS OF THE APPLICATION APPROVAL DATE)

TO THE EXTENT THAT EXISTING INFORMATION/STUDIES/REPORTS ARE AVAILABLE TO THE APPLICANT, PLEASE ATTACH THE FOLLOWING.

1. ENVIRONMENTAL DATA
   A PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT PREPAKED IN ACCORDANCE WITH ASTM E 1527 (American Societyfor Testing and Materials: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process), AND ALL ENVIRONMENTAL REPORTS RELATED TO CONTAMINANTS ON OR EMANATING FROM THE SITE.
2. OWNERS
   A LIST OF PREVIOUS OWNERS WITH XAMES, LAST KNOWN ADDRESSES AND TELEPHONE NUMBERS (DESCRIBE APPLICANT'S RELATIONSHIP, IF ANY. TO EACH PREVIOUS OWSER LISTED. IF NO RELATIOSSHIP. PUT " NONE).
3. OPERATORS
   A LIST OF PREVIOUS OPERATORS WITH NAMES, LAST KNOWN ADDRESSES AND TELEPHONE NUMBER (DESCRIBE APPLICANT'S RELATIONSHLP. IF ANY. TO EACH PREVIOUS OPERATOR LISTED. IF NO RELATIONSHIP, PUT "NONE").

INDICATE KNOWN OR SUSPECTED CONTAMINANTS AND THE MEDIA WHICH ARE KNOWN OR SUSPECTED TO HAVE BEEN AFFECTED:

Contaminant Category	Soil	Groundwater	Surface Water	Sediment	Soil Gas
Petroleum	X	X			
Chlorinated Solvents					
Other VOCs					
SVOCs					
Metals					
Pesticides					
PCBs					
Other*_____	X	X			

*PLEASE DESCRIBE: asbestos. lead paint

1. HAS THE DEC ISSUED A RECORD OF DECISION FOR THE SITE UNDER THE ERP? ☐YES ☐NO
2. HAS GROUNDWATER OR A SURFACE WATER BODY BEEN CONTAMINATED ABOVE STANDARDS:' ☐YES ☐NO
   IF YES. CHECK ALL THAT APPLY:
   - ☐ A. THE INFLUENT TO A PUBLIC OR PRIVATE WATER SCPPLY HAS BEEK CONTAMINATED OR THREATENED.
   - ☐ B. A CLASS A OR **AA** SURFACE WATER BODY OR A PRIMARY OR PRINCIPAL AQUIFER HAS BEEN CONTAMINATED WITHOUT AFFECTING A S EXISTING WATER SUPPLY.
   - ☐ C. GROUNDWATER HAS BEEN CONTAMINATED ABOVE STANDARDSOR A SURFACE WATER HAS BEEN IMPACTED.
3. HAVE ENDANGERED, THREATENED OK RARE SPECIES. STATE PROTECTED STREAMS. OR STATE REGULATED WETLANDS BEEN IMPACTED BY RELEASES FROM THE SITE:' ☐YES ☐NO
4. ARE CONTAMINANTS PRESENT IN SOILS/WASTE AT LEVELS THAT EXCEED DEC DIVISION OF ENVIRONMENTAL REMEDIATION GUIDANCE VALUES? ☐YES ☐NO
5. IS THE SITE LOCATED IN A DESIGNATED EMPIRE ZONE'! ☐YES ☐NO
6. IS THE SITE LOCATED IN A DESIGNATED EN-ZONE PURSUANT TO TL § 31 (b)(6)? ☐YES ☐NO
7. HAS ALL OR PART OF THE SITE BEEN IDLE OR ABANDONED FOR MORE THAN ONE YEAR? ☐YES ☐NO
7. HAS THE APPLICANT SIGNED AN AGREEMENT WITH A PRIVATE PARTY TO REUSE THE SITE ONCE IT IS RESTORED? ☐YES ☐NO
8. HAS THE APPLICAST COMMITTED TO A NEW PUBLIC OR RECREATIONAL USE? ☐YES ☐NO
9. HAS THE APPLICANT COMPLIED WITH THE STATE ENVIRONMENTAL QUALITY REVIEW ACT (SEQRA) REGARDING THIS ACTION? IF YES. INCLUDE THE DETERMINATION (NEGATIVE DECLARATION OR FINDINGS STATEMENT) IN THE ATTACHED PROJECT DESCRIPTION AND IDENTIFY ALL INVOLVED AGENCIES IN THE COORDINATED REVIEW. ☐YES ☐NO
10. IS THE APPLICANT AWARE OF OTHER FUNDING SOURCES FOR REMEDIATING THE SITE? IF YES. PROVIDE SOURCES(S) AND DOLLAR AMOUNT IN THE ATTACHED PROJECT DESCRIPTION. ☐YES ☐NO

The undersigned on behalf of the applicant does hereby certify that:

- All statements made for the purpose of obtaining State assistance for the proposed project either are set out in full in this application, or are set out in full in exhibits attached to this application and incorporated by this reference: and
- The individual whose signature appears hereon is authorized to sign this application for the municipality.

A FALSE STATEMENT MADE HEREIN IS PUNISHABLE AS A CLASS "A" MISDEMEANOR PURSUANT TO SECTION 210.45 OF THE PENAL LAW.

Norman L. Polanski Jr. — Signature of Individual Authorized to Sign the Application

8-27-04 — Date

The undersigned on behalf of the Community Based Organization acting in partnership with the municipality does hereby certify that:

- The Community Based Organization is a not-for-profit corporation, exempt from taxation under section 501(c)(3) of the internal revenue code whose stated mission is promoting reuse of brownfield sites within a specified geographic area in which the Community Based Organization is located, which has 25% or more of its board of directors residing in the community in such area;
- The Community Based Organization represents a community with a demonstrated financial need:
- Not more than 25% of the members, officers or directors of the Community Based Organization are or were employed by or receiving compensation from any person responsible for a site under title 13 or title 14 of article 27 of the Environmental Conservation Law, article I? of the navigation law or under applicable principles of statutory or common law liability; and
- The individual whose signature appears hereon is authorized to sign this application for the Community Based Organization.

A FALSE STATEMENT MADE HEREIN IS PUNISHABLE AS A CLASS "A" MISDEMEANOR PURSUANT TO SECTION 210.45 OF THE PENAL LAW.

Signature of Individual Authorized to Sign for the Community Hased Organization

Date

SUBMITTAL INFORMATION:

Four (4) complete copies, one with original signatures. are required.

Three (3) of the copies, one with original signatures, must be sent to:

Chief, Site Control Section
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7020

- **One (1)** copy must be sent to the DEC regional contact in the regional office covering the county in which the site is located. Please check our website for the address of our regional offices: http://www.dec.state.ny.usiwebsite/derlindex.htinl

FOR DEPARTMENT USE ONLY:

ERP SITE NO:_____ **ERP SITE T&A CODE:**_____ **PROJECT MANAGER:**_____

2.0 Municipal Authorization

CERTIFICATION OF ACTION TAKEN AT COUNCIL MEETING

TO: Norman L. Polanski, Jr., Mayor
Richard Juda, City Attorney
NYS Department of Environment and Conservation

RE: Resolution requesting state assistance for restoration of six lots on **Ridge Road.**

I, Jacqueline A. Caferro, City Clerk of the City of Lackawanna, New York, do hereby certify the following action was taken at the City Council meeting of July 19,2004.

Moved by Councilman Estrada seconded by Councilman **Jaworski** to adopt resolution as written.

Yeas: Kozub, Jaworski, Schiavi, Estrada, **Spadone**

Nays: 0

Carried: 5-0

Dated: Lackawanna, NY
July 19,2004

Office of the **City Clerk**

Jacqueline A. Caferro
City Clerk

Cc: file

RESOLUTION NO. 32, 2004

WHEREAS, the City of Lackawanna herein called the "Municipality", after thorough consideration of the various aspects of the problems associated with vacant land located on Ridge Road in the City of Lackawanna and after the study of available data, has hereby determined that certain work, as described in its application and attachments, herein called the "Project", is desirable and is in the public interest, and is required in order to implement the Project; and

WHEREAS, Article *56* of the Environmental Conservation Law authorizes State assistance to municipalities for environmental restoration projects by means of a contract and the Municipality deems it to be in the public interest and benefit under this law to enter into a contract therewith;

NOW, THEREFORE, BE IT

RESOLVED, that the Mayor is the representative authorized to act on behalf of the Municipality in all matters related to State assistance under ECL Article *56,* Title 5. The representative is also authorized to make application, execute the State Assistance Contract, submit Project documentation, and otherwise act for the Municipality's governing body in all matters related to the Project and State assistance;

BE IT FURTHER

RESOLVED, that the Municipality agrees that it will fund its portion of the cost of the Project and that funds will be available to initiate the Project's field work within twelve (12) months of written approval of its application by the Department of Environmental Conservation;

BE IT FURTHER

RESOLVED, that one (1) certified copy of this Authorization be prepared and sent to the Albany office of the New York State Department of Environmental Conservation together with the Application for State Assistance;

THIS RESOLUTION SHALL TAKE EFFECT IMMEDIATELY.

Dated: July 19, 2004
Lackawanna, New York

APPROVED:

Ronald Spadone
Council President

APPROVED -
AS TO FORM AND SUFFICIENCY

City Attorney

3.0 Project Description, Project Budget, Project Schedule

3.0 Project Description

a. Purpose and Scope

The purpose of the Site Investigation and Remedial Alternatives Report is to ascertain the nature and extent of possible contamination by hazardous substances on a vacant parcel in the City of Lackawanna. This site is composed of six contiguous commercial lots that front on a major arterial in the City. The site has housed a number of different commercial activities dating back to the early 1900's. The project will investigate the site in order to protect public health and the environment, and to put the property back to productive use benefiting residents of the community of Lackawanna and the state of New York. The City of Lackawanna is a Federal Renewal Community and the site itself is located in a designated En-Zone and in a designated Empire Zone.

The objectives of the project include:

- Assessment of environmental conditions at the site.
- A limited site investigation to determine the nature and extent of possible contamination at the site.
- Evaluation of remedial options, which are protective of human health and the environment, based on community needs and end-use planning for the property.

The scope of the project is designed to assess environmental media at the Site that may have been contaminated by a number of past site activities, including:

- The demolition and/or weathering of buildings that likely contained asbestos containing materials and lead-based paint.
- The introduction of urban fill material of unknown origin to properties on the site.
- Potential aboveground or underground heating fuel storage tanks.

The scope of work includes site surveying, surface soil sampling and analysis, test trenching, subsurface soil sampling and analysis, and groundwater sampling and analysis. Each of these project components is discussed in detail in the attached project Work Plan.

A New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) and NYSDEC Analytical Services Protocol (ASP)-approved analytical laboratory will analyze all samples collected during the investigation. ASP Category B data packages will be produced for each sample. A Data Usability Summary Report (DUSR) will be prepared upon the receipt of all analytical data to ensure that the quality of the data is sufficient to evaluate remedial alternatives.

b. Current and Contemplated Use

The site is a level city lot topped with dirt and weeds. There are no structures on the site currently as the former structures were demolished many years ago. Visual inspection reveals evidence of remaining foundations and basements. It is believed that buildings were demolished into the basements and covered over, therefore, there are concerns over materials left subsurface and how that would impact the environment and future development. The lots were abandoned

and the City was required to take ownership in the late 1970's to maintain the property and prevent further deterioration of the area.

The neighborhood in which the site is located is struggling with many socio-economic challenges and a subsequent decline in the availability of retail and other commercial establishments. This will be an important factor in reuse planning for the site, as will the site's location on a major arterial in the City. Another factor in the eventual reuse of the property will be the City's strong desire to have a revenue-producing use on the site. The site is zoned Neighborhood Commercial and is located in a designated En-Zone and in a designated Empire Zone. The site is serviced by public drinking water and wastewater and storm water facilities and has electric and gas service supplied by Niagara Mohawk. The site is proximate to the Yemeni Community Center and the Second Baptist Church, both primarily serving residents of the First Ward in Lackawanna.

c. Estimated Project Costs

A detailed project budget is included at the end of this section and in the attached Project Work Plan. The Proposed Site Investigation and Remedial Alternatives Report project is estimated to cost $104,900, of which the USEPA will pay 10% - $10,490. The City of Lackawanna, therefore, is requesting $94,410 in funding from the NYSDEC.

d. Estimated Schedule

The detailed project schedule is included at the end of this section and in the attached Project Work Plan. The schedule estimates a three-month timeline for completion of the Investigation activities. The start date of Investigation activities will be dependent on: review and certification of application completeness; execution of the State Assistance Contract; and finalization of the work plan and budget.

e) Satisfying Criteria of ECL 56-0505

(1) Benefit to the environment: The site is located in a heavily urbanized area of the City of Lackawanna, in a neighborhood that faces many socioeconomic challenges. A remediated and redeveloped property in such a location would offer substantial reduction in the blight and malaise of the surrounding area.

(2) Economic benefit to the state: Due to its strategic location on a major arterial on the City of Lackawanna, and its proximity to several keys areas of redevelopment activity (including the former Bethlehem Steel property, the Steelawanna Industrial Park, and the City of Buffalo's Union Ship Canal) the site is well-positioned for redevelopment of a commercial nature. In addition it is located at the edge of an economically depressed area known as the 1st Ward. The site is located in a designated En-Zone and in a designated Empire Zone. Lackawanna is also a Federal Renewal Community.

(3) Potential opportunity for public recreational use: the City's primary interest at this point is in creating an opportunity for the private sector to develop an enterprise on the site that will generate employment as well as municipal, state and federal tax revenues.

(4) Opportunity for other sources to find the project: the City has identified this site through its USEPA Brownfields Assessment Program, and is using the federal funding for the required 10% cost share. Through its Brownfields Pilot the City is developing a track record and familiarity with the EPA and other finding organizations.

f. Other Sources of Funding

The City of Lackawanna has secured finding from the USEPA Brownfields Assessment Program to provide 10% of the project costs as required by the Environmental Restoration Program.

COST SUMMARY
SIX VACANT LOTS - RIDGE ROAD
LACKAWANNA, NEW YORK

TASK	DESCRIPTION	BILLABLE TOTALS Labor Costs	ODC's	SUBs	Total
50	Project Management (1)	$ 7,300		$ -	$ 7,300
100	Mob / Demob / Sub Procurement	$ 2,781	$ 157	$ -	$ 2,938
200	Site Investigations	$ 5,368	$ 3,569	$ 28,550	$ 37,487
300	IDW Disposal	$ 611	$ 59	$ 4,500	$ 5,170
400	Data Analysis / Reduction	$ 4,485	$ 206	$ 3,500	$ 8,191
500	Qual. HH Risk Assessment (RA)	$ 11,179	$ 453	$ -	$ 11,632
600	RAA	$ 10,373	$ 527	$ 8,000	$ 18,900
700	RI/RAR Preparation	$ 10,606	$ 634	$ -	$ 11,240
800	Task Meetings and Public Participation	$ 1,986	$ 88	$ -	$ 2,074
	TOTAL BILLABLE	$ 54,689	$ 5,693	$ 44,550	$ 104,932
				PROJECT COST	$ 104,900

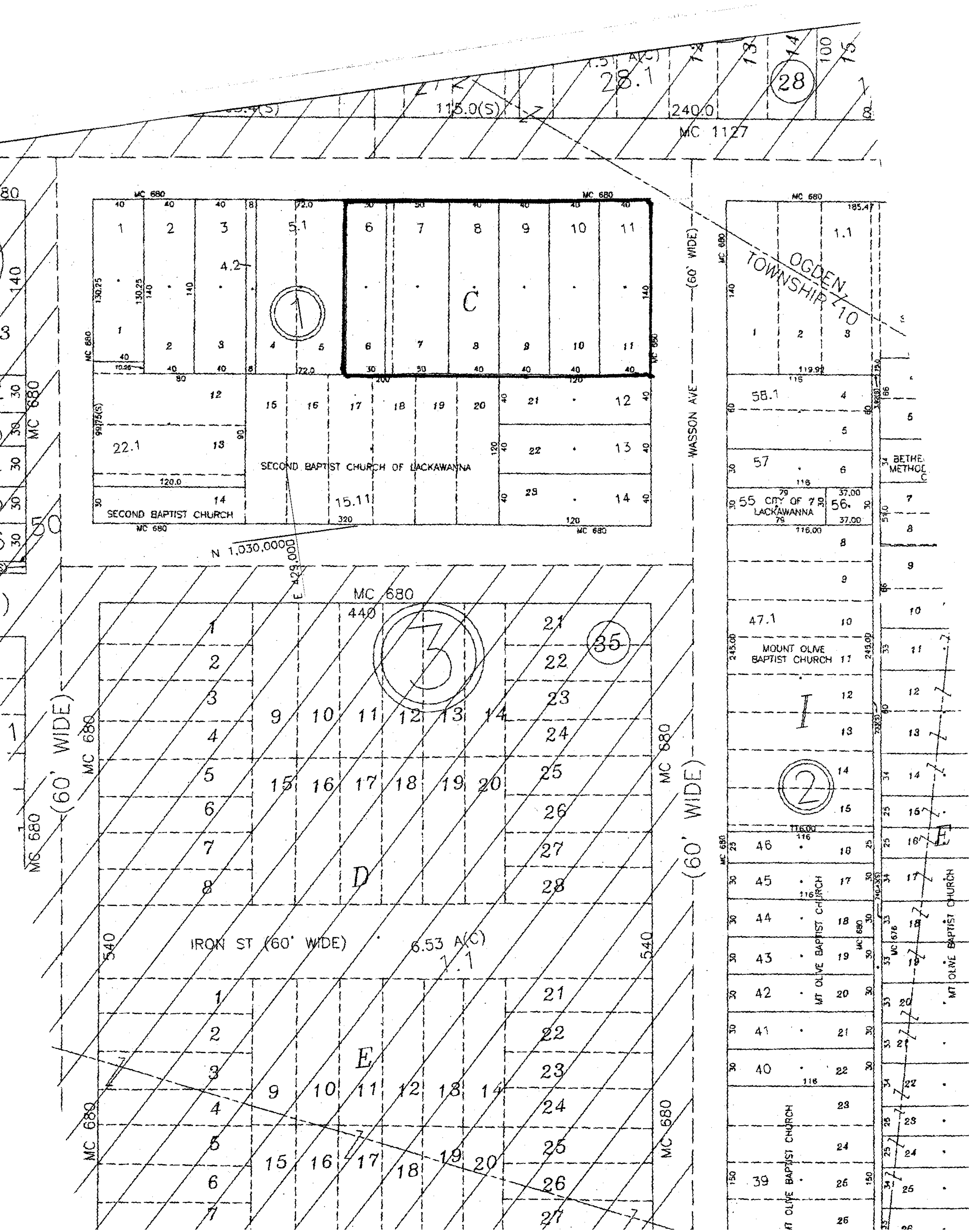
Notes:

(1) Represents management costs of Redevelopment Coordinator.

SCHEDULE FOR PLANNED INVESTIGATION ACTMTIES
SIX VACANT LOTS SITE - RIDGE ROAD
LACKAWANNA, NEW YORK

	2004																					2005								
	August					September				October				November					December				January					February			
	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28
Investigation Activity																															
Submittal of Work Plan (8/27/04)				◆																											
EPA / NYSDEC Review of Work Plan																															
Execution of State Assistance Contract										■	■	■	■	■																	
Field Investigation														■	■	■															
Sample Analysis																	■	■	■	■											
Site Survey and Map Preparation																	■	■	■	■											
Third Party Data Validation																					■	■	■	■							
Prepare Qualitative Human Health Risk Assessment																					■	■	■	■							
Prepare Site Investigation / Remedial Alternatives Report (SI/RAR)																					■	■	■	■	■	■					
Submit SI/RAR report to EPA and NYSDEC for review																											◆				

4.0 Tax Map and Site Location Map


MC 1127
OGDEN TOWNSHIP 10
WASSON AVE
(60' WIDE)
MC 680
SECOND BAPTIST CHURCH OF LACKAWANNA
SECOND BAPTIST CHURCH
CITY OF LACKAWANNA
MOUNT OLIVE BAPTIST CHURCH
MT OLIVE BAPTIST CHURCH
BETHEL METHODIST
IRON ST (60' WIDE)
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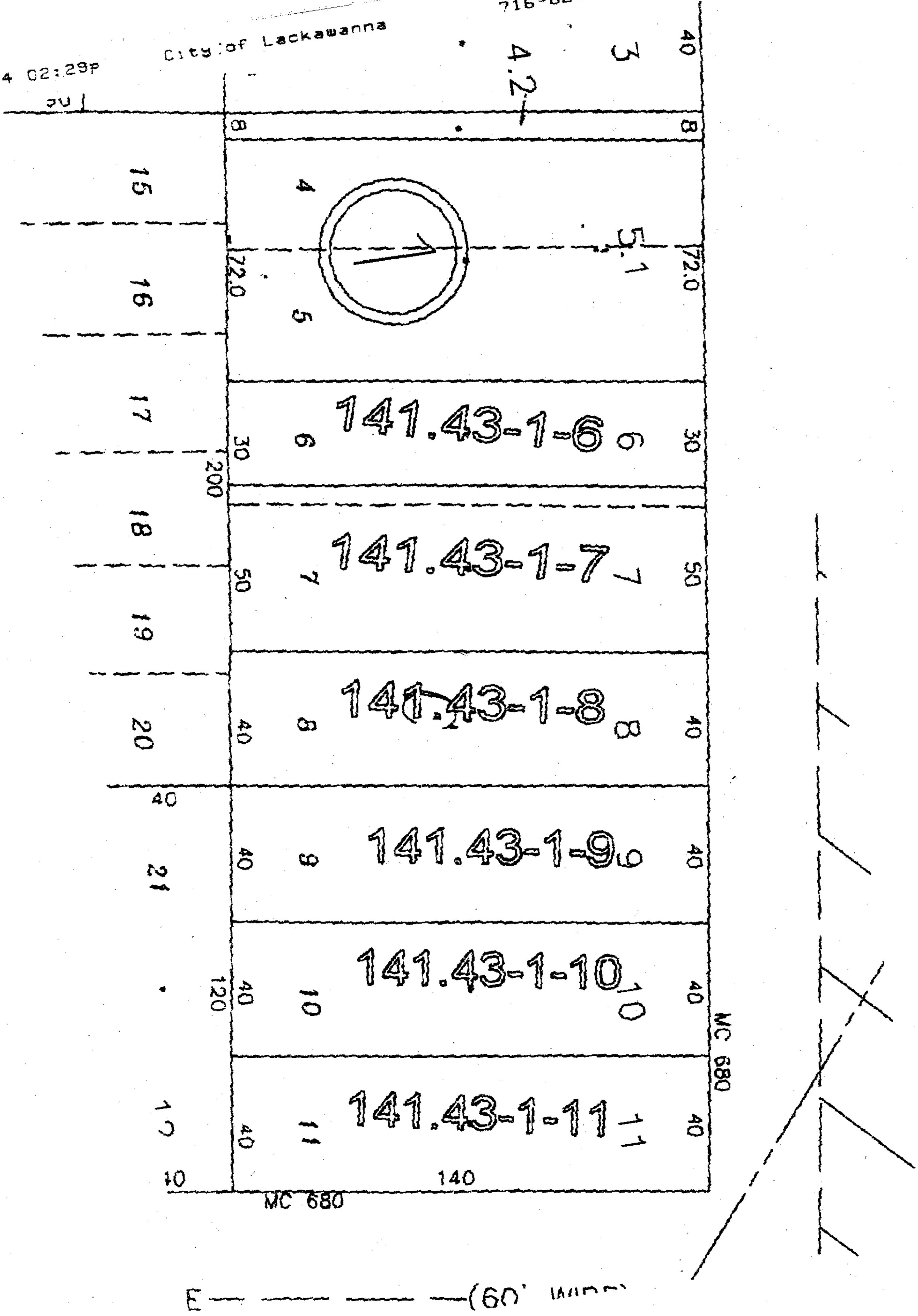
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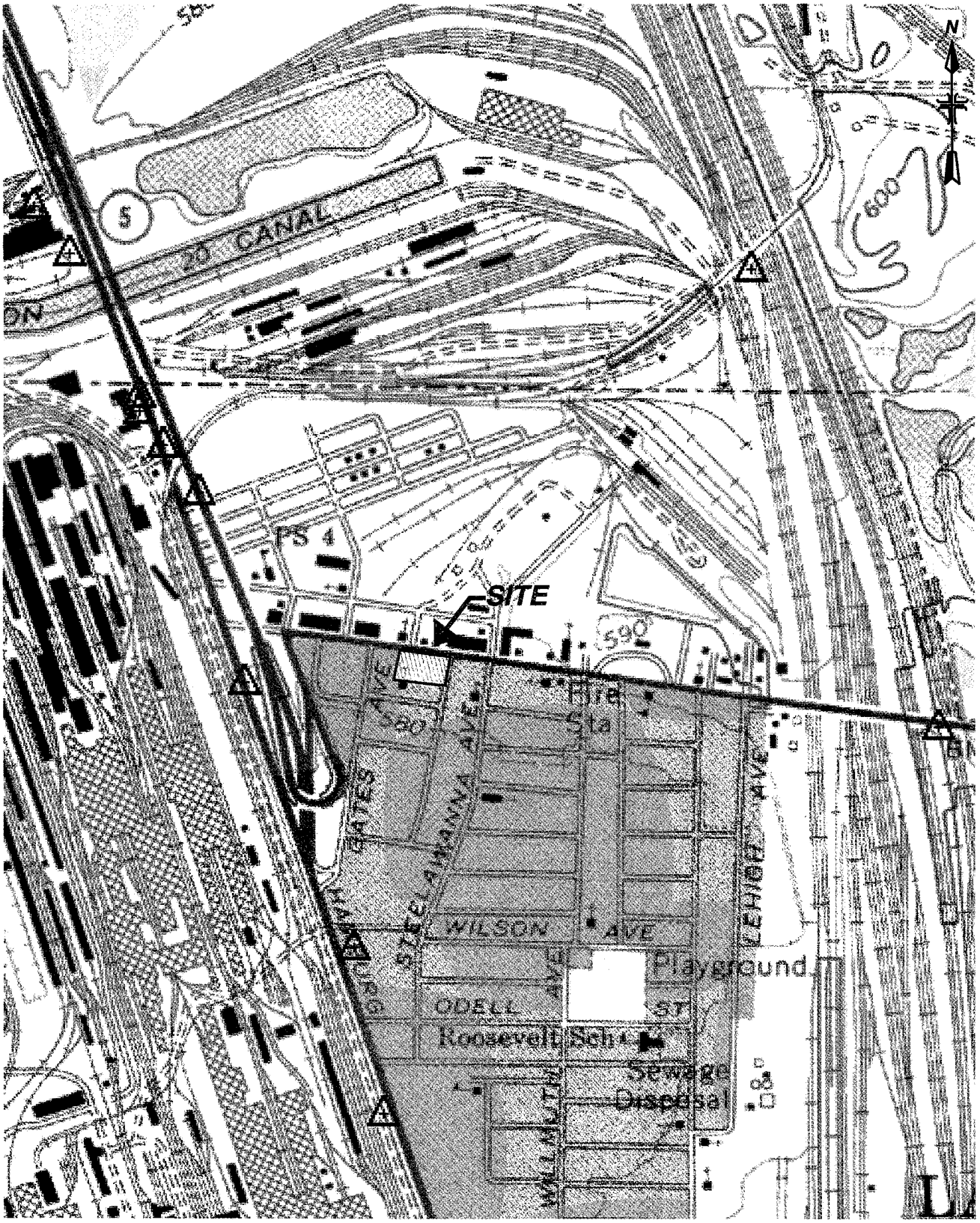


Latitude: +42.827366°N **Longitude:** -078.847126°W		**Six Vacant Lots, Ridge Road Lackawanna, New York**	**NYSERP APPLICATION SITE LOCATION MAP**
4852-001	*August 2004*		

5.0 Environmental History and Existing Data

5.0 Environmental History and Existing Data

Based on interviews with city officials and review of Sanborn Maps from the year 1915, 1927, and 1927-1950, it is known that a variety of commercial activities including a tin shop, bakery, jeweler, men's clothing store, general retail and restaurants operated on the site. It is known that the structures were constructed on the site primarily between 1915 and 1927. Those structures were constructed in the manner and of materials typical of that period. The Sanborn Maps indicate the buildings were mainly two story brick framed structures along Ridge Road and Wasson Avenue, and several single story wood-frame and stone structures at the rear of the main structures or along the southern property boundary.

The structures were used until the late 1960's to early 1970's and subsequently abandoned and demolished. The lots were abandoned and the City was required to take ownership in the late 1970's to maintain the property and prevent further deterioration of the area. Visual inspection reveals evidence of remaining foundations and basements. The City strongly suspects that the structures were demolished into the basements and covered with fill.

The primary environmental concerns at the site are based on the suspected demolition methods and on the building materials common to the era when the structures were constructed and occupied, such as asbestos containing materials and lead-based paint. Additionally, the City has concerns over the type of urban fill material that may have been brought to the site and the storage and use of petroleum based heating fuels.

The Ownership History of the Six Vacant Lots site is included on the following page. The City of Lackawanna is not aware of any environmental testing data that may exist from the site.

Ownership History of Six Vacant Lots on Ridge Road
Based on City of Lackawanna Assessor Records

SBL#	ADDRESS	CURRENT OWNER	FORMER OWNERS
141.43-1-6	113 Ridge Road	City of Lackawanna (since 1977)	Erie County (in-rem 1977); Edward James (1972-1977); Tomaka Drug. Co. Inc. (1970-1972); David Norman (1968-1970)
141.43-1-7	117 Ridge Road	City of Lackawanna (1979-1985; & since 1990)	Lackawanna Community Development Corporation (1985-1990); City of Lackawanna (1979-1985) Erie County (in-rem 1979); John Green (1976-1979); Jack Watson (1974-1976)
141.43-1-8	121 Ridge Road	City of Lackawanna (since 1978)	Romie Dardon (1966-1978); Rebecca Shapiro (1962-1966); Hill Credit Jewelers (1957-1962); Max Kaiser(-1957)
141.43-1-9	125 Ridge Road	City of Lackawanna (since 1978)	Erie County (in-rem 1978); Vladmir Ilich (1965-1978); Michael Bychak (1965-1965); James Caros(-1965)
141.43-1-10	129 Ridge Road	City of Lackawanna (since 1977)	Marcus Weinstein (____-1977)
141.43-1-11	135 Ridge Road	City of Lackawanna (since 1977)	Marcus Weinstein (____-1977)

6.0 Proof of Ownership

Certification of Ownership

I, Richard S. Juda, Jr., being an attorney duly admitted to the practice of law in the State of New York, affirm under the penalties of perjury the following:

1. That I am the attorney for the City of Lackawanna, the Municipality which is the applicant for State Assistance pursuant to Title 5 of Article 56 of the Environmental Conservation Law to undertake an Environmental Restoration Project known as the Site Investigation/Remedial Alternatives Report for the "Six Vacant Lots Site" at 113 to 135 Ridge Road;

2. That the Property commonly known as 113, 117, 121, 125, 129-133, and 135 Ridge Road, Lackawanna, New York, the subject of the Project is more particularly described in the attached Schedule A;

3. That I hereby certify to the Commissioner of Environmental Conservation that I have examined or caused to be examined the title to the Property, and that I have approved the same, and that as of the date of this affirmation a good and marketable title hereto in fee is vested in and may be conveyed by the City of Lackawanna;

4. That annexed hereto is/are a certified copy/copies of the deed/deeds whereby such title to the Property was conveyed to the City of Lackawanna, and that I hereby certify to the Commissioner of Environmental Conservation that the property title, conveyed by said deed/deeds, is identical to the Property which is the subject of the Project; and,

5. That I make this affirmation to be attached as an exhibit and incorporated by reference into such application.

Dated: August 26,2004

Richard S. Juda, Jr.

Schedule A

All that tract or parcel of land, situate in the City of Lackawanna, County of Erie and State of New York being part of Lot No. 35, Township 10, Range 8 of the Buffalo Creek Reservation and being Sublot 6, under Map Cover 680, filed in the Erie County Clerk's Office and being the same land acquired by Erie County as Serial No. 223 in the County's In Rem Tax Foreclosure action No. 133; and also

All that tract or parcel of land, situate in the City of Lackawanna, County of Erie, State of New York, and being part of Farm Lot 35, Township 10, Range 8, and being Sublot 7 and the East 10' of Sublot 6, under Map Cover 680, filed in the Erie County Clerk's Office, Fox Tract Subdivision, (117-119) Ridge Road., South side, 50' x 140'; and being the same land acquired by Erie County as Serial No. 475 in the County's In Rem Tax Foreclosure action No. 135; and

All that tract or parcel of land, situate in the City of Lackawanna, County of Erie and State of New York, being part of Great Lot Number thirty-five (35), Buffalo Creek Reservation, and Number Twenty-four (24) and Twenty-eight (28) of the Gore Tract, Township ten (10), Range Eight (8) more particularly described as follows:

Beginning at a point on the southerly line of Ridge Road one hundred and twenty (120) feet westerly from the westerly line of Wasson Street; thence running southerly at right angles one hundred and forty (140) feet; thence running westerly at right angles forty (40) feet; thence running northerly at right angles one hundred and forty (140) feet; thence running easterly at right angles forty (40) feet to the point of beginning.

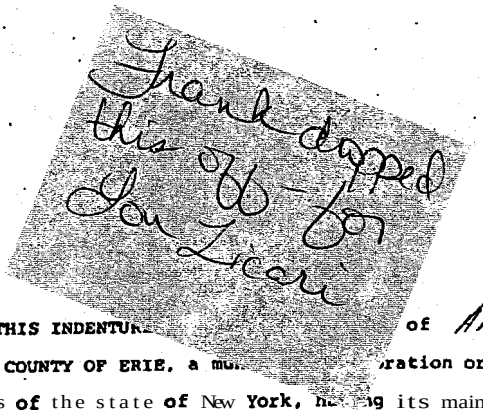
Being Subdivision Lot Number Eight (8) Block " G as shown on map filed under Cover number 680 in the Erie County Clerk's Office.

Together with and subject to the benefits and burdens of a driveway agreement dated April 22, 1920, recorded in the Erie County Clerk's Office June 23 1920, in Liber 1485 of Deeds, at Page 628; and

All that tract or parcel of land, situate in the City of Lackawanna, County of Erie and State of New York being part of Lot No. 35, Township 10, Range 8 of the Buffalo Creek Reservation and according to map filed under Cover No. 680 is known as Subdivision Lot No. Nine (9) in Block "C" being 40 feet front and rear by 140 feet in depth; and

All that tract or parcel of land, situate in the City of Lackawanna, County of Erie and State of New York, and being part of Lot No. 35, of the Buffalo Creek Reservation, Township 10, Range 8 and being Subdivision Lot No. 10 and Subdivision Lot No. 11, Block C of the Fox Tract Subdivision; intending to be the same lands acquired by Erie County as Serial No. 994 and 995 in the County's In Rem Tax Foreclosure action No. 137.

141.43-1-6 . 113 RIDGE



THIS INDENTURE, made the 12th day of APRIL, 1977, between COUNTY OF ERIE, a municipal corporation organized under the Laws of the state of New York, having its main office and principal place of business at 95 Franklin Street, City of Buffalo, County of Erie and State of New York, party of the first part, and CITY OF LACKAWANNA, a municipal corporation organized under the Laws of the State of New York and having its main office and principal place of business in the City Hall, RIDGE ROAD, City of Lackawanna, County of Erie and State of New York, party of the eecond part.

W I T N E S S E T H :

That the party of the first part, in consideration of ONE AND NO MORE DOLLARS ($1.00 & No More), lawful money of the United Statee, paid by the party of the second part, and for 'other good and valuable consideration does hereby remise, release and quitclaim forever unto the party of the second part, its successors and assigns, the following parcels of real property obtained by the County of Erie as a consequence of Erie County's In Rem Tax Foreclosure Action No. 133:

ALL THOSE TRACTS OR PARCELS OF LAND situate in the CITY OF LACKAWANNA, County of Erie and State of New York, described as follws:

FILED
ERIE COUNTY
CLERK'S OFFICE
MAY 12 11 2 AM '77

RECEIVED
$ exempt
REAL ESTATE
MAY 12 1977
TRANSFER TAX
ERIE
1979 COUNTY

liber 8506 page 403

Liber 8506 PG 404

COUNTY OF ERIE - DEPARTMENT OF LAW

Serial No. 203

129 Gates Avenue West Side, Triangle. Sublot Pts. 4 and 5, Ex. Hy.

Serial No. 215

175 Ingham Avenue West Side, 34 x 100, Sublot 26, Bl. E.

Serial No. 216

28 Lebanon Street North side, 30 x 100 Sublot 27, Bl.A.

Serial No. 217

30 Lebanon Street North Side, 30 x 100. Sublot 26, B1.A.

Serial No. 221

53-5 Ridge Road South side, 40 x 120 Sublot 3.

Serial No. 222

71-3 Ridge Road South Side, 40 x 120, Sublot 6

Serial No. 223

113 Ridge Road South Side. 30 x 140, Sublot 6, Bl. C.

Serial No. 224

321 Ridge Road South Side 30.2 x 106.8, Sublot 3.

Serial No. 225

323 Ridge Road South Side, 30.2 x 103, Sublot 4.

4

THIS CONVEYANCE is made and accepted pursuant to the terms of an Agreement between the City of Lackawanna and the county of Erie dated the 18th day of August. 1975, authorized by resolution of the Erie County Legislature on the 15th day of July, 1975 and by reeolution of the City Council of the City of Lackawanna on the 28th day of July 1975.

TO HAVE AND TO HOW all and singular the premises above mentioned and described and hereby conveyed unto tho party of the second part. its succeesors and aseigns forever.

IN WITNESS WHEREOF the said party of the first part has caused its corporate seal to be hereunto affixed and these presents to be signed by its duly authorized officer tk day and year first above written.

Approved as to Form:

Assistant County Attorney

COUNTY OF ERIE

BY

EDWARD V. REGAN
County Executive

Approved as to Content:

Commissioner of Finance

LIBER 8506 PAGE 406

STATE OF NEW YORK)
COUNTY OF ERIE) SS:

On this 28th day of April 1977, before me, personally came EDWARD V. REGAN to me personally known, who being by me duly sworn, did depose and say that he resides at 18 Oakland Place, in the City of Buffalo, Erie County, New York; that he is the County Executive of the COUNTY OF ERIE, the corporation described in and which executed the above instrument: that he knows the seal of said corporation: that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the ERIE COUNTY LEGISLATURE; and that he signed his name by like order.

Katherine Sargent

NOTARY PUBLIC
State of New York
My Commission Expires March 30, 19[illegible]

A-4823-③

REFEREE'S DEED

VINCENT J. MUFFOLETTO,
Erie County Commissioner
of Finance, as Referee

TO 70

CITY OF LACKAWANNA

Dated: 4/26 1977

STATE OF NEW YORK
ERIE COUNTY CLERK'S OFFICE
Recorded in Liber 8506 Page 403
of Deeds
on the 12 day of May
A. D., 1977 at 11:14 o'clock A M
and examined.

Clerk

WILLIAM E. STRAUB
ATTORNEY FOR COUNTY OF ERIE
7TH FLOOR, ERIE COUNTY HALL
25 DELAWARE AVE.
BUFFALO, N.Y. 14202

1 - 8 50 - 36

LIBER 8506 PAGE 407

106—DEED—Quit Claim (XXXXXXX) Corporation

This Indenture,

made the 16th day of January, Nineteen Hundred and Ninety

Between LACKAWANNA COMMUNITY DEVELOPMENT CORPORATION, A New York not-for-Profit Corporation, having its business office at 227 Ridge Road Lackawanna, New York 14218

part y of the first part, and

CITY OF LACKAWANNA, a municipal corporation organized under the laws of the State of New York with offices at City Hall, 714 Ridge Road, Lackawanna, New York 14218

part y of the second part,

Witnesseth, that the said part y of the first part, in consideration of One and No More----------Dollars ($1.00 and No More) lawful money of the United States. paid by the part y of the second part, do hereby remise, release and forever Quit-Claim unto the said part y of the second part, its successors and assigns forever,

All that Tract or Parcel of Land, situate in the City of Lackawanna, County of Erie, State of New York, and being part of Farm Lot 35, Township 10, Range 8, and being Sublot 7 and the East 10' of Sublot 6, under Map Cover 680, filed in the Erie County Clerk's Office, Fox Tract Subdivision, (117-119) Ridge Road, South side. 50' x140'; and being the land acquired by Erie County as Serial No. 475 In the County's In Rem Tax Foreclosure action No. 135.

141.23-1-7

117 RIDGE RD

RECEIVED
$. EXEMPT
JAN 19 1990
TRANSFER TAX
ERIE COUNTY

U 010130 P 495

This Indenture,

Made the 1st *day of* August *Nineteen Hundred and* Seventy-eight

Between ROMIE DARDEN and MINNIE MRDEN. his wife. 38 Washington Street. Lackawanna, N.Y. 14218.

partite of the first part, and

CITY OF **LACKAWANNA**, a municipal corporation, organized under the laws of the State of New York and having its principal office and place of business at the City Hall. 714 Ridge Road, City of Lackawanna. County of Erie and State of New York, **Zip** Code 14218

party of the second part,

Witnesseth, *that the part of the first part, in consideration of* ******ONE AND NO MORE*******AND 00/100********** *Dollar s* ($ 1.00 & no more) *lawful money of the United States, paid by the part of the second part, do hereby grant and release unto the part of the second part,* their distributees, successors in interest *and assigns forever,*

All that Tract or Parcel of Land, situate in the city **of Lackawanna**, County of Erie and State of New York, being part of Great Lot **Number** thirty-five (35). Buffalo Creek Reservation, and Number Twenty-four (24) and twenty-eight (28) of the Gore Tract. Township ten **(10)**, Range eight (8) more particularly described as follows:

BEGINNING at a point on the southerly line of Ridge Road one hundred and twenty (120) feet. westerly from the westerly line of **Wasson** Street; thence running southerly at right angles one hundered and forty (140) feet; **thence** running westerly at right angles forty (40) feet; thence running northerly at right **angles** one hundred and forty (140) feet; thence running easterly at right angles forty (40) feet to the point of beginning.

BEING Subdivision Lot Number eight (8) Block **"C"** as shown on map filed under Cover number 680 in the Erie County Clerk's Office.

TOGETHER with and subject to the benefits and burdens of a driveway agreement dated April 22, 1920, recorded in the Erie County Clerk's Office June 23, 1920, in Liber 1485 of Deeds, at Page 628.

141.43-1-8

12.1 R1065

This Indenture

Mode the 23rd *day of* December *Nineteen Hundred and* Seventy-seven

Between VLADIMIR ILICH residing at 145 Hobby Lane, Orchard Park, New York 14127

part y of the first part, and

CITY OF LACKAWANNA, a municipal corporation, with its principal office located at Lackawanaa City Hall, Lackawanna, New York

part y of the second part.

Witnesseth *that the said part y of the first part, in consideration of* One and no more ---------- 00/100 *Dollars,* ($ 1.00 & no more) *lawful money of the United States. paid by the part Y of the second port, do es hereby remise, release and forever Quit-Claim unto the said party of the second part,* its successors *and assigns forever, all*

ALL THAT TRACT OR PARCEL OF LAND situate in the City of Lackawanna, County of Erie and State of New York being part of Lot No. 35, Township 10, Range 8 of the Buffalo Creek Reservation and according to map filed under Cover No. 680 is known as Subdivision Lot No. Nine (9) in Block "C" being 40 feet front and rear by 140 feet in depth.

Subject to any and all easements, rights of way and restrictions of record, if any and all unpaid real property taxes/

41.43-1-9

195 2.06-5

141.43-1-10 / 11

129-133 RIDGE

— Sale April 6 In Rem 137 — County to City of Lackawanna

THIS INDENTURE made the 3rd day of 1982 between the COUNTY OF ERIE, a municipal corporation organized under the Laws of the State of New York. having its main office and principal place of business at 95 Franklin Street. City of Buffalo. County of Erie and State of New York, party of the first part. and the CITY OF LACKAWANNA, a municipal corporation organized under the laws of the State of New York and having its main office and principal place of business in the City Hall, Lackawanna, New York. County of Erie. State of New York, party of the second part,

WITNESSETH

That the party of the first part. in consideration of ONE AND NO MORE DOLLARS ($1.00 and no more), lawful money of the United States, paid by the party of the second part, and for other good and valuable consideration does hereby remise, release and quitclaim forever unto the party of the second part, its successors and assigns. the following parcels of real property obtained by the County of Erie as a consequence of Erie County's In Rem Tax Foreclosure Action No. 137, sale of April 6, 1982.

ALL THAT TRACT OR PARCEL OF LAND situate in the CITY OF LACKAWANNA, County of Erie. State of New York. described as follows:

RECEIVED
$ EXEMPT
REAL ESTATE
AUG 03 1982
TRANSFER TAX
ERIE COUNTY

LIBER 9145 PAGE 449

ALL THAT TRACT OR PARCELS OF LAND SITUATE IN THE CITY OF LACKAWANNA, COUNTY OF ERIE, STATE OF NEW YORK, described as follows:

Serial No.	Description
962	169 Ingham, W. Block E Lot 24 33' x 100'
963	173 Ingham Ave., W. Block E Lot 25 Bradford Tract 34' x 100'
964	207 Ingham Ave. Block G Lot 51 34' x 100'
965	211 Ingham Ave., W. Bradford Tc Block a; lot 52 33' x SO'
976	30 Ridge Rd., N. Stoney Pt. Land Co. Lot 16 25' x 100'
977	28 Ridge Rd., N. Stoney Point 15.5' x 100'
978	26 Ridge Rd. N. Stoney Pt., 27' x 100' Lot No. 14

LIBER 9145 PAGE 450

991 77 Ridge Rd., S.
Fox Tract
BlockA
Lot 1, hlf E.12' of
lot 1
12' x 140'

994 129-133 Ridge Rd., S.
Fox Tract
Block C lot 10
40' x 140'

995 135 Ridge Rd., S.
Fox Tract
Block C Lot 11
40' x 140'

997 231-3 Ridge Rd. S
Lot NO. 2
Koons Tract
33.3' x 110.1'

THIS CONVEYANCE is made and accepted pursuant to the terms of an Agreement between the COUNTY OF ERIE and the CITY OF LACKAWANNA, dated the 1st day of April, 1982, authorized by resolution of the Erie County Legislature adopted on the 6th day of May, 1982, and by resolucion #12 of the Common Council of the City of Lackawanna. dated the 16th day of February. 1982. and effective for a period of three years from the 1st day of April, 1982 until the 31st day of March. 1985.

TO HAVE AND TO HOW all and singular the premises above mentioned and described and hereby conveyed unto the party of the second part. its successors ans assigns forever.

IN WITNESS WHEREOF the said party of the first part has caused its corporate seal co be hereunto affixed and thoea present to be signed by its duly authorized officer the day and year first above written.

COUNTY OF ERIE

By: _____

County Executive

Approved as to Form

_____ Doc. No. 33553-FE

Assistant County Attorney
Erie County, New York

Approved as to Content:

_____

Erie County Commissioner of Finance

LIBER 9145 PAGE 452

STATE OF NEW YORK)
COUNTY OF ERIE)

On chis 3 day of Aug, 1982, before me. personally came EDWARD J. RUTKOWSKI, to me personally known. who being by 'me duly sworn. did depose and say that he is the County Executive of the COUNTY OF ERIE. 95 Franklin Street, Buffalo, New York, 14202. the corporation described in and vhich executed the above instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the ERIE COUNTY LEGISLATURE; and that he signed his name by like order.

GLORIA JAROS
Notary Public, State of New York
Qualified in Erie County
Commission Expires March 30, 19 83

Sworn to before me
this day of 1982.

LIBER 9145 PAGE 453

Box 476

DEED
IN REM 137 SALE OF APRIL 6, 1982

COUNTY OF ERIE
EDWARD J. RUTKOWSKI
Erie County Executive
95 Franklin Street
Buffalo, New York

to 164

CITY OF LACKAWANNA
CITY HALL
LACKAWANNA, NEW YORK

Dated: August 3 1982

STATE OF NEW YORK
ERIE COUNTY CLERK'S OFFICE
Recorded in Liber 9145 Page 449
of Deeds
on the 3 day of August
A. D., 1982, at 2:27 o'clock P.M.
and examined.

Eugene M. Pigott
County Clerk

EUGENE P. PIGOTT, JR.
ATTORNEY FOR COUNTY OF ERIE
69 DELAWARE AVENUE, SUITE 900
BUFFALO, NEW YORK 14202

I HEREBY CERTIFY that the within instrument is entitled to be filed, recorded or indexed in your office without charge, pursuant to the Provisions of § 8017, C. P. L. R.
County of Erie, Department of Taxation
By
Dir. - Real Prop. Tax Division

1982 AUG -3 PM 2:27

FILED
ERIE COUNTY
CLERK'S OFFICE

LIBER 9145 PAGE 454

1-190-NF-32

7.0 Supporting Documents

USEPA Brownfields Assessment Demonstration Pilot Project And NYSDEC – Clean Water/Clean Air Bond Act - Environmental Restoration Project

WORK PLAN

SIX VACANT LOTS SITE (113 through 135 RIDGE ROAD) LACKAWANNA, NEW YORK

City of Lackawanna
Lackawanna, New York

Prepared by:

Malcolm Pirnie, Inc.
40 Centre Drive
Orchard Park, New York 14127

August **2004**
4852-001

MALCOLM PIRNIE

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Table of Contents

MALCOLM PIRNIE

LIST OF TABLES

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LIST OF ATTACHMENTS

Introduction

SECTION 1

The City of Lackawanna, New York (City) has been selected to receive a grant under the United States Environmental Protection Agency's (USEPA) Brownfields Assessment Program to support economic development in the City through the identification, assessment, cleanup, and redevelopment of Brownfields properties. In addition, in order to leverage these EPA funds for maximum benefit towards development of the site, the City has elected to apply for supplemental funding through the New York State Department of Environmental Conservation (NYSDEC) 1996 Clean Water/Clean Air Bond Act. This site-specific Work Plan summarizes the scope of work for a Site Investigation and Remedial Alternatives evaluation of a site consisting of six vacant lots (the Site) located at 113 through 135 Ridge Road in Lackawanna, Erie County, New York. This work plan was prepared in accordance with both EPA and NYSDEC guidance for the applicable funding programs. The objectives of the investigation include:

- Assessment of environmental conditions at the site.
- A limited site investigation to determine the nature and extent of possible contamination at the site.
- Evaluation of remedial options, which are protective of human health and the environment, based on community needs and end-use planning for the property.
- Project Management and Planning to support revitalization of the property.

This Work Plan and the associated Quality Assurance Project Plan (QAPP) and Health and Safety Plan (HASP) will be submitted to the USEPA and the New York State Department of Environmental Conservation (NYSDEC) for regulatory review. A

Community Involvement Plan (CIP) for the City's Brownfields program was previously submitted by the City of Lackawanna and approved by the EPA in October of 2003

Site Description and Background

SECTION 2

2.1 Site Location And Description

The Site includes six vacant lots identified with addresses of 113, 117, 121, 125, 129, and 135 Ridge Road in Lackawanna, Erie County, New York. Figure 2-1 identifies the location of the Site.

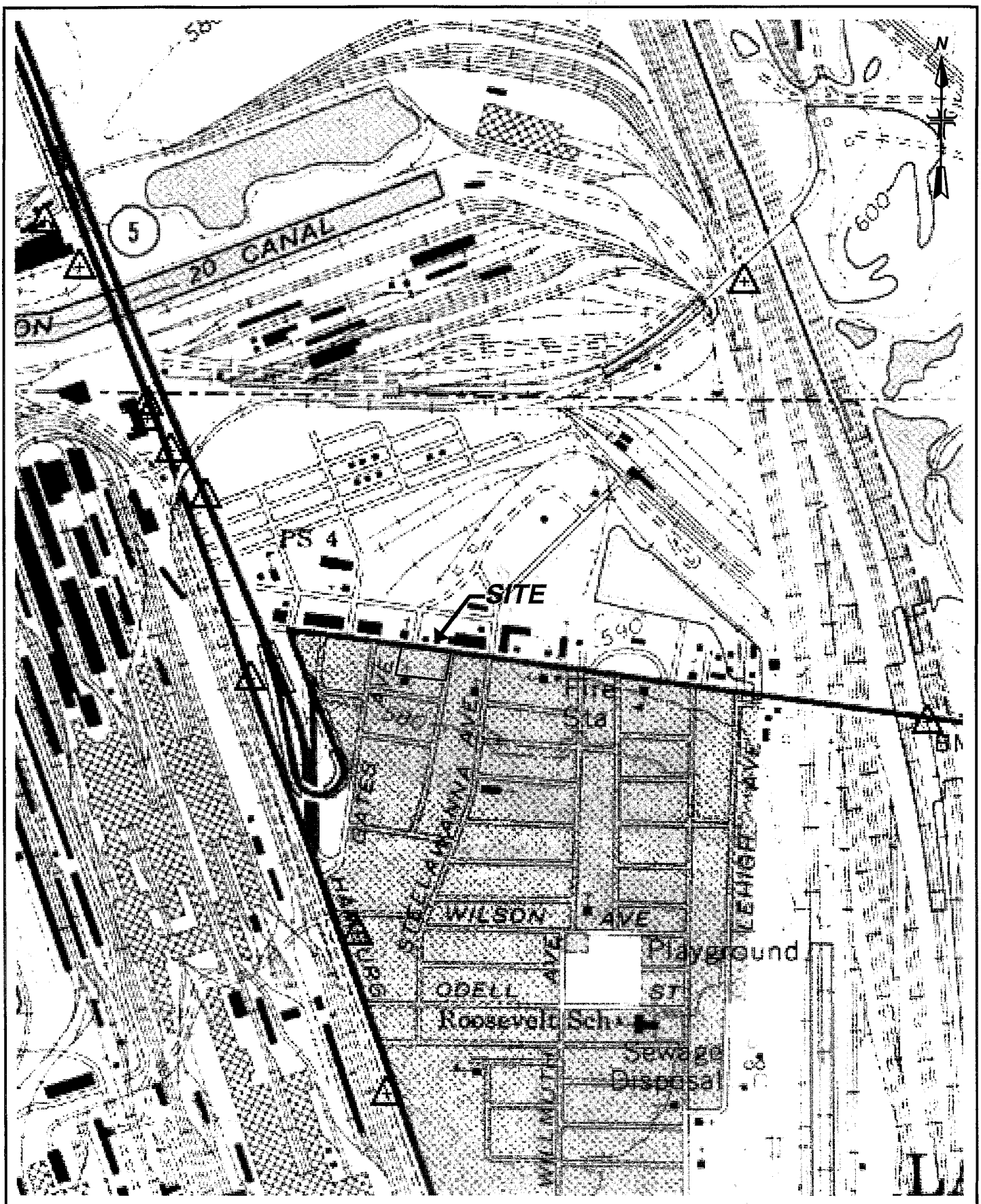
Currently, the Site is a vacant dirt/gravel covered lot with no aboveground structures. Foundations of previous structures still remain on site. It is suspected that the former structures were demolished and the debris was pushed into the basements of these structures and covered with soil fill.

2.2 Geology/Hydrogeology

The Niagara Sheet of the Geologic Map of New York was reviewed to determine the underlying bedrock at the site (Fisher et al., 1970). Levanna Shale or Stafford Limestone members are present at the Site and a majority of the surrounding area.

The Niagara Sheet of the Surficial Geologic Map of New York was used to identify characteristics of the surface geology at the Site (Caldwell et al., 1986). Lacustrine silt and clay deposits associated with proglacial lakes were identified in the area underlying the Site. These soil types are listed as having thicknesses of up to 100 meters.

The Soil Survey of Erie County, New York, produced and distributed by the United States Department of Agriculture, Soil Conservation Service, identified soils at the Site as Urban lands (UrA) forming in loamy glacial till deposits, and containing Udorthents



Latitude: +42.827366°N Longitude: -078.847126°W		**Six Vacant Lots, Ridge Road Lackawanna, New York**	**FIGURE 2-1 SITE LOCATION MAP**
4852-001	*August 2004*		

complexes (USDA-SCS, 1986). Urban lands are identified by being greater than 85 percent covered by roads, parking lots, buildings and other generally impervious surfaces. Additionally, urban lands are drained by man made improvements; therefore natural soil structure is likely disturbed by human activity. Soil identified as Udorthents are also included in soil classification at the site. Udorthents are generally brown silt loam from surface to approximately five inches below ground surface and silty loam or silty clay with greater than 40 percent rock fragments to as deep as 60 inches. Since this Site is classified as urban lands, variations and deviations in site characteristics resulting from human activity are likely.

Groundwater likely flows toward Lake Erie to the west or southward towards Smoke Creek. Topography at the Site is relatively level with elevations estimated from the USGS topographic maps at 580 feet above mean sea level (AMSL).

2.3 Site History

Based on interviews with city officials and review of Sanborn Maps[B] from the years 1915, 1927, and 1927 – 1950, it is known that a variety of commercial activities including a bakery, jeweler, men's clothing store, restaurants and a tin shop operated on the site. The Sanborn Maps[B] indicate that the structures were constructed on the site primarily between 1915 and 1927. Those structures were likely constructed in the manner and of materials typical of that period. The Sanborn Maps® indicate the buildings were mainly two story brick framed structures along Ridge Road and Wasson Avenue, and several single story wood-framed and stone structures at the rear of the main structures or along the southern property boundary. Based on the review of City Directories and the Sanborn Maps®, it is believed that many of the buildings existed until the late 1960's, however this could not be verified. It is not known when the former buildings were demolished.

It is not known if any previous environmental investigations have taken place at any of the six lots. The City of Lackawanna acquired the properties in the late 1970's.

The primary environmental concerns at the site are based on the common building materials, such as asbestos containing materials and lead based paint. Other potential

environmental concerns include the storage and/or use of petroleum based heating fuels at the site.

Site Investigation

SECTION 3

Given its long history of development, a variety of potential contaminants may have been introduced into the site's environmental media. Some of the activities that have likely occurred at the Site that could have affected soil and groundwater include:

- The demolition and/or weathering of buildings that likely contained asbestos containing materials and lead-based paint.
- The introduction of urban fill material of unknown origin to properties on the site.
- Above ground or underground heating fuel storage tanks.

The scope of work is designed to assess environmental media at the Site that may have been affected by the above-listed sources. The base scope of work includes site surveying, surface soil sampling and analysis, test trenching, subsurface soil sampling and analysis, and groundwater sampling and analysis. A New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) and NYSDEC Analytical Services Protocol (ASP)-approved analytical laboratory will analyze all samples collected during the investigation. ASP Category B data packages will be produced for each sample. A Data Usability Summary Report (DUSR) will be prepared upon the receipt of all analytical data to ensure that the quality of the data is sufficient to evaluate remedial alternatives. A summary of the samples to be collected for each investigation task is presented in Table 3-1.

MALCOLM PIRNIE

TABLE 3-1
SAMPLING SUMMARY
SIX VACANT LOTS - RIDGE ROAD
LACKAWANNA, NEW YORK

Investigation Method	*Total Soil Samples*	*Total Groundwater Samples*
Test Trenches		
Test Trenches will be dug in each lot to determine the nature and extent of fill material and former bulding foundation limits. One subsurface soil/fill material sample, a composite sample from the trenches, will be analyzed for each lot.	**6**	***0***
Soil Borings and Monitoring Wells		
Three groundwater monitoring wells will be installed within the property boundaries. The total depth of each the monitoring well will be dependent on the depth to groundwater. One soil sample will be collected from the unsaturated soil zone in each boring. Once installed, a groundwater sample will be collected from each monitoring well.	**3**	**3**
Surface Soil Sampling		
One composite surface soil sample will be analyzed for full TCL/TAL analysis at each lot. The sample will be a composite of soil/fill material collected from three locations on each lot, with the exception of the VOC fraction. The VOC fraction will be collected as a grab sample selected by visual observations or elevated PID readings. If all areas yeild no elevated PID readings or visual discolorationlstaining, the VOC sample will be selected from the center of each lot.	**6**	**0**
Quality Assurance/Quality Control Samples		
Blind Duplicate Sample	**1**	**1**
Matrix Spike/Matrix Spike Duplicate Sample	**2***	**2***
Trip Blank	**3****	**1****
Total Samples		
Total Investigation sample count	**21**	***7***

All samples will be analyzed for VOCs, SVOCs, TAL Metals, PCBs, and Pesticides.

* Matrix spike and matrix spike duplicate samples will not be analyzed for metals.

** Trip blanks will be analyzed for VOCs only.

3.1 Site Survey

A survey will be conducted at the Site to create a base map, and to determine the locations of sampling and investigation activities relative to Site features. The survey will include:

- Relevant features of the Site (i.e., streets, utilities, surface features);
- Sampling locations
- Elevation of groundwater monitoring wells.

The survey will provide sufficient detail to prepare a site assessment report and, if required, plans and specifications for remedial activities. The survey will report Northing and Easting coordinates to the nearest 0.1 feet in reference to a relative coordinate system, and elevation to the nearest 0.01 feet in reference to the National Geodetic Vertical Datum (NGVD) of 1929.

3.2 Surface Soil Sampling

One composite surface soil sample will be collected within each of the six lots from a depth not exceeding two inches below ground surface. The sample will be a composite of soil/fill material collected from three locations at each lot, with the exception of the sample selected for Volatile Organic Compounds (VOCs) analysis. The VOC fraction will be collected as a grab sample selected by visual observations or elevated PID readings. If all three sample points within a lot yield no elevated PID readings or visual discoloration/staining, the VOC sample will be selected from the center sampling location of each lot.

Sampling and sample handling procedures will be conducted in accordance with the QAPP. The surface soil samples will be analyzed for Target Compound List (TCL) VOCs, semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals, polychlorinated biphenyls (PCBs), and pesticides. The location of each sample will be noted on a site map and marked with a wooden stake for subsequent surveying.

Descriptions of the sampled soil and observations of the ground surface will be recorded during sampling.

3.3 Subsurface Soil Sampling

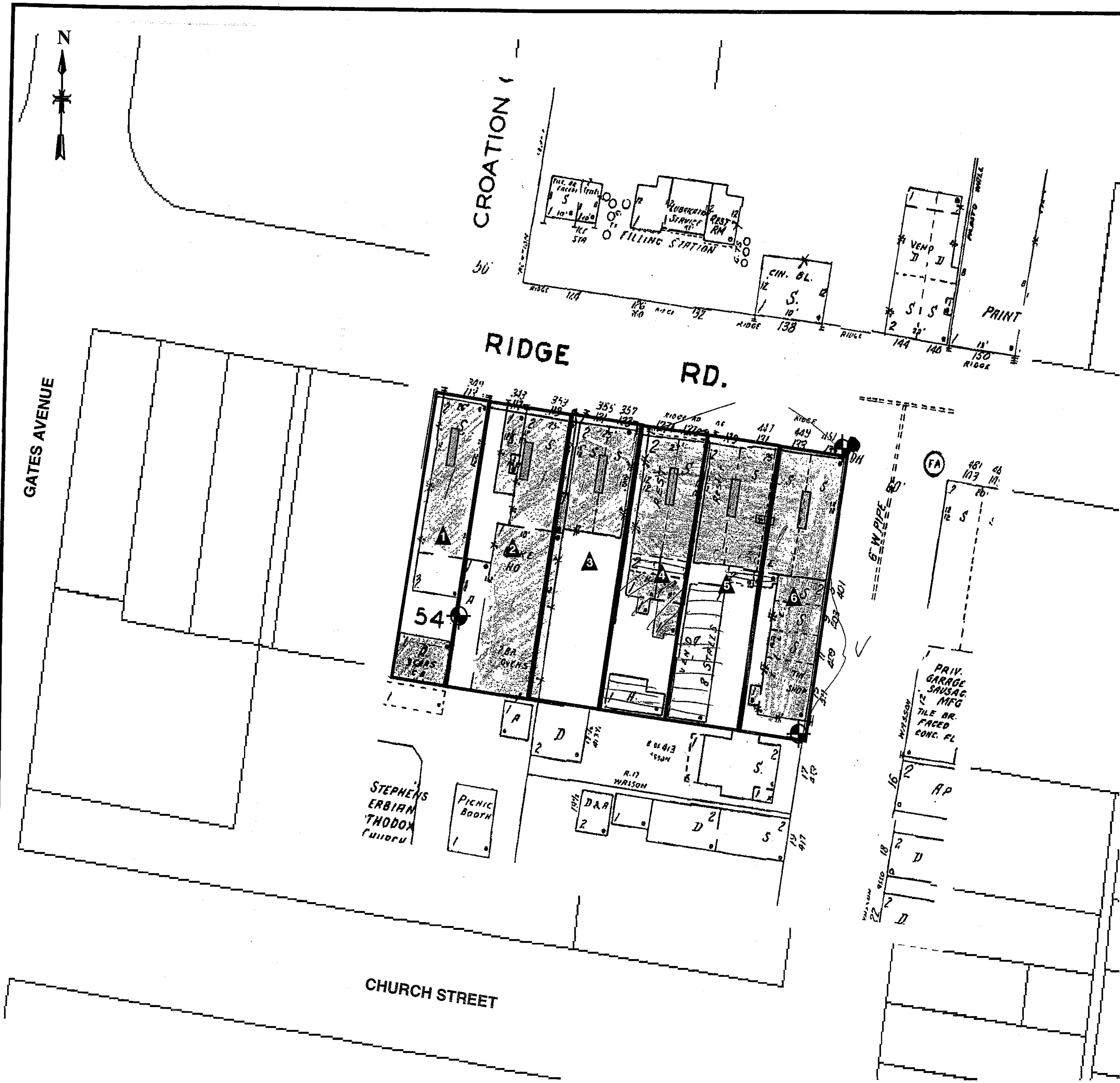
Subsurface soil samples will be collected from test trenches and soil borings. The test trenches will be located in areas that likely received urban fill material following demolition activities at the Site. Figure 3-1 identifies three soil boring locations where subsurface soil samples will be collected. The test trench locations shown on Figure 3-1 represent the number of samples to be collected for analysis, and not the actual locations of the trenching activities. All test trenching, soil boring and sample collection and handling activities will be conducted in accordance with the QAPP.

3.3.1 Test Trenches

Test trenching will be conducted using a backhoe or similar device in areas where extensive construction debris is expected. Trenches will allow for a more accurate determination of the type and extent of fill material present. The test trenches will be excavated within former building footprints, based on the 1927 – 1950 Sanborn Map® insert shown on Figure 3-1. The test trenches will penetrate the construction debris and/or fill material on each of the six lots. Several test trenches will be excavated at each lot to define the limits of former building foundations. Excavated materials will be screened for VOCs using a photoionization detector (PID), and visually inspected for the presence of contamination. The on-site geologist will record all observations and sample descriptions in the field-boring log. One composite sample of excavated material will be collected for each lot. A total of six samples will be analyzed for VOCs, SVOCs, TAL metals, PCBs, and pesticides. The sample selected for VOC analysis will be a grab sample fi-om the test trench exhibiting the highest PID reading or visual evidence of staining.

3.3.2 Soil Borings

A total of three soil borings will be drilled at the Site, two along the eastern Site boundary and one near the western Site boundary. The proposed boring locations were selected in



LEGEND

SIX VACANT LOTS SITE

PROPOSED TEST TRENCH
(Several test trenches will be excavated per lot to determine nature and extent of fill and former building foundation limits. One subsurface soil/fill material sample, a composite sample from the trenches, will be analyzed for each lot.)

PROPOSED MONITORING WELL

PROPOSED SURFACE SOIL SAMPLE
(Composite of 3 locations per lot)

1927-1950 SANBORN MAP OVERLAY

APPROXIMATE SCALE IN FEET
0 25 50 100

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SIX VACANT LOTS SITE
LACKAWANNA, NEW YORK

PROPOSED SAMPLING LOCATIONS

MALCOLM PIRNIE, INC.
JULY 2004

FIGURE 3-1

areas outside of former structures. These borings will be drilled to evaluate the depth and composition of fill material as well as native subsurface soil at the site. At a minimum, it is anticipated that one composite sample of subsurface material in the unsaturated zone will be collected fiom each boring. Additional samples may be collected if PID readings or field observations indicate the potential presence of contamination. The samples will be analyzed for VOCs, SVOCs, TAL metals, PCBs, and pesticides. The sample for VOC analysis will be collected fiom the split spoon at a discrete depth interval displaying the greatest evidence of contamination. If no evidence of contamination is observed, the sample will be collected from the depth interval located immediately above the groundwater table. The soil borings will be drilled to a maximum depth of 10 feet below the groundwater table.

3.4 Groundwater Sampling

Groundwater samples will be collected from monitoring wells installed in the three soil borings discussed in Section **3.3.2** and shown on Figure 3-1. Monitoring well installation, development, and groundwater sampling will be conducted in accordance with the QAPP.

3.4.1 Monitoring Well Installation

Two-inch diameter PVC monitoring wells will be installed in the eight-inch boreholes and will be screened to intercept the water table. Each well will be constructed using 10 feet of 0.01-inch slot PVC well screen. Additional details for monitoring well installation are included in the QAPP.

3.4.2 Monitoring Well Development

Monitoring wells will be developed upon completion to minimize turbidity in subsequent groundwater samples and to improve their hydraulic properties. Where appropriate, development water will be discharged to the ground surface adjacent to each well in accordance with NYSDEC guidelines. Purged groundwater will be temporarily contained in pre-cleaned five-gallon buckets prior to discharge to evaluate whether sheens and/or non-aqueous phase liquids (NAPLs) are present in the purge water. In the event that

sheens and/or NAPLs are observed during well development, purged water will be collected in UN-approved 55-gallon steel drums and staged on-site for characterization and proper disposal.

3.4.3 Groundwater Sampling

Groundwater samples will be collected from each of the monitoring wells a minimum of one week after well development has been completed. Prior to groundwater purging and sampling the water level in each monitoring well will be measured and recorded. If the formation permeability is sufficient enough for adequate groundwater recharge, groundwater sampling will be conducted in accordance with the USEPA Low-Flow Low-Purge Sampling Protocol (USEPA, 1998). If the formation permeability is insufficient, groundwater sampling will be conducted according to NYSDEC Groundwater Sampling Protocols (NYSDEC, 1991). To the extent practicable, groundwater purging rates will be low enough to prevent significant drawdown of the groundwater level in the well. Water levels will be monitored during sampling to verify that excessive draw down is not occurring. Sampling procedure details are included in the QAPP. Each groundwater sample will be analyzed for VOCs, SVOCs, TAL metals, PCBs, and pesticides. To evaluate geochemical characteristics of the groundwater, and to evaluate the effectiveness of well purging, temperature, pH, oxidation-reduction potential, specific conductivity, turbidity, and dissolved oxygen will be measured during purging and immediately prior to groundwater sampling. If groundwater turbidity is greater than 50 Nephelometric Turbidity Units (NTUs) at the time of sampling, both filtered and unfiltered samples will be collected and analyzed for TAL metals.

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Risk Screening and Exposure Pathway Analysis

SECTION 4

A Human Health Risk Screening and Exposure Pathway Analysis will be performed following the receipt of all analytical data. The Qualitative Exposure Analysis will be used to evaluate if the presence and concentration of detected chemicals in the investigated environmental media pose human health concerns. This assessment seeks to identify relevant environmental media and chemicals of potential concern that may present a health risk to the populations in and around the vicinity of the Site. In this context, the objectives of the risk assessment will be to:

- Evaluate the available analytical data in comparison to NYSDEC criteria.
- Evaluate potential receptors and exposure pathways associated with any detected contamination.
- Characterize the potential for adverse impacts to human health and the environment.
- Assist in determining the need for additional action.

The results of the qualitative risk assessment will be important in considering the potential for reuse of the Site.

The purpose of the human health risk screening is to evaluate potential human health risks associated with the Site. The objectives of the risk screening are to:

- Identify environmental media and chemicals of potential concern;
- Provide an evaluation of potential human receptors and exposure pathways at and around the site.
- Characterize the potential for adverse effects to human health in the absence of any actions to control or mitigate site contamination, if present.

The human health evaluation is conducted in the typical four-step process:

1. Data Evaluation: relevant site data are analyzed, and environmental media and chemicals of potential concern are identified;

2. Exposure Assessment: chemical release mechanisms are analyzed, potentially exposed human populations are identified, and potential exposure pathways and routes are identified;

3. Toxicitv Assessment: qualitative toxicity information is presented for the chemicals of potential concern;

4. Risk Characterization: the potential for adverse human health risks (noncarcinogenic and carcinogenic) is evaluated, and the risk information is summarized to determine the baseline risk in the absence of future remediation.

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Remedial Alternatives Evaluation

SECTION 5

If warranted based on information collected during the site assessments, a Focused Remedial Plan will be prepared to identify and screen remedial options for the Site. The Plan will include potential end use alternatives and site-specific cleanup objectives. The plan will also include an evaluation of potential remedial technologies, a recommended remedial approach, and estimated costs and schedule for implementation. In addition to evaluating treatment technologies, "No Action" and "Return to Pre-Disposal Condition" alternatives will also be evaluated.

5.1 End-Use Planning

Potential end-use scenarios will be identified so that an appropriate re-use, which is protective of human health and the environment, can be selected. Risk-based remedial action goals will be developed based on the potential end-use scenarios. It is anticipated that the final end-use for the Site will be commercial. Malcolm Pimie will work with Wendell Duchsherer Architects & Engineers to develop the draft conceptual end-use plans. These plans will address the potential end-uses of the site based on site characteristics (i.e., location, zoning, community needs, degree of contamination, etc.) and will be consistent with the City's redevelopment goals. The draft end-use plans will be presented to the project stakeholders and finalized based on comments received.

5.2 Technology Screening

Based on the remedial action objectives and each identified general response action, potential treatment technologies and their associated containment or treatment and disposal requirements will be identified. A prescreening of these potential treatment technologies for suitability as part of aremedial alternative will be conducted.

Technologies which could prove extremely difficult to implement, which might not achieve the remedial objective in a reasonable time, or which might not be applicable or feasible based on the site-specific conditions will be eliminated from further consideration. The remaining technologies will be combined into remedial alternatives that meet the response objectives.

5.3 Preliminary Screening of Remedial Alternatives

Potential remedial alternatives will be screened on the basis of effectiveness, implementability, and cost. These screening criteria are briefly described below:

- **Effectiveness** - The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated as to the protection it would provide and the reductions in toxicity, mobility, or volume of contaminants it would achieve.

- **Implementability** - The implementability evaluation will be used to measure both the technical and administrative feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will be considered.

- **Cost** – The cost evaluation will include estimates of capital costs, annual operation and maintenance (O&M) cost, and present worth analysis. These conceptual cost estimates will be order-of-magnitude estimates.

5.4 Analysis of Alternatives

The remedial alternatives that pass the preliminary screening will be further evaluated. Alternatives with extremely low cost/benefit values will be deleted from further

consideration. Alternatives that provide similar levels of protection, yet which have significantly different cost will be compared. The least costly of these will be selected for further study. An alternative will be recommended which is protective of public health and the environment and is cost-effective. Each potential alternative will be evaluated with respect to the following:

- Short-term impacts and effectiveness.
- Long-term effectiveness and performance.
- Reduction of toxicity, mobility, or volume.
- Feasibility and Irnplementability.
- Compliance with standards, criteria, guidelines, and proposed long-term Brownfields Redevelopment use.
- Overall protection of human health and the environment.
- Effect on property value, if any.
- Cost effectiveness.
- State and community acceptance.

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Site Investigation/ Remedial Alternatives Report

SECTION 6

6.1 Site Investigation Report Format

A Site Investigation/Remedial Alternatives Report (SI/RAR) will be prepared and submitted to the USEPA and NYSDEC for review and comment. The SI Portion of the report will include the following:

- Discussion of field investigation activities;
- Presentation of analytical results for all media sampled;
- Quality assurance/quality control evaluation of the analytical data including the results of the data validation;
- Discussion of the nature and extent of contaminants;
- Comparison of analytical results to Eastem US Background Concentrations for Metals as listed in NYSDEC TAGM 4046;
- Contaminant Fate and Transport;
- Exposure Assessment;
- Conclusions and recommendations drawn from the interpretation of the data;
- Supporting data, including analytical data packages, field log forms, and monitoring well construction diagrams.

6.2 Remedial Alternatives Report

The RAR Portion of the report will include the following:

- Identification and Development of Alternatives;
- Detailed Analysis of Alternatives;
- Recommended Remedial Alternative;
- Justification for Remedial Alternative selection;
- Supporting data, including calculations, and cost estimates.

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SECTION 7

Utilization Plan

7.1 Minority/Women-Owned Business Enterprise (MBE/WBE)

This MBE/WBE Plan documents the good faith efforts to be undertaken to comply with the requirements of USEPA and NYSDEC to subcontract with minority- 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 of the USEPA and NYSDEC. This goal is as follows:

- The Contractor agrees to make good faith efforts to subcontract percentages of the total contract value to New York State certified MBE and WBE firms, as per USEPA requirements, as well as meet NYSDEC goals based on a percentage of the State Assistance provided.

7.1.1 Malcolm Pirnie Corporate Affirmative Action Statement

Malcolm Pirnie supports the USEPAs commitment to minority- and women-owned business enterprises. The firm will make good faith efforts to meet or exceed the 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.

7.1.2 Good Faith Efforts Undertaken To Ensure MBE/WBE Participation

7.1.2.1 General

As part of the USEPA Brownfields Pilot Demonstration Project at the six vacant lots site, the City of Lackawanna has retained Malcolm Pirnie to perform the following Tasks:

- Perform a Site Investigation (SI).
- Prepare an SI Report.

Subcontractors will be needed to assist or provide services listed below. Subcontractors will be selected in accordance with USEPA procurement guidelines.

- Drilling Services

  Survey

- Trenching/Excavation Services
- Laboratory Analytical Services; and
- Data Validation Services.

7.1.2.2 MBE/WBE Work Assignment Participation

In accordance with the Assistance Agreement between the USEPA and the City, the MBE/WBE participation goals for this project are:

- MBE: 8.8 percent
- W E : 8.8 percent

It is expected that MBE/WBE subcontractors will be contacted to submit bids for drilling services, data validation services, and surveying services.

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SECTION 8

Schedule

Figure 8-1 presents the schedule for the Project.

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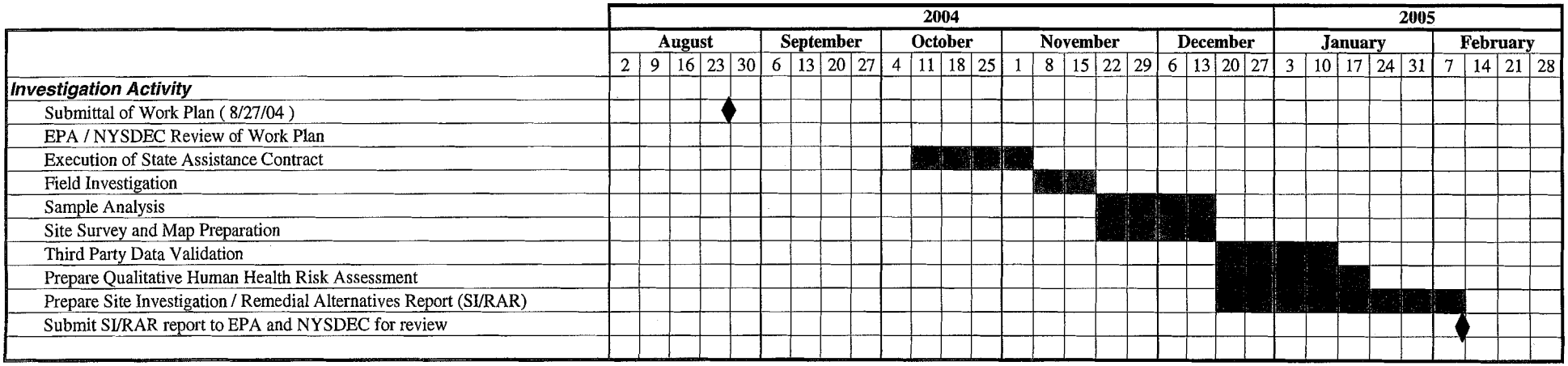
FIGURE 8-1

SCHEDULE FOR PLANNED INVESTIGATION ACTIVITIES
SIX VACANT LOTS SITE - RIDGE ROAD
LACKAWANNA, NEW YORK



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SECTION 9

References

Caldwell, D.H. and R.J. Dineen, 1986, Surficial Geological Map of New York, Niagara Sheet, New York State Museum-Geological Survey, Map and Chart Series No. 40, Scale 1:250,000.

Fisher, D.W., Rickard, L.V., 1970, Geologic Map of New York- Niagara Sheet, The University of New York, The State Education Department, Map and Chart Series No. 15, Scale 1:250,000.

New York State Department of Environmental Conservation, Bureau of Spill Prevention and Response, Division of Water, March 1991, Section 5.5, *Sampling Guidelines and Protocols.*

United States Department of Agriculture – Soil Conservation Service (USDA-SCS), 1992, Soil Survey of Erie County, New York.

United States Environmental Protection Agency (USEPA), Region II, 1998, *Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling Standard Operating Procedure.*

SITE SPECIFIC HEALTH AND SAFETY PLAN

MALCOLM PIRNIE

SECTION 1: GENERAL INFORMATION AND DISCLAIMER		PROJECT NUMBER:	4852-001
PROJECT NAME:	Six Vacant Lots Site-Ridge Road, Lackawanna, NY	CLIENT NAME:	City of Lackawanna
PROJECT MANAGER:	Jim Richert	PROJECT DPM:	Brad Walker
PREPARED BY:	Brad Walker	DATE:	8/26/2004

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	Rural Metro	(716) 882-8400
HOSPITAL (Map attached)	Our Lady of Victory Hospital	(716) 828-3830
FIRE DEPARTMENT	Lackawanna Fire Department	(716) 827-6436
POLICE ▮ SECURITY	Lackawanna City Police Dept.	(716) 822-4900
HAZMAT/ SPILL / OTHER RESPONSE	Lackawanna Fire Department	(716) 827-6436

(B) CORPORATE RESOURCES

MALCOLM PIRNIE 24 17 EMERGENCY ▮ INCIDENT TELEPHONE NUMBERS		(800) 478-6870 (24 HOURS)
CORPORATE HEALTH AND SAFETY **	MARK MCGOWAN. CIH, CSP	(914) 641-2484 WHI
	JOSEPH GOLDEN, EMT-P, CET, CHMM	(914) 641-2978 WHI
CORPORATE HEALTH PHYSICIST	LES SKOSKI	(201) 398-4377 NNJ
CORPORATE HUMAN RESOURCES **	PATRICIA OLSIEWICZ (WORKERS COMP / OSHA LOG)	(914) 641-2913 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: Six Vacant Lots Site-Ridge Road, Lackawanna, NY

ADDRESS: 113 - 135 Ridge Rd.

TOWNSHIP/ COUNTY: Erie County / City of Lackawanna

☐ FEDERAL ☐ STATE ☒ MUNICIPAL / REGIONAL ☐ PRIVATE

SITE CLIENT CONTACT: Lou Zicari

PHONE NUMBER: 574-6445

SITE SAFETY CONTACT: Brad Walker

(716)667-6650

☐ HAZARDOUS (RCRA)	☐ UST / LUST	☐ REFINERY
☐ HAZARDOUS (CERCLA / STATE)	☒ BROWNFIELD	☐ WTP / WWTP
☐ CONSTRUCTION	☐ CHEMICAL PLANT	☒ OTHER:
☐ LANDFILL (NON-HAZARDOUS)	☐ CHEMICAL PLANT	Former Industrial
☐ ACTIVE	☒ INACTIVE	
☒ HAZARDOUS WASTE	☐ SOLID WASTE	☒ CONSTRUCTION
☐ HYDROGEOLOGY	☐ ENVIRONMENTAL	☒ AIR / ODOR
☐ WASTE WATER	☐ WATER	☒ OTHER:
☐ PRE-JOB VISIT	☐ AUDIT	☒ AIR ☐ SEDIMENT
☒ (SUB) CONTRACTOR OVERSIGHT	☒ OTHER:	☒ SURFACE WATER ☒ SURFACE SOIL
☐ CONSTRUCTION MGMT	Soil Sampling	☒ GROUND WATER ☐ LANDFILL
☐ INSPECTION		☒ WASTE WATER ☒ OTHER
☐ INVESTIGATION SURVEY		☒ WASTE STREAM Subsurface Soil

DATE(S) OF FIELD ACTIVITIES: 10125104 - 11119104

(E) FIELD TASKS

MALCOLM PIRNIE TASKS (List field tasks to be performed by Malcolm Pirnie staff)

M1. Subcontractor Oversight

M2. Soil sampling

M3. Groundwater Sampling

M4.

TASKS PERFORMED BY OTHERS (List field tasks to be performed by client, subcontractors, or contractors)

01. Drilling / test trench Excavation

02. Surveying

03. Utility mark-out

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-today 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: Jim Richert

PROJECT OFFICER: Scott MacFabe

SITE SAFETY OFFICER: Brad Walker

ALTERNATE SAFETY OFFICER(S): Scott Compston

PUBLIC INFORMATION OFFICER: Kent McManus

SITE RECORDKEEPER: Brad Walker

FIELD TEAM LEADER: Brad Walker

FIELD TEAM PERSONNEL: Brad Walker

Scott Compston

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** ▮ of this plan.

SUBCONTRACTOR(S): TBD
(All subcontractors will have OSHA 40hr./8hr. training and current medical monitoring.)

FEDERAL AND STATE AGENCY REPS:

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 / BBP (EXP DATE)			(EXP DATE)	FIT TEST MAKE / SIZE / TYPE			(DATE)
Scott Compston	08/00	12/03	03/03			12/04	12/03	12/03	05/05	MSA	MED	FF	05/03
Brad Walker	05/00	06/04	06/03			12/04	07/05	06/02	11/04	MSA	MED	FF	06/05

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

(CHECK ALL THAT APPLY)

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
Lead Paint	TO	Soil	Unknown	☐ PPM ☐ mg/m³
Asbestos	TO	Soil	Unknown	☐ PPM ☐ mg/m³
Petroleum Products	VO	SOIL	Unknown	☐ PPM ☐ mg/m³

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 (wrrosive, 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
M1	Inhalation / Contact	Low	Air monitoring w/PID and dust meter
M2	Inhalation / Contact	Low	Air monitoring w/PID and dust meter
M3	Contact	Low	PPE (gloves)

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

Brad Walker 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: Orange Traffic cones and caution tape around the drill rig and open test trenches.

No unauthorized person should be within this area.

(B) WORK ZONES - CONTAMINATION

The prevailing wind conditions are Southwest 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: N/A

Please refer to Attachment 2 for a description of the Community Health and Safety plan for the site.

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.

- (X) AIR MONITORING EQUIPMENT (See Section 9)
- (X) BARRIER TAPE
- (X) COMMUNICATIONS - ONSITE
- (X) 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
- (X) 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
- (X) MSDSs – ATTACHED (See Section 11)
- ☐ MSDSs - FACILITY / OTHERS
- (X) PPE - PHYSICAL HAZARDS (See Section 15)
- (X) PPE - CHEMICAL HAZARDS (See Section 15)
- (X) RESPIRATORY PROTECTION PROGRAM & EQUIPMENT (APR) (See Section 15)
- ☐ RESPIRATORY PROTECTION PROGRAM & EQUIPMENT (SAR) (See Section 15)
- (X) 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: (716) 667-0900 and (716) 667-6654

(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 USE
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 I FACILITY SPECIFIC SAFE WORK PRACTICES:

Safe Work Practices 1-10 are inclusive for the site.

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	greater than 25% LEL
☐ 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	5 ppm above background
☐ FID					
☐ Colorimetric tubes:					
_____	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
_____	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Radiation: ☐ a ☐ β ☐ gamma	☐ Continuous	☐ Hourly	☐ x Day	☐ Other	
☐ Respirable Dust Meter	☒ continuous	☐ Hourly	☐ x Day	☐ Other	150 mcg/m3
☐ 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.

Oxygen Levels

Less than 19.5%	Level B necessary for work to start 1 continue. Consider toxicity potential.
19.5% to 23.5%	Work may start 1 continue. Investigate changes. Continuous monitoring.
Greater than 23.5%	PROHIBITED WORK CONDITION

Flammability 1 Explosive Hazards

Less than 10% of LEL	Work may start 1 continue. Consider toxicity potential.
10% to 25% of LEL	Work may start 1 continue. Continuous monitoring.
Greater than 25% of LEL	PROHIBITED WORK CONDITION.

Uncharacterized Airborne Organic Vapors or Gases

Background'	Work may start 1 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

Characterized Airborne Orsanic Vapors or Gases**

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 = $3C_N EL_N$) if more than one contaminant is present.

Radiation

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: _____

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 30-50 °F. If it is determined that heat stress or cold stress monitoring is required (mandatory for heavy exertion in PPE at temperatures over 70°F, or at temperatures under 40°F 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):

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 Pimie 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:

Alconox

Nitric acid

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 Pimie 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 Level D decontamination protocol shall be used with the following decontamination stations:

(1) Scrub with alconox and water mixture

(2) Rinse with tap water

(3) Rinse with nitric acid (only required for sampling equipment for metals analysis)

(4) Rinse with Tap Water

(5) Rinse with Distilled Water

(6)

(7)

(8)

(Other) Large equipment and augers will be steam cleaned.

The following decontamination equipment is required: Steam cleaner

☒ Decon Pad (Plastic Sheet) ☒ Dry Brushes ☒ Buckets Other Steam cleaner

☒ Trash Cans/Bags ☒ Wet Brushes ☒ Hose ▮ Spray

Alconox and water Will be used as the decontamination solution

SECTION 15: PERSONAL PROTECTIVE EQUIPMENT

TASK *	RESPIRATORS & CARTRIDGE'	USE ** (See Section 16)	CLOTHING	GLOVES	BOOTS	OTHER
M1	FF Mult/P	UP	NS	L	SL	HH G HP
M2	FF Mult/P	UP	NS	L	SL	HH G HP
M3	FF Mult/P	UP	NS	L	SL	HH G HP

* Same as Section 3E

** UP = Upgrade
CONT = Continuous

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

CODES:

RESPIRATORS'	CARTRIDGES'	CLOTHING	GLOVES[2]	BOOTS	OTHER
HF = Half Face APR	P = Particulate	N/S = No Special	Co = Cotton	SL = Leather Safety	HH = Hard Hat
FF = Full Face APR	OV = Organic Vapors	C = Coveralls	Le = Leather	H = Hip (Fireman)	G = Safety Glasses
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
			PVC = Polyvinyl Chloride		
			PVA = Polyvinyl Alcohol		
			Other:		

1 - List all that apply, i.e., FF w/ OVIAGIP

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

Respiratory protection will be upgraded under the following conditions: Volatile organic compounds measured in ambient air at 5 ppm above background (sustained). Dust concentrations above 150 micrograms per cubic meter.

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

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 judgement, 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:

Verbal communication

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 N/A which is a minimum of 250 feet away from the incident

(B) FIRE OR EXPLOSION

Upon discovery of a fire or an explosion, the abovedesignated 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 4 minutes from the site. Ambulance response time is 5 minutes. _____ of Rural Metro 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

(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:	Jim Richert	*812612004*
Project DPM:	Brad Walker	*812612004*
Local H&S Coordinator:	Dean Discenza	*811712004*
Corporate H & S	Mark McGowen	

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)

Scott Compston		
Brad Walker		

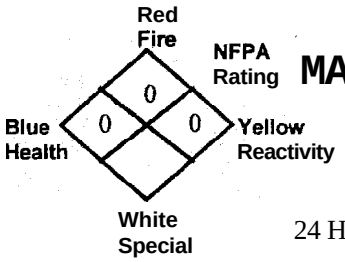
VISITOR (Print Name)

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 Community HASP as Attachment 2 to the Work Plan.

Alconox ®



MATERIAL SAFETY DATA SHEET

Alconox, Inc
30 Glenn Street
White Plains, NY 10603

24 Hour Emergency Number – Chem-Tel(800) 255-3924

I. IDENTIFICATION

Product Name (as appears on label)	ALCONOX
CAS Registry Number:	Not Applicable
Effective Date:	January 1, 2001
Chemical Family:	Anionic Powdered Detergent
Manufacturer Catalog Numbers for sizes	1104, 1125, 1150, 1101, 1103 and 1112

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

There are no hazardous ingredients in ALCONOX as defined by the OSHA Standard and Hazardous Substance List 29 CFR 1910 Subpart Z.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point (F):	Not Applicable
Vapor Pressure (mm Hg):	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (Water=1):	Not Applicable
Melting Point:	Not Applicable
Evaporation Rate (Butyl Acetate=1):	Not Applicable
Solubility in Water:	Appreciable-Soluble to 10% at ambient conditions
Appearance:	White powder interspersed with cream colored flakes.
pH:	9.5 (1%)

IV. FIRE AND EXPLOSION DATA

Flash Point (Method Used):	None
Flammable Limits:	LEL: No Data UEL: No Data
Extinguishing Media:	Water, dry chemical, CO_2, foam
Special Fire fighting Procedures:	Self-contained positive pressure breathing apparatus and protective clothing should be worn when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None

V. REACTIVITY DATA

Stability:	Stable
hazardous Polymerization:	Will not occur
Incompatibility (Materials to Avoid):	None
Hazardous Decomposition or Byproducts:	May release CO_2 on burning

VI. HEALTH HAZARD DATA

Route(s) of Entry:	Inhalation? Yes Skin? No Ingestion? Yes
Health Hazards (Acute and Chronic):	Inhalation of powder may prove locally irritating to mucous membranes. Ingestion may cause discomfort and/or diarrhea. Eye contact may prove irritating.
Carcinogenicity:	NTP? No IARC Monographs? No OSHA Regulated? No
Signs and Symptoms of Exposure:	Exposure may irritate mucous membranes. May cause sneezing.
Medical Conditions Generally Aggravated by Exposure:	Not established. Unnecessary exposure to this product or any industrial chemical should be avbided. Respiratory conditions may be aggravated by powder.
Emergency and First Aid Procedures:	Eyes: Immediately flush eyes with water for at least 15 minutes. Call a physician. Skin: Flush with plenty of water. Ingestion: Drink large quantities of water or milk. Do not induce vomiting. If vomiting occurs administer fluids. See a physician for discomfort.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken if Material is Released or Spilled:	Material foams profusely. Recover as much as possible and flush remainder to sewer. Material is biodegradable.
Waste Disposal Method:	Small quantities may be disposed of in sewer. I titi should be disposed of in accordance with local ordinances for detergent products.
Precautions to be Taken in Storing and Handling:	Material should be stored in a dry area to prevent caking.
Other Precautions:	No special requirements other than the good industrial hygiene and safety practices employed with any industrial chemical.

VIII. CONTROL MEASURES

Respiratory Protection (Specify Type):	Dust mask - Recommended
Ventilation:	Local Exhaust-Normal Special-Not Required Mechanical-Not Required Other-Not Required
Protective Gloves:	Impervious gloves are useful but not required.
Eye Protection:	Goggles are recommended when handling solutions.
Other Protective Clothing or Equipment:	None
Work/Hygienic Practices:	No special practices required

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH BUT NO WARRANTY IS EXPRESSED OR IMPLIED.

MSDS Number: N3666 * * * * * *Effective Date: 05/25/01* * * * * *Supercedes: 11/17/99*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

NITRIC ACID 10% Re S.

1. Product Identification

Synonyms: Aqua Fortis; Azotic Acid
CAS No.: 7697-37-2
Molecular Weight: 63.01
Chemical Formula: HNO3 (10% solution)
Product Codes: Product Codes: H262

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Nitric Acid	7697-37-2	10%	Yes
Water	7732-18-5	90%	No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS

TO ALL BODY TISSUE. OXIDIZER CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

Potential Health Effects

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison.

Inhalation:
Corrosive! May cause irritation of the nose, throat, and respiratory tract including coughing and choking. Higher concentrations or prolonged exposure to vapors of nitric acid may lead to pneumonia or pulmonary edema.
Ingestion:
Corrosive. May cause immediate pain and bums of the mouth, throat, esophagus and gastrointestinal tract.
Skin Contact:
Corrosive! May cause redness, pain, and severe skin bums.
Eye Contact:
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
Chronic Exposure:
Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.
Aggravation of Preexisting Conditions:
Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance.
Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:
Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.
Explosion:
May react explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc.
Fire Extinguishing Media:
Water or water spray.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Increases the flammability of combustible, organic and readily oxidizable materials.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

---

7. Handling and Storage

Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from combustible, organic, or any other readily oxidizable materials. Protect from freezing.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Nitric Acid:
OSHA Permissible Exposure Limit (PEL):
2 ppm (TWA)
ACGIH Threshold Limit Value (TLV):
2 ppm (TWA); 4 ppm (STEL)
Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Canister-type respirators using sorbents are ineffective.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:
Clear to pale yellow solution.

Odor:
Suffocating, acrid.

Solubility:
Infinitely soluble.

Density:
1.054

pH:
No information found.

% Volatiles by volume @ 21C (70F):
100 (as water and acid)

Boiling Point:
ca. 101C (ca. 214F)

Melting Point:
ca. -3C (ca. 27F)

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
No information found.

Evaporation Rate (BuAc=1):
No information found.

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.
Conditions to Avoid:
Heat and incompatibles.

11. Toxicological Information

For Nitric Acid: Investigated as a mutagen and reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Nitric Acid (7697-37-2)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

.....
Proper Shipping Name: NITRIC ACID **(WITH 10%** NITRIC ACID)
Hazard Class: 8
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 20L

International (Water, I.M.O.)
.....
Proper Shipping Name: NITRIC ACID **(WITH** 10% NITRIC ACID)
Hazard Class: 8
UN/NA: UN2031
Packing Group: II
Information reported for product/size: 20L

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

Ingredient	TSCA	EC	Japan	Australia
Nitric Acid (7697-37-2)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\----------------------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Nitric Acid (7697-37-2)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part I\----------------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Nitric Acid (7697-37-2)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Nitric Acid (7697-37-2)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: Yes (Mixture / Liquid)

Australian Hazchem Code: 2PE
Poison Schedule: S6

WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0 Other: Oxidizer
Label Hazard Warning:
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. OXIDIZER CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.
Label First Aid:
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 9, 16.
Disclaimer:
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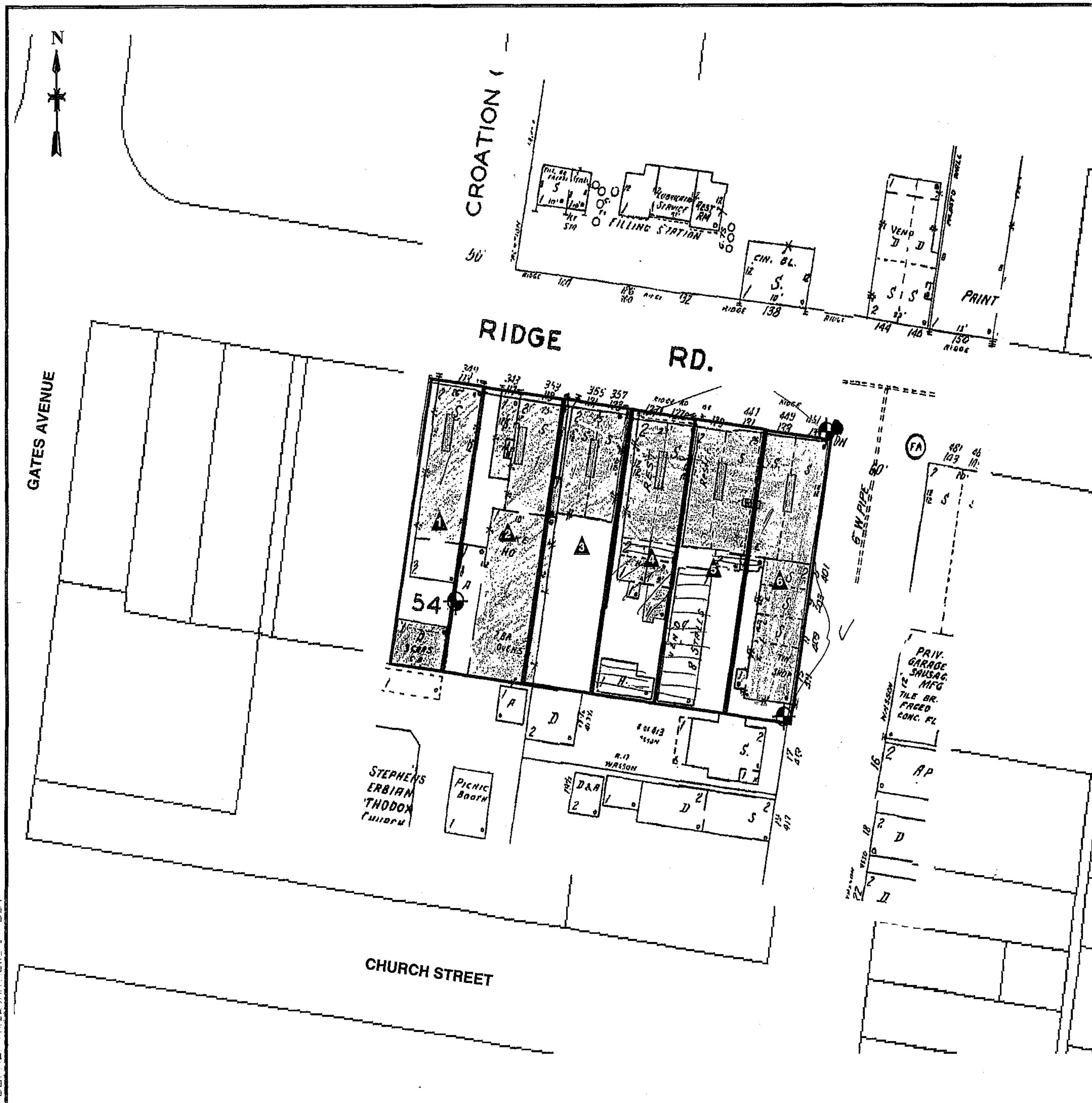
Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)



LEGEND

SIX VACANT LOTS SITE

PROPOSED TEST TRENCH
(Several test trenches will be excavated per lot to determine nature and extent of fill and former building foundation limits. One subsurface soil/fill material sample, a composite sample from the trenches, will be analyzed for each lot.)

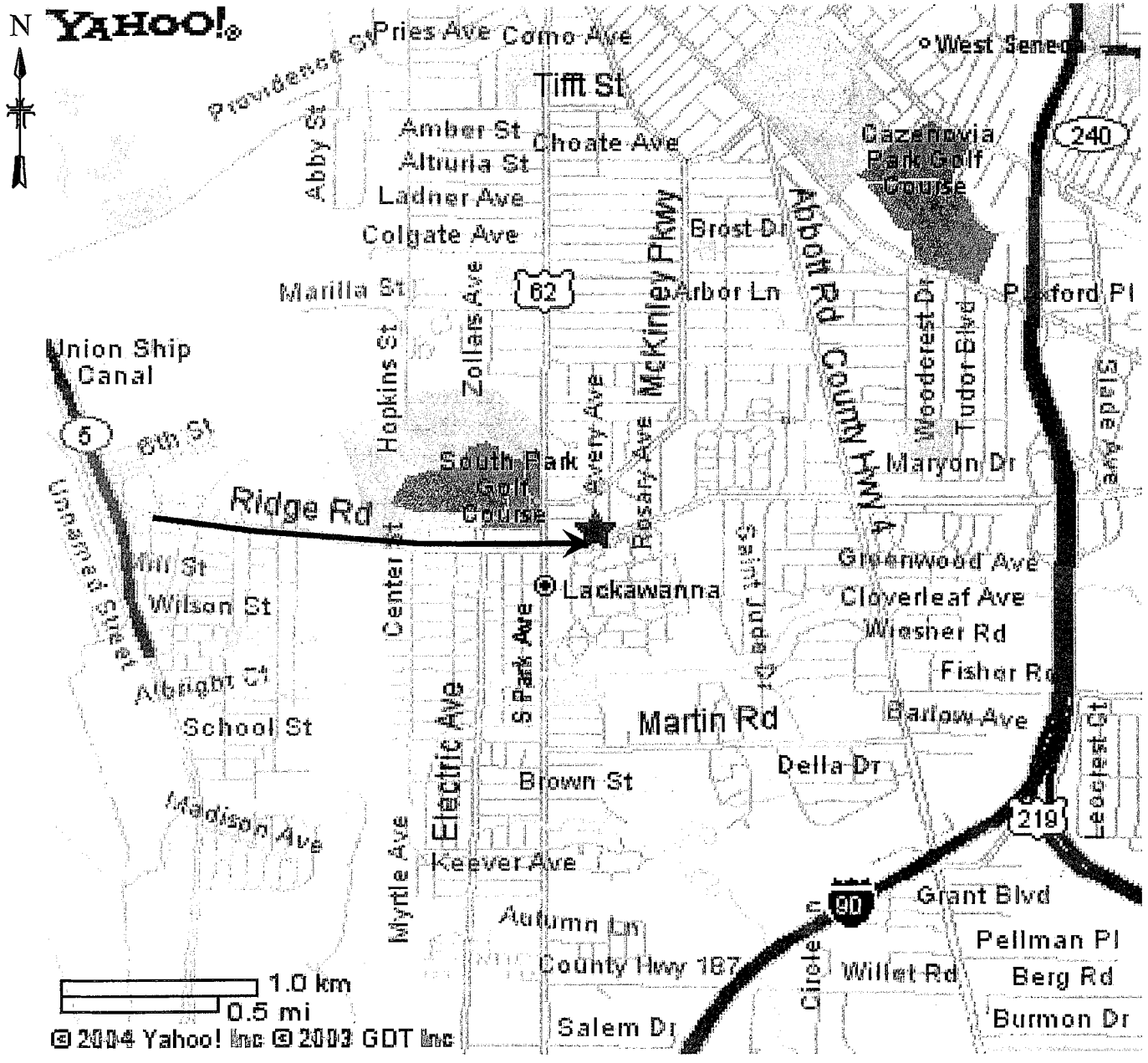
PROPOSED MONITORING WELL

PROPOSED SURFACE SOIL SAMPLE
(Composite of 3 locations per lot)

1927-1950 SANBORN MAP OVERLAY

APPROXIMATE SCALE IN FEET
0 25 50 100

MALCOLM PIRNIE	SIX VACANT LOTS SITE LACKAWANNA, NEW YORK	PROPOSED SAMPLING LOCATIONS	MALCOLM PIRNIE, INC. JULY 2004 FIGURE 1



DIRECTIONS

Start at **RIDGE RD, LACKAWANNA**

- go East **1.3** mi.
- Turn LEFT on **MELROY AVE**
- go **0.1** mi.
- Arrive at **55 MELROY AVE, LACKAWANNA**

MALCOLM PIRNIE	**HEALTH AND SAFETY PLAN** **Six Vacant Lots Site- Ridge Road** **LACKAWANNA, NEW YORK**	**Directions To Our Lady Of Victory Hospital** **55 MELROY AVE, LACKAWANNA**	 **FIGURE 2**

ATTACHMENT 2

Community Health and Safety Plan

COMMUNITY HEALTH AND SAFETY PLAN
SIX VACANT LOTS SITE – 113 through 135 RIDGE ROAD
LACKAWANNA, NEW YORK

Air Monitoring

Malcolm Pirnie will conduct air monitoring during intrusive activities involved with the investigation at the Six Vacant Lots Site. Additional details for air monitoring are provided in Sections 7 and 9 of the Health and Safety Plan (HASP). Air monitoring will consist of the following:

- A Malcolm Pirnie field team member will monitor for the presence of particulate matter (dust), organic vapors, and combustible gases at the nearest property boundaries during intrusive activities. At a minimum, this perimeter monitoring will take place immediately following the initiation of intrusive activities and periodically during such activities. All monitoring will be conducted using the following meters or an equivalent:
    - Dust Monitoring - Miniram dust meter;
    - Organic Vapors - Minirae 2000 photoionization detector (PID) equipped w/ a 10.6 eV lamp;
    - Combustible gas monitoring – MultiRAE PLUS LEL/O_2/CO/H_2S detector.
- All monitoring will be conducted using the equipment and procedures presented in Sections 7 and 9 of the HASP.
- The field team member will document the location, time, wind direction, and measurements in the project field log book during each round of site monitoring.
- If the dust exceeds 150 micrograms per cubic meter ($\mu g/m^3$) and/or the total organic vapor concentration exceeds 5 parts per million (ppm) above background and/or combustible gases exceed 25% of the lower explosive limit (LEL) at the nearest downwind property boundary, all operations will be halted until the source of the dust and/or vapors has been located and addressed.

Site Work Zones

Site work zones with definitive boundaries will be established to prevent or minimize exposure from the project hazards. Malcolm Pirnie will establish and maintain safe perimeter work zones around open excavations, excavators, drill rigs and other heavy equipment. All work zones will be marked with orange traffic cones and caution tape.

Only authorized, trained, and qualified personnel with the appropriate PPE will be admitted into the site work zones.

USEPA Brownfields Assessment Demonstration Pilot Project

And

NYSDEC 1996 CLEAN WATER/CLEAN AIR BOND ACT ENVIRONMENTAL RESTORATION PROJECT

QUALITY ASSURANCE PROJECT PLAN

SIX VACANT LOTS SITE
113 through 135 RIDGE ROAD
LACKAWANNA, NEW YORK

City of Lackawanna
Lackawanna, New York

Prepared by:

Malcolm Pirnie, Inc.
40 Centre Drive
Orchard Park, New York 14127

August 2004
4852-001

MALCOLM PIRNIE

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MALCOLM PIRNIE

Introduction and Project Organization

SECTION 1

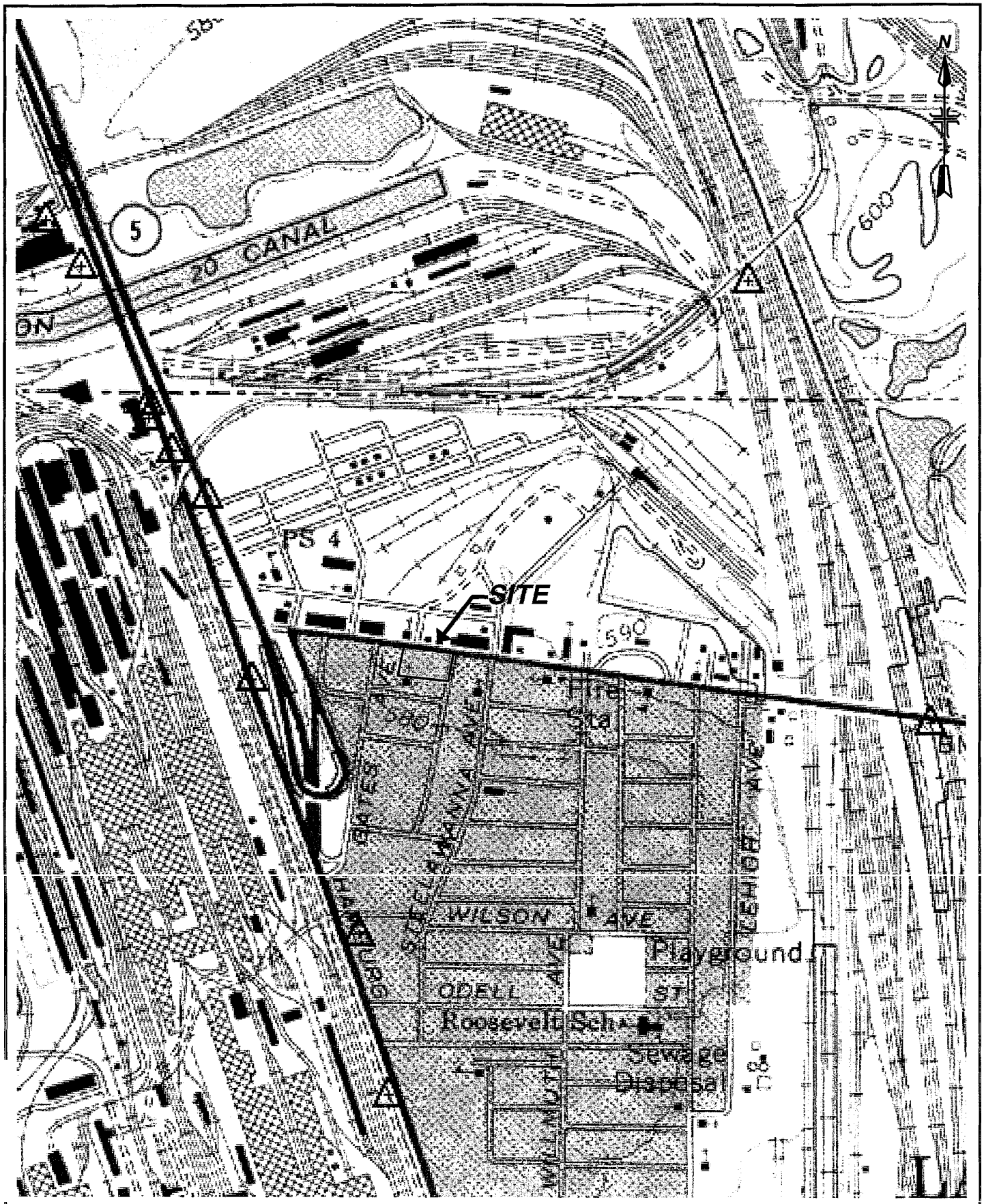
1. Background/Objectives

The City of Lackawanna (City), New York has been selected to receive a grant under the United States Environmental Protection Agency's (USEPA) Brownfields Assessment Demonstration Pilot Program to support economic development in the City through the identification, assessment, cleanup, and redevelopment of Brownfields properties. In addition, in order to leverage these EPA funds for maximum benefit towards development of the site, the City has elected to apply for supplemental funding through the New York State Department of Environmental Conservation (NYSDEC) 1996 Clean Water/Clean Air Bond Act. This Work Plan has been prepared in support of the application for NYSDEC Bond Act funding.

The Six Vacant Lots on Ridge Road consists of six parcels of land with a total area of approximately 0.75 acres. The Site is located in a mixed industrial, commercial, and residential area of Lackawanna. Historically, commercial buildings were present on the Site but have subsequently been demolished. The location of the Site is shown on Figure 1-1.

This Quality Assurance Project Plan (QAPP) presents, in specific terms, the policies, organizations, objectives, functional activities, and quality assurance (QA) and quality control (QC) activities designed to achieve the data quality goals of the project at the Six Vacant Lots Site.

The QA addressed herein is applicable to both the field sampling activities and the laboratory analyses of field samples. Laboratory analyses and QC procedures will be in accor-



Latitude: +42.827366°N Longitude: -078.847126°W		**Six Vacant Lots, Ridge Road Lackawanna, New York**	**FIGURE 1-1 SITE LOCATION MAP**
4852-001	*August 2004*		

dance with the USEPA SW846 analytical methodologies and the 1989 New York State Department of Environmental Conservation (NYSDEC) Analytical Services Protocol (ASP). Malcolm Pirnie will subcontract the analytical laboratory to analyze the field samples collected during the Site Investigation (SI). The selected laboratory will be certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) and the NYSDEC for ASP analyses.

The methods and procedures presented in this Site-specific QAPP are in accordance with those contained in the USEPA Region 2 Generic Brownfields QAPP for Brownfields Assessment Demonstration Pilot Projects (Generic QAPP) (USEPA, 1999), the USEPA Region 2 Brownfields Project Planning Guidance (USEPA, 2000), and USEPA Guidance for the Data Quality Objectives Process (EPA QA/G-4) (USEPA, 2000a). A copy of the signed *Title and Approval Page* for the Generic QAPP is presented in Attachment 1.

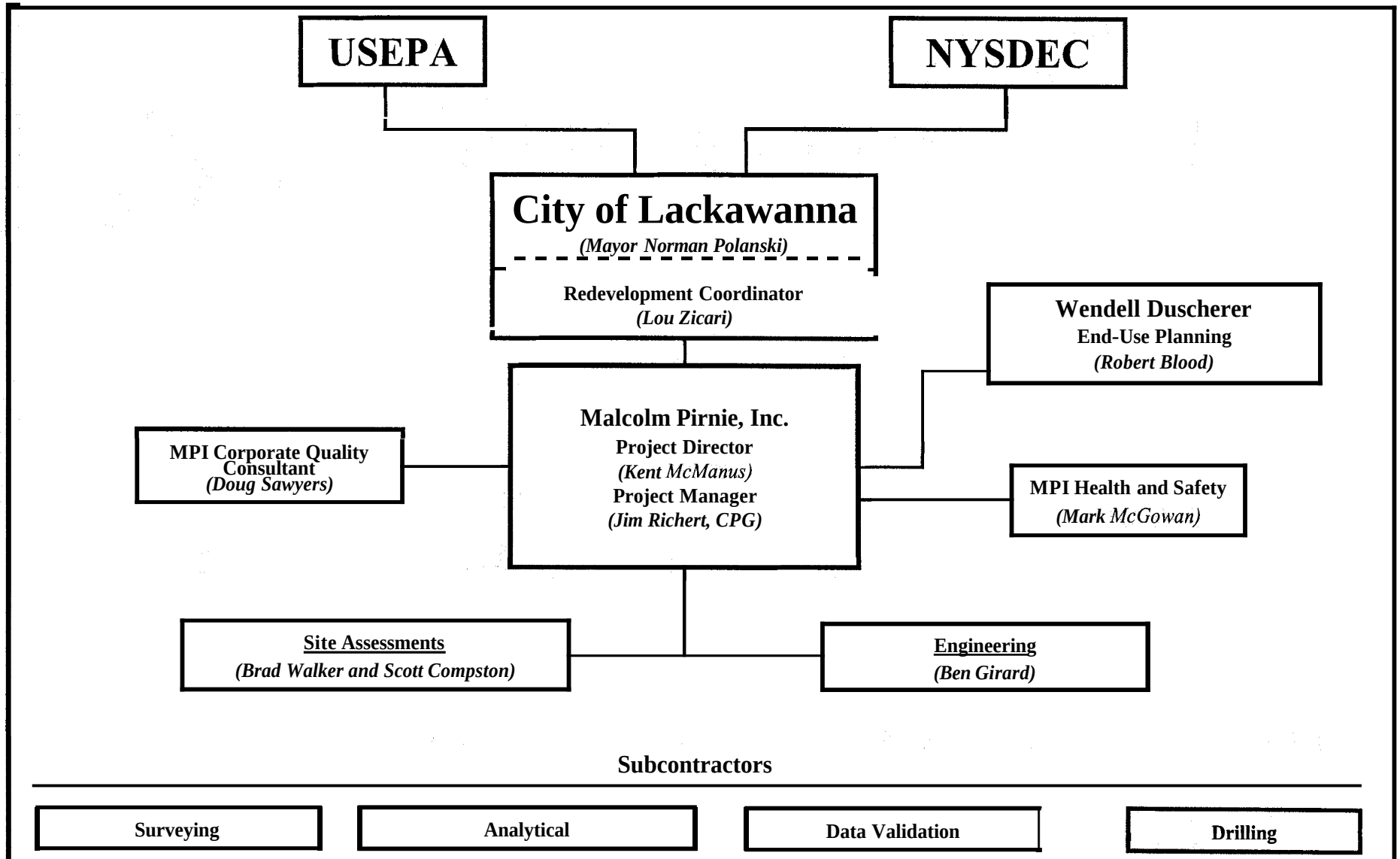
1.2 Project Organization and Responsibility

The City has entered into an Assistance Agreement with the USEPA for the execution of the Project. In addition, the City has applied for partial finding for the project under the New York State Department of Environmental Conservation (NYSDEC) 1996 Clean Water/Clean Air Bond Act. As such, the City will have the overall responsibility of assuring that the Project is conducted in accordance with the guidelines set forth in the Assistance Agreement. The City has retained Malcolm Pirnie, Inc. (Malcolm Pirnie) to implement the Project on their behalf

1.2.1 Project Organization

The Project organization is presented on Figure 1-2. The responsibilities for key Malcolm Pirnie staff positions are summarized below:

- ***Jim Richert – Project Manager:*** Responsible for planning and implementation of the SI/RAR on behalf of the City.



MALCOLM PIRNIE	QUALITY ASSURANCE PROJECT PLAN SIX VACANT LOTS – RIDGE RD LACKAWANNA, NEW YORK	PROJECT ORGANIZATION	FIGURE 1-2

- ***Brad Walker – Project Leader:*** *Directs all field activities. Assists Project Manager with implementation of SI/RAR activities. Ensures that Health and Safety procedures are observed in the field.*

- ***Doug Sawyers - Quality Consultant:*** *Responsible for independent technical review ofproject scope, objectives, quality, and reports.*

- ***Jim Richert – Citizen Participation Coordinator:*** *Responsible for coordinating community involvement in the Demonstration Pilot process.*

- ***Mark McGowan – Health and Safety:*** *Responsible for identifying and prescribing appropriate protective measures for field investigations.*

1.2.2 Subcontractors

Subcontractors will be required for data validation, survey, laboratory analytical services, and drilling. Subcontractors have not been solicited or selected at the time of submitting this QAPP.

MALCOLM PIRNIE

Quality Assurance Objectives

SECTION 2

2.1 Data Requirements/Levels of Concern

The purpose of the SI is to characterize the nature and extent of contaminants at the Site in accordance with the SI Work Plan. SI analytical sampling results will be used to determine if contaminant concentrations in soil and groundwater exceed State Standards Criteria and Guidance Values (SCGs). The SCGs for this project are as follows:

- Groundwater: New York State Class GA Standards.
- Soil: NYSDEC Technical and Administrative Guidance Memo (TAGM) HWR-94-4046.

The SCGs for this project are presented in Appendix A. Data gathered during the SI will be used to identify cost-effective, environmentally sound, long-term measures for remediation of the Site, if required.

2.2 Data Quality Objectives Development

2.2.1 Problem Definition

The investigation is being performed under a $200,000 Brownfields Pilot Demonstration Grant awarded to the City by the USEPA and the NYSDEC Clean Water/Clean Air Bond Act. The objective of the investigation is to evaluate environmental conditions at the Site and to assess whether remedial measures are necessary to be protective of human health and the environment. Potential exposure scenarios include incidental contact or ingestion

of surface soil containing metals, polychlorinated biphenyls (PCBs), pesticides, volatile organic compounds (VOCs), or semivolatile organic compounds (SVOCs) at concentrations greater than NYSDEC TAGM 4046 recommended cleanup objectives, and incidental contact of construction workers with subsurface soil and groundwater containing VOCs, SVOCs, metals, pesticides and PCBs present at concentrations greater than NYSDEC TAGM 4046 recommended cleanup objectives or NYSDEC Class GA standards.

2.2.2 Decision Identification

Samples will be collected in areas identified in the Work Plan. If the above-mentioned contaminants of concern (COCs) are present at concentrations greater than the applicable NYSDEC standards, then remedial measures and/or additional investigation will be necessary to protect human health and the environment.

2.2.3 Decision Inputs

The following inputs will be necessary to make the decision identified above:

- Concentrations of COCs in surface soil and groundwater samples obtained through laboratory analysis using USEPA SW846 analytical protocols and validated by a third party data validator.

2.2.4 Study Boundaries

The sample population will include groundwater and soil at the Six Vacant Lots Site as defined in the Work Plan. Permission from the affected property owners to sample soil and groundwater has already been granted.

2.2.5 Tolerable Limits and Decision Errors

Potential sources of error include sampling error associated with the inherent variability in surface and subsurface physical conditions, and measurement error associated with sample collection techniques and/or analytical procedures. The most critical decision

error would be the conclusion that COCs were not present at concentrations greater than the applicable standards, when, in truth, COCs were indeed present at those concentrations (the false rejection). To verify that the data collected during the investigation is of sufficient quality to support critical decisions, all analytical work shall be conducted using USEPA SW846 analytical methods in accordance with NYSDEC ASP, 1989, Revised 1991, and subsequent revisions. Table 2-1 lists the methods that will be used for this project. To measure and control the quality of analysis and to verify that the Data Quality Objectives (DQO) are met, certain QA parameters are defined and utilized in data analysis activities for this project. They are defined as follows:

- ***Precision*** - is a measure of mutual agreement among individuals of the same property, usually under prescribed similar conditions. Precision is expressed in terms of standard deviation and is evaluated based on the calculated relative percent difference (RPD) of standard matrix spikes, sample matrix spikes, and sample duplicates (field duplicates and laboratory duplicates). The evaluation of precision for this project will be based on the RPD between duplicate standard matrix spikes, duplicate sample matrix spikes, and sample duplicates. The maximum allowable RPD for this project will be ±30 percent for organic analyses and ±25 percent for inorganic analyses. Calculations for analytical precision are presented in Section 7.4.

- ***Accuracy*** - is the degree of difference between measured or calculated values and true values. The difference is expected to be within the precision interval for the measurement to be deemed accurate. For this project, accuracy will be measured based on the average percent recovery of standard matrix control spikes. Laboratory-generated accuracy criteria for use in this project are summarized in Table 2-2. Calculations for analytical accuracy are presented in Section 7.4.

- ***Representativeness*** - expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. To assure that the samples delivered to the laboratory for analysis are representative of the Site conditions, quality assurance procedures for sample collection and handling (discussed below) will be followed whenever samples are collected.

- ***Completeness*** - is a measure of the amount of the data obtained from a measurement ***system*** compared to the amount that was expected to be obtained under correct normal conditions. The goal and objective is 100 percent completeness. However, due to unforeseen field conditions, laboratory conditions

TABLE 2-1
SUMMARY OF SAMPLE ANALYSIS METHODS
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

ANALYTE(S)	MATRIX	METHOD(S)
TCL Volatile Organic Compounds	soiljwater	SW-846 8260B
TCL Semi-Volatile Organic Compounds	soil/water	SW-846 8270C
Polychlorinated Biphenols	soiljwater	SW-846 8082
Pesticides	soil/water	SW-846 8081
TAL Metals	soil/water	6010B/7470A/7471A

and analytical limitations (such as matrix interference or required dilution) that could result in data qualification, it may not be possible to achieve 100 percent completeness. The minimum level of laboratory completeness is expected to be 95 percent for each analytical parameter. The minimum level of project completeness will be 90 percent. This is expected to be achieved by ensuring proper sample packaging and extraction procedures. The project manager has the responsibility of deciding whether re-sampling and reanalysis are required to meet the data quality objectives. The project manager will then inform the laboratory coordinator and the QA supervisor of the decision.

- ***Comparability*** - is the confidence with which one data set can be compared with another. All data will be calculated and reported in units consistent with standard procedures so that the results of the analyses can be compared with those of other laboratories. The objectives of the analytical laboratory for comparability are to:

    1. Demonstrate traceability of standards to NIST or EPA sources;
    2. Use standard methodology;
    3. Report results from similar matrices in standard units;
    4. Apply appropriate levels of quality control within the context of the laboratory QA program;
    5. Participate in inter-laboratory studies to document laboratory performance; and
    6. Follow NYSDEC data validation process, which recommends the use of USEPA data validation guidelines.

- ***Sensitivity*** - The data generated during the SI will be sensitive enough to meet SCG criteria. Contract-required detection limits (CRDLs) for this project are listed in Table 2-2.

TABLE 2-2
SUMMARY OF LABORATORY ACCURACY CRITERIA AND DETECTION LIMITS
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

DRAFT REQUIRES LAB SPECIFIC INFO

ANALYTE	METHOD	CRDL SOIL (ug/kg)	ACCURACY (% RECOVERY)	CRDL (ug/L)	ACCURACY (% RECOVERY)
1,1,1,2-Tetrachloroethane	8260B	5	70 - 137.2	5	89.3 - 115.7
1,1,1-Trichloroethane	8260B	5	72.5 - 131.3	5	81.9 - 123.3
1,1,2,2-Tetrachloroethane	8260B	5	62.1 - 135.9	5	74.2 - 124
1,1,2-Trichloroethane	8260B	5	61.7 - 145.7	5	82.6 - 120.4
1,1-Dichloroethane	8260B	5	73.1 - 127.1	5	89.1 - 113.1
1,1-Dichloroethene	8260B	5	62.1 - 133.5	5	67.4 - 124.4
1,1-Dichloropropene	8260B	5	71.6 - 129.2	5	85 - 118
1,2,3-Trichlorobenzene	8260B	5	71 - 123.8	5	60.8 - 128.6
1,2,3-Trichloropropane	8260B	5	62.6 - 134	5	69.3 - 127.5
1,2,4-Trichlorobenzene	8260B	5	73.2 - 121.8	5	69.3 - 125.7
1,2,4-Trimethylbenzene	8260B	5	73.7 - 121.7	5	80.9 - 119.9
1,2-Dibromo-3-chloropropane	8260B	5	44.8 - 160	5	60 - 128.4
1,2-Dibromoethane (EDB)	8260B	5	69 - 136.2	5	80.3 - 121.1
1,2-Dichlorobenzene	8260B	5	80.9 - 116.9	5	88.2 - 113.4
1,2-Dichloroethane	8260B	5	64.3 - 148.9	5	80.5 - 121.9
1,2-Dichloropropane	8260B	5	74.8 - 127	5	87 - 114
1,3,5-Trimethylbenzene	8260B	5	72.8 - 123.2	5	83.4 - 117.6
1,3-Dichlorobenzene	8260B	5	80.6 - 116.6	5	91 - 111.4
1,3-Dichloropropane	8260B	5	72.1 - 132.1	5	82.8 - 118.2
1,4-Dichlorobenzene	8260B	5	78.7 - 117.1	5	88.3 - 110.5
2,2-Dichloropropane	8260B	5	58 - 139.6	5	52.2 - 141.6
2-Chloroethyl vinyl ether	8260B	5	15.3 - 168.9	5	0.0 - 336.5
2-Chlorotoluene	8260B	5	77.8 - 117.4	5	90.2 - 112.4
2-Hexanone	8260B	5	22.7 - 188.9	5	36.5 - 146.9
4-Chlorotoluene	8260B	5	80 - 116	5	88.2 - 114
4-Isopropyltoluene	8260B	5	68.2 - 127	5	79.7 - 119.9
4-Methyl-2-pentanone	8260B	5	31.2 - 174.6	5	58.6 - 137.8
Acetone	8260B	5	13.4 - 164.6	5	30.8 - 116.6
Benzene	8260B	5	79.2 - 119.4	5	88.4 - 113
Bromobenzene	8260B	5	83.1 - 117.3	5	90.6 - 114
Bromochloromethane	8260B	5	71.4 - 135.6	5	89.2 - 117.4
Bromodichloromethane	8260B	5	73.6 - 134.8	5	88 - 118
Bromoform	8260B	5	54.2 - 156.2	5	70.2 - 132.6
Bromomethane	8260B	5	46.7 - 163.7	5	54.2 - 140
Carbon disulfide	8260B	5	35.4 - 156	5	60.3 - 128.1
Carbon tetrachloride	8260B	5	68.2 - 136.6	5	78.3 - 124.5
Chlorobenzene	8260B	5	81.6 - 116.4	5	91.1 - 111.5
Chloroethane	8260B	5	61.4 - 140.6	5	61.8 - 130.8
Chloroform	8260B	5	77 - 129.2	5	88.2 - 116.4
Chloromethane	8260B	5	51.1 - 142.9	5	63.3 - 132.3
cis-1,2-Dichloroethene	8260B	5	78.4 - 123.4	5	91.3 - 113.5
cis-1,3-Dichloropropene	8260B	5	73.9 - 130.9	5	82.1 - 118.1
Dibromochloromethane	8260B	5	73.5 - 131.7	5	84.5 - 119.9
Dibromomethane	8260B	5	63.6 - 145.8	5	83.2 - 122.2
Dichlorodifluoromethane	8260B	5	25.1 - 172.7	5	36.4 - 176.8
Ethylbenzene	8260B	5	77.1 - 121.5	5	89.9 - 114.5
Hexachlorobutadiene	8260B	5	54.4 - 134.8	5	62.8 - 118
Iodomethane	8260B	5	48.6 - 147.6	5	62.7 - 138.9
Isopropylbenzene	8260B	5	75 - 125.4	5	86.6 - 116.6
Methyl ethyl ketone		5	23.8 - 172.6	5	0.0 - 336.5
Methylene chloride		5		5	82.6 - 117.4

TABLE 2-2
SUMMARY OF LABORATORY ACCURACY CRITERIA AND DETECTION LIMITS
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

DRAFT REQUIRES LAB SPECIFIC INFO

ANALYTE	METHOD	SOIL CRDL (ug/kg)	SOIL ACCURACY (% RECOVERY)	AQUEOUS CRDL (ug/L)	AQUEOUS ACCURACY (% RECOVERY)
MTBE	8260B	***5***	63.4 - 140.2	5	35.7 - 179.7
Naphthalene	8260B	***5***	50.2 - 139	5	50.4 - 139.8
n-Butylbenzene	8260B	5	62.7 - 130.5	5	70.1 - 127.7
n-Propylbenzene	8260B	5	68.1 - 126.3	5	84.6 - 117
sec-Butylbenzene	8260B	5	64.4 - 129.8	5	80.6 - 119
Styrene	8260B	5	80.9 - 122.3	5	90.6 - 115.2
tert-Butylbenzene	8260B	5	68.6 - 127.4	5	84 - 120.6
Tetrachloroethene	8260B	5	73.9 - 124.9	5	78.7 - 124.9
Toluene	8260B	5	79.5 - 120.3	5	92.2 - 112
trans-1,2-Dichloroethene	8260B	5	66.1 - 135.7	5	89.1 - 113.1
trans-1,3-Dichloropropene	8260B	5	66.5 - 141.5	5	76.9 - 122.5
Trichloroethene	8260B	5	80.1 - 120.9	***5***	90.1 - 111.7
Trichlorofluoromethane	8260B	***5***	56.7 - 161.1	***5***	39.6 - 151.2
Vinyl acetate	8260B	***5***	24.3 - 161.1	5	0.0 - 218
Vinyl chloride	8260B	***5***	56.3 - 137.9	5	63.3 - 129.9
Xylenes, total	8260B	***5***	77.8 - 122.2	5	90.5 - 113.9
1,2,4-Trichlorobenzene	8270C	330	47.1 - 108.8	10	42.6 - 113.4
1,2-Dichlorobenzene	8270C	330	43.9 - 106.0	10	43.9 - 103.1
1,3-Dichlorobenzene	8270C	330	42.6 - 103.4	10	43.6 - 99.2
1,4-Dichlorobenzene	8270C	330	42.9 - 103.2	10	43.3 - 99.5
2,2'-oxybis (1-Chloropropane)	8270C	330	35.7 - 117.1	10	53.3 - 102.6
2,4,5-Trichlorophenol	8270C	670	54.3 - 109.0	20	52.2 - 119.4
2,4,6-Trichlorophenol	8270C	330	48.6 - 109.5	10	49.9 - 118.5
2,4-Dichlorophenol	8270C	330	50.5 - 109.2	10	47.5 - 115.8
2,4-Dimethyphenol	8270C	330	0.0 - 125.8	10	39.8 - 97.1
2,4-Dinitrophenol	8270C	670	0.0 - 127.2	20	3.8 - 147.0
2,4-Dinitrotoluene	8270C	330	48.3 - 118.1	10	63.0 - 114.9
2,6-Dinitrotoluene	8270C	330	50.7 - 111.7	10	60.2 - 113.4
2-Methylphenol	8270C	330	34.5 - 106.8	10	29.6 - 106.6
2-Chloronaphthalene	8270C	330	46.9 - 108.8	10	48.4 - 111.4
2-Chlorophenol	8270C	330	44.3 - 107.4	10	44.8 - 105.0
2-Methylnaphthalene	8270C	330	37.3 - 124.4	10	38.7 - 126.6
2-Nitroaniline	8270C	670	42.3 - 115.3	20	58.6 - 111.2
2-Nitrophenol	8270C	330	47.5 - 107.9	10	50.8 - 112.7
3,3'-Dichlorobenzidine	8270C	330	0.0 - 116.6	10	25.6 - 123.0
3-Nitroaniline	8270C	670	1.3 - 104.5	20	28.4 - 135.2
4,6-Dinitro-2--methylphenol	8270C	670	27.1 - 120.5	20	39.8 - 138.3
4-Bromophenyl-phenylether	8270C	330	51.7 - 114.7	10	47.7 - 132.2
4-Chloro-3-methylphenol	8270C	330	52.5 - 111.9	10	53.6 - 112
4-Chloroaniline	8270C	330	0.0 - 74.0	10	0.0 - 123.8
4-Chlorophenyl-phenylether	8270C	330	46.4 - 119.0	10	52.1 - 122.8
4-Methylphenol	8270C	330	38.4 - 109.3	10	26.8 - 106.0
4-Nitroaniline	8270C	670	2.7 - 119.5	20	25.4 - 152.4
4-Nitrophenol	8270C	670	43.7 - 128.3	20	0.0 - 144.9
Acenaphthene	8270C	330	46.4 - 109.6	10	54.7 - 112.5
Acenaphthylene	8270C	330	47.0 - 107.3	10	54.3 - 108.9
Anthracene	8270C	330	45.8 - 113.6	10	55.7 - 123.9
Benzo(a)anthracene	8270C	330	49.1 - 113.4	10	56.2 - 120.2
Benzo(a)pyrene	8270C	330	43.2 - 110.3	10	55.6 - 111.1
Benzo(b)fluoranthene	8270C	330	45.1 - 117.3	10	58.0 - 108.5
Benzo(g,h,I)perylene	8270C	330	42.7 - 116.7	10	41.7 - 129.5

TABLE 2-2
SUMMARY OF LABORATORY ACCURACY CRITERIA AND DETECTION LIMITS
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

DRAFT REQUIRES LAB SPECIFIC INFO

ANALYTE	METHOD	CRDL SOIL (ug/kg)	LABORATORY ACCURACY (% RECOVERY)	CRDL (ug/L)	LABORATORY ACCURACY (% RECOVERY)
Benzo(k)fluoranthene	8270C	330	45.2 - 117.6	10	49.5 - 121.3
bis(2-Chloroethoxy)methane	8270C	330	44.9 - 110.1	10	53.4 - 106.8
bis(-2-Chloroethyl) Ether	8270C	330	41.4 - 107.5	10	51.3 - 101.4
bis(2-Ethylhexyl)phthalate	8270C	330	38.6 - 131.2	10	55.8 - 113.5
Butylbenzylphthalate	8270C	330	47.6 - 116.9	10	60.9 - 109.1
Carbazole	8270C	330	7.1 - 176.3	10	0.0 - 219.7
Chrysene	8270C	330	35.0 - 123.9	10	23.1 - 154.8
Dibenzo(a,h)anthracene	8270C	330	37.2 - 122.6	10	33.1 - 141.6
Dibenzofuran	8270C	330	49.2 - 112.1	10	56.2 - 114.9
Diethylphthalate	8270C	330	52.4 - 113.8	10	62.0 - 113.9
Dimethylphthalate	8270C	330	53.3 - 110.3	10	63.2 - 110.0
Di-n-butylphthalate	8270C	330	50.3 - 119.3	10	55.8 - 124.4
Fluoranthene	8270C	330	51.3 - 116.6	10	53.9 - 128.2
Fluorene	8270C	330	43.7 - 118.6	10	56.2 - 118.3
Hexachlorobenzene	8270C	330	52.8 - 115.1	10	49.9 - 132.6
Hexachlorobutadiene	8270C	330	51.1 - 110.8	10	39.1 - 117.7
Hexachlorocyclopentadiene	8270C	330	3.3 - 113.8	10	0.0 - 105.2
Hexachloroethane	8270C	330	43.1 - 105.3	10	44.1 - 97.6
Indeno(1,2,3-cd)pyrene	8270C	330	39.3 - 120.3	10	44.7 - 122.2
Isophorone	8270C	330	42.3 - 106.2	10	53.8 - 106.1
Naphthalene	8270C	330	46.1 - 107.9	10	47.8 - 111.3
Nitrobenzene	8270C	330	47.3 - 107.1	10	54.0 - 105.8
N-Nitroso-di-n-propylamine	8270C	330	41.0 - 108.5	10	51.6 - 100.0
N-Nitrosodiphenylamine (1)	8270C	330	41.5 - 114.7	10	45.0 - 120.9
Pentachlorophenol	8270C	670	20.5 - 102.3	20	0.0 - 141.8
Phenanthrene	8270C	330	50.9 - 114.6	10	53.6 - 125.1
Phenol	8270C	330	43.4 - 111.1	10	0.0 - 126.1
Pyrene	8270C	330	45.9 - 119.5	10	62.3 - 112.8
Aluminum	6010B/7470A/7471A	30	68.4 - 113.4	300	79.4 - 110
Antimony	6010B/7470A/7471A	3	78.4 - 102.4	30	73.5 - 106.5
Arsenic	6010B/7470A/7471A	2	83.3 - 115.1	20	74.7 - 115.5
Barium	6010B/7470A/7471A	20	85.6 - 113.2	200	85.2 - 107.4
Beryllium	6010B/7470A/7471A	0.6	82.5 - 108.9	6	80.7 - 107.7
Cadmium	6010B/7470A/7471A	0.5	85.6 - 115	5	75.3 - 118.5
Calcium	6010B/7470A/7471A	80	76.1 - 103.1	800	72.8 - 107.6
Chromium	6010B/7470A/7471A	2	81.9 - 109.5	20	79.3 - 106.3
Cobalt	6010B/7470A/7471A	5	75 - 117.6	50	79.5 - 106.5
Copper	6010B/7470A/7471A	3	82.7 - 112.1	30	80.7 - 107.7
Cyanide, total	9010B/9012A	1	60.84 - 127.38	20	74.6 - 108.38
Iron	6010B/7470A/7471A	300	82.7 - 112.1	300	79 - 114.4
Lead	6010B/7470A/7471A	1	86 - 112.4	10	75 - 114.6
Magnesium	6010B/7470A/7471A	50	79.8 - 107.4	500	79.9 - 108.7
Manganese	6010B/7470A/7471A	5	81.8 - 110.6	50	81.6 - 106.2
Mercury	6010B/7470A/7471A	0.1	74.2 - 130	0.3	83.8 - 117.4
Nickel	6010B/7470A/7471A	5	82.9 - 109.9	50	80.2 - 109.6
Potassium	6010B/7470A/7471A	200	78 - 106.2	2000	78.9 - 105.3
Selenium	6010B/7470A/7471A	2	80.7 - 110.1	20	74.6 - 114.8
Silver	6010B/7470A/7471A	3	65 - 118.4	30	70.8 - 112.2
Sodium	6010B/7470A/7471A	10	77.5 - 100.3	100	72.2 - 107.6
Thallium	6010B/7470A/7471A	1	84.8 - 111.8	10	76.5 - 113.1
Vanadium	6010B/7470A/7471A	5	78.5 - 110.3	50	78.9 - 105.9
Zinc	6010B/7470A/7471A	5	84.7 - 111.1	50	[illegible]

Notes:
CRDL - Contract-required detection limit
ug/kg - micrograms per kilogram
ug/l - micrograms per liter

2.3 Data Quality Objectives (DQOs)

In this section the DQOs for each data collection activity are described along with the necessary QA/QC requirements. Anticipated QA/QC samples for these data collection activities are presented in Tables 2-3 and 2-4.

2.3.1 Air

Air monitoring will be performed during SI activities to provide information concerning the health and safety of the workers at the Site and for the population in nearby residences and businesses. The air monitoring results will be used to select appropriate personal protective equipment (PPE) and to stop work in the event that perimeter levels exceed those indicated in the Health and Safety Plan. The air monitoring will be conducted using portable field instrumentation to screen the Site. As such, the DQO for air monitoring is to provide real-time data with instruments sensitive enough to measure contaminant levels that threaten health and safety. contaminants that will be monitored in air, as well action levels for PPE requirements and stop work determinations are presented in Table 2-5.

Table 2-5: Air Monitoring Requirements

Analyte	Instrument	Action Level	Description
VOCs	Photoionization Detector (PID)	0-5 ppm*	Level D
		5-25 ppm*	Upgrade to Level C
		25-500 ppm*	Upgrade to Level B
		Above 500 ppm*	Stop Work
Respirable Dust	Mini-RAM	150 mcg/m^3*	Upgrade to Respirator with HEPA Filter

Sustained measurement above background in breathing zone.

TABLE 2-3
SUMMARY OF GROUNDWATER SAMPLES
SIX VACANT LOTS SITE - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

LOCATION	TOTAL SAMPLES	ANALYSIS				
		VOC	SVOC	PCBs	PESTICIDES	METALS
INVESTIGATIVE SAMPLES						
Groundwater	3	3	3	3	3	3
QA/QC SAMPLES						
Field Duplicates	1	1	1	1	1	1
Matrix Spikes	1	1	1	1	1	1
Matrix Spike Duplicates	1	1	1	1	1	1
Field Blanks	1	1	1	1	1	1
Trip Blanks	1	1	-	-	-	-
TOTALS	8	8	8	8	8	7

TABLE 2-4
SUMMARY OF SURFACE AND SUBSURFACE SOIL SAMPLES
SIX VACANT LOTS SITE - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

LOCATION	TOTAL SAMPLES	ANALYSIS			
		VOC	SVOC	PCB	METALS
INVESTIGATIVE SAMPLES					
Soil Borings	3	3	3	3	3
Test Pits	6	6	6	6	6
Surface Soil	6	-	6	6	6
QA/QC SAMPLES					
Field Duplicates	1	1	1	1	1
Matrix Spikes	1	1	1	1	1
Matrix Spike Duplicates	1	1	1	1	1
Field Blanks	1	1	1	1	1
Trip Blanks	1	1	-	-	-
TOTALS	20	14	19	19	19

2.3.2 Groundwater

Groundwater will be sampled and analyzed to characterize the nature and extent of groundwater contamination at the Site. Field instrumentation will be used during sampling activities to collect representative samples. As such, data from the field instrumentation must be of sufficient quality to measure groundwater conditions prior to sampling (as discussed in Section 3.1.6.3). Analytical data will be used to identify the location of any groundwater contamination, to aid in determining contaminant source locations and to determine if any SCGs have been exceeded. In order to meet these objectives, the data from the groundwater samples must be of known quality. Therefore USEPA SW846 analytical methodologies with NYSDEC ASP Category B deliverables have been chosen for all groundwater analyses. These deliverables are characterized by rigorous QA/QC protocols and documentation, which historically have provided high quality data able to meet the DQOs for this data. It is likely that subsurface conditions at the Site are highly variable, therefore all groundwater samples will be considered critical samples. Groundwater sample analyses are summarized in Table 2-3.

2.3.3 Soil

The objective of the soil sampling program is to define the nature and extent of contamination in both surface and subsurface soil at the Site. To be useful in meeting these objectives, the data from the soil samples must be of known quality. To support the DQOs, USEPA SW846 analytical methodologies with NYSDEC ASP Category B deliverables have been chosen for soil analyses. These methods and procedures are capable of producing high quality data characterized by rigorous QA/QC protocols and documentation. Soil sample analyses are summarized in Table 2-4. All surface soil samples will be critical samples for the evaluation of potential risks to human health and the environment.

Field Investigation Procedures

SECTION 3

3.1 Sampling Procedures and Equipment

The field investigation procedures that will be followed during this SI are summarized below.

3.1.1 Decontamination of Sampling Equipment

Cross contamination of samples from any source is to be avoided. All sampling equipment must be clean and free from the residue of any previous samples. All non-dedicated sampling equipment must be cleaned initially and prior to being reused. The following is the procedure for decontamination and does not apply to heavy equipment or drilling equipment, with the exception split spoons or equivalent samplers. All heavy equipment and drilling equipment will be steam cleaned in a predesignated location prior to use and between locations.

To accomplish this, the following procedures will be followed:

- Wash and scrub with low phosphate detergent;
- Rinse with tap water;
- Rinse with 10 percent HNO_3, ultra-pure (1 percent HNO_3 for carbon steel);
- Rinse with tap water;
- Rinse with isopropanol (pesticide grade or better);
- Rinse thoroughly with deionized water;

- Air dry; and
- Wrap in aluminum foil for transport.

Monitoring well evacuation tubing and equipment such as pneumatic bladder pumps, will be decontaminated by thoroughly washing all internal and external surfaces with soapy water and rinsing with deionized water prior to use. All tubing must be dedicated to individual monitoring wells (i.e., tubing cannot be reused).

Field instrumentation should be cleaned per manufacturer's instructions. Probes, such as those used in pH and conductivity meters, and thermometers must be rinsed prior to and after each use with deionized water.

3.1.2 Subsurface Soil Sampling

3.1.2.1 Soil Sampling Objectives

Subsurface soil samples will be collected to evaluate the vertical and horizontal extent of contamination in the subsurface soils at the Site and to document the underlying stratigraphy. Specific sampling objectives are outlined in the Work Plan.

3.1.2.2 Soil Sampling Equipment

The following equipment will be used to collect split-spoon soil samples:

- Photoionization Detector (PID)
- Roll of polyethylene sheeting
- Stainless steel spatula or spoon
- Stainless steel bowl
- Latex gloves (disposable)
- Neoprene gloves
- Certified, precleaned sample containers
- Aluminum foil

- Field logbook and pen
- Decontamination equipment.

3.1.2.3 Soil Sampling Procedures – Soil Borings

A two-inch diameter split spoon sampler will be driven into the subsurface to create a borehole approximately 2.25-inch to 2.5 inches in diameter. Subsurface soil samples will be removed from the borehole in two-foot intervals. The total number of two-foot samples collected from each soil boring will be dependent on the final depth of the boring. A qualified field geologist will characterize the soil samples and record his/her observations on a field boring log.

After soil characterization and logging, the soil core will be split and screened for VOCs using a PID. The criteria for PID sensitivity shall be the same as that discussed in Section 2.3.1.

Soil samples designated for VOC analysis shall be collected directly from the sampling device. After collecting the sample for VOC analysis, the remaining soil from the two-foot sample interval will be emptied into a stainless steel bowl and homogenized for additional analyses. The location(s) for collection of field duplicates, field blanks, and matrix spike/matrix spike duplicate samples shall be determined in the field based on subsurface soil conditions.

The boring will be drilled to the bottom of each sample interval using 4.25-inch diameter hollow stem augers prior to driving the next two-foot split spoon. This method will verify that soil sampled is representative of the reported depth interval.

3.1.2.4 Soil Sampling Procedures – Test Trenches

A backhoe or similar device will be used to identify subsurface materials in the locations of former buildings at the Site. Excavated material will be removed on intervals not to exceed two feet and screened for the presence of VOCs using a PID. Soil samples designated for VOC analysis shall be collected directly from the bucket from the interval displaying the greatest evidence of contamination. If no contamination is evident, the VOC sample will be collected from the approximate center of the fill material. After

collecting the sample for VOC analysis, soil from the depths representing the vertical extent of the fill material will be placed into a stainless steel bowl and homogenized for additional analyses. The location(s) for collection of field duplicates, field blanks, and matrix spike/matrix spike duplicate samples shall be determined in the field based on subsurface soil conditions. The bucket of the backhoe, and any other part of the trenching device that comes in contact with excavated soil will be decontaminated using a steam cleaner.

3.1.3 Monitoring Well Installation

3.1.3.1 Installation Objectives

Monitoring wells will be installed at the Site to collect groundwater samples for chemical quality analysis. Groundwater elevations will be measured in the wells to evaluate the horizontal components of groundwater flow.

3.1.3.2 Installation Equipment

A truck mounted rotary drilling rig equipped with 4.25-inch inner diameter hollow stem augers will be used to create an eight-inch diameter borehole. The two-inch diameter PVC monitoring well and riser pipe will be advanced through the borehole to the water table by hand. Probes and any other large pieces of equipment that come into contact with the soil must be steam cleaned before use and between boreholes. If visibly contaminated with free phase products or any other contaminants, probes and other equipment must be decontaminated by the following procedure:

- Wash and scrub with low-phosphate detergent.
- Tap water rinse.
- Rinse with isopropanol.
- Thoroughly rinse with deionized, demonstrated analyte free water.
- Air dry.

Decontamination solutions shall be provided by the selected subcontractor and will be included in the mobilization/demobilization cost. Decontamination fluids shall be handled in accordance with Section **3.2,** Investigation Derived Waste.

3.1.3.3 Monitoring Well Installation Procedures

Upon reaching the bottom of the soil boring a minimum of six inches of clean filter pack sand will be emplaced into the bottom of the casing. The monitoring well assembly, consisting of two-inch I.D. schedule-40 PVC casing with approximately 10 feet of continuous 0.01-inch slot schedule-40 PVC screen, will be inserted through the temporary casing. Monitoring well screens will be placed at the intervals as described in the Work Plan.

Clean filter pack sand will then be poured into the annular space between the temporary casing and the monitoring well assembly as the temporary casing is slowly removed. The filter pack sand will extend approximately two feet above the screened interval. A minimum one-foot thick layer of bentonite pellets will be placed above the filter pack by slowly dropping the pellets along the side of the monitoring well casing. If the bentonite pellets are emplaced above the water table, they will be hydrated with potable water. After allowing sufficient time for the bentonite to hydrate, the temporary casing will continue to be removed and the remainder of the annulus will be tremie grouted to the surface with a cement-bentonite grout. The cement-bentonite grout will consist of a mixture of portland cement and water in the proportion of five to six gallons of water per 94-pound bag of cement, with approximately three to five percent bentonite powder.

The PVC riser will be sealed at the ground surface with gravel based portland cement. The riser will be extended to approximately three-inches below the ground surface and will be capped with a locking expansion cap and a flush mount curb-box protective cover.

3.1.4 Water Level Measurements

3.1.4.1 Measurement Objectives

Water levels in monitoring wells will be measured and used in conjunction with horizontal and vertical ground survey data to determine horizontal and vertical components of groundwater flow. Water level measurements will also be used to determine the volume of standing water in monitoring wells for development and purging activities.

3.1.4.2 Measurement Equipment

The following equipment will be used for the measurement of water levels:

- Electronic water level indicator
- Field logbook and pen
- Photoionization Detector (PID)
- Deionized Water
- Low Phosphate Detergent

3.1.4.3 Measurement Procedure

At each monitoring well, the J-plug and PVC cap will be removed and the head space and breathing zone's air quality will be monitored with a PID. The criteria for PID sensitivity shall be the same as that discussed in Section 2.3. This step may be omitted in subsequent rounds of water level measurements in those monitoring wells that yielded no detectable amounts of vapors or gases from prior sampling rounds. If air quality readings in the breathing space around the well exceed action levels set in the Health and Safety Plan (HASP) (and in Section 2.4), appropriate measures will be taken as listed in the HASP.

Prior to measuring water levels, a measurement mark will be established on the PVC well riser by cutting a small notch into the riser at its highest point. The elevation of the measurement point will be surveyed to the nearest 0.01 feet relative to the on-Site datum.

The battery of the electric water level indicator will be checked by pushing the battery check button, and waiting for the audible signal to sound or the instrument light to come on. The water level indicator will be decontaminated before collecting a measurement in each monitoring well by using an alconox wash and deionized water rinse. The instrument will then be turned on and the probe will be slowly lowered into the monitoring well, until the audible signal is heard or the instrument light goes on, indicating that the sensor in the probe has made contact with the water surface in the monitoring well.

The depth to water will be recorded to the nearest one-hundredth of a foot, from the top of the measuring mark on the monitoring well riser. The date, time, monitoring well number, and depth to water will be recorded in the field book.

3.1.5 Monitoring Well Development

3.1.5.1 Development Objectives

Monitoring wells installed at the Site will be developed to improve their hydraulic properties by removing sediment from the monitoring well and clearing the monitoring well screen of fine particles.

3.1.5.2 Development Equipment

The following equipment will be needed to develop the monitoring wells:

- Electric water level indicator
- Polyethylene or nalgene tubing and foot-valve
- Down hole pump
- Bottom-filling PVC bailer
- Bailer cord
- Temperature, pH, dissolved oxygen, specific conductivity and turbidity meters
- Photoionization Detector (PID)
- Field logbook and field logs

- Roll of polyethylene sheeting
- Decontamination equipment

3.1.5.3 Development Procedures

Monitoring well development will be conducted using one or more of the following techniques:

- Bailing
- Inertial Pumping
- Surge Block

Monitoring well development will be conducted at least 24 hours after installation. Prior to developing each monitoring well, the initial water level and total depth will be measured. Following well development, the total depth will again be measured to determine the quantity of sediment removed.

All equipment placed into the monitoring well will be either decontaminated prior to its introduction into the monitoring well, in accordance with Section 3.1.1, or it will be dedicated. Monitoring well development will proceed with repeated alternating sequences of surging and removal of water from the monitoring well, until the discharge water is relatively sediment free.

The effectiveness of the development procedure will be monitored after each well volume has been removed by field parameter measurements such as turbidity, pH, temperature, and conductivity measurements. These field measurements and other observations will be recorded on a Well Development/Purging Log, presented in Appendix B.

In general, monitoring well development will be discontinued after a minimum of 10 well volumes have been removed and stabilization of field parameter measurements has occurred, or when the turbidity of the discharge water reaches 50 Nephelometric Turbidity Units (NTUs) or less.

Water generated during the development process will be disposed in accordance with Section 3.5.

3.1.6 Groundwater Sampling

3.1.6.1 Sampling Objectives

Groundwater samples will be collected for chemical quality analysis. Specific sampling objectives are outlined in the Work Plan. Samples will be collected at least one week after the monitoring wells have been developed.

3.1.6.2 Sampling Equipment

The following equipment will be needed to collect groundwater samples for analysis:

- Electric water level indicator
- Pneumatic bladder pump
- Teflon-lined polyethylene tubing and foot-valve
- Temperature, pH, dissolved oxygen, specific conductivity and turbidity meters
- Photoionization Detector (PID)
- Field logbook and field logs
- Laboratory prepared sample containers
- Roll of polyethylene sheeting
- Decontamination equipment

3.1.6.3 Sampling Procedures

Groundwater sampling will be conducted in accordance with the USEPA Low-Flow Sampling Protocol (USEPA 1998) or NYSDEC Sampling Guidelines and Protocols (NYSDEC 1991). A piece of polyethylene sheeting will be fitted over the monitoring well and laid on the ground. The sampling equipment will be placed on the polyethylene sheeting. The well cap will be removed and the headspace at the top of the monitoring well will be measured with a PID. This step may be omitted in those monitoring wells which have already demonstrated in the previous rounds of water level measurement that

they contain no or insignificant amounts of vapors or gases. The PID will be calibrated before the start of each sampling event.

Clean, new teflon-lined polyethylene tubing will be attached to the pneumatic bladder pump, which will be decontaminated between monitoring well locations, as described in Section 3.1.1. The pump will be lowered into the water column to a maximum depth of two feet above the bottom of the well. A foot-valve will be used in conjunction with the tubing to eliminate back flow from the pump. The well will be purged at a rate suitable to minimize drawdown. Field parameters, consisting of pH, specific conductance, temperature, dissolved oxygen, reduction potential, turbidity, and water level will be measured in each monitoring well prior to, during, and after purging (just before sampling) through the use of a flow-through cell. Both the pH and the specific conductivity meters will be calibrated for water temperature before each sampling event.

The volume of water removed from each monitoring well will be dependent upon the amount of time required for stabilization of the field parameters. In general, the well will be considered stabilized for sample collection when field parameters have stabilized for three consecutive readings as follows:

- pH: +/- 0.1 standard units
- Specific Conductance: +/- 3%
- Reduction Potential: +/- 10 millivolts
- Dissolved Oxygen +/- 10%
- Turbidity +/- 10%

When the field parameters have stabilized, the volume of water purged will be recorded, and groundwater in the monitoring well will be sampled through the pump at the same flow rate used to purge the well. The purge water will be discharged as described in Section 3.5.

The analytical parameters and order of sample collection for groundwater samples will be:

1. In-situ measurements: temperature, pH, specific conductance and dissolved oxygen;

2. Volatile organic compounds (VOCs);
3. Semi-volatile organic compounds (SVOCs);
4. RCRA metals;
5. Pesticides;
6. PCBs.

The sample bottles will be pre-preserved by the laboratory. The preservation requirements are presented on Table 3-1. The sample bottles will be immediately placed in a cooler held at 4°C.

Disposable gloves will be worn by the sampling personnel and changed between sampling points.

Data to be recorded in the field logbook will include purging and sampling methods, depth to water, volume of water removed during purging, pH, temperature and specific conductivity values, and PID readings.

Groundwater samples for metals analysis will be filtered in the field using a borosilicate filter apparatus with 0.45 micron filters if the turbidity at the time of sample collection is greater than 50 NTUs. In this case, both unfiltered and filtered groundwater samples will be submitted to the analytical laboratory for analysis.

3.1.7 Surface Soil Sampling

3.1.7.1 Sampling Objectives

Surface soil samples will be collected from the locations outlined in the Work Plan. Specific goals of surface soil sampling activities are also outlined in the Work Plan. The location of each surface soil sample will be measured relative to permanent Site features and marked on a Site diagram in the field logbook. Additionally, all sampling locations will be marked in the field with a survey stake and labeled with the sample I.D. to facilitate subsequent surveying of the sampling location.

TABLE 3-1
SAMPLE CONTAINER, PRESERVATION, AND HOLDING TIME REQUIREMENTS
SIX VACANT LOTS SITE - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

MATRIX	ANALYSIS	CONTAINER	PRESERVATION	HOLDING TIME
Soil	TCL Volatiles	1 - 2 oz. glass	Cool to 4 deg. C	7 days
	TCL Semi-Volatiles	1 - 8 oz. glass	Cool to 4 deg. C	5 days
	PCBs	2 - 4 oz. Glass	Cool to 4 deg. C	14 days
	RCRA Metals	1 - 8 oz. glass	Cool to 4 deg. C	180 days
Groundwater	TCL Volatiles	2 - 40 ml glass w/ septum cap	HCl, Cool to 4 deg. C	14 days
	TCL Semi-Volatiles	2 - liter amber glass	Cool to 4 deg. C	7 days
	Pesticides and PCBs	2 - liter amber glass	Cool to 4 deg. C	7 days
	RCRA Metals	1 liter polyethylene	HNO_3, Cool to 4 deg. C	180 days
Surface Soil	TCL Semi-Volatiles	1 - 8 oz. glass	Cool to 4 deg. C	5 days
	Pesticides and PCBs	2 - 4 oz. Glass	Cool to 4 deg. C	14 days
	TAL Metals	1 - 8 oz. glass	Cool to 4 deg. C	180 days

3.1.7.2 Sampling Equipment

- Stainless steel trowel or spoon
- Stainless steel bowl
- Latex or Nitrile surgical gloves (disposable)
- Neoprene gloves
- Certified, precleaned sample containers
- Aluminum foil
- Field logbook and pen
- Decontamination equipment
- Survey stakes

3.1.7.3 Sampling Procedures

A volume of soil six inches by six inches by six inches deep will be collected and transferred to a stainless steel mixing bowl. No surface soil will be collected from a depth exceeding two inches below ground surface. Upon collection, the grab sample will be homogenized in a stainless steel bowl and classified. Twigs, leaves roots, grass, and rocks will be removed from the sample as they are not considered part of the soil matrix. After the soil is homogenized, a sample will be placed in laboratory-provided sample containers. Samples will be immediately placed in a cooler and held at 4°C.

Sampling equipment will be decontaminated as discussed in Section 3.1.1. Disposable gloves will be worn by the sampling personnel and changed between sampling points. While performing any equipment decontamination, phthalate-free gloves (nitrile or natural rubber) will be worn in order to prevent phthalate contamination of the sampling equipment by interaction between the gloves and the organic solvent(s).

Data to be recorded in the field log book includes the information outlined in Section 4.4 with the addition of USCS soil description and observations of the ground surface surrounding the sampling location.

3.2 Field Quality Control Samples

Quality control procedures will be employed to check that sampling, transportation and laboratory activities do not bias sample analytical quality. Trip blanks, field blanks, duplicate samples, matrix spike samples and matrix spike duplicates will provide a quantitative basis for validating the analytical data. A summary of the anticipated QA/QC samples for each media is included in Tables 2-3 and 2-4.

3.2.1 Trip Blanks

The trip blanks will be prepared by the laboratory by filling 40 ml vials with a Teflon-lined septum with deionized, analyte-free water. The trip blank will accompany the day's sample containers at all times. One trip blank will be returned to the laboratory with each cooler containing environmental samples for VOC analysis. The trip blank will be analyzed for volatile organic compounds, to detect possible contamination during shipment. Trip blanks will remain in the shipping cooler from the time of packing, in the laboratory, to arrival back at the laboratory

3.2.2 Field Blanks

A field blank consists of an empty set of laboratory-cleaned sample containers. At the field location, deionized, analyte-fi-ee water is passed through decontaminated sampling equipment and placed in the empty set of sample containers for analysis of the same parameters as the samples collected with the sampling equipment. One field blank will be collected per every 20 environmental samples, per media.

3.2.3 Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample pairs are analyzed by the laboratory to provide a quantitative measure of the laboratory's precision and accuracy. When performing USEPA SW846 volatile organic or organic extractable analysis with NYSDEC Category B deliverables, the laboratory must be supplied with triple sample volume for each Sample Delivery Group (SDG) in order to perform matrix spike and

matrix spike duplicate analyses. This does not include field or trip blanks. Blanks do not require separate matrix spike or duplicate analyses regardless of their matrix.

The limits on an SDG are:

- Each Case for field samples, or
- Each 20 field samples within a Case, or
- Each fourteen calendar day period during which field samples in a Case are received (said period beginning with receipt of the first sample in the SDG), whichever comes first.

Field personnel will specify samples for MSMSD analysis. Extra volume is not required for aqueous samples for inorganic analysis. Non-aqueous samples (soils/sediment) do not require that any extra volume of sample be submitted to the laboratory for MSMSD samples.

3.2.4 Field Duplicates

For each sample matrix, a field duplicate sample will be collected at a rate of one sample per 20 environmental samples per media. The duplicate sample is collected at the same location as the environmental sample. The field duplicate sample is identified using the sample designation system described in Section 3.3. The identity of the field duplicate is not revealed to the laboratory. The analytical results of the environmental sample will be compared to the field duplicate sample, to evaluate field sampling precision.

3.3 Sample Designation

A sample numbering system will be used to identify each sample. This system will provide a tracking procedure to allow retrieval of information about a particular sample, and will assure that each sample is uniquely numbered. The sample identification will consist of at least three components as described below. Identification numbers for soil boring samples will also have a fourth component.

- ***Project Identification:*** The first component consists of a two-letter designation, which identifies the project Site. For this project, the two-letter designation will be VL for Vacant Lots.

- ***Sample type:*** The second component, which identifies the sample type, will consist of a two-letter code as follows:

  MW - Monitoring well (Groundwater Sample)

  SB - Soil from Soil Boring

  TT - Soil from Test Trench

  SS - Surface Soil

- ***Sample Location:*** The third component identifies the sample location using a two-digit number.

- ***Sample Identification:*** The fourth component will only be used for soil boring samples, to indicate the interval from which the sample was collected.

- ***Quality Assurance/Quality Control Samples:*** The samples will be labeled with the following suffixes:

  FB - Field Blank

  MS - Matrix Spike

  MSD - Matrix Spike Duplicate

  TB - Trip Blank.

Duplicate samples will be numbered uniquely as if they were samples. **A** record of identification for duplicate samples will be maintained.

Examples of identification numbers are given below:

VL-SB-02-10:	Soil from Soil boring, boring location number 2, 10 feet below ground surface.
VL-MW-3-MSD:	Monitoring well groundwater sample, monitoring well sample location 3, matrix spike duplicate.
VL-MW-TB:	Trip blank for monitoring well groundwater sample.

3.4 Field Documentation

3.4.1 Introduction

Documentation of an investigative team's field activities often provides the basis for technical Site evaluations and other such related written reports. All records and notes generated in the field will be considered controlled evidentiary documents and may be subject to scrutiny in litigation.

Personnel designated as being responsible for documenting field activities must be aware that all notes may provide the basis for preparing responses for legal interrogatories. Field documentation must provide sufficient information and data to enable reconstruction of field activities. Numerically serialized field logbooks provide the basic means for documenting field activities. The following information must be provided on the inside front cover of each field logbook:

- Project Name (Site Name)
- Site Location
- Site Manager
- Date of Issue

Control and maintenance of field logbooks is the responsibility of the Field Team Leader.

3.4.2 Documentation of Field Activities

Field logbook entries must be legibly written and provide an unbiased, concise, detailed picture of all field activities. Use of preformatted data reporting forms must be identifiable and referenced to field notebook entries.

Step-by-step instructions and procedures for documenting field activities are provided below and in following sub-sections. These instructions and procedures are organized as follows:

Instruction and procedures relating to the format and technique in which field logbook entries are made are as follows:

- Leave the first two pages blank. They will provide space for a table of contents to be added when the field logbook is complete.
- The first written page for each day identifies the date, time, Site name, location, MPI personnel and their responsibilities, other non-personnel and observed weather conditions. Additionally, during the course of Site activities, deviations from the work plan must also be documented.
- All photos taken must be traceable to field logbook entries. It is recommended to reference photo locations on the Site sketch or map.
- All entries must be made in ink. Waterproof ink is recommended.
- All entries must be accompanied by the appropriate military time (such as 1530 instead of 3:30).
- Errors must be lined through and initialed. No erroneous notes are to be made illegible.
- The person documenting must sign and date each page as it is completed.
- Isolated logbook entries made by a team member other than the team member designated responsible for field documentation, must be signed and dated by the person making the entry.
- Additions, clarifications, or corrections made after completion of field activities must be dated and signed.

3.4.3 General Site Information

General Site characteristics will be recorded. Information may include

- Type of access into facility (locked gates, etc.)
- Anything that is unexpected on Site (e.g., appearance of drums that have not been previously recorded)

- Information obtained from interview with access or responsible party personnel (if applicable), or other interested party contact on Site.
- Names of any community contacts on Site.
- A Site map or sketch may be provided. It can be sketched into the logbook or attached to the book.

3.4.4 Sample Activities

A chronological record of each sampling activity must be kept.

- Explanation of sampling at the location identified in the sampling plan (e.g., discolored soil, stressed vegetation).
- Exact sample location, using permanent recognizable landmarks and reproducible measurements.
- Sample matrix
- Sample descriptions, i.e., color, texture, odor (e.g., soil type, murky water) and any other important distinguishing features.
- Decontamination procedures, if used.

As part of chain-of-custody procedures, recorded on-Site sampling information must include sample number, date, time, sampling personnel, sample type, designation of sample as a grab or composite, and any preservative used. Sample locations should be referenced by sample number on the Site sketch or map. The offer and/or act of providing sample splits to a thirty party (e.g., the responsible party representative; state, county, or municipal, environmental and/or health agency, etc.) must be documented.

3.4.5 Sample Dispatch Information

When sampling is complete, all sample documentation such as chain-of-custody forms shall be copied and copies placed in the project files. A notation of numbers of coolers shipped, carrier and time delivered to pick-up point should be made in a field notebook.

3.5 Control and Disposal of Investigation Derived Waste

Investigation-derived wastes will be handled in accordance with the NYSDEC Proposed Decision TAGM. Disposal of contaminated groundwater generated during Site Investigations and the Final TAGM - Disposal of Drill Cuttings. As borings are advanced, spillage and disposal of potentially contaminated soils and water will be minimized through the implementation of the procedures described below.

Drill cuttings and spoils generated at each boring will be placed (shoveled) on polyethylene sheeting. After completing the boring, the cuttings/spoils will be returned to the borehole provided that the borehole will not be used for the installation of a monitoring well, that it did not penetrate an aquitard or aquiclude and that the cuttings/spoils do not contain oily (product) substances. The boring will then be topped off with a cement/bentonite grout cap.

Excess cuttings/spoils which are not returned to the borehole will be spread out and dewatered (dewatering will be allowed to infiltrate the ground) next to the borehole. Groundwater that is purged from monitoring wells or discharged during drilling activities may be disposed of at each Site and allowed to infiltrate into the ground based on the following conditions:

1. There is a defined Site that is the source of the groundwater contamination;
2. There is no free product observed such as LNAPLs and DNAPLs;
3. Recharge pits are used to preclude run-off from the Site and the pits are covered with clean soil when no longer needed;
4. The infiltrating groundwater is being returned to the same water-bearing zone from which it is being purged.

If the above criteria are not met, the materials will be containerized in U.S. Department of Transportation (DOT)-approved, 55-gallon steel drums. Soils and water will be drummed separately; the contents will be identified on weather-resistant labels attached to drum exteriors. Open-topped drums will be used to containerize soils and close-topped drums will be used to containerize water.

Depending on the levels of personal protection used during the field investigation, some disposable personal protective equipment (PPE) and decontamination fluids will be generated. Attempts will be made to wash surface contamination off so that PPE (e.g., Tyvek coveralls, gloves, and other disposable items) may be disposed of as ordinary solid waste. If contamination is suspected, these materials will be collected and containerized in UN-approved, 55-gallon steel drums (separately from contaminated soils and water); the contents will be identified with weather-resistant labels attached to drum exteriors. Decontamination fluids, except those containing solvents and/or nitric acid, will be disposed of with drilling fluids and cuttings generated at the Site. Decontamination fluids containing solvents or nitric acid will be containerized separately from drilling fluids.

Containerized materials will be transported to, and staged at, a designated location. Malcolm Pirnie will maintain a log of the containers and their contents; the contents will be evaluated upon receipt of results of the analytical data obtained during field investigations. Handling, transportation, and disposal of these materials will be in accordance with requirements of RCRA and other applicable federal, state, and local regulations. Nonhazardous disposable items will be contained and disposed of in a dumpster or via a licensed waste hauler, as appropriate.

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Sample and Document Custody Procedures

SECTION 4

4.1 Sample Handling

The analytical laboratory will provide the sample containers necessary for all soil and groundwater samples. Container closures will be screw-on type and made of inert materials. Sample containers will be cleaned and prepared by the laboratory prior to being sent to the Site. Trip blanks will be used to check for false positives due to laboratory cleaning procedures or cross contamination during sample shipment.

All samples collected will be identified with a sample label. A label will be attached to each bottle and each sample will be identified with a unique sample number.

Immediately following sample collection, each sample container will be marked with the following information:

Sample Code

- Project Number

Date/Time

- Sample Type
- Requested analysis

Preservative, if used

Sampler's Initials

The sample code will indicate the Site location, media sampled and the sample station.

After all sample identification information has been recorded, each sample label will be covered with waterproof clear plastic tape to preserve its integrity. All samples will be recorded and tracked under strict chain-of-custody protocols. In the field, each sample will be checked for proper labeling. The samples will then be packed into coolers with ice and shipped to the laboratory. A chain-of-custody form will be completed for each cooler. The form will be signed and dated by the person who collected the samples, the person the samples were relinquished to for transport to the laboratory, and the laboratory sample controller/custodian who receives the samples.

4.2 Completion of Chain-of-Custody Record

A chain-of-custody record is a printed form that accompanies a sample or group of samples as custody is transferred from person to person. A sample chain-of-custody form is included in Appendix B. It documents custody transfer from person to person and sample information recorded on bottle labels. A chain-of-custody record is a controlled document.

As soon as practicable after sample collection, preferably after decontamination, the following information must be entered on the chain-of-custody form. All information is to be recorded in black ink.

1. ***Malcolm Pirnie project number.*** Enter the seven-digit alphanumeric designation assigned by Malcolm Pirnie that uniquely identifies the project Site.
2. ***Project name.*** Enter Site name.
3. ***Samplers.*** Sign the name(s) of the sampler(s).
4. ***Station number.*** Enter the sample number for each sample in the shipment. This number appears on the Malcolm Pirnie, Inc. sample identification label.
5. ***Date.*** Enter a six-digit number, indicating the year, month, and day of sample collection (YYMMDD); for example, 031125.
6. ***Time.*** Enter a four-digit number indicating the military time of collection; for example, 1354.
7. ***Composite or grab.*** Indicate the type of sample.

8. ***Station location.*** Describe the location where the sample was collected.

9. ***Number of containers.*** For each sample number, enter the number of sample bottles that are contained in the shipment.

10. ***Remarks.*** Enter any appropriate remarks.

4.2.1 Transferring Custody From Malcolm Pirnie, Inc. Shipper to

Common Carrier

Instructions for Malcolm Pirnie, Inc. shipper transferring custody of samples to a common carrier are given below.

1. Sign, date, and enter time under "Relinquished by" entry.
2. Enter name of carrier (e.g., UPS, Federal Express) under "Received by."
3. Enter bill-of-lading of Federal Express airbill number under "Remarks."
4. Place the original of the chain-of-custody form in the appropriate sample shipping package. Retain a copy with field records.
5. Sign and date the custody seal. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected in the field.
6. Wrap the seal across filament tape that has been wrapped around the package at least twice.
7. Fold the custody seal over on itself so that it sticks together.
8. Complete other carrier-required shipping papers.

Common carriers will usually not accept responsibility for handling chain-of-custody forms; this necessitates packing the record in the sample package.

4.2.2 Transferring Custody From Malcolm Pirnie, Inc. Sampler

Directly to Carrier

To transfer custody of samples from the Malcolm Pirnie, Inc. sampler directly to a carrier, proceed as above, except eliminate the Malcolm Pirnie, Inc. shipper's signature.

Calibration Procedures and Frequency

SECTION 5

5.1 Introduction

Instruments must be properly calibrated to produce technically valid data. Documented calibration and calibration check results verify that the instruments used for measurement are in proper working order and the data produced is reliable. The calibration requirements described or referenced in this section are necessary to support the data quality objectives for this project. When calibration requirements are met, the data will support the focused investigation decisions dealing with the nature and extent of contamination and safety concerns. In the event that the data is used in court, documented calibrations are necessary to ensure that the data is legally defensible.

5.2 Calibration Procedures for Field Equipment

5.2.1 Field Equipment

The table on the following page provides a list of the tasks that will require field equipment, and the specific field instruments that will be used for each task and which require calibration.

Task	Field Instrument
Monitoring Well Installation	Mini Rae Photoionization Detector
Groundwater Sampling	Mini Rae Photoionization Detector
	Horiba U-22 Water Quality Checker
	pH Meter
	Temperature Probe
	Specific Conductivity Meter
	Turbidimeter
	Oxidation-Reduction Meter
	Dissolved Oxygen Meter
Air Monitoring	Mini Rae Photoionization Detector
	MIE DataRam Dust Monitor

5.2.2 General Procedures

The manufacturer specifications for operation and maintenance procedures for the field equipment to be used during these tasks are provided in Appendix C. General calibration procedures and requirements are described below:

- All instruments will be calibrated at least once a month.
- All instruments will have the calibrations checked at a minimum at the start of each day before measurements are made.
- The calibration and calibration checks will indicate that the sensitivity of the instrument (practical detection limit) is adequate to meet project needs and that the instrument is accurate over the working range.
- All calibration information will be recorded in the field log book. This includes date and time, technician signature, calibration procedure, calibration results, calibration problems, recalibration and maintenance, and instrument serial numbers.
- All calibration standards will be of National Bureau of Standards (NBS) quality and their sources listed and documented so that standards are traceable. In addition, only technicians trained in the use of the field instruments will operate

them. If the instrument readings are incorrect at the time of the initial calibration, the instrument will either be calibrated by the technician or returned to the manufacturer for calibration. If the instrument readings are incorrect after a continuing calibration check, the preceding sample results will be reviewed for validity, and reanalyzed if necessary.

5.3 Laboratory Calibration Procedures

All samples analyzed according to the USEPA SW846 analytical methodologies shall follow the procedures described in the applicable Statement of Work (SOW). The calibration procedures and frequency are specifically described for each analysis contained in the SOW. All calibration results shall be recorded and kept on file, and will be reviewed and evaluated by the data validator as part of analytical data validation procedures.

Instrument calibration will be checked with a reference standard prior to the analysis of any sample. The standards used for calibrations will be traceable to the National Bureau of Standards (NBS), and each calibration will be recorded in the laboratory notebook for the particular analysis. Any printouts, chromatograms, etc., generated for the calibration will be kept on file.

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Analytical Procedures

SECTION 6

Environmental samples collected for laboratory analysis during the initial sampling phases of the focused SI will be analyzed by a NYSDEC ASP-certified laboratory for VOCs, SVOCs, metals, and PCBs using USEPA SW846 analytical methodologies accompanied by NYSDEC ASP Category B deliverables. Table 2-1 summarizes the analytical procedures and their sources that will be utilized for this site. The analytical methods listed in Table 2-1 are sufficient to support the DQOs for this project. In particular, the detection limits of these methods are adequate to support the DQOs. The SW846 methods and procedures used for the analysis of VOCs (Method 8260B), SVOCs (Method 8270C), metals (Methods 6010B, 7470A, and 7471A), and PCBs (Method 8082) for the selected laboratory are listed below.

- Volatile Organic Compounds by GC/MS – SW 846 Method 8260B, Revision #5 (SOP ID: M8260-SWGMSVOA-05), selected *laboratory*, January 2004.

- Determination of Extractable Semi-Volatile Organic Compounds by SW-846 Method 8270C, Revision #7 (SOP ID: M8270C-BNA-07), selected laboratory, January 2004.

- Trace Element Analysis by Inductively Coupled Plasma-Atomic Emission Spectrometric Method, Revision #7 (SOP ID: M6010B-Trace Elements-07), selected laboratory, January 2004.

- Determination of Polychlorinated Biphenyls (PCBs) by Capillary Gas Chromatography, Electron Capture Detector. Revision #5 (SOP ID: M8082-PCB-05), selected laboratory, January 2004.

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Data Reduction, Validation and Reporting

SECTION 7

7.1 Introduction

The purpose of this section is to describe procedures for production of the large amounts of data in a clear and useable format. In addition, data quality and technical validity must be verified prior to data use. The samples collected at this Site will be analyzed according to USEPA SW846 analytical methodologies, in which data reduction and reporting schemes are well developed and clearly defined. The employment of this method achieves comparability with other similarly analyzed environmental samples. Reduction, validation and reporting specifications for these analyses are detailed below.

7.2 Data Reduction

Data reduction is the process by which raw analytical data generated from the analytical instrument systems is converted into useable concentrations. The raw data, which takes the form of area counts or instrument responses, is processed by the laboratory and converted into concentrations expressed in terms of milligrams per liter (mgll) or milligrams per kilogram (mg/kg), parts per million (ppm), micrograms per liter (ygll), parts per billion (ppb) or micrograms per kilogram (yglkg). These concentrations are the standard method for expressing the level of contamination present in environmental samples.

The process used to convert the instrument output into useable concentrations is clearly defined in the USEPA SW846 methodologies. The resulting concentrations are comparable to other environmental samples in general and will be comparable to data previously collected for this Site.

7.3 Data Validation

Although rigorous validation of the data generated by the laboratory will be performed by a third party data validation subcontractor, the laboratory will be responsible for reviewing data to determine if any analytical problems exist. Specifically, the laboratory will develop a case narrative describing how closely the data meet the DQOs presented in this QAPP.

7.4 Data Reporting

The laboratory will report TCL data consistent with ASP reporting requirements. The QA reporting will include the following accuracy and precision protocols as performed on the appropriate QA samples.

For precision, the relative percent difference (RPD) and the percent relative standard deviation (% RSD) will be calculated:

$$RPD = \frac{D_1 - D_2}{(D_1 + D_2)/2} \times 100$$

RPD = Relative Percent Difference

D_1 = First Sample Value

D_2 = Second Sample value (Duplicate)

For accuracy, the percent recovery (%R) of spikes will be calculated:

$$\%R = \frac{SSR - SR}{SA} X\ 100$$

SSR = Spiked Sample Result

SR = Sample Result

SA = Amount Spike Added

Field sample precision will be assessed through analysis of duplicate samples and the above RPD equations. Accuracy will be assessed through the analysis of check standards and the above percent recovery equation. Field data will also be assessed in relation to specific project needs.

One copy of the ASP Category B data packages will be delivered to a third party data validation subcontractor for data assessment. The data packages will include the case narrative. The data validation report and the data usability report will be submitted to the USEPA as part of the corresponding SI Report. This package will include sampling analysis and summary forms. Data validation will be performed using guidance from the following documents:

- *USEPA Region 2 Evaluation of Metals Data for the Contract Laboratory Program (SOP# HW2 Rev. 11);*
- *USEPA Region 2 Validating Semivolatile Organic Compounds by SW-846 Method 8270 (SOP# HW22 Rev. 2);*
- *USEPA Region 2 Validating Volatile Organic Compounds by SW-846 Method 8260B (SOP# HW24 Rev. 1).*
- *USEPA Region 2 Validating Polychlorinated Biphenyls by SW-846 Method 8082 (SOP# HW23B Rev. 1.0).*
- *USEPA Region 2 Validating Pesticide/PCB Compounds by SW-846 Method 8080A (SOP# HW23 Rev. 0, May 1995)*

7.5 Reconciliation with Data Quality Objectives

Calculations and determinations for data precision, accuracy and completeness will be performed in accordance with the procedures presented in Section 7.4 upon the receipt of the validated analytical data. Results will be compared to the project specifications discussed in Section 2.2. If the results do not meet the project specifications, the data will be flagged as questionable and the cause of the failure (i.e., analytical methods, equipment failure, or sampling error) will be evaluated. The Project Manager and Technical Director will be responsible for decisions regarding use of questionable data. Potential outcomes of this evaluation will include limitations on the use of the data, rejection of the data, and/or re-sampling. **Any** limitations on the use of the data will be detailed in the Site Investigation Report. Corrective action procedures are discussed further in Section 12.

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Internal Quality Control Checks

SECTION 8

8.1 Introduction

In order to monitor the quality of the analytical data generated for this investigation, an appropriate number of quality control (QC) methods will be employed for all field and laboratory measurement systems. The employment of QC methods permits the validation of the analytical methodology utilized and provides a measure of the suitability of the methodology to meet the DQOs prior to the beginning of measurement or analysis. Once the measurement and analysis has begun, the employment of QC methods permits the monitoring of the system output for quality. The QC results presented with the environmental sample data, allows the data to be assessed for quality, and a determination made on how well the data has met the DQOs.

Laboratory generated data is used to accurately identify and quantify hazardous substances, while field generated data is used in conjunction with the laboratory data for further investigation of contamination at the Site. Both laboratory and field internal QC programs include steps to assure the data are reliable for the extent they will be used in the focused investigation. In general, laboratory QC programs are more rigorous than field QC programs.

8.2 Field Quality Control

The intended data uses have been identified and the DQOs established for all field measurement activities in Sections 3 and 5 of this QAPP. Section 3 contains SOPs, which

describe the use and calibration of field instruments. QC methods will be used to demonstrate that the instruments are capable of producing reliable data. The QC checks employed for field instruments are as follows:

QC Method	Purpose	Frequency
Calibration Check Sample	Insures proper working order of instrument. Measures instrument accuracy and sensitivity.	Daily
Background Sample	Provides measure of instrument reliability.	Daily
Duplicate Sample	Measures instrument precision.	5%
Trip Blanks	Measures potential contamination from sample transport, the environment and/or shipping.	Minimum of one per cooler of aqueous volatile samples
Field Blanks	Measures potential contamination due to poor sampling device decontamination procedures.	One per every 20 environmental samples per media.

The calibration check samples will be analyzed daily and duplicate samples will be analyzed at a minimum frequency of five percent. The calibration check verifies that the instrument is capable of accurately identifying and quantifying contaminants of concern. The duplicates provide a quantitative measurement of the precision of the instrument. Background samples are similar to blanks and provide information regarding instrument reliability. The information is recorded in field logbooks. The field technician uses the results from these QC methods to monitor the instrument at the time of the analysis. If QC results indicate a problem with the instrument, corrective action will be taken and, if necessary, the samples will be reanalyzed.

MALCOLM PIRNIE

Quality Assurance Audits

SECTION 9

9.1 Introduction

To monitor the capability and performance of all investigation activities, Malcolm Pirnie QA personnel may conduct audits. Audits are conducted to determine the suitability and capability of project activities to meeting project quality goals. On-Site field audits will be conducted to monitor the field techniques, procedures and the overall implementation of the QAPP procedures. These may be conducted periodically by the Site Quality Assurance Officer (QAO). Data quality audits (DQAs), are conducted to determine if the data generated by the sampling and analysis satisfies the predetermined DQOs. The Site QAO will be responsible for conducting DQAs of all data generated from project activities.

9.2 Field Audits

Field audits will include an evaluation of:

1. Sample collection and analytical activities.
2. Equipment calibration techniques and records.
3. Decontamination and equipment cleaning.
4. Equipment suitability and maintenance/repair.
5. Background and training of personnel.

6. Sample containers, preservation techniques and chain-of-custody.
7. Data log books.

Field audit forms are provided in Appendix B. A written QA audit report will be prepared by the Site QAO and submitted to the Project Officer and Project Manager. The report will identify any deficiencies found and recommend corrective action. Follow-up reports describing corrective actions which have been completed will be submitted to the Project Officer and Project Manager.

9.3 Performance Audits (PAs)

Data Quality Audits (DQAs) are conducted to determine if the data is adequate to support the DQOs and to determine the cause of deficiencies in the event that the data quality is not adequate. This audit will be conducted by the Site QAO after the data has been fully validated. The Site QAO will first determine to what extent the data can be used to support the decision-making process. Secondly, the Site QAO will identify the cause of any deficiencies in the data, whether technical, managerial, or both.

MALCOLM PIRNIE

SECTION 10

Preventative Maintenance

10. Purpose

The purpose of the preventative maintenance program is to ensure that the sampling, field testing and analytical equipment perform properly thereby avoiding erroneous results, and minimizing equipment downtime. The preventative maintenance program also provides for the documentation of all maintenance to be used as evidence of instrument maintenance and for scheduling of future maintenance. This section describes the equipment maintenance program for field instruments and those responsible for implementation of the program at the Six Vacant Lots Site. The specific equipment maintenance procedures are given in the equipment SOPs and the preventative maintenance SOPs presented in Appendix C. The laboratory preventative maintenance program is the responsibility of the laboratory and only the minimum requirements are mentioned here.

10.2 Responsibilities

Title	Responsibilities
Field Team Leader	Keeping all maintenance records. Development and implementation of maintenance program.
Equipment Manager	Maintaining storage of equipment within the Malcolm Pirnie equipment inventory. Carrying out all maintenance according to schedule. Informing field team members of specific maintenance requirements.

MALCOLM PIRNIE

SECTION 11

Data Assessment

11 . Overview

All analytical data received by Malcolm Pirnie from the analytical laboratories will be assessed to determine to what extent the data can be used in making sound project decisions. The goal of data assessment is to characterize the data so that project decisions are made using data that is of sufficient quality to been support those decisions. The levels of quality needed to support the various project decisions have stated in the form of the DQOs. Where the DQOs are met, the data is useful in making necessary decisions.

In order to determine how well the DQOs have been met, all data will be reviewed and validated by a qualified data validation subcontractor. The data will be reviewed and validated with the intended data uses and DQOs being utilized to aid in decisions regarding data usefulness.

11.2 Data Assessment

11.2.1 Task I – Completeness

Data assessment will include a review of the data package to determine completeness. A complete data package will consist of the following eight components.

1. All sample chain-of-custody forms.

2. The case narrative(s) including all sample/analysis summary forms.
3. Quality Assurance/Quality Control summaries including all supporting documentation.
4. All relevant calibration data including all supporting documentation.
5. Instrument and method performance data.
6. Documentation showing the laboratory's ability to attain the contract specific method detection limits for all target analytes in all required matrices.
7. All data report forms including examples of the calculations used in determining final concentrations.
8. All raw data used in the identification and quantitation of the contract specified target compounds.

All deficiencies in the requirement for completeness shall be reported to the consultant immediately. The laboratory shall be contacted by the Project QAO or data validator and shall be given ten calendar days to produce the documentation necessary to remove the deficiencies.

11.2.2 Task II – Compliance

The Validator shall review the submitted data package to determine compliance with those portions of the work plan that pertain to the production of laboratory data. Compliance is defined by the following criteria.

1. The data package is complete as defined in Task 1 above.
2. The data has been produced and reported in a manner consistent with the data requirements of the QAPP and the laboratory subcontract.
3. All protocol required QA/QC criteria have been met.
4. All instrument tune and calibration requirements have been met for the time frame during which the analytes were completed.
5. All protocol required initial and continuing calibration data is present and documented.
6. All data reporting forms are complete for all samples submitted. This will include all sample dilution/concentration factors and all premeasurement sample cleanup procedures.

7. All problems encountered during the analytical process have been reported in the case narrative along with any and all actions taken by the laboratory to correct these problems.

The data validation task requires that the Validator conduct a detailed comparison of the reported data with the raw data submitted as part of the supporting documentation package. It is the responsibility of the Validator to determine that the reported data can be completely substantiated by applying protocol-defined procedures for the identification and quantitation of the individual analytes. To assist the Validator in this determination the following documents are recommended for SW-846 Methods 8260B, 8270C, 6010B; and 7470A/7471A; however, the EPA Functional Guidelines will be used for format only. The specific requirements noted in the Project Quality Assurance Project Plan are prerequisite, for example, holding times or special analytical project needs, to those noted in the Functional Guidelines.

1. USEPA SW846 protocols.
2. Data validation standard operating procedures (SOPs) such as:
   a. USEPA Region 2 Validating Volatile Organic Compounds by SW-846 Method 8260B (SOP#HW24 Rev. 1);
   b. USEPA Region 2 Validating Semivolatile Organic Compounds by SW-846 Method 8270 (SOP#22 Rev. 2);
   c. USEPA Region 2 Evaluation of Metals Data for the Contract Laboratory Program (SOP# HW2 Rev. 11).
   d. USEPA Region 2 Validating PCB Compounds by SW-846 Method 8082 (SOP#HW-23B Rev. 1)
   e. USEPA Region 2 Validating Pesticide/PCB Compounds by SW-846 Method 8080A (SOP# HW23 Rev. 0, May 1995)

11.3 Reports

The Validator shall submit a final report covering the results of the data review process. This report shall include the following:

1. A general assessment of the data package as determined by the accomplishment of Section 11.2, above.
2. Detailed descriptions of any and all deviations from the required protocols. (These descriptions must include references to the portions of the protocols involved in the alleged deviations).
3. Any and all failures in the Validator's attempt to reconcile the reported data with the raw data from which it was derived. (Again, specific references must be included). Telephone logs should be included in the validation report.
4. A detailed assessment by the Validator of the degree to which the data has been comprised by any deviations from protocol, QA/QC breakdowns, lack of analytical control, etc., that occurred during the analytical process.
5. The report shall include, as an attachment, a copy of the laboratory's case narrative including the NYSDEC required sample and analysis summary sheets.
6. The report shall include an overall appraisal of the data package.
7. The validation report shall include a chart presented in a spreadsheet format, consisting of Site name, sample numbers, data submitted to laboratory, year of analytical protocol used, matrix, fractions analyzed, e.g., volatiles, semi-volatiles, Metals, CN, PCBs, pesticides. Space should be provided for a reference to the NYSDEC ASP when non-compliance is involved and a column for an explanation of such violation.

MALCOLM PIRNIE

SECTION 12

Corrective Action

12.1 Non-Conformance Reports

Corrective action will be undertaken when a non-conforming condition is identified. A non-conforming condition occurs when QA objectives for precision, accuracy, completeness, representativeness or comparability are not met, or when procedural practices or other conditions are not acceptable.

A non-conformance report will be prepared by the Site QAO, approved by the Technical Manager, and issued to the Project Manager and other appropriate parties. The non-conformance report will describe the unacceptable condition and the nature of corrective measures recommended and will include a discussion of specific data involved, the impact to data quality, and ultimate data usability. A schedule for compliance will also be provided.

12.2 Corrective Action

The non-conformance report will be transmitted to a responsible officer of the ASP laboratory, the City of Lackawanna Representative, the Project Officer and the Project Manager. The non-conformance report will specify, in writing, the corrective action recommended including measures to prevent a recurrence of the original deficiency. Appropriate documentation of corrective action will also be prepared. The Site QAO will monitor implementation of the corrective action, and provide written record as to whether the original problem has been resolved.

12.3 Stop-Work Order

A Stop-Work Order may be issued, upon authorization, by the Site QAO, if corrective action does not adequately address a problem or if no resolution can be reached. To issue a Stop-Work Order, written authorization is required from the Project Manager and the City of Lackawanna Representative. If disagreement occurs among these individuals, it will be brought before successively higher levels of management until the issue is resolved.

12.4 Documentation of the Stop-Work Order

The conditions and need for a Stop-Work Order will be documented in sufficient detail to permit evaluation of the deficiency and determination of proper corrective action. Pertinent communications will be attached to the Stop-Work Order and referenced in the appropriate spaces. Such communications include discussions, correspondences, or telephone conversations which pertain to evaluation of the problem and potential solutions, and implementation of the preferred solution.

12.5 Resumption of Work

In order for work to resume following a Stop-Work Order, the Project Manager and the City of Lackawanna Representative must rescind it in writing.

12.6 Course and Action to Prevent Recurrence

The Site QAO is responsible for tracking non-conforming conditions, evaluating the effectiveness of corrective measures, and assuring that the necessary steps have been taken to prevent recurrence of the original problem.

12.7 Field Changes

The Project Manager is responsible for all Site activities. In this capacity the Project Manager will at times be required to modify Site programs in response to changing Site conditions. At such times the responsible Field Team Leader will notify the Project Manager of the anticipated change, and obtain the approval of the Project Manager and implement the necessary changes. The Project Manager will notify in writing the Site QAO, the Project Officer, and the City of Lackawanna Representative. A copy of the notification will be attached to the file copy of the affected document. If an unapproved action has been taken during a period of deviation, the action will be evaluated to determine the significance of any departure from established procedures.

Changes in the program will be documented on a field change request which is signed by the Field Team Leader and the Project Manager. The Project Manager will maintain a log for the control of field change requests.

The Project Manager is responsible for controlling, tracking and implementing the identified changes. Completed field change requests are distributed to affected parties which will include as a minimum: Project Officer, Project Manager, Site QAO, Field Team Leader, and the City of Lackawanna Representative.

MALCOLM PIRNIE

Quality Assurance Reports to Management

SECTION 13

Malcolm Pirnie field staff will promptly report any difficulties to the Project Manager. The laboratory will provide a written description on any quality assurance, problems to Malcolm Pirnie with submission of the analytical data packages.

Following any quality assurance audits, the Site QAO will submit a Quality Assurance report to the Project Manager describing the performance of the quality assurance program. Problems or issues that arise independent of audits, may be identified to project manage

MALCOLM PIRNIE

SECTION 14

References

USEPA, 1983, Methods for Chemical Analysis for Water and Wastes, EPA-60018-79-020.

USEPA, 1986, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, Third Edition.

USEPA, 1987, Data Quality Objectives for Remedial Response Activities, CDM Federal Programs Corporation.

USEPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, 540689004.

USEPA, 1989, Region II CERCLA Quality Assurance Manual, Final Copy, Revision 1.

USEPA, 1989, Soil Sampling Quality Assurance User's Guide, Second Edition, EPA-600/8-891046.

USEPA, Contract Laboratory Statement of Work for Inorganic Analysis, 3/90.

USEPA, Contract Laboratory Statement of Work for Organic Analysis, 3/90.

USEPA, 1990, SOP No. HW-2, Region II Evaluation of Metals Data for the Contract Laboratory Program, Revision XI, 3/90.

USEPA, 1998, Region II Low Stress (Low-Flow) Purging and Sampling Procedure for Collecting Ground Water Samples from Monitoring Wells, Final.

USEPA, 1999, SOP No. HW-24, Region II Validating Volatile Organic Compounds by SW-846 Method 8260B, Revision 1.

USEPA, 2000, Region II Brownfields Project Planning Guidance, Final, April 2000.

USEPA, 2000a, Guidance for the Data Quality Objectives Process, EPA QA/G-4, August 2000.

USEPA, 2001, SOP No. HW-22, Region II Validating Semivolatile Organic Compounds by SW-846 Method 8270, Revision 2.

USEPA 2002, SOP No. HW-23B, Region II Validating PCB Compounds by SW-846 Method 8082, Revision 1.

ATTACHMENT 1

U.S. EPA Generic Brownfields QAPP Title and Approval Page

U.S. EPA REGION 2
GENERIC BROWNFIELDS QAPP

FORM A: TITLE AND APPROVAL PAGE

GENERIC BROWNFIELDS QUALITY ASSURANCE PROJECT PLAN APPROVAL PAGE

Brownfields Assessment Demonstration Pilot
Six Vacant Lots – Ridge Road
Lackawanna, New York

The attached EPA Region 2 Generic Brownfields Quality Assurance Project Plan (QAPP) has been submitted in compliance with the provisions of the City of Lackawanna Brownfields Assessment Pilot Cooperative Agreement No. BP-98275701-1.

The undersigned agrees to use the Generic Brownfields Quality Assurance Project Plan Boilerplate to prepare the Site Specific Sampling, Analysis, and Monitoring Plan (SAMP) for Brownfields sites funded under the Brownfields Economic Redevelopment Initiative. The undersigned also agrees to incorporate any comments provided by the New York State Department of Environmental Conservation (NYSDEC) concerning the Site Specific SAMP.

Pilot Name: **Brownfields Assessment Demonstration Pilot**
Six Vacant Lots – Ridge Road
Pilot State: **New York**

Pilot Project Manager Concurrence:

Signature: _____

Printed Name: _____

Date: _____

U.S. EPA Region 2 Manager Approval:

Signature: _____

Printed Name: _____

Date: _____

APPENDIX **A**

Standards Criteria and Guidance Values

MALCOLM PIRNIE

APPENDIX A
SUMMARY OF ANALYTE CRITERIA AND GUIDANCE VALUES
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

Substance	Analytical Method	Aqueuos	Soils	
		Class GA Groundwater Standard[1] (ug/l)	TAGM Rec. Soil Cleanup Objective[2] (mg/kg)	Eastern US Background Concentrations[3] (mg/kg)
VOCs				
1,1,1,2-Tetrachloroethane	8260B	5*	NA	-
1,1,1-Trichloroethane	8260B	5*	0.8	-
1,1,2,2-Tetrachloroethane	8260B	5*	0.6	-
1,1,2-Trichloroethane	8260B	1	NA	-
1,1-Dichloroethane	8260B	5*	0.2	-
1,1-Dichloroethene	8260B	5*	0.4	-
1,1-Dichloropropene	8260B	(5)	NA	-
1,2,3-Trichlorobenzene	8260B	5*	NA	-
1,2,3-Trichloropropane	8260B	0.04	0.4	-
1,2,4-Trichlorobenzene	8260B	5*	NA	-
1,2,4-Trimethylbenzene	8260B	5*	NA	-
1,2-Dibromo-3-chloropropane	8260B	0.04	NA	-
1,2-Dibromoethane (EDB)	8260B	0.0006	NA	-
1,2-Dichlorobenzene	8260B	3	7.9	-
1,2-Dichloroethane	8260B	0.6	0.1	-
1,2-Dichloropropane	8260B	1	NA	-
1,3,5-Trimethylbenzene	8260B	5*	NA	-
1,3-Dichlorobenzene	8260B	3	1.6	-
1,3-Dichloropropane	8260B	5*	NA	-
1,4-Dichlorobenzene	8260B	3	8.5	-
2,2-Dichloropropane	8260B	5*	NA	-
2-Chloroethyl vinyl ether	8260B	NA	NA	-
2-Chlorotoluene	8260B	5*	NA	-
2-Hexanone	8260B	50	NA	-
4-Chlorotoluene	8260B	5*	NA	-
4-Isopropyltoluene	8260B	5*	NA	-
4-Methyl-2-pentanone	8260B	NA	1	-
Acetone	8260B	50	0.2	-
Benzene	8260B	1	0.06	-
Bromobenzene	8260B	5*	NA	-
Bromochloromethane	8260B	5*	NA	-
Bromodichloromethane	8260B	(50)	NA	-
Bromoform	8260B	(50)	NA	-
Bromomethane	8260B	5*	NA	-
Carbon disulfide	8260B	60	2.7	-
Carbon tetrachloride	8260B	5	0.6	-
Chlorobenzene	8260B	5*	1.7	-
Chloroethane	8260B	5*	1.9	-
Chloroform	8260B	7	0.3	-
Chloromethane	8260B	5*	NA	-
cis-1,2-Dichloroethene	8260B	5*	NA	-
cis-1,3-Dichloropropene	8260B	0.4+	NA	-
Dibromochloromethane	8260B	5*	N/A	-
Dibromomethane	8260B	5*	NA	-

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APPENDIX A
SUMMARY OF ANALYTE CRITERIA AND GUIDANCE VALUES
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

Substance	Analytical Method	Aqueuos	Soils	
		Class GA Groundwater standard[t1]) (ug/l)	TAGM Rec. Soil Cleanup Objective[(2)] (mg/kg)	Eastern US Background Concentrations[(3)] (mg/kg)
VOCs (cont'd)				
Dichlorodifluoromethane	8260B	5*	NA	
Ethylbenzene	8260B	5*	5.5	
Hexachlorobutadiene	8260B	0.5	NA	-
Iodomethane	8260B	5*	NA	
Isopropylbenzene	8260B	5*	NA	
Methyl ethyl ketone	8260B	50	NA	
Methylene chloride	8260B	5*	0.1	
MTBE	8260B	10	NA	
Naphthalene	8260B	(10)	NA	
n-Butylbenzene	8260B	5*	NA	
n-Propylbenzene	8260B	5*	NA	
sec-Butylbenzene	8260B	5*	NA	
Styrene	8260B	5*	NA	-
tert-Butylbenzene	8260B	5*	NA	-
Tetrachloroethene	8260B	5*	1.4	-
Toluene	8260B	5*	NA	-
trans-1,2-Dichloroethene	8260B	5*	NA	-
trans-1,3-Dichloropropene	8260B	0.4+	NA	-
Trichloroethene	8260B	5*	NA	-
Trichlorofluoromethane	8260B	5*	NA	-
Vinyl acetate	8260B	NA	NA	-
Vinyl chloride	8260B	2	NA	-
Xylenes, total	8260B	5	NA	-
SVOCs				
1,2,4-Trichlorobenzene	8270C	5*	NA	-
1,2-Dichlorobenzene	8270C	3	NA	-
1,3-Dichlorobenzene	8270C	3	NA	-
1,4-Dichlorobenzene	8270C	3	NA	-
2,2'-oxybis (1-Chloropropane)	8270C	NA	NA	-
2,4,5-Trichlorophenol	8270C	NA	0.1	-
2,4,6-Trichlorophenol	8270C	NA	NA	-
2,4-Dichlorophenol	8270C	1+	0.4	-
2,4-Dimethyphenol	8270C	(50)	NA	-
2,4-Dinitrophenol	8270C	(10)	0.200 or MDL	-
2,4-Dinitrotoluene	8270C	5*	NA	
2,6-Dinitrotoluene	8270C	5*	NA	-
2-Methylphenol	8270C	NA	0.100 or MDL	-
2-Chloronaphthalene	8270C	(10)	NA	-
2-Chlorophenol	8270C	1+	0.8	-
2-Methylnaphthalene	8270C	NA	36.4	-
2-Nitroaniline	8270C	5*	0.430 or MDL	-
2-Nitrophenol	8270C	1+	0.330 or MDL	
3,3'-Dichlorobenzidine	8270C	5*	N/A	-
3-Nitroaniline	8270C	5*	0.500 or MDL	-

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APPENDIX A
SUMMARY OF **ANALYTE** CRITERIA AND GUIDANCE VALUES
SIX VACANT LOTS - RIDGE ROAD
CITY OF **LACKAWANNA,** NEW YORK

Substance	Analytical Method	Aqueuos	Soils	
		Class GA Groundwater **Standard**[1] (ug/l)	TAGM Rec. Soil Cleanup **Objective**[2] (mg/kg)	Eastern US Background **Concentrations**[3] (mg/kg)
SVOCs (cont'd)				
4,6-Dinitro-2--methylphenol	8270C	NA	NA	-
4-Bromophenyl-phenylether	8270C	NA	NA	
4-Chloro-3-methylphenol	8270C	NA	0.240 or MDL	
4-Chloroaniline	8270C	5*	NA	
4-Chlorophenyl-phenylether	8270C	NA	NA	
4-Methylphenol	8270C	NA	0.9	
4-Nitroaniline	8270C	5*	NA	
4-Nitrophenol	8270C	NA	0.100 or MDL	
Acenaphthene	8270C	(20)	50.0 ***	
Acenaphthylene	8270C	NA	41.0	
Anthracene	8270C	(50)	50.0 ***	
Benzo(a)anthracene	8270C	(0.002)	0.224 or MDL	
Benzo(a)pyrene	8270C	ND	NA	
Benzo(b)fluoranthene	8270C	0.002	NA	
Benzo(g,h,I)perylene	8270C	NA	NA	
Benzo(k)fluoranthene	8270C	0.002	NA	
bis(2-Chloroethoxy)methane	8270C	5*	NA	
bis(-2-Chloroethyl) Ether	8270C	1	NA	-
bis(2-Ethylhexyl)phthalate	8270C	5	50.0 ***	
Butylbenzylphthalate	8270C	(50)	NA	
Carbazole	8270C	NA	NA	
Chrysene	8270C	(0.002)	0.4	-
Dibenzo(a,h)anthracene	8270C	NA	0.014 or MDL	
Dibenzofuran	8270C	NA	6.2	
Diethylphthalate	8270C	(50)	NA	
Dimethylphthalate	8270C	(50)	NA	
Di-n-butylphthalate	8270C	50	NA	
Fluoranthene	8270C	(50)	50.0 ***	
Fluorene	8270C	(50)	50.0 ***	-
Hexachlorobenzene	8270C	0.04	0.41	
Hexachlorobutadiene	8270C	0.5	NA	-
Hexachlorocyclopentadiene	8270C	5*	NA	
Hexachloroethane	8270C	5*	NA	-
Indeno(1,2,3-cd)pyrene	8270C	(0.002)	NA	
Isophorone	8270C	50	4.40	
Naphthalene	8270C	(10)	13.0	
Nitrobenzene	8270C	0.4	0.200 or MDL	
N-Nitroso-di-n-propylamine	8270C	NA	NA	
N-Nitrosodiphenylamine(1)	8270C	(50)	NA	
Pentachlorophenol	8270C	1*	I.0 or MDL	
Phenanthrene	8270C	(50)	50.0 ***	
Phenol	8270C	1*	0.03 or MDL	
Pyrene	8270C	(50)	50.0 ***	

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APPENDIX A
SUMMARY OF ANALYTE CRITERIA AND GUIDANCE VALUES
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

Substance	Analytical Method	Aqueuos	Soils	
		Class GA Groundwater Standard[1] (ug/l)	TAGM Rec. Soil Cleanup Objective[2] (mg/kg)	Eastern US Background Concentrations[3] (mg/kg)
PEST/PCBs				
Aroclor-1016	8082	0.09+	1.0+ (surface) 10.0+ (Subsurface)	-
Aroclor-1221	8082			-
Aroclor-1232	8082			-
Aroclor-1242	8082			-
Aroclor-1248	8082			-
Aroclor-1254	8082			-
Aroclor-1260	8082			-
4,4'-DDD	8081	0.3	NA	-
4,4'-DDE	8081	0.2	2.1	-
4,4'-DDT	8081	0.2	2.1	-
Aldrin	8081	ND	0.041	-
alpha-BHC	8081	0.01	NA	-
alpha-Chlordane	8081	0.05	NA	-
beta-BHC	8081	0.04	NA	-
delta-BHC	8081	0.04	NA	-
Dieldrin	8081	0.004	0.044	-
Endosulfan I	8081	NA	0.9	-
Endosulfan II	8081	NA	0.9	-
Endosulfan sulfate	8081	NA	1.0	-
Endrin	8081	ND	0.10	-
Endrin aldehyde	8081	5*	NA	-
Endrin ketone	8081	5*	NA	-
gamma-BHC (Lindane)	8081	0.05	NA	-
gamma-Chlordane	8081	0.05	NA	-
Heptachlor	8081	0.04	0.10	-
Heptachlor epoxide	8081	0.03	0.02	-
Methoxychlor	8081	35	Note (4)	-
Toxaphene	8081	0.06	NA	-
Metals				
Aluminum	6010B/7470A/7471A	NA	SB	33,000
Antimony	6010B/7470A/7471A	3	SB	NIA
Arsenic	6010B/7470A/7471A	25	7.5 or SB	3-12 **
Barium	6010B/7470A/7471A	1000	300 or SB	15-600
Beryllium	6010B/7470A/7471A	(3)	0.16 (HEAST) or SB	0-1.75
Cadmium	6010B/7470A/7471A	5	1 or SB	0.1-1
Calcium	6010B/7470A/7471A	NA	SB	130 - 35,000 ***
Chromium	6010B/7470A/7471A	50	10 or SB	1.5 - 40 **
Cobalt	6010B/7470A/7471A	NA	30 or SB	2.5 - 60 **
Copper	6010B/7470A/7471A	200	25 or SB	1 - 50
Cyanide, total	9010B/9012A	200	NA	#N/A
Iron	6010B/7470A/7471A	300	2,000 or SB	2,000 - 550,000
Lead	6010B/7470A/7471A	25	SB ****	****
Magnesium	6010B/7470A/7471A	(35,000)	SB	100 - 5,000
Manganese	6010B/7470A/7471A	300	SB	50 - 5,000

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APPENDIX A
SUMMARY OF ANALYTE CRITERIA AND GUIDANCE VALUES
SIX VACANT LOTS - RIDGE ROAD
CITY OF LACKAWANNA, NEW YORK

Substance	Analytical Method	Aqueuos	Soils	
		Class GA Groundwater Standard[1] (ug/l)	TAGM Rec. Soil Cleanup Objective[2] (mg/kg)	Eastern US Background Concentrations[3] (mg/kg)
Metals (cont'd)				
Mercury	6010B/7470A/7471A	0.7	0.1	0.001 - 0.2
Nickel	6010B/7470A/7471A	100	13 or SB	0.5 -25
Potassium	6010B/7470A/7471A	NA	SB	8,500 - 43,000 **
Selenium	6010B/7470A/7471A	10	2 or SB	0.1 - 3.9
Silver	6010B/7470A/7471A	50	SB	N/A
Sodium	6010B/7470A/7471A	20,000	SB	6,000 - 8,000
Thallium	6010B/7470A/7471A	(0.5)	SB	N/A
Vanadium	6010B/7470A/7471A	NA	150 or SB	1-300
Zinc	6010B/7470A/7471A	(2,000)	20 or SB	9-50

Notes:

(1) Class GA Ambient Water Quality Standards and Guidance Values from TOGS series 1.1.1, June 1998, and April 200 Addendum

(2) Technical and Administrative Guidance Memorandum (TAGM) #4046, ***Determination of SoiI Cleanup Objective and Cleanup Levels, Appendix A - Recommended SoiI Cleanup Objectives.***

(3) Technical and Administrative Guidance Memorandum (TAGM) #4046, ***Determination of SoiI Cleanup Objective and Cleanup Levels, Appendix A - Eastern US Background*** *Concentrations.*

(4) As per TAGM 4046, total pesticides cannot exceed 10 ppm.

* Represents principal organic contaminant standard for groundwater.

** New York State Background.

*** Site specific forms of cyanide should be taken into consideration when establishing soil cleanup objectives.

**** Background values for Lead vary. Rural areas 4 - 61 ppm, urban areas 200 - 500 ppm.

Values in ( ) represent Guidance Values.

+ Represents sum of isomers or congeners.

ŧ Applies to sum of all phenolic compounds.

NA - Not Applicable or Not Available.

SB - Site Background.

mg/kg - milligrams per kilogram (ppm)

ug/l - micrograms per liter (ppb)

APPENDIX B

Field Forms

MALCOLM PIRNIE, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.:	SITE NAME:
SAMPLERS (SIGNATURE):	

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS							REMARKS

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS:	

Distribution Original accompanies shipment, copy to coordinator field files

MALCOLM PIRNIE

Test Trench Log

Project: _____
Project No.: _____
Client: _____
Location: _____

Excavarion Dates: _____
Excavation Method: _____
Logged / Checked BY: _____
Test Pit Location #: _____

Test Pit Location:

Test Pit Cross Section:

Grade

TIME
Start: End:

Depth BGS	Soil Description	Graphic Log	Photos Y / N	Samples Y / N	Comments (Include seepage horizons)

Sheer ____ *of* ____

OVERBURDEN BOREHOLE LOG

MALCOLM PIRNIE

Borehole No. _____

Project : _____
_____
Project No.: _____
Client: _____
Location: _____

Surface Elev.: _____
Ref. Elev.: _____
Contractor: _____
Driller: _____
Rig Type: _____

Date Started: _____
Date Finished: _____
Drilling Method: _____
Water Depth (bgs): _____
Logged By: _____

Depth (BGS)	Sample ID	Sample Type	Blows / 6 inches	Recovery / Length (ft.)	Soil Classification / Symbol (Include depths)	Lithology Description and Remarks *Density/Consistency. Color. Plasticity. Soil Types. Texture. Fabric. Bedding. Moisture. Other Characteristics*	Moisture *(dry, moist, wet, saturated)*	PID Scan (ppm)	PID Headspace (ppm)

Votes:

MALCOLM PIRNIE

FIELD SAMPLING LOG

DATE	TIME	SAMPLE ID	DEPTH	MATRIX	SAMPLE LOCATION	SAMPLE DESCRIPTION	ANALYSIS	FIELD MEASURE MENTS	NOTES
							TCL VOCs ☐ Grain Size ☐ TCL SVOCs ☐ RCRA Haz. Waste ☐ TAL Metals ☐ Dioxins ☐ Cyanide ☐ Atterberg ☐ Pesticides ☐ TOC ☐ PCBs ☐ Permeability ☐		
							TCL VOCs ☐ Grain Size ☐ TCL SVOCs ☐ RCRA Haz. Waste ☐ TAL Metals ☐ Dioxins ☐ Cyanide ☐ Atterberg ☐ Pesticides ☐ TOC ☐ PCBs ☐ Permeability ☐		
							TCL VOCs ☐ Grain Size ☐ TCL SVOCs ☐ RCRA Haz. Waste ☐ TAL Metals ☐ Dioxins ☐ Cyanide ☐ Atterberg ☐ Pesticides ☐ TOC ☐ PCBs ☐ Permeability ☐		
							TCL VOCs ☐ Grain Size ☐ TCL SVOCs ☐ RCRA Haz. Waste ☐ TAL Metals ☐ Dioxins ☐ Cyanide ☐ Atterberg ☐ Pesticides ☐ TOC ☐ PCBs ☐ Permeability ☐		
							TCL VOCs ☐ Grain Size ☐ TCL SVOCs ☐ RCRA I-laz. Waste ☐ TAL Metals ☐ Dioxins ☐ Cyanide ☐ Atterberg ☐ Pesticides ☐ TOC ☐ PCBs ☐ Permeability ☐		
							TCL VOCs ☐ Grain Size ☐ TCL SVOCs ☐ RCRA Haz. Waste ☐ TAL Metals ☐ Dioxins ☐ Cyanide ☐ Atterberg ☐ Pesticides ☐ TOC ☐ PCBs ☐ Permeability ☐		

MALCOLM PIRNIE

FIELD METER DAILY CALIBRATION LOG

Date: _____

Weather: _____

Air Monitoring / Sampling

Meter Type *(HNU, PID, CGI)*	Manufacturer	Model #	Serial #	MPI Bar Code #	Calibration Gas				Battery Check Initial	Battery Check Final	Background/ Initial Reading	Final Reading	Calibrators Initials
					Cal Gas Type	Cal Gas Concentration	Lot #	Expiration or Date Made					

Comments: _____

Groundwater Monitoring

Meter Type *(pH, Cond, Turb, Ox/Redox, etc..)*	Manufacturer	Model #	Serial #	MPI Bar Code #	Calibration / Ref. Solution				Battery Check Initial	Battery Check Final	Actual Reading	Calibrators Initials
					Ref. Soln.	Std value	Lot #	Expiration or Dale Made				

Comments: _____

Multi Meters (Horiba, YSI, Hydrloab, etc..)

Manufacturer	Model #	Serial #	MPI Bar Code #	Calibration / Ref. Solution			Battery Check Initial	Battery Check Final	Error codes?	Error codes Corrected?	All parameters calibrated?	Calibrators Initials
				Ref. Soln.	Lot #	Expiration or Date Made						

Comments: _____

Field Team Leader Signature _____ *Date*

MALCOLM PIRNIE

WELL NO.:

WELL PURGING AND SAMPLING LOG

PROJECT TITLE: _____

PROJECT NO.: _____

DATE: _____ STAFF: _____

PURGE METHOD: _____

SAMPLE METHOD: _____ TIME COLLECTED: _____

PURGINGING and SAMPLING DATA:

1. Total Casing and Sceen Length (ft.) _____
2. Casing Internal Diameter (in.) _____
3. Water Level Below Top of Casing (ft.) _____
4. Volume of Water in Casing (gal.) _____
5. Photoionization Detector at Wellhaed (ppm) _____

(Vol = 0.0408 [(2)^2 x { (1) - (3) }])

Constants for Calculating Borehole and Well Water Volumes							
Well Diam.	1"	2"	3"	4"	5"	6"	8"
Vol. (gal/ft)	0.04	0.17	0.38	0.66	1.04	1.50	2.60

Low Row Stabilization Criteria	
pH	+/- 0.1
Cond.	3%
Turb.	10% if > 1 NTU
DO	10%
Temp.	3%
Eh	+/- 10 mV

PARAMETER	ACCUMULATED VOLUME PURGED										
Gallons	*Initial*										
Time (24 hr. clock)											
pH (s.u.)											
Conductivity (mS/cm)											
Turbidity (NTUs)											
Dissolved Oxygen (mg/l)											
Temperature (^{0}C)											
Eh (mV)											
Depth to Water (ft.)											
Purge (Flow) Rate											
Appearance											

Notes:

MALCOLM PIRNIE

DRUM INVENTORY FORM

SITE NAME: _____

CLIENT: _____

PROJECT NO.: _____

TALLY	DRUM NO.	DRUM TYPE[1]	CONTENTS	VOLUME gal.	SEALED (Y,N)	LABELED (Y,N)	DATE FILLED	COMMENTS
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

1 - Drum types: 1A2 = Open top Drum, 1A1 = sealed top (Bung opening) drum

HORIBA

JQA-E-90039 (Head Office/Factory) ISO 14001 Award of Certification
Horiba received these standards for excellence from the International Organization for Standardization.
ISO 9001 JQA-0298

CE marking compliant

Water Quality Monitoring System

U-20 Series

N E W

NOW AVAILABLE WITH DETACHABLE CABLE !!

1 month continuous monitoring

Depth up to 100 meters

GPS function

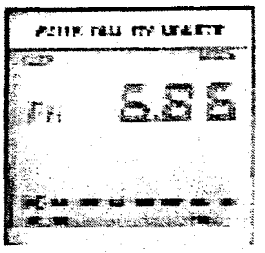
13 simultaneous parameters

Visit Our Web Site at:
http://www.horiba-water.com

One-touch calibration makes work easy

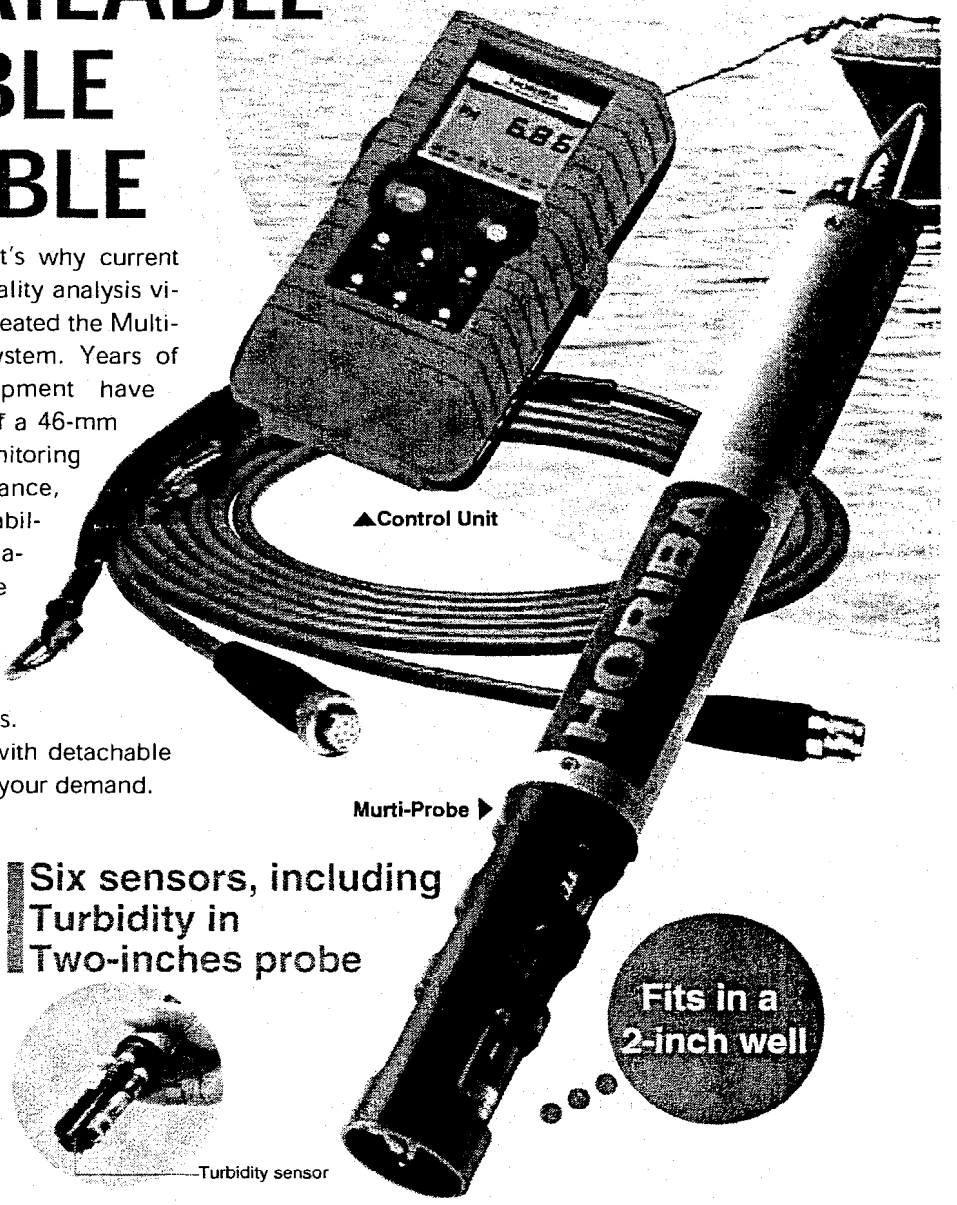
Just submerge the probe into the calibration beaker filled with standard solution and press the button for simultaneous one-point calibration. The system also enables two-point calibration where high-precision measurement data is required.

- **Press a button**
  One point calibration for all 5 parameters (pH, Conductivity, Turbidity, DO, Depth) at once with pH4 solution.
- **Press another button**
  One point calibration for all 3 Ion parameters (Cl^-, NO_3^-, Ca^{2+} only) at once with Ion one-point calibration solution.



U-20 Series NOW AVAILABLE WITH CABLE DETACHABLE

Water is as precious as life itself. That's why current threats to water supplies make water quality analysis vital to our very existence. HORIBA has created the Multi-function Water Quality Monitoring System. Years of HORIBA sensor technology development have reached their culmination in the form of a 46-mm diameter sensor probe: a compact monitoring solution offering high pressure tolerance, long-term continuous measurement capability and highly accurate, simultaneous analysis of 13 parameters. In addition to the Water Quality Monitoring System's own capabilities, it was designed by HORIBA to be compatible with GPS and other data processing techniques. And now, the U-20 series is available with detachable cable, and the flow through cell to meet your demand.



▲Control Unit

Murti-Probe ▶

Six sensors, including Turbidity in Two-inches probe

Turbidity sensor

Fits in a 2-inch well

Dry Cell Battery Operated Meter

You don't have to worry about charging the battery. Just buy a common dry cell battery at a store.

up to one month

Data logging

The sensor's built-in memory function enables continuous measurement for as long as one month* — just by leaving the probe submerged in the sample. Personnel need not be present during the measurement process — the data can even be captured by personal computers in remote locations.

*With measurements every 15 minutes.

Simultaneous measurement of

13 parameters

With the W-23P unit (only), simultaneous measurements of up to 13 parameters (from pH, dissolved oxygen, and conductivity to seawater specific gravity and a variety of ions) can be obtained — much more quickly and easily than with conventional instruments. With its powerful measurement capabilities, the compact U-20 series is recommended for all water quality researchers and professionals.

Measurement at depths as low as

100 meters

With its superior durability and high pressure resistance, the newly developed sensor facilitates measurements as far as 100 meters below the water surface. Thus, in addition to rivers, lakes and other shallow bodies, high-precision measurement can now be readily obtained — and water quality can be monitored — at dams, and even in the open sea.

World's First!

HORIBA's high-precision dissolved oxygen sensor (Patented)

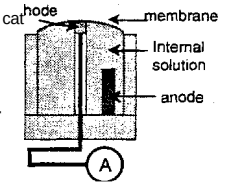
With its membrane galvanic cell, the HORIBA dissolved oxygen sensor is virtually impervious to eddies and flows in the solution. Highly precise measurements can now be obtained with ease.

HORIBA DO Sensor needs no stirring, quick response

● Diaphragm Galvanic battery method

Cathode : $O_2+2H_2O+4e^- \rightarrow 4OH^-$

Anode : $2Pb+4OH^- \rightarrow 2PbO+2H_2O+4e^-$



Larger the cathode surface is, more it is influenced by the eddies and flows of samples. The cathode of the new DO sensor is 1/45 smaller than the old type., obtained 95% influence free from the water flow!!

● Response efficiency

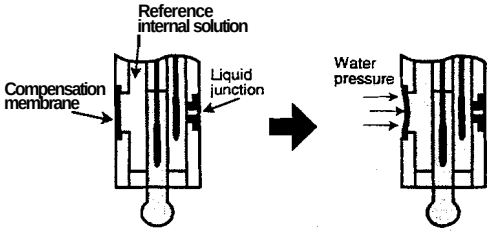
Response from Air to Zero-gas	U-20
T90	30 sec
T95	55 sec

Polarographicmethod may have slower response.

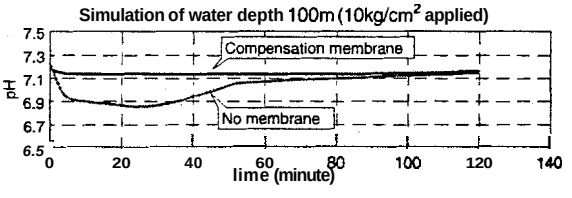
● Membrane replacement

Membrane of DO sensor can replace by membrane replacement kit.

Pressure compensation membrane



Simulation of water depth 100m (10kg/cm² applied)



System enables

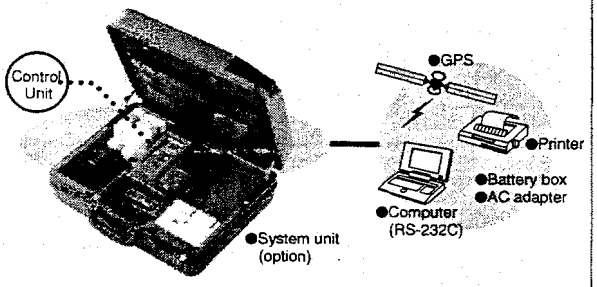
GPS

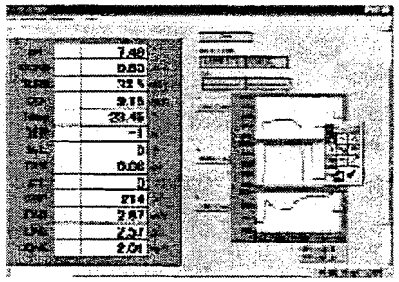
and numerous other data processing mechanisms

System capabilities can be greatly increased by installing the Global Positioning System (GPS), supplied with unit U-2002. GPS allows measurement of location and time, in addition to water quality, and enables main unit screen display of the obtained data — an indispensable function for maintaining detailed records. With the acquired longitude, latitude and depth data, subject locations can be mapped in **3-D.**

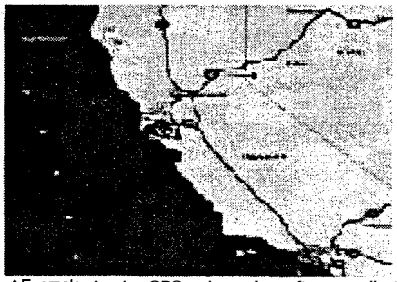
GPS functions by processing satellite signals to provide position measurement with pinpoint accuracy. It is widely employed in air and sea navigation, as well as car navigation systems

The system unit alone is compatible with many I/O interfaces.





▲Example of typical measurement screen



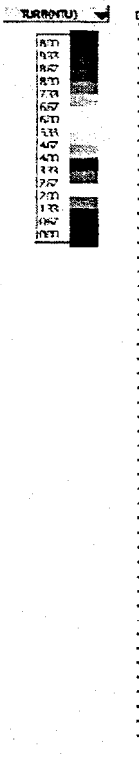
▲Example showing GPS and mapping software application
(GPS MAPN TRACK made by MAGELLAN SYSTEM CORPORATION is used for mapping software.)

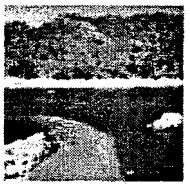
WATER QUAUTY DATA

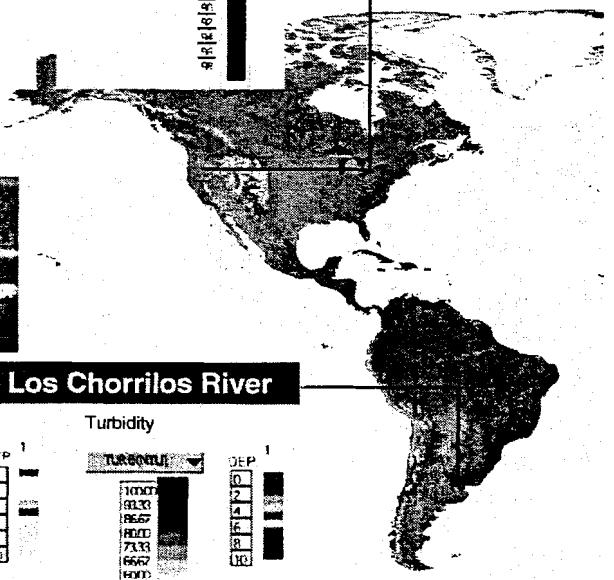
U.S.A. : Lake Tahoe

Temperature

Turbidity

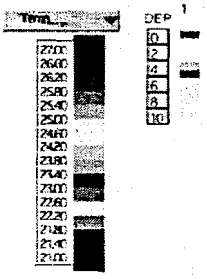




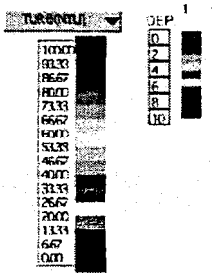


Argentine : Los Chorrilos River

Temperature



Turbidity



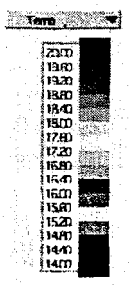
This product has been developed in cooperation with the International Lake Environment Committee (ILEC)

http://www.ilec.or.jp

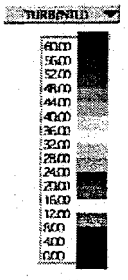
AROUND THE WORLD

Denmark : Lading Marsh

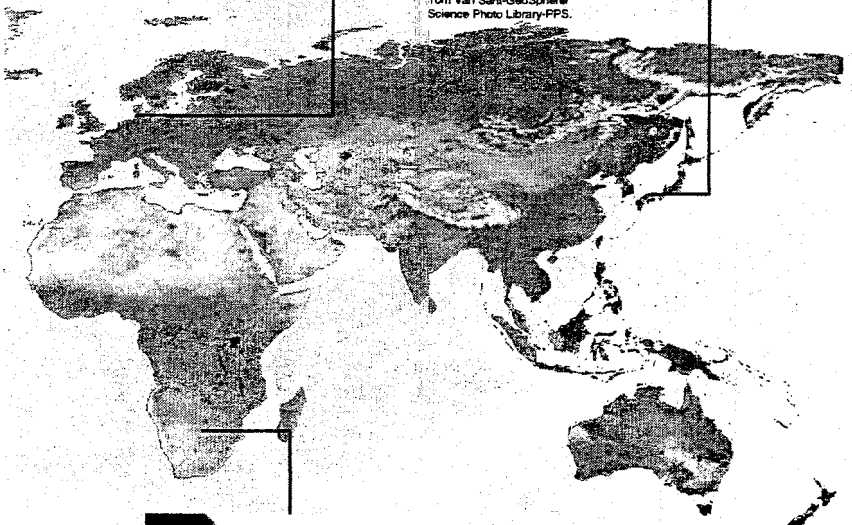
Temperature



Turbidity

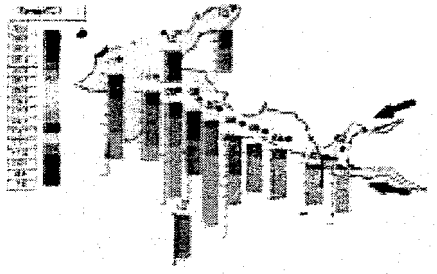


Japan : Lake Biwa



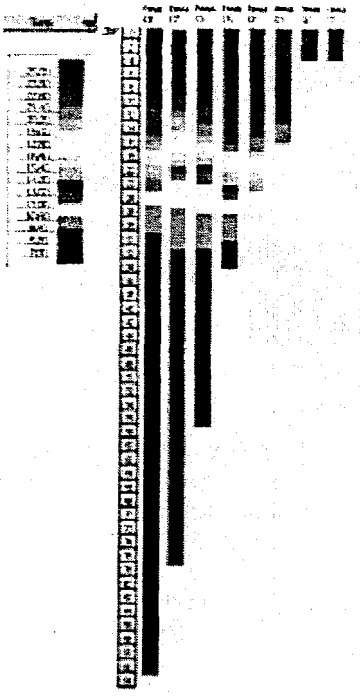
Zimbabwe : Lake Chivero

Temperature

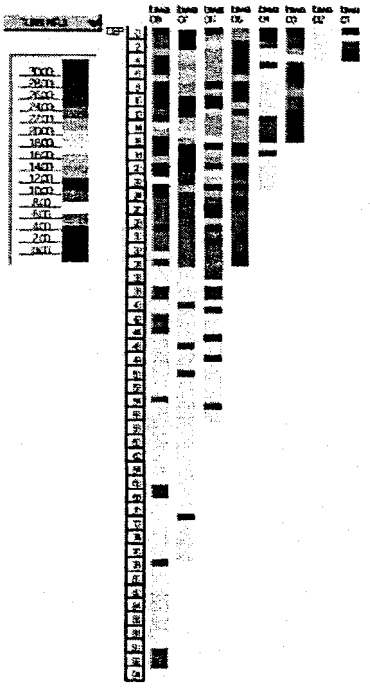


Turbidity

Temperature

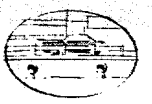


Turbidity



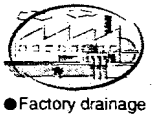
U-20 series applications

@Oceans and seas

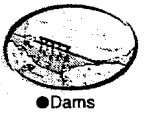


●City sewage water

@Lakes and marshes

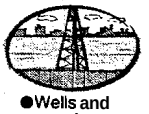


●Factory drainage



●Dams

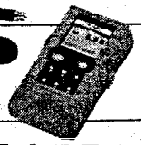
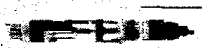
●Farm water



●Wells and ground water

●Nurseries

Application requiring various cable lengths, measurement at multi-[illegible]
with your tool, select necessary parts from the following table.

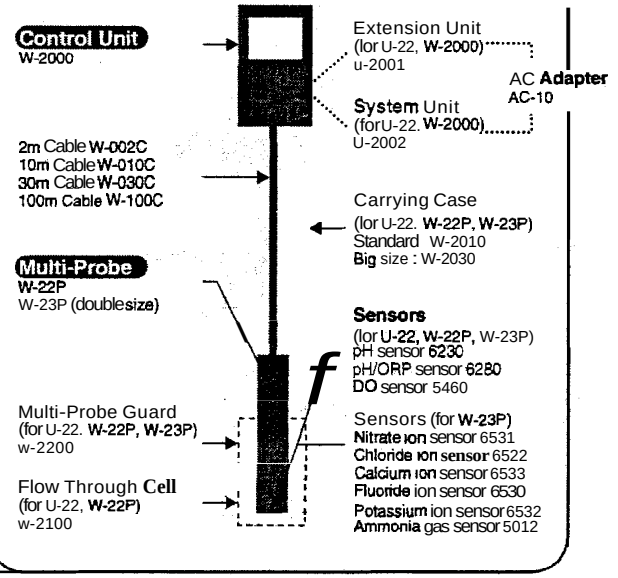
U-20 series		Model Name	Description
Multi-Probe 		W-22P	Multi-probe for upto simultaneous 10 parameters measurement At least one set of a cable and a control unit is necessary to view or download the measurement. Guaranteed measurement depth is 100m
		W-23P	Multi-probe for upto simultaneous 13 parameters measurement, including 3 ions. At least one set of a cable and a control unit is necessary to view or download the measurement Guaranteed measurement depth is 100m
Cables	2m	W-002C	
	10m	W-010C	
	30m	W-030C	
	100m	W-100C	
Control Unit 		W-2000	Necessary for inputting calibration, measurement mode to the multi-probe. connecting with U-2001(extension unit). The measurement data can be viewed on an LCD.
Sensors 	pH	6230	Part No.9037-0056-00
	pH/ORP	6280	Part No.9037-0057-00
	Dissolved Oxygen	5460	Part No.9037-0058-00 DO membrane replacement kit available
	Nitrate Ion	6531	Part No.9037-0059-00 Nitrate ion cartridge available
	Chloride Ion	6522	Part No.9037-0060-00 Chloride ion cartridge available
	Calcium Ion	6533	Part No.9037-0061-00 Calcium ion cartridge available
	Fluoride Ion	6530	Part No.9037-0063-00 Fluoride ion cartridge available
	Potassium Ion	6532	Part No.9037-0064-00 Potassium ion cartridge available
	Ammonia	5012	Part No.9037-0062-00 Ammonia membrane replacement kit available
System Unit 		U-2002	Simultaneous measurement with GPS, Printer, RS-232C output possible. Battery compartment allows upto 300 hours continuous measurement.
Extension Unit 		U-2001	For connection with AC-10 and GPS. Printer or PC. GPS unit should comply NMEA-0183 Version 2.1. Suggested model is Magellan® MAP-410, GPS315.
Carrying Case 	Cable less than 10m	W-2010	Multi-probe Guard and Flow Through Cell cannot be stored
	Cable more than 30m	W-2030	Multi-probe Guard and Flow Through Cell can be stored.
Flow Through Cell 		W-2100	Applicable only for U-22 set and W-22P. Water pressure ; 0 kPa Water flow ; 0.1~0.5L/min
Multi-probe Guard 		W-2200	
Communication Cable		RS-232C	For 9-pin
AC adapter 		AC-10	100 V or 220 V
Standards and internal solutions 	pH4 Standard solution	100-4	Part No.90050016-00
	pH7 Standard solution	100-7	Part No.9003-0017-00
	pH9 Standard solution	100-9	Part No.9003-0018-00
	ORP Standard powder	160-51	Part No.9003-0031-00 250 ml X 10packs, 89 mV at 25°C
	ORP Standard powder	160-22	Part No 9003-0030-00 250 ml X 10packs, 258 mV at 25°C
	pH Reference electrode internal solution	330	Part No.9037-0052-00 500 ml
	Ion one-point calibration solution	130	Part No.9037-0065-00 250 ml, for Nitrate ion, Chloride ion, Calcium ion only
	Nitrate Reference electrode internal solution	302	Part No.9037-006600 50 mL
	Chloride Reference electrode internal solution	301	Part No.9037-0067-00 50 mL
	Calcium/Fluoride Reference electrode internal solution	300	Part No.9003-0032-00 250 mL
	Potassiu Reference [illegible] internal solution	303	Part No.9037-0069-00 50 mL
	Ammonia Reference elect [illegible] rterna [illegible] lu	3	Part No.9012-0009-00 250 mL

*Horiba do not supply standard solutions for Conductivity, Turbidity, Dissolved Oxygen and Ions.
Please contact your local distributor or ask Honba offices around the world for suggested standards supplier(see back cover for addresses).

Standard Accessories

	Sensor probe with built-in sensors (depth. conductivity, temperature, turbidity), pH4 standard solution, Reference soluhon. calibration beaker, batteries, instruction manual
	Sensor probe with built-in sensors (depth, conductivity, temperature, turbidity), pH4 standard solution, Reference soiution, ion auto-cal solution, calibration beaker, batteries, instruction manual
	Control Unit, Grip holder, batteries
	Reference internal solution (50 mL)
	Reference internal solution (50 mL)
	Reference internal solution (50 mL)
	Reference internal solution (50 mL)
	Reference internal solution 150 mL)
	Reference internal solution (50 mL)
	Sample software (Windows 95, 98)
	Sample software (Windows 95, 98)

Suggested combination



U-20 series specifications

			U-22SET	W-22P	W-23P
Control Unit	Water proof construction	IP-67	●		
Multi-Probe ※1	Measurement temperature	0–55 C			
	Storage temperature	5–60 C			
	Measurement depth ※2	to 100 m			
	Maximum probe size	95 mm			
	Probe length	430 mm	●	●	●
	Continuous use available ※3	30days	to 30 m		
	Data logging	—			
	Manual data memory (2880 items)	—			
	Automatic calibration				
pH ●Two-point calibration ●Automatic temperature compensation	Measuring principle	Glass electrode method			
	range	pH 0~14			
	Resolution	0.01 pH	e	r	n e
	Repeatability	±0.05 pH			
	Accuracy	±0.1 pH			
Dissolved oxygen ●Salt correction (0 to 40 ppt /automatic) ●Automatic temperature compensation	Measuring principle	Diaphragm gavanic battery method			
	range	0–19.99 mg/L			
	Resolution	0.01 mg/L	●	●	●
	Repeatability	±0.1 mg/L			
	Accuracy	±0.2 mg/L			
Conductivity ●Auto range ●Automatic temperature conversion (25°C) ●SI units	Measuring principle	4 AC electrode method			
	range	0–9.99 S/m			
	Resolution	0.1%F.S	●	●	●
	Repeatability	±1%			
	Accuracy	±3%			
Salinity	Measuring principle	Conductivity conversion			
	range	0–4%			
	Resolution	0.01%	●	●	●
	Repeatability	±0.1%			
	Accuracy	±0.3%			
Total Dissolved Solids (TDS) ●Conversion factor setting	Measuring principle	Conductivity conversion			
	range	0–100 g/L			
	Resolution	0.1%F.S	●	●	●
	Repeatability	±2 g/L			
	Accuracy	±5 g/L			
Seawater specific gravity ●Display σt, σ0, σ15	Measuring principle	Conductivity conversion			
	range	0–50 σt			
	Resolution	0.1 σt	●	●	●
	Repeatability	±2 σt			
	Accuracy	±5 σt			
Temperature	Measuring principle	Thermistor method			
	range	0–55°C			
	Resolution	0.01°C	●	●	●
	Repeatability	±0.3°C			
	Accuracy	±1.0°C			
Turbidity ●Unit selection	Measuring principle	Penetration and scattering method			
	range	0–800 NTU			
	Resolution	0.1 NTU	●	●	●
	Repeatability	±3%			
	Accuracy	±5%			
Water depm	Measuring principle	Pressure method			
	range(NTU or mg/L)	0~100m			
	Resolution	1 m	●	●	●
	Repeatability	±3%			
	Accuracy	±5%			
Oxidation **reduction potential(ORP)**	Measuring principle	Platinum electrode method			
	range	±1999 mV			
	Resolution	1 mV	●	●	●
	Repeatability	±5 mV			
	Accuracy	±15 mV			
Ion ●Auto range	Measuring principle	Ion electrode method			
	Resolution	0.1%F.S			
	Repeatability	±5%			●
	Accuracy	±10%			
Nitric acid ion	range	NO_3^-: 0.62~62,000 mg/L(pH 3~7)			●
Chloride ion		Cl^-: 0.4~35,000 mg/L(pH 3~11)			
Calaum ion		Ca^{2+} 0.4~40 080 mg/L(pH 5~11)			
Fluoride ion		F^- 0.02~19,000 mg/L(pH4~10 20 mg/L)			●
Potassium ion		K^+ 0.04~39 000 mg/L(pH5~11.39 mg/L)			
Ammonia		NH_3 0.1~1 000 mg/L(pH 12 or more)			
Simultaneously measurable parameters			10	10	13

Note The accuracy rating value is obtained from measurements at an intermediate point of the standard solution after two-point calibration (at room temperature and pressure)
The repeatability and accuracy rating percentages are based on the full scale (except for salinity).

※1: Organic solvents, strong acids, and strong alkaline solvents cannot be measured.

※2: The maximum depth for ion measurements are 100 m for nitric acid ion, chloride ion, fluoride ion, 15 m for calcium ion, ammonia, and 3 m for potassium ion.

※3: Based on the data measured automatically at 15 minutes intervals. The battery life a into account.
Periodical maintenance and calibration is necessary when a lot of shellfishes and seaweeds exist at the measurement point.

● Influence of Hindering Ions, The values show permissible coexistence limits

Nitrate Ion	ClO_4=0.03 I^-=0.1 Br^-=2 NO_2-=3 Cl^-=40 F^-=200 CH_3COO^-=300 SO_4^{2-}= more than 1000
Chloride Ion	$S_2O_3^{2-}$, S^{2-}, I^-, Ag^+, Hg^{2+}=Not possible SCN^-=0.3 MnO^{4-}=0.1 Br^-=0.03
Calcium Ion	Fe^{3+}=0.1 Fe^{2+}, Zn^{2+}=1 Sr^{2+}=50 Ni^{2+}, Cu^{2+}=70 Co^{2+}=350 Mn^{2+}=500 Mg2+=1,000 Na^+,K^+, Ba^{2+}, NH_4^+=more than 1000
Fluoride Ion	OH^-=10, All negative ions except for OH^- is permissible
Potassium ion	Rb^+=0.4 Cs^+=3 NH_4^+=70 Li. Na^+, Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}=more than 1000
Ammonia	—

Option

■System unit Model U-2002
(with GPS, printer, and sample software)

Please specify the pnnter voltage 100, 110, 220V

■Carrying Case
W-2010(for cable length less than 10m).
W-2030(for cable length more than 30m)

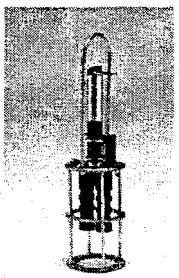
Please select appropriate carrying case depending on your cable length
'Multi-probe guard or Flow Through Cell can only be stored in W-2030

W-2010

■Flow Through Cell
Model W-2100

Applicable only for U-22 set and W-22P.

.Multi-probe Guard
Model W-2200



*Multi-Probe not included

■Extension Unit
Model U-2001

Attaching the extension adapter to the main unit enables connection of an AC adapter, analog output, and RS-232C interface.

MAC adapter
Model AC-10

Connection to the extension adapter or system unit is required.
Please specify the voltage: 100, 110, 220v

■Communication Cable
Model RS-232C

For RS-232C communication. U-2001 or U-2002 is necessary.

Spare parts

■Cartridges for ion sensor replacement

Tip name	Model No.	Part No.
Nitrate ion cartridge	7681	9003-0152-00
Chloride ion cartridge	7660	9003-0150-00
Calcium ion cartridge	7683	9003-0154-00
Potassium ion cartridge	7682	9003-0153-00
Fluoride ion cartridge	7661	9003-0151-00

■Membranes

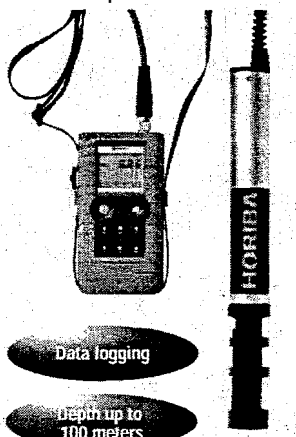
Ammonia membrane replacement kit (approx. 6 uses)	Membrane (NH_3)	9037-0070-00
Dissolved oxygen membrane replacement kit (approx. 50 uses)	Membrane (DO)	9037-0074-00

Application not requiring detachable cable, U-22 SET will be our suggested selection.

U-22 SET (Cable not detachable)

U-22 -2m **U-22 -10m** **U-22 -30m**

Enhanced model with Turbidity, ORP and depth function in 2-inch probe. Available in economical price



Data logging

Depth up to 100 meters

10 simultaneous parameters

Parameters

pH, Dissolved oxygen.
Conductivity, Salinity,
Total dissolved solids (TDS),
Seawater specific gravity,
Temperature, Turbidity, Depth,
Oxidation reducbon potential (ORP)

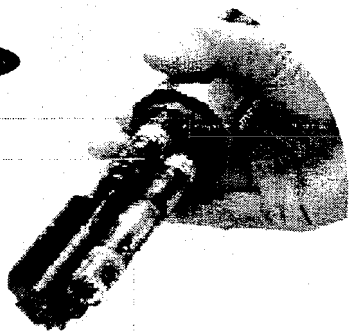
Packing list

Main unit
- Sensor probe with the cable (2m, 10m, 30m).
  Type of cable length is selected depending on applications
  Sensor
- pH4 standard solution (250 ml)
  pH internal solution (250 ml)
  Syringe (with needle)
  Sensor spanner
  Calibration beaker
  Grip holder
- Carrying case
  Dry cell 6F22 (S006P) (1 piece)
  Dry cells (R03) (3 pieces)
  Operation manual

R&D TOP 100 AWARD FOR 2000
'The Honba U-20 sones has been selected by R&D Magazines to be one out or 100 international products and manufacturersto be awarded the Top 100 Award of the year 2000'

Multi-Probe

W-22P



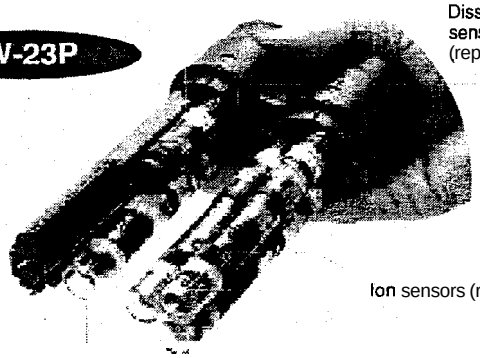
Depth sensor

Dissolved oxygen sensor (replaceable)

pH/ORP sensor (replaceable)

Conductivity/temperature/ turbidity sensors

W-23P



Dissolved oxygen sensor (replaceable)

Depth sensor

Ion sensors (replaceable)

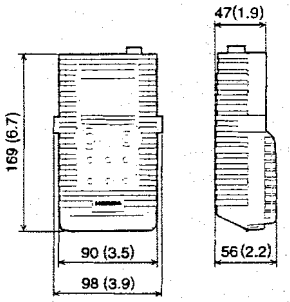
pH/ORP sensor (replaceable)

Conductivity/temperature/turbidity sensors

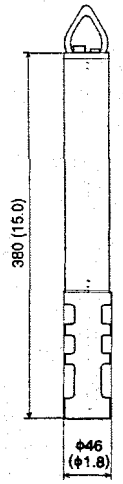
■External dimensions unit: mm (in)

The weight of the U-22 SET is approximately 1985g with 10m cable

W-2000 Control unit

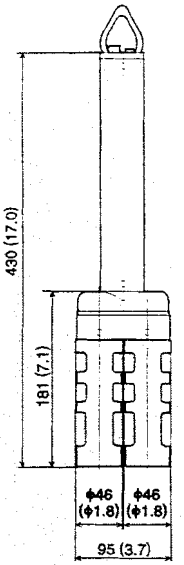


W-22P



Weight: appmx 900 g

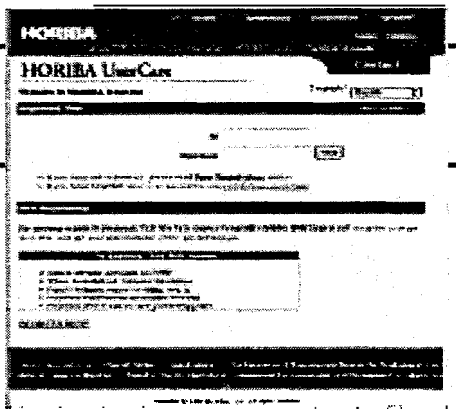
W-23P



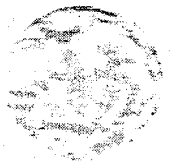
Weight: approx 1100 g

Customer Registration System

Register as a Horiba meter user to receive periodical information such as FAQ, Software upgrade, Technical documents and lot others.



Horiba continues contributing to the preservation of the global environment through analysis and measuring technology.



⚠ Please read the operation manual before using this product to assure safe and proper handling of the product.

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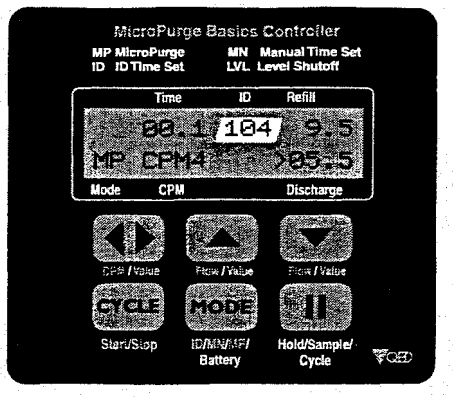
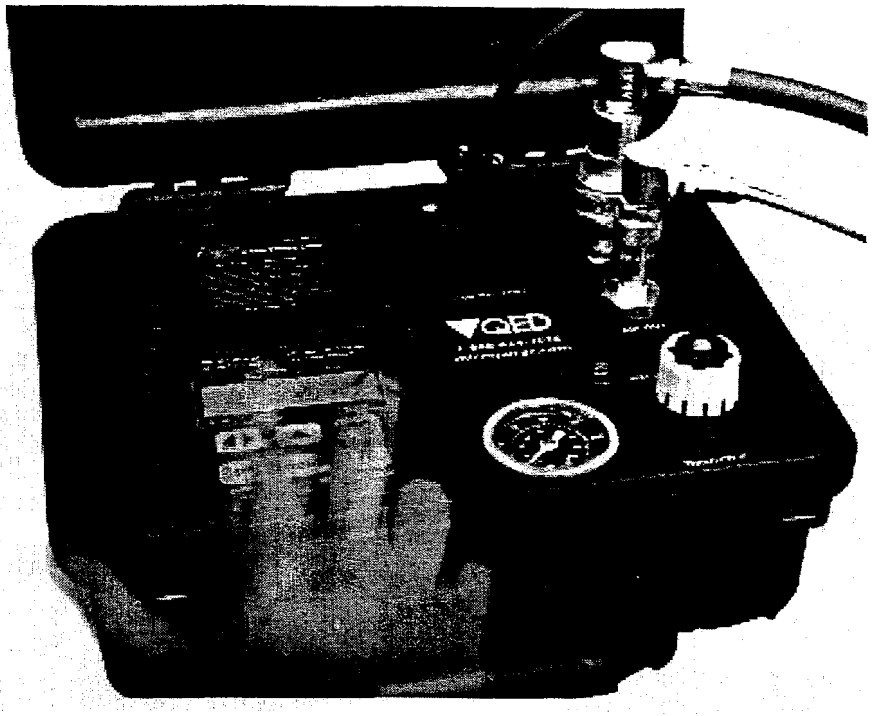
Printed in Japan ZH-S(SK)63

MP 10 Digital Controller

PATENT PENDING



Simple arrow key control of low-flow rates makes purge rate adjustment easy.



Expert flow and drawdown control for low-volume purging

The MicroPurge basics™ MP10 Controller revolutionizes low-flow sampling with advanced logic control of purge flow and well drawdown. Simple up-down arrow keys increase and decrease purge flow, driving a microprocessor to re-create expert techniques for low-flow adjustment. Then, optimized settings are identified for recall in the next round of sampling.

The MP10 also offers an easy way to prevent excessive monitoring well drawdown during purging, by linking to the optional MP30 Drawdown/Water Level Meter.

The lightweight, compact MPlO sets the pace for a new generation of genuine MicroPurge basics equipment, first in control and power for low-flow sampling.

Simple, stable, repeatable flow rate setting

The MPlO controls the most advanced low-flow sampling sys-

MicroPurge® basics™ MP10 Controller Advantages

- Exclusive MicroPurge control mode uses simple arrow keys to adjust low-flow rates easily and repeatably, using a microprocessor to re-create the flow adjustment strategies used by experienced samplers.
- Connection port allows linking to optional MP30 Drawdown/Water Level Meter, which signals MP10 Controller to enter standby mode if drawdown limit is exceeded.
- Multi-mode digital control includes MicroPurge Mode, ID Mode for repeat events, and manual control.
- Weatherproof controls are housed in a rugged, compact (10-3/4" x 9-3/4" x 5") case.
- Full digital display of all setting and status information.

MICROPURGE CONTROLLER SPECIFICATIONS

SYSTEM SPECIFICATIONS:	
Model No.:	MP10
Dimensions:	10-3/4"x9-3/4"x5" (27x25x13 cm)
Weight:	5.5 lbs (2.5 kg)
Case Material:	Structural Resin
Keypad:	6 Keys
Display:	2 Line, 16 Character / LCD Display
Power:	3 "AA" batteries
Battery Life:	50,000 Cycles @ 70°F (21°C)
Max. Pressure:	120 PSI (827.5 kPa)
Max. Pump Depth:	250 Feet (76 m)
Operating Temperature:	-20 - 150°F (-29 - 66°C)
Connection to MP30 Drawdown Meter	Heavy-duty cable (supplied with MP30)

tem ever made. You will purge and sample quickly and easily, with precise, steady low-flow pumping rates from one sampling event to the next. QED's new basics equipment incorporates the advantages of downsized equipment, which is lighter and more portable, reduces equipment cost and increases sampling crew productivity. Simplified, sealed electronics complete a design that delivers famous QED durability and value.

MicroPurge basics controllers can be connected to the MP30 Drawdown Meter for optional Automatic Drawdown Control, an industry first.

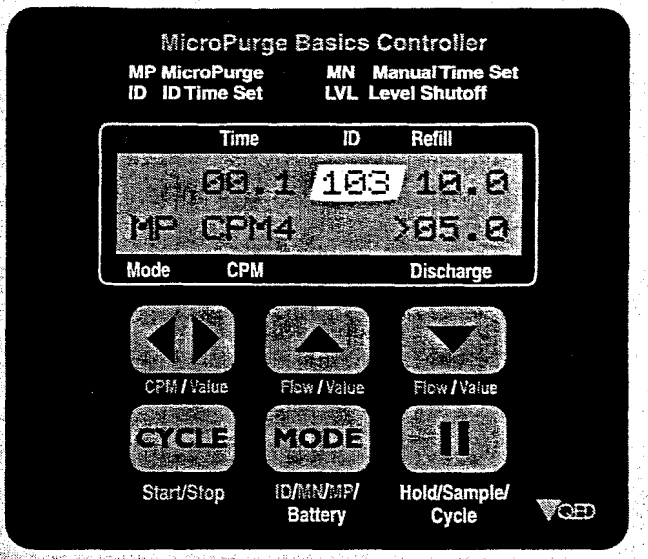
Multi-mode digital control

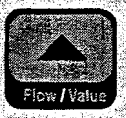
The MP10 gives you three easy-to-use operating modes, to cover every sampling protocol and situation.

- **MicroPurge** (MP) Mode optimizes control settings to reach the desired pump flow rate; you don't calculate pump cycles, refill or discharge times.
- ID Mode recalls previously optimized settings for each well, providing consistent performance every time.
- User Set (MN) Mode provides manual pump control for extreme depths and other special cases.

Can be used with any bladder pump system with the use of simple adapters

How It Works





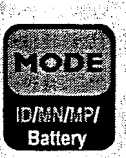
Pressing the UP Arrow increases pump flow in controlled steps.

The DOWN Arrow Key decreases the flow rate in controlled steps.

The LEFT/ RIGHT Arrow Key adjusts Cycles Per Minute (CPM) of your pump.

The ID Number changes when an UP or DOWN Arrow is pressed. In ID Mode, this number recalls settings for future sampling.

The CYCLE Key Starts and Stops pump cycling.



The MODE Key changes modes from default MP (MicroPurge) to ID Mode to MN (User Set) Mode. This key also allows battery check.

Pressing the PAUSE Key puts the controller in HOLD Mode, stopping flow. A second press allows push button controlled vial filling. A third press returns system to normal cycling.

MicroPurge Mode Quick Guide

1. Opening cover turns power ON. (Close to turn OFF)
2. Select desired Cycles Per Minute (CPM) with the ◀▶ key (default value is 4 CPM).
3. Turn throttle to set depth on gauge to 10 - 20 feet deeper than the pump location in the well.
4. Press CYCLE to START pumping.
5. When water discharge begins, adjust throttle until a slow, steady flowstream is achieved.
6. Press ▲▼ keys to set the desired purge flow rate.
7. To collect samples, continue purge flow, or use ⏸ key to directly control sample flow and pause.

Pine Environmental Services, Inc.

QED Compressor 12V, Model 3020

Electric 12 VDC Compressor - lightweight, low-output air source

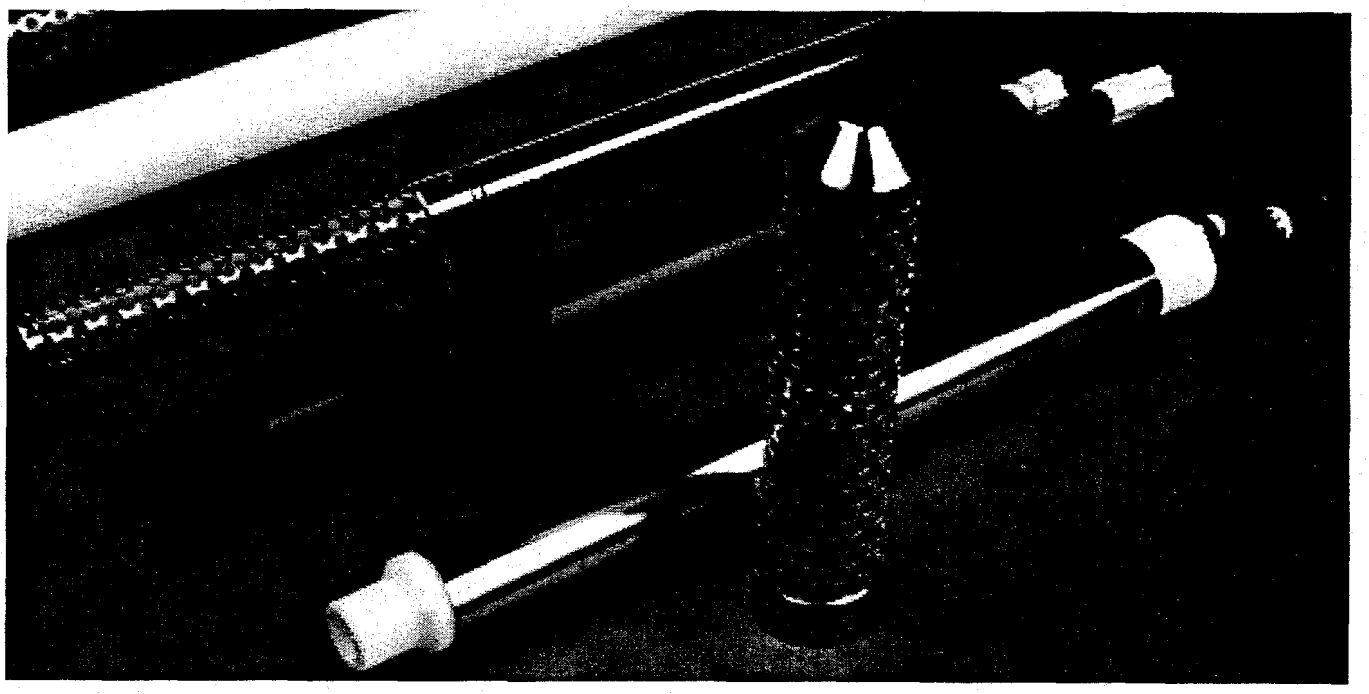
Oil-less electric compressor
The 3020 Compressor is a useful option for low-flow sampling of wells at depths to 100 feet. It runs on a 12 volt DC electrical supply, and can be connected to your vehicle's battery with the supplied cables, or driven by a separate power source.

At just 15x11x6-1/2" and 15 pounds, it offers an extremely convenient, portable pneumatic power choice for many sampling systems.

Electric Compressor Specifications:

- **Model No.** 3020
- **Dimensions** 15 x 11 x 6.5" (38x28x17 cm)
- **Weight** 15 lbs (7 kg)
- **Power Supply** 12 VDC (battery cable)
- **Max. Pressure** 100 PSI (6,895 kPa)
- **Rec. Max. Lift** 100 Feet (30 m)
- **Output** 0.21 SCFM @ 100 psi (0.357 m3/h @ 6,895 kPa)

Well Wizard® Bladder Pumps: The Low-Flow Sampling standard



The leaders since 1982 in dedicated pump technology, performance, and support.

The heart of every low-flow ground water monitoring system is the sampling device. For the system to do its job properly, the sampling device must:

- run reliably even at low rates (100 ml/min or less) over a wide range of conditions;
- operate gently without increasing turbidity or altering samples;
- deliver reliable performance for many years without needing frequent repairs or maintenance.

For nearly 20 years, Well Wizard pumps from QED have been doing all this... at more sites... for more users... then any other system.

The most complete low-flow pump selection

MicroPurge system pumps come in an unsurpassed range of sizes, materials, and capabilities, including models for deep wells, narrow or obstructed casings, and small-volume pumps for low-yield wells. Together with MicroPurge controllers, flow cells, and accessories, they create the most reliable, cost-effective low-flow system available.

Field proven pump designs and exclusive, high performance PTFE bladder formulation offer the reliability critical to long-term monitoring. QED was first in the industry with a standard 10-year sampling pump warranty.

Unmatched regulatory and user acceptance

Bladder pumps, EPA-accepted for low-flow sampling, have been shown to deliver superior sample accuracy and precision in dozens of independent studies. Nearly 70,000 Well Wizard bladder pumps are in use — more than all other brands and types of dedicated around water samplers combined.

Well Wizard®
Bladder Pump Advantages

- **EPA-accepted low-flow sampling accuracy.**
- **Models for every well — low yield, short water column, depths to 1,000 feet, casing I.D. down to 1.25".**
- **Proven reliability since 1982, with the industry's first standard 10-year warranty.**
- **Exclusive PTFE bladder formulation rated for years more flex life than other bladder materials.**
- **Rental program available.**

How They Work

Well Wizard Bladder Pumps

Designed for superior low-flow sampling performance

Pneumatic bladder pumps operate with a unique, gentle action ideal for low-flow sampling. Timed on/off cycles of compressed air alternately squeeze the flexible bladder to displace water out of the pump, and release it to allow the pump to refill by submergence, without creating any disturbance that could affect sample chemistry. Bladder pumps run easily at low rates for extended times, without the problems of other devices.

- No overheating of high-speed electric pump motors, which can alter samples and ruin the pumps.
- No churning action, like that of bailers or inertial-lift samplers that increase turbidity.
- No suction to cause degassing of dissolved volatile contaminants.

The bladder prevents contact between the pump drive air and the sample, and the downwell equipment is permanently dedicated to each well, so both samples and the well are protected from disturbance or the danger of cross-well contamination.

The easiest system to order and use

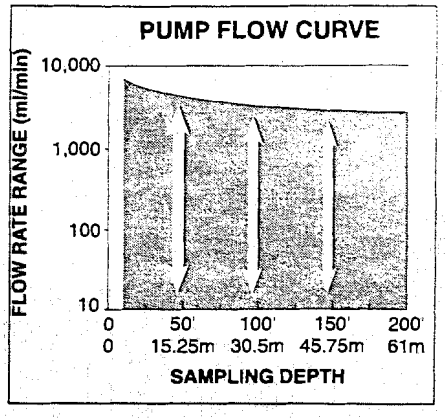
Well Wizard Bladder Pumps are part of the complete low-flow MicroPurge sampling system engineered for easy installation and use. QED application specialists will help specify the most effective, economical pumps and accessories for your site.

Each pump is cleaned and laboratory-certified to be free of volatile organic compounds, acid extractable and base neutral contaminants. Your system is preassembled, with tubing cut to length, ready to install.

If desired, installation by OSHA-certified field technicians is available. QED customer support — with trained local representatives, 24-hour toll-free hotline, and next-day loaners or service turnaround when needed — backs you with unmatched expertise and service.

More MicroPurge dedicated sampling systems and pumps have been chosen since 1982 than all other manufacturers' equipment combined.

To find out why, call QED today for a Low-Flow Data Sheet and site-specific cost analysis.



This graph shows the extremely wide range of precisely controlled flow rates available from Well Wizard Bladder Pumps and MicroPurge basics™ controllers. Consult QED for flow rates at greater depths or other special applications.

Added System Benefits

Well Wizard pumps will provide the most precise low-flow purging and sampling when operated by a MicroPurge basics™ Model MP10 Controller, with purge water monitoring via the MicroPurge basics™ MP20 Flow Cell.

MICROPURGE PUMP SPECIFICATIONS

Model No.	Pump Materials	Length	O.D.	Fitting Material	*Tubing Size	Volume (ml)	Max. Lift
T1100M	Teflon	3.3' (1.0 m)	1.66" (4.2 cm)	Teflon	1/4 & 3/8" (6 & 9 mm)	395	250' (75m)
P1101M	PVC	3.4' (1.04 m)	1.66" (4.2 cm)	Poly'propylene	1/4 & 3/8" (6 & 9 mm)	395	300' (90m)
P1101HM	PVC	3.3' (1.0 m)	1.66" (4.2 cm)	Stainless Steel	1/4 & 3/8" (6 & 9 mm)	395	600' (180m)
ST1101PM	316 Stainless Steel	3.4' (1.04 m)	1.66" (4.2 cm)	Stainless Steel	1/4 & 3/8" (6 & 9 mm)	395	1,000' (305m)
T1200M	316 S.S. and Teflon	3.4' (1.04 m)	1.50" (3.8 cm)	Stainless Steel	1/4 & 3/8" (6 & 9 mm)	495	300' (90m)
T1250	316 Stainless Steel	1.25' (0.38 m)	1.50" (3.8 cm)	Stainless Steel	1/4 & 1/4" (6 & 6 mm)	100	300' (90m)
P1150	PVC, Teflon	1.63' (0.5 m)	1.66" (4.2 cm)	Polypropylene	1/4 & 1/4" (6 & 6 mm)	130	300' (90m)
T1300	316 S.S. and Teflon	3.8' (1.16 m)	1.00" (2.5 cm)	Stainless Steel	1/4 & 3/8" (6 & 9 mm)	220	300' (90m)

* To choose 1/2" (13 mm) rather than 3/8" (9 mm) discharge tube oqtion, delete suffix M from pump model number.

INTAKE SCREEN SPECIFICATIONS

Model No.	Material	Screen Size	Fits Pump Model(s)
35200	Stainless Steel	0.01" (0.25 mm) mesh	T1200, T1250
37789	PVC	.010" (0.25 mm) slot	P1101, P1101H
37727	PVC	.010" (0.25 mrn) slot	P1250 (also P1101, P1101H)
37733	Teflon	.010" (0.25 mm) slot	T1100

Note: Pump models ST1101P, T1300 include intake screens. Screens are optional on other pump models, but are required for full 10-year warranty coverage.

MATERIALS SPECIFICATIONS

Stainless Steel:	Type 316 electropolished
PVC:	NSF-grade, extruded specifically for QED with no markings or lubricants.
Teflon (pumps):	duPont Teflon® and other premium PTFE resins
Teflon (bladders):	Q-flex exclusive 200,000 cycle rated PTFE.

Teflon is a registered duPont trademark.

MiniRAE PLUS Classic

PID Monitor

Rugged, reliable, and operates on durable lead-acid batteries to provide up to 10 hours of continuous operation.

The MiniRAE was the world's first hand-held, portable Photo-Ionization Detector (PID). It has proved itself rugged and reliable, withstanding environments beyond its original design specifications. The MiniRAE PLUS Classic is the newest improved and simplified version of the MiniRAE VOC monitor. Durable lead-acid batteries still provide continuous monitoring for up to ten hours of continuous operation. Improvements include better linearity, increased range from 0.1 - 4000 ppm, easier lamp and sensor access, faster pump, and better leak-tightness, all at a lower cost.

Key Features

- Lower Cost
- Lightweight and Compact
  - 18 ounces with batteries
- Dependable and Accurate
  - Rugged design, microprocessor control
- User Friendly
  - Menu driven, intuitive end-user operation
  - Large easy-to-read back-light display
  - Simple calibration instructions
- Functional Performance
  - Extended range of 0.1 to 4,000 ppm
- Mechanical Quality
  - Airtight gas inlet probe and sensor
  - Easier lamp and sensor access
  - Easy-to-replace metal filter

Applications

- Confined Space Entry
  - Shipyard and maritime
  - Land-fill operations
  - Trenches, silos, railcars
- Waste water treatment plants
- Refineries and petrochemical plants including offshore drilling and plant shut-downs
- Power plants
- Pulp and paper
- Steel mills
- Environmental clean-up
- Hazardous waste spills
- Chemical process control and leak detection

RAE Systems **Inc.**
1339 Moffett Park Drive • Sunnyvale, California **94089** USA
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Email RaeSales@raesystems.com• www raesystems.com

AL001 Rev 1-10/00

RAE SYSTEMS

Detector Specifications

	UL, and c-UL, Classified as to Intrinsic Safety for use in Class 1, Division I, Groups A, B, C and D (US & Canada), EEx ia IIC T4 (Europe)
	7.1"L X 2.7"W X 1.8"H (18.0 cm X 6.9 cm X 4.6 cm)
	18 ounces with battery (0.5 kg)
	Photo-ionization sensor with interchangeable 9.8 eV, 10.6 eV or 11.7 eV lamps
	10 hours of continuous operation
	Two rechargeable 6V, 500 mAh sealed lead-acid. Field replaceable.
	Diaphragm pump with >500 ml/min. intake flow rate
	6" flexible, 5/32" diameter tube
	5/32" diameter barb fitting
	Wrist strap
	7 digit LCD with LED back light
	0 V to 2.5 V
	0.0 - 99.9 ppm 0.1 ppm +/- 2ppm or +/-10% 100 - 999 ppm 1 ppm +/- 10% 1000 - 4000 ppm 1 ppm +/- 20%
	<5 seconds to reach 90% of exposed concentration
	2 operation keys, 2 programming keys and ON/OFF key
	Low and high alarm limits in the Survey Mode
	90 dB buzzer and flashing red LED to indicate exceeded preset limits, low battery, or lamp failure
	Two-point field calibration for zero and span gases
	0°C to 40°C (32°F to 104°F)
	0% to 95% relative humidity (non-condensing)

Ordering Information

MiniRAE PLUS Classic (PGM-76)

Basic Kit 76:

- MiniRAE PLUS Classic unit with 10.6 eV PID detector and rechargeable battery pack
- Leather carrying case
- 6" Inlet probe
- Operation & Maintenance Manual

Accessories:

- Spare rechargeable battery pack
- Remote access probe
- Calibration kit: 34 liter calibration gas bottle, calibration adapter with Teflon tubing and Tedlar bag
- 9.8 eV and 11.7 eV lamps for VOC monitor
- Replacement filters and O-rings
- Tool kit

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MiniRAE PLUS Classic

MultiRAE PLUS

One-to-Five Gas Monitor with VOC Detection

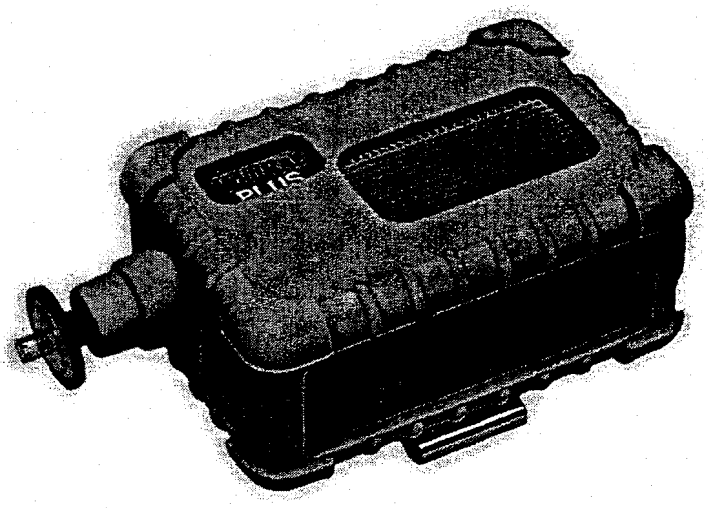
The MultiRAE PLUS is an extremely flexible one-to-five sensor instrument for use in confined space, emergency response, industrial hygiene, and many other monitoring applications. The MultiRAE is the only instrument available on the market today that can offer protection using both standard gas detection sensors for the detection of oxygen, combustible gas, and specific toxic gases, as well as an integrated Photo-Ionization Detector (PID) for the ultimate in broad-range toxic gas detection. The MultiRAE's versatility allows it to replace a wide range of monitors, saving training and maintenance costs. The MultiRAE is quickly and easily changed from a sophisticated technician instrument to a simple text or display only monitor. The same monitor can be used as a personal monitor, a hand-held sniffer, or as a continuous operational area monitor.

Advanced Features

- Rugged weather-proof composite case
- Visual alarm with flashing LED
- Automatic liquid trap protection for pump
- Any two plug-in "smart" toxic sensors: CO, H_2S, SO_2, NO, NO_2, Cl_2, HCN, NH_3, PH_3
- Programmable alarms can be changed on the MultiRAE or from easy-to-use Windows 3.1, 95, 98 and NT software
- Sample-draw over 100 feet (30m) horizontally and vertically
- Diffusion grill protected by Gortex™ moisture membrane
- Large digital display
- Loud audible alarm with varying tones for different alarm conditions and an optional remote vibration alarm for noisy areas
- Runs on alkalines, Ni-Cd batteries or continuously when plugged into charger or 12V automotive adapter
- Available as diffusion unit or with internal, sample-draw pump
- Deep-discharge battery option
- Easy one-button calibration with auto-zero capability

Applications

- Confined Space Entry
  - Waste water treatment plants
  - Shipyard and maritime confined spaces
  - Land-fill operations
  - Trenches, silos, railcars
  - Sewers and manholes
- Refineries and petrochemical plants, including offshore drilling and plant shut-downs
- Power plants
- Pulp and paper industry
- Steel mills
- Soil, well, and water head-space analysis
- Aviation / wing tank entry



RAE Systems Inc.
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ISO 9001 CERTIFIED

AL001 Rev 1-10/00

Specifications

Sensor Specifications

Gas Monitor	Range	Resolution	Response Time (t_{90})
Oxygen	0 ~ 30%	0.1%	15 seconds
Combustible gas	0 - 100% LEL	1%	15 seconds
VOCs	0 - 200 pprn	0 1 ppm	10 seconds
	200 - 2000 pprn	1 pprn	10 seconds
Carbon Monoxide	0 - 500 ppm	1 ppm	20 seconds
Hydrogen Sulfide	0 - 100 ppm	1 ppm	30 seconds
Sulfur Dioxide	0 - 20 ppm	0 1 ppm	15 seconds
Nitric Oxide	0 - 250 pprn	1 ppm	20 seconds
Nitrogen Dioxide	0 - 20 ppm	0 1 ppm	25 seconds
Chlorine	0 - 10 pprn	0 1 ppm	60 seconds
Hydrogen Cyanide	0 - 100 pprn	1 ppm	60 seconds
Ammonia	0 - 50 ppm	1 ppm	150 seconds
Phosphine	0 - 5 ppm	0.1 pprn	60 seconds

Detector Specifications

4.65"L x 3.0"W x 1.9"H (11.8 cm x 7.6 cm x 4.8 cm)
16 oz with battery (454 g)
Protected catalytic bead for combustible gases Interchangeable electrochemical sensors for oxygen and toxic gases Photo-ionization detector for VOCs, 10.6 eV lamp standard
Rechargeable, 4.8 V, 1.4 Ah, Ni-Cd battery pack 4 AA alkaline battery adapter Field replaceable Smart battery charger: Up to 10 hours through built-in or external charger. Includes deep discharge option.
10 hours continuous Unit will run and charge simultaneously
2 line, 16 digit LCD with LED back light automatically in dim light or alarm condition
1 operation key and 2 programming keys
Wrist strap and high visibility rubber boot
Instantaneous (up to 5) values: Oxygen as percentage by volume Combustible gas as percentage of lower explosion limit (LEL) Toxic gases and VOCs as parts per million by volume High and low values for all gases STEL and TWA values of toxic gases and VOCs Battery and shut down voltage Date, time, elasped time, temperature LEL/VOC scale (using correction factors)
UL, cUL Class 1, Division I, Group A, B, C, D EEx ia IIC T4
90 dB buzzer and flashing red LED to indicate exceeded preset limits High - 3 beeps and flashes per second Low - 2 beeps and flashes per second STEL and TWA - 1 beep and flash per second Alarms latching with manual override or automatic reset Additional diagnostic alarm and display message for low battery and pump stall
Two point field calibration for zero and span gas
20,000 points (64 hours, 5 channels at one minute intervals) download to PC with serial number of unit, user ID, site number, calibration date
1 - 3600 seconds, programmable
Internal pump, flow rate 150 cc/min.
-4° to 113° F (-20° to 45°C)
0% to 95% relative humidity (non-condensing)

MultiRAE PLUS Accessories

Monitor only includes

- Monitor as specified
- Sensors as specified
- Shipping Case
- Carbon filters (for units *with* CO)
- Calibration adapter
- Quick reference guide
- Operation video (as specified)
- Operation and maintenance manual
- Rubber boot with belt-clip
- Alkaline battery adapter
- Rechargeable units additionally include:
  - — Nickel-Cadium (Ni-Cd) battery
  - — 120 V AC/DC Wall Adapter (if specified)
- Pumped units additionally include:
  - — 10 Water trap filters
  - — Inlet probe 3"
  - — Water trap adapter

Monitor with Accessories Kit also includes:

- Hard transport case with pre-cut foam
- 15' (5 m) Teflon"tubing
- Constant flow hand pump (for diffusion models)
- Lamp Cleaning Kit

Optional Calibration Kit also include:

- Four-gas mix in a 34L cylinder; (50% LEL, 20.9% O_2, *25 ppm* Hydrogen Sulfide, 50 *ppm* Carbon Monoxide)
- Calibration regulator (male) and tubing
- Isobutylene gas in a 34L cyclinder;
- Calibration regulator (female) and tubing

Datalogging **Monitors** also include:

- Software, ProRAE Suite Package for Windows$_T$" 95, 98 & NT
- Computer Interface cable

Warranty: Lifetime on non-consuming components (per RAE Standard Warranty), 2 years for O_2, LEL, CO and H_2S sensors, 1 year all other sensors, 1 year pump, 1 year battery, 1 year for 10.6 eV PID lamp

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MultiRAE PLUS

Specifications

Concentration measurement range (auto-ranging):[1]
0.0001 to 400 mg/m³

Precision/repeatability (2-sigma):[2,3]
± 1% of reading or ±0.001 mg/m³, whichever is greater (1-second averaging)
± 0.3% of reading or ± 0.0003 mg/m³, whichever is greater (10-second averaging)

Accuracy:[1]
± 2% of reading ± precision

Resolution:
0.1% of reading or 0.0001 mg/m³, whichever is greater

Scattering coefficient range:
10⁻⁷ to 0.4 m⁻¹ (resolution: 3 significant digits, maximum)

Visual range (@ λ=550 nm):
0.001 to 337 km (resolution: 3 significant digits, maximum)

Ångström coefficient measurement range:
0.0 to 4.0

Particle sizing range (log-normal, σ_g = 2.0, m = 1.59):
0.05 to 10 µm

Particle size range of maximum response (concentration measurements):
0.08 to 10 µm

Temperature measurement range:
-15° to 60°C (accuracy: 0.05°C)

Relative humidity measurement range (@ 25°C):
0 to 100% (accuracy: 2%, noncondensing)

Sampling flow rate range:[4]
1.0 to 3.0 liters/minute
(accuracy: 0.05 liters/minute, adjustability: 0.1 liters/minute)

Measurement/display integration time range:[4]
1 to 60 seconds (selectable in 1-second steps)

Measurement/display update frequency:
1 per second

HEPA filter cartridge replacement frequency (typical):
Less than 1 per 5 years (@ < 1 mg/m³)

Alarm level range:[4]
Selectable over entire measurement range

Data logging averaging periods:[4]
1 second to 24 hours (selectable in 1-second increments)

Data logging memory capacity:
50,000 data points in up to 99 tags (data groups)

Programmable zeroing periods:[4]
1 to 168 hours (selectable in 1 hour increments;
if enabled, logging period must be more than 10 minutes)

Elapsed time readout range:
1 second to 100,000 hours (over 11 years),
in seconds, minutes, and hours

DR4 2.5M/5M/75M/10M 9/00 Printed in USA

Digital communications:
RS232/RS485: full duplex, 4800 baud, software-controlled, device-filtered

Computer requirements:
IBM-compatible PC, 486 or higher; Windows™ 95 or higher; 8 MB memory or more

Analog outputs:[4]
0 to 5 V and 4 to 20 mA, with selectable full scale ranges between 0.1 and 400 mg/m³

Power:
- Internal battery: rechargeable, sealed lead-acid, 6.5 Ahr, 6 V, 20-hour run time between charges (typical)
- AC line: universal voltage charger/power supply (included), 100-250 V, 50-60 Hz (CE marked)
- Optional solar power system (Model DR-SOL)

Alarm outputs:
- Alarm switch: 30 V (off, open), 2.5 A (on, closed)
- Alarm signal: 0 V (off), 5 V (on) (1 mA maximum load current)
- Audio alarm (back panel): More than 65 dB @ 1 m

Operating environment:
-10° to 50°C (14° to 122°F); 10 to 95% RH, noncondensing

Storage environment:
-20° to 70°C (-4° to 158°F)

Dimensions:
134 mm (5.28 in) H x 184 mm (7.25 in) W x 346 mm (13.63 in) D

Weight:
5.3 kg (11.7 lbs)

Safety approvals and certifications:
The DataRAM 4 complies with US FCC rules (Part 15) and has received CE certification.

Standard accessories included:
- Universal voltage battery charger/power supply
- Standard HEPA filter cartridge
- Analytical filter holder
- PC communications software disk
- Digital output cable
- Carrying case and instruction manual

[1] Referred to gravimetric reference calibration (NIST traceable) with SAE Fine test dust (mmd = 2 to 3 µm, σ_g = 2.5, as aerosolized)
[2] At 25°C
[3] For single-wavelength concentration sensing
[4] User selectable

MIE

Monitoring Instruments for the Environment, Inc.
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Toll-Free: 1-888-643-4968 ■ TEL: (781) 275-1919
FAX: (781) 275-2121 ■ www.mieinc.com

MODEL DR-4000
Dual Wavelength Nephelometer

Ambient Air Monitoring

$PM_{2.5}$ Monitoring

Remediation Site Perimeter Monitoring/Alarming

Real-Time Fine Particle Size Determination

Indoor Air Quality Monitoring

Workplace and Plant Monitoring

Source Monitoring

Atmospheric Scattering and Visibility Monitoring

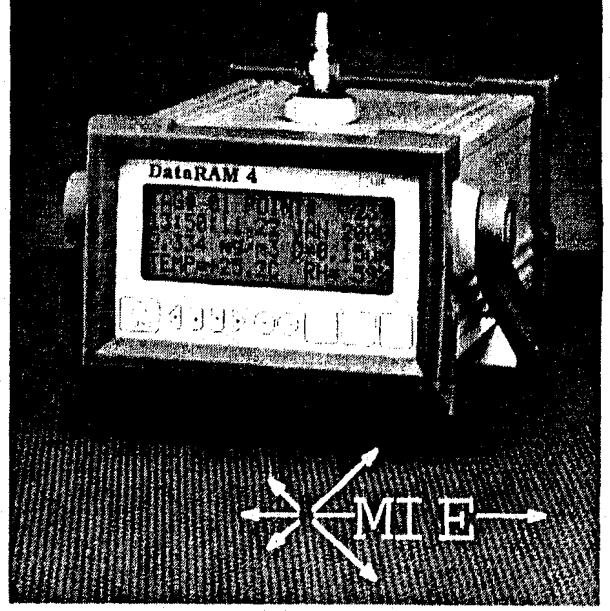
Measurement of Ångström Coefficient

Mobile Monitoring

Toxicology and Aerosol Research

DataRAM 4™

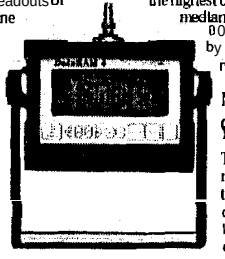
Portable Particle Sizing Aerosol Monitor/Data Logger



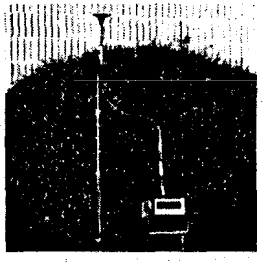
Real-Time Particulate Monitoring and Particle Size Selective Measurements

Measures Airborne Particulate Concentrations and Size in Real-Time

The DataRAM 4™ provides direct and continuously updated readouts of concentrations of airborne dust, smoke, mist, and fumes as well as the median particle size. In addition, both air temperature and humidity are displayed. All data can be logged in the integral, large-capacity, non volatile memory. Up to 50000 data blocks can be stored in up to 99 tagged groups.



An on board audible alarm as well as switched and active alarm outputs are triggered whenever concentrations exceed a user-selected level.



With appropriate aerodynamic particle discriminators, the DataRAM 4 provides measurements correlated with PM_{10}, $PM_{2.5}$, $PM_{1.0}$, and respirable fractions.

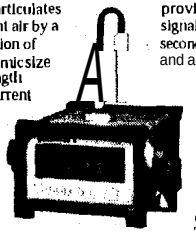
Determines Particle Median Size Regardless of Concentration

DataRAM 4's patented two-wavelength particle detection system provides the volume median particle diameter of the sampled aerosol, over the remarkably wide concentration range of 1 microgram per cubic meter to 400 milligrams per cubic meter.

Unlike typical particle counting devices, the DataRAM 4 is totally immune to particle coincidence errors, even at the highest concentrations. Volume median particle sizes down to 0.05 µm can be measured by this unique spectral nephelometric technique.

Monitors Mass Concentrations of Fine Particulates ($PM_{2.5}$)

The DataRAM 4 monitors in real-time the concentrations of fine particulates in ambient air by a combination of aerodynamic size preselection, two wavelength nephelometry, and concurrent sensing/correction for relative humidity. This patented technique provides a continuous measurement of $PM_{2.5}$ independent of particle size and moisture, without altering the sample stream (i.e., without heating, diffusion drying, denuding, etc.)



DataRAM 4 with Cyclone Precollector for respirable particle measurements

Measures Scattering and Ångström Coefficients, and Visual Range

In addition to measuring the mass concentration of airborne particulates, the DataRAM 4 measures the scattering coefficient at two wavelengths (in units of inverse megameters) and computes the coefficient at the relerence wavelength of 550 nanometers, as well as the Angstrom exponent (a measure of atmospheric fine particle she) Based on the 550 nni scattering coefficient, the instrument then calculates the visual range (in kilometers)

Complete Digital Communications

The DataRAM 4 has both RS232 and RS485 data ports lor two-way digital communications with personal computers

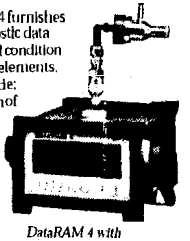
Special software (Windows™ compatible) provided with the instrument allows data transfer either in real time or from the DataRAM 4's logging memory for tabular and/or graphic computer presentation. All operational and programming functions of the DataRAM 4 can be controlled from a remote location through the RS485 communications port. Sampling start and stop as well as data transfer can be controlled via modem or other digital transmission paths.

Analog Signal and Alarm Outputs

For added versatility, the DataRAM 4 provides two separate analog signal outputs, updated every second: a voltage output (0-5 V) and a current output (4-20 mA), both programmable over the instrument's full measurement range. Two alarm outputs (and an audible horn) are also included: voltage step (0 to 30 VDC) and switching output (2.5 A maximum). The alarm level is also user programmable over the entire measurement range of the instrument.

Detailed Diagnostic Information

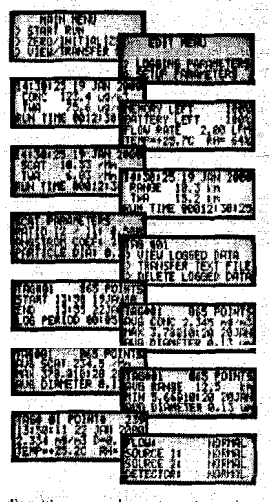
The DataRAM 4 furnishes complete diagnostic data on the functional condition of all its critical elements. Examples include: condition of each of the two sensing sources, optical background level, scattering detector condition, sampling air flow control, internal battery charge status, charging current, etc. Any deviation from normal conditions is flagged on screen.



DataRAM 4 with Metal Cyclone for particle size separation

Self-Purging, Automatic Zeroing, and Clean Air Protection of Optics

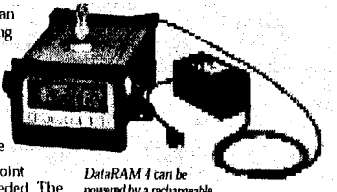
The DataRAM 4's field proven flow configuration includes a large-capacity HEPA filter cartridge directly down stream of the photometric sensing stage. Typically replaced every two years, this filter provides particle-free air that is partially recirculated over all critical optical surfaces to ensure their cleanliness.



For either manual or automatic zeroing, an electronically controlled solenoid valve diverts the entire filtered air stream through the optical sensing chamber to achieve zero air without the need for an external filter.

Self-Calibrating Internal Filter

A 37 mm membrane filter (for which a special holder/adapter is provided) can be used in place of the zeroing HEPA filter cartridge for gravimetric calibration and/or chemical analysis of collected particulates. The DataRAM 4 can be easily calibrated by readjusting the calibration constant to agree with gravimetric measurements obtained from the on board filter. Because the photometric response of the instrument is exactly linear over its entire operating range, only single point gravimetric calibration is needed. The second point of the straight response line is the zero concentration obtained by self purging.



DataRAM 4 can be powered by a rechargeable internal battery or an external power source

Large Character Screen, Menu Driven Displays, and Scrolling of Logged Data

A large (48 cm² active area) LCD screen with 4 lines of alphanumeric text provides highly visible readouts. The screen has automatic backlighting whenever the DataRAM 4 is powered from the AC line current (through its power supply/charger). The instrument provides users with a variety of self explanatory informational screens. The main measurement ween, lor example, displays real time and date, mass concentration, time averaged concentration from the start of the run, and elapsed run time. Logged data can ire displayed/scrolled during or after a measurement run and transferred to a PC.

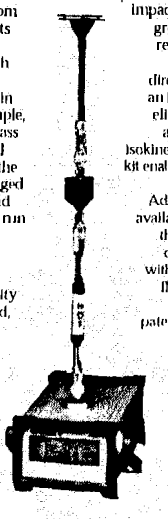
Several Power Options

The DataRAM 4's large-capacity rechargeable battery (long-lived, "memory"-free) provides noninterruptible power to the unit. A charger/power supply is provided for continuous long term operation. For portable monitoring, the instrument is designed to run without external power for 20 hours. An optional solar power system is available for remote installations.

Expandable To A Complete Particulates Characterization System

Available accessories extend the capabilities of the DataRAM 4 lor a wide range of monitoring/particle sizing applications. Aerodynamic particle size separators (cyclones and jet to plate impactors) measure specific size groups such as the thoracic, respirable, PM_{10}, $PM_{2.5}$ and $PM_{1.0}$ fractions. An omni directional sampling inlet and an in line heater (for mist/fog elimination) are available for ambient air monitoring. An isokinetic sampling probe/nozzle kit enables duct/stack monitoring.

Additional accessories will be available for the DataRAM 4 in the near future, providing a complete systems capability with unparalleled performance flexibility. These accessories/capabilities will include: a patented turntable aerodynamic particle size separator for aerodynamic particle size distribution analysis, and a condensation/nucleation module for ultrafine particle monitoring.



DataRAM 4 with ambient monitoring accessories

Model 101

Water Level Meter

For measuring the depth of water in wells, boreholes, and standpipes, the Model 101 Water Level Meter is the most accurate and reliable of the Solinst meters. It is easy to operate and read to 1/100 ft. or to each millimeter.

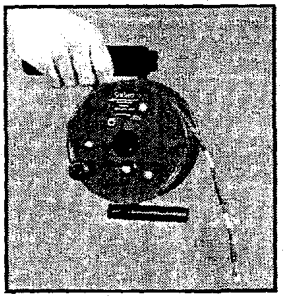
Conductivity and temperature profiling accessories are available for models fitted with a P4 probe. (See overleaf and Data Sheet 101/C4/T4 for more detail.) Also available is the less expensive Model 102 Coaxial Cable Water Level Meter for use in small diameter tubes. (Data Sheet 102.)

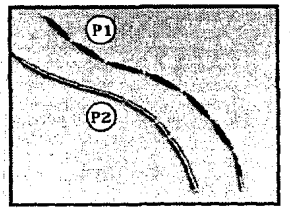
Operating Principles

The Model 101 Water Level Meter uses a choice of probe designs, attached to a permanently marked polyethylene tape, fitted on a well-balanced reel. It is powered by a standard 9 volt battery housed in an easy-access battery drawer. The conductors embedded within the tape each have seven strands of stainless steel for strength and flexibility.

The probe incorporates an insulating gap between electrodes. When contact is made with water, the circuit is completed, activating a loud buzzer and a light. The water level is then determined by taking a reading directly from the tape at the top of the well casing or borehole.

Narrow Mini 101



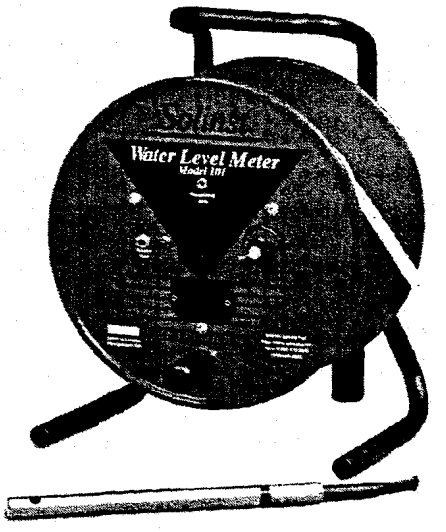


An accurate tape for use in narrow diameter applications.

The Mini 101 Water Level Meter is ideal for use in narrow diameter applications as small as 3/8" (10mm).

The narrow 1/4" (6 mm) tape is mounted on a convenient small reel that is light weight and fits easily into a backpack. The accurate, flat white tape is marked each 1/100 ft. or each mm.

The Mini 101 is available in **30** ft, **65** ft. 10m and 20m lengths with a choice of the 1/4" (6mm) P1 probe, or the heavier 3/8" (10mm) P2 probe.



Tape Specifications

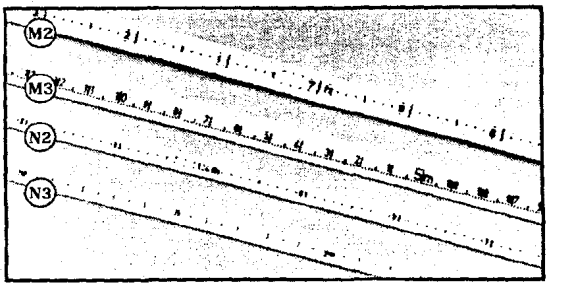
The high quality polyethylene tape reels smoothly, remains flexible and hangs straight in the well, irrespective of temperature. Permanent markings each millimeter or 1/100 ft. allow accurate readings, traceable to national standards.

Stranded stainless steel conductors resist corrosion, provide strength and are non-stretch. They make the tape very easy to repair and splice. The dog-bone design avoids adherance to wet surfaces. Markings are permanently impregnated onto one side of the tape and are available in your choice of scale or with a combination of scales.

M2 Feet and tenths: with markings every 1/100 ft.

M3 Meters and centimeters: with markings every mm.

N2 **and** N3 As below, but on the narrow 1/4" (6mm) tape for the Mini 101 Water Level Meter.



Features

Accurate
- Markings each 1/100 ft. or millimeter
- Traceable to national standards
- Sensitivity adjustable to conductivity
- Shielded probes to avoid false readings

Reliable
- Permanent, heat impregnated markings
- Non-stretch stainless steel conductors

Long Life
- Rugged, corrosion proof components
- Strong, flexible tape. is easily spliced

Printed in Canada

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Reels

Standard reels are ergonomically designed for good balance and ease of use, with a stand-alone design, convenient carrying handle and an excellent brake.

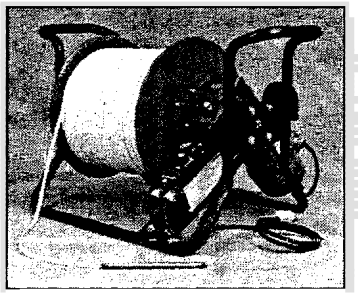
They are robust and smooth running. The battery is housed in a convenient battery drawer and each reel has a probe holder and brake. The reels are equipped with an on/off sensitivity switch, light, buzzer, and a battery test button.

The mini reel is sturdy, yet very compact and easy to carry.

Length Options

Solinst Model 101 Water Level Meters are available on reels as shown at right, in the following standard lengths:

Mini Reel	30 ft	10 m	**Medium Reel**	500 ft.	150 m
(Narrow tape)	65 ft	20 m		650 ft.	200 m
Small Reel	100 ft.	30 m		750 fi.	250 m
	150 ft	50 m		1000 ft.	300 m
	200 ft.	60 m	**Large Reel**	1250 ft.	400 m
	250 ft	80 m		1500 ft	450 m
	300 fi.	100 m		1650 ft.	500 m
	400 ft.	120 m		2000 ft.	600 m
			XL **Reel**	2500 ft.	750 m
				3000 ft.	) m



Power Reel

Tape Guide

Tape Guide/Datum

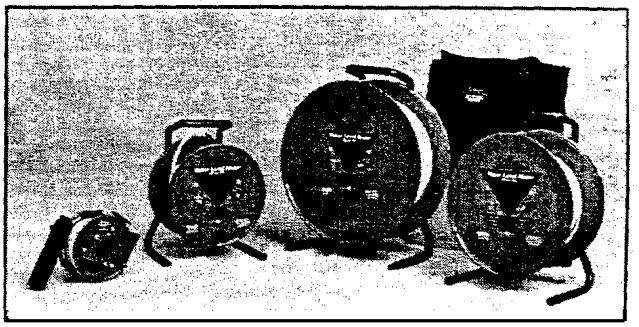
A tape guide is provided with each standard Water Level Meter. It protects the tape from damage on rough edges of well casing and ensures easy, consistent measurements. regardless of who takes the readings. It can also provide reel support on the casing, as shown above.

Other Options.

Power Reels: Power reels can be very useful to allow faster or less strenuous operation of longer lengths of tape. The 110 volt power reels are available on request.

Carrying Bag: Padded nylon carrying bags are available, as an optional extra. The sturdy design has a convenient shoulder strap, zippered front pocket, zippered top, and a grommet in the base to prevent moisture build-up.

Replacement Parts: Replacement probes, tapes with probe and other spare parts are available. Meters can also be returned directly to Solinst, or to authorized repair facilities in Canada or the U.S.A. for service or repair.



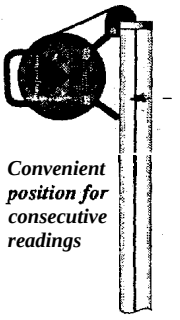
Probe Options (Standard Tape)

All probes are designed to reduce or eliminate problems with cascading water.

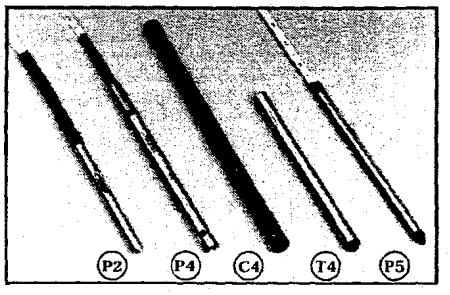
P2 **Stainless Steel:** with a neoprene strain relief.
Size: 0.5" dia. by 7.5" long (12.7 mm x 190 mm)

P4 **Environmental:** stainless steel probe® required for use of C4/T4 profiling sleeves. (See 101/C4/T4 Data Sheet). Pressure-sealed probe pulls apart for easy cleaning and decontamination and to accept C4 and T4 sleeves.
Size: 0.625" dia. by 8.625" (159 mm x 220 mm).

P5 **Submersible:** stainless steel, leak-proof probe. Simple design is easy-to-clean, hangs straight in the well, and has almost zero water displacement.
Size: 0.5" dia. by 8.625" long (12.7 mm x 220 mm).



Convenient position for consecutive readings



C4 **Conductivity Sleeve*** allows profiling of conductivity with depth. Low maintenance conductivity cell in sleeve slips over the P4 probe body. Analog readout plugs into the reel faceplate.'
Range: 0-80,000µS/cm. Depth: 1250ft. (400m)
Size: 0.75" dia. by 13.875" (19.05 mm x 353 mm).

T4 **Temperature Sleeve*** allows profiling of temperature with depth. Sleeve enclosing a thermistor slips over the P4 probe body. Readout plugs into reel. The T4 Sleeve may be used with the analog Conductivity and Temperature Readout, or the Solinst digital multimeter.*
Range: -50°C to +150°C. Depth: 1250ft. (400m)
Size: 0.625" dia. by 8.75" (15.9 mm x 222 mm).

® US Patent: 5031452 *See Data Sheet 101/C4/T4 for more information.

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