City of Johnstown

33-41 E. Main Street • Johnstown, New York 12095

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ENVIRONMENTAL RESTORATION PROGRAM
PROJECT # E 518022

Remedial Investigation/ Alternatives Analysis Work Plan

Former Karg Brothers Tannery
Johnstown, New York

January 2009

Prepared By:

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MALCOLM PIRNIE

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1. Introduction

The City of Johnstown, New York (City) has received a grant under the 1996 Clean Water/Clean Air Bond Act Environmental Restoration Program to conduct a Remedial Investigation/Alternatives Analysis (RI/AA) for the Former Karg Brothers Tannery and adjacent properties in Johnstown, New York. This site-specific Work Plan summarizes the scope of work for the RI/AA. The objectives of the investigation include:

- Assessment of the nature and extent of the environmental conditions both on and off-site.
- Evaluation of remedial options, which are protective of human health and the environment, and consider the municipality's "Contemplated Use" of the property.
- Produce data for remedial decision-making which supports the evaluation of remedial alternatives and enables the New York State Department of Environmental Conservation (NYSDEC) to prepare a Proposed Remedial Action Plan (PRAP) and Record of Decision (ROD) for the site.

Contaminants associated with tanneries (i.e. heavy metals) were detected at levels which exceeded corresponding NYSDEC TAGM (Technical and Administrative Guidance Memorandum) 4046 Cleanup Objectives in soil and to a much lesser extent, groundwater samples on the former Karg Brothers Tannery property during the previous United States Environmental Protection Agency (USEPA) Brownfields Pilot. It had been discussed by the USEPA and the City of Johnstown that no further action would be required at this site as long as the remaining concrete slabs and the soil beneath them are not disturbed while the site is being redeveloped for future use. However, the presence of heavy metals, such as arsenic, chromium, mercury, and zinc, most likely associated with the former Karg Brothers Tannery were also identified at levels exceeding the NYSDEC TAGM 4046 Cleanup Objectives in soil samples collected from off-site properties adjacent to the former Karg Brothers Tannery. The presence of these metals warrant further investigation.

Under the New York State ERP, the City proposes to install groundwater monitoring wells and to collect groundwater and soil samples at off-site properties adjacent to the facility to further delineate the extent of the tannery related compounds off-site and to assess the environmental conditions and to determine, if necessary, the most cost-effective and appropriate remediation of these properties. Additionally, in order to

maintain a greater range of site redevelopment options, on-site soil, including areas beneath the concrete slabs, will be investigated.

This Work Plan and appended Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP) including a Community Air Monitoring Plan (CAMP), and Citizen Participation Plan (CPP) will be submitted to the NYSDEC for regulatory approval. A Phase I Environmental Liability Assessment and a Pre-Demolition Asbestos Survey were conducted at the site by O'Brien & Gere in 1996 (O'Brien & Gere, 1996). The site was investigated by Weston Solutions, Inc. of Edison, New Jersey for the United States Environmental Protection Agency (USEPA) in 2001, through the USEPA Removal Action Branch (RAB) for the City of Johnstown. A draft Integrated Assessment Report was submitted to the NYSDEC in June 2002 (Weston Solutions, Inc., 2002).

2. Site Description and Background

2.1. Site Location and Description

The site, located in the north-central portion of the City of Johnstown (Figure 1), consists of the former Karg Brothers Tannery property with an area of approximately 5.3 acres, and the 10 adjacent properties shown on Figure 2 with a total land area of approximately 2.6 acres. The former Karg Brothers facility was constructed in the early 1900s and operated until its closure in 1995, at which time it treated approximately 5,000 hides each day, consisting of degreasing, pickling, beaming, tanning, and finishing of cow, deer, and sheep hides. At present, the ground cover largely consists of the remaining concrete slabs of the former buildings that were removed during the USEPA Removal Action, with remaining areas covered by gravel, asphalt, or grass (Figure 3). Adjacent parcels are either undeveloped or residential, with the exception of two former gasoline stations on either side of East Fulton Street.

2.2. Geology/Hydrogeology

Based upon regional mapping, the area of the site is largely underlain by Ordovician shale (Fisher et al., 1970). Near surface deposits at the site are largely mapped as lacustrine sand (Cadwell et al., 1988).

2.3. Previous Sampling Results

In November 2001, 36 soil samples were collected by Weston Solutions, Inc. on the former Karg Brothers Tannery property as well as on a few of the properties adjacent to the facility. Samples were analyzed for Target Compound List (TCL) organics and Target Analyte List (TAL) inorganics.

Seven of the 36 soil samples were collected on the off-site properties located immediately west and northwest of the facility. Arsenic, chromium, lead, mercury, and zinc were detected at concentrations that exceeded the 6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs) in at least one soil sample collected from at least one off-site property. All soil samples were collected within the top two feet of the ground surface. Chromium and lead were detected at concentrations greater than the corresponding Part 375 Unrestricted Use SCOs at many of the sampling locations. Phenanthrene, benzo(a)anthracene, chrysene, benzo(a)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene were all detected at concentrations that exceeded the corresponding Part

375 Unrestricted Use SCOs at one of the off-site properties. 4,4'-DDE and 4,4'-DDT were detected at concentrations that exceeded the corresponding Part 375 Unrestricted Use SCOs at one of the off-site properties.

Soil samples located on the former Karg Brothers Tannery facility contained concentrations of heavy metals associated with tannery operations in excess of Part 375 Unrestricted Use SCOs as high as 206 milligrams per kilogram (mg/kg) for arsenic, 1,290 mg/kg for chromium, and 21.7 mg/kg for mercury, and 452 mg/kg for zinc, with these high values located near the end of East Canal Street. Additionally, lead was detected in several samples at concentrations exceeding the corresponding Part 375 Unrestricted Use SCO, up to concentrations as high as 1430 mg/kg. Acetone and methylene chloride were detected at concentrations that exceeded the 6 NYCRR Part 375 Unrestricted Use SCOs in at least one soil sample collected from the site. Benzo(a)anthracene, chrysene, benzo(a)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene were all detected at concentrations that exceeded the corresponding Part 375 Unrestricted Use SCOs in at least one soil samples collected from the site. 4,4'-DDE, 4,4'-DDD, and 4,4'-DDT were detected at concentrations that exceeded the corresponding Part 375 Unrestricted Use SCOs in at least one soil samples collected from the site.

Nineteen sediment samples and nine groundwater samples were collected on- and off-site. Arsenic, chromium, lead, mercury, and zinc concentrations exceeded the New York State Sediment Criteria for Metals at many of the sediment sample locations. Groundwater samples collected in 2001 contained concentrations of aluminum, arsenic, iron, manganese, and sodium that exceeded the corresponding New York State Class GA Groundwater Standards.

3. Site Investigation

The scope of work for the RI/AA is designed to evaluate the magnitude and extent of contaminants associated with the former tannery operations (i.e., heavy metals), at both on- and off-site properties, the potential for off-site migration of contaminants to the Cayadutta Creek, and to evaluate remedial alternatives for all affected on- and off-site media. The base scope of work includes a background soil evaluation, screening of surface soils to direct the subsequent subsurface soil sampling, as well as the installation and sampling of groundwater monitoring wells.

The scope of work and sampling rationale are based on the results of previous sampling (summarized in Section 2.3) and knowledge of past site use, which indicate that heavy metals associated with former tannery operations are the primary contaminants at the site. While cyanide has not been detected at elevated concentrations in any previous samples, on-site project metals analyses will include cyanide as cyanide-based compounds were used by the tanning industry during the time the site was active. The parcel adjacent to the former tannery to the east was used only for warehousing of finished products and was not associated with the tanning process and is therefore not included in this investigation. The former presence of bulk chemical and petroleum storage tanks supports the analysis of samples for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Pesticides were detected in one off-site sample and seven on-site samples at concentrations in excess of Unrestricted Use SCOs, however, these concentrations do not exceed Restricted-Residential SCOs, the proposed future use of the site. Polychlorinated biphenyls (PCBs) were not detected in any of the previous samples collected.

An analytical laboratory approved by the New York State Department of Health (NYSDOH) under the Environmental Laboratory Approval Program (ELAP), and certified to perform NYSDEC Analytical Services Protocol (ASP) will analyze all samples collected during the investigation. Analytical results will be reported in ASP Category B data packages. 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. All sample collection, handling activities, and QA/QC sampling will be conducted in accordance with the project QAPP (Appendix A)

3.1. Background Soil Evaluation

Five background soil samples will be collected from the neighborhood surrounding the project site. Two samples will be collected near the southern High School fields

southwest of the site, and three samples will be collected from the Sir William Johnson State Park northwest of the site, as shown on Figure 5. In accordance with Draft DER-10 Technical Guidance for Site Investigation and Remediation (DER-10), surface soil consisting of soil to a depth of two inches below ground surface (bgs), excluding vegetative cover, will be sampled. At each location, samples will be collected from wooded areas, and not the managed lawns and recreational fields. Background soil samples will be submitted for analysis of TAL metals plus cyanide by USEPA Methods 6010C and 7471B.

3.2. Surface Soil Screening

Given the large size of the site and the number of adjacent off-site properties to be investigated, a preliminary screening of surface soils will be conducted using a portable X-ray fluorescence (XRF) unit. The XRF is capable of detecting multiple metals, including those previously detected at the site, in real time. This preliminary screening will allow for a more focused and efficient subsurface soil sampling effort than analytical sampling alone. In accordance with DER-10, surface soil consisting of soil to a depth of two inches bgs, excluding vegetative cover, will be screened during this phase. For the Karg property, screening locations will be based on approximately 40 foot spacing in areas of accessible soils (i.e., not covered by concrete slabs or other obstructions), as shown on Figure 6. For the adjacent off-site properties, screening locations will be based on approximately 20 foot spacing, as shown on Figure 6. Using a handheld Global Positioning System (GPS) receiver, the coordinates of each screening location will be recorded for spatial presentation and analysis of the screening results. To ensure that remedial decisions are not based solely on XRF screening results, ten percent of the XRF screening samples will also submitted for analysis of TAL metals by USEPA Methods 6010C and 7471B. Analysis of cyanide will be added to the TAL metals list for on-site samples, but not for off-site samples. At least one soil sample for laboratory analysis will be collected from each property in the assessment area.

Upon receipt of the laboratory analytical results, the XRF results will be compared with the laboratory results through linear regression analysis to evaluate the effectiveness of the XRF in screening for metals in soil. Additionally, metals concentrations will be added to the existing site basemap to guide the subsurface sampling. If cyanide is detected at concentrations significantly above SCOs, off-site sampling may be required and will be determined in consultation with the NYSDEC. The location of subsequent subsurface soil borings will be determined in consultation with the NYSDEC based on the XRF data and previous site analytical data.

3.3. Subsurface Soil Sampling

Subsurface soil borings will be advanced at locations determined in consultation with the NYSDEC following comparison and discussion of the XRF and laboratory analytical results.

Continuous samples will be collected using a direct-push drill rig equipped with a macro-core sampler. Upon collection, each sample will be screened for VOCs using a photoionization detector (PID), screened for metals using a portable XRF at one foot intervals, and visually inspected for staining. An on-site geologist will classify the sample in accordance with the Unified Soil Classification System (USCS). The depth of each boring will depend on site-specific conditions, however, it is anticipated that the soil borings will be advanced to the depth of the water table for on-site soil borings and to a depth of four feet bgs for the off-site soil borings. Up to two samples from each boring will be submitted for analysis of the following parameters:

- TAL metals plus cyanide by USEPA Methods 6010C and 7471B;
- TCL VOCs by USEPA Method 8260B; and
- TCL SVOCs by USEPA Method 8270D.

It is expected that the depth intervals with the highest metals (Cr, As, Hg, Pb, Ba, Cd, Ag, and Se) and VOC concentrations, as determined by field screening, will be submitted to the laboratory, but sample submission and depth will be determined by the field geologist, in consultation with the on-site NYSDEC representative, if present. Analysis of cyanide will be added to the TAL metals list for on-site samples, but not for off-site samples. Specific details for subsurface soil sampling are included in the QAPP, in Appendix A.

3.4. Groundwater Evaluation

Groundwater samples will be collected from monitoring wells installed at locations based on screening and laboratory results and in consultation with the NYSDEC. Specific details for monitoring well installation, development, and groundwater sampling are included in the QAPP, in Appendix A.

3.4.1. Monitoring Well Installation

Two-inch I.D. PVC monitoring wells with 10-foot long screens will be installed at locations based upon soil sample results (up to eight wells) and will be screened to intercept the water table. Filter pack sand will be poured around the well screen and bentonite chips will be placed above the screened interval to seal the well. The remainder of the borehole will be filled with cement-bentonite grout. Each boring will be

completed with a steel flush mount well cover and locking well cap. Additional details for monitoring well installation are included in the project QAPP (Appendix A).

3.4.2. Monitoring Well Development

Upon completion, monitoring wells will be developed to minimize turbidity in groundwater samples collected from each well and to improve their hydraulic properties. Development water generated will be discharged on the ground surface adjacent to each well in accordance with NYSDEC guidelines. In the event that sheens or staining 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. Prior to groundwater sampling the water level in each monitoring well will be measured and recorded. Groundwater sampling will be conducted in accordance with the USEPA Low-Flow Low-Purge Sampling Protocol (USEPA, 1998). Sampling procedure details are included in the project QAPP (Appendix A). Each groundwater sample will be submitted for analysis of the following parameters:

- TAL metals plus cyanide by USEPA Method 6010C and 7470A;
- TCL VOCs by USEPA Method 8260B (first round only);
- TCL SVOCs by USEPA Method 8270D (first round only).

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 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.

If the results of groundwater monitoring well sampling indicate the presence of groundwater contamination at the site perimeter, the investigation will be expanded offsite to define the extent of the off-site contamination, and to identify potential down-gradient receptors. Rising head hydraulic conductivity tests will be performed at all groundwater monitoring wells. Hydraulic conductivity testing will be conducted in accordance with the QAPP (Appendix A).

3.5. 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. If required, soil and/or

groundwater will be contained in U.N.-approved 55-gallon drums. The drums will be properly labeled with their contents, staged on pallets, and covered with a tarp until they can be properly disposed off-site. Final disposal of any containerized soil cuttings and/or groundwater will be based on the results of soil and groundwater samples collected from the site.

3.6. Site Survey

A survey will be conducted at the site to determine the locations of sampling and investigation activities relative to site features. The survey will include:

- Soil boring and groundwater monitoring well 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.

3.7. Preliminary Data Evaluation and IRM Recommendation

A continuous evaluation of the information and data obtained from the Site Investigation will be performed. Recommendations in the form of Interim Remedial Measures (IRMs) which may be appropriate for the site will be made as warranted based upon the results of the investigation. If no IRMs are recommended, documentation of such will be provided to the NYSDEC.

4. Remedial Investigation/Alternatives Analysis Report

4.1. Remedial Investigation Reporting

A RI/AA Report will be prepared and submitted to the NYSDEC for review and comment. The report will include the following:

- Discussion of field investigation activities.
- Discussion of the physical characteristics of the site and surrounding off-site areas.
- Presentation of analytical results for all media sampled.
- Quality assurance/quality control evaluation of the analytical data including the results of the data quality review.
- Discussion of the nature and extent of contaminants.
- Comparison of analytical results to background concentrations and applicable regulatory standards and objectives.
- Qualitative risk assessment in terms of health and environment will be made based upon identified contaminant fate and transport mechanisms.
- Conclusions and recommendations based on the interpretation of the data, including development of Preliminary Remedial Action Objectives (RAOs) for each affected media.
- Supporting data, including analytical data packages, field log forms, and monitoring well construction diagrams.

4.2. Alternatives Analysis Reporting

The Alternatives Analysis portion of the report will evaluate the applicable remedial alternatives for the site. Each of the alternatives will be evaluated for relative technical applicability and cost effectiveness. The AA will also include the contemplated use (i.e., Restricted Use – Residential) for the site so that an appropriate remedy, which is protective of human health and the environment, can be selected. Cleanup objectives for

the site will be developed in accordance with the applicable local, state, and federal regulations, as provided in Draft DER-10 Technical Guidance for Site Investigation and Remediation. Soil sample results from the off-site properties will be compared to the Unrestricted Use SCOs. General response actions will be developed based on the results of the RI, the clean-up objectives, and the re-use for the site.

4.2.1. End Use Planning

The City of Johnstown wishes to redevelop the site to increase the aesthetic quality of the property and promote local economic growth. While it is anticipated that the site will be redeveloped as a mixture of commercial and greenspace, the City currently wishes to retain a range of site redevelopment options, from restricted residential through light industrial use. It is assumed that the future use of the adjacent off-site properties will remain consistent with the existing residential and commercial uses. Remedial action goals that are protective of human health and the environment will be developed based on the least restrictive end use scenario (restricted residential).

4.2.2. Development and Analysis of Alternatives

Potential remedial alternatives will be developed based on site characteristics evaluated during the RI. Remedial action alternatives will be developed with the goal of restoring the site to pre-release conditions to the extent feasible, and/or to levels consistent with municipality's least restrictive "Contemplated Use" of the site, and to remediate off-site areas by:

- Establishing Remedial Action Objectives (RAOs) for each affected medium;
- Identifying potential general response actions on a medium-specific basis, while evaluating response actions for effectiveness, reliability, and cost;
- Identifying and Screening Technologies; and
- Assembling suitable technologies into remedial alternatives.

Alternatives will be evaluated in accordance with the factors in 6NYCRR375-1.10(c) (1-7, inclusive). The following criteria will be used to evaluate remedial alternatives:

- Overall protection of human health and the environment.
- Compliance with Standards, Criteria, and Guidance (SCG).
- Short-term effectiveness.
- Long-term effectiveness and performance.
- Reduction of toxicity, mobility, and volume.

- Feasibility.
- Community acceptance.

The alternatives will be analyzed against the first six criteria and then compared against one another to determine the most cost-effective, protective remedy. The seventh criterion will be evaluated by the NYSDEC once the public comment period for the final RI/AA report and PRAP has concluded.

5. Utilization Plan

5.1. Minority/Women-Owned Business Enterprises (MBE/WBE)

This MBE/WBE Plan documents the good faith efforts to be undertaken to comply with the requirements of 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 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.

5.1.1. Malcolm Pirnie Corporate Affirmative Action Statement

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

5.1.2. Good Faith Efforts Undertaken To Ensure MBE/WBE Participation

5.1.2.1. General

As part of the 1996 Clean Water/ Clean Air Bond Act Environmental Restoration Project at the Former Karg Brothers Tannery, the City of Johnstown has retained Malcolm Pirnie to perform the following Tasks:

- Perform a Remedial Investigation (RI).
- Prepare an RI/AA Report.

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

- Geoprobe Soil Borings;
- Drilling/Monitoring Well Installation;
- Survey;
- Laboratory Analytical Services; and

- Data Usability Summary Report (DUSR).

5.1.2.2. MBE/WBE Work Assignment Participation

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

- MBE: 6 percent.
- WBE: 6 percent.

It is expected that MBE/WBE subcontractors will be utilized for laboratory analytical services and in the preparation of the DUSR.

6. Schedule

The estimated project schedule is presented in the following milestone schedule:

Anticipated Project Schedule	**Day(s)**
Final Work Plan Approval	0
Bidding	1 – 20
Award of Contracts	21 - 35
Remedial Investigation	36 – 115
RI/AA Reporting	116 - 150
NYSDEC Review and PRAP Development	151 – 180
Public Comment	181 - 226
ROD	227 - 250

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

7. References

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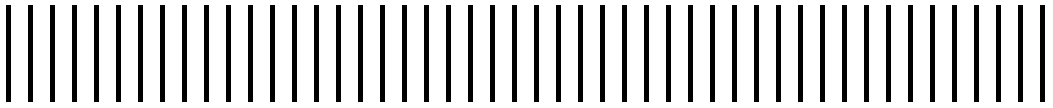
Weston Solutions, Inc. for USEPA, 1994, Integrated Assessment Report – Karg Brothers, Inc. Site, Volumes I and II.

City of Johnstown
Remedial Investigation/Alternatives Analysis
Work Plan

Figures



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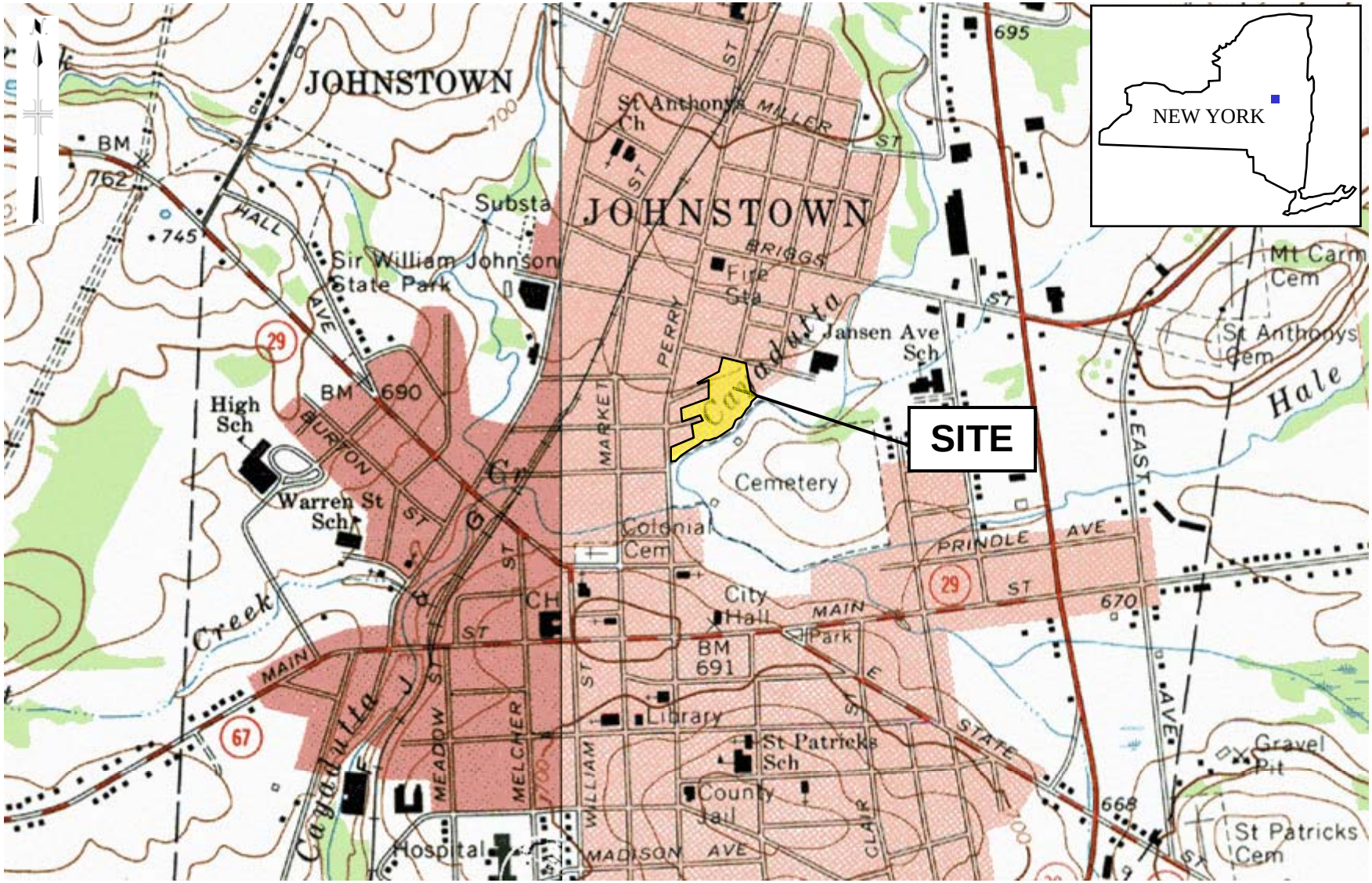

SOURCE: U.S.G.S 7.5 MIN. PECK LAKE AND GLOVERSVILLE QUADS

SCALE IN FEET

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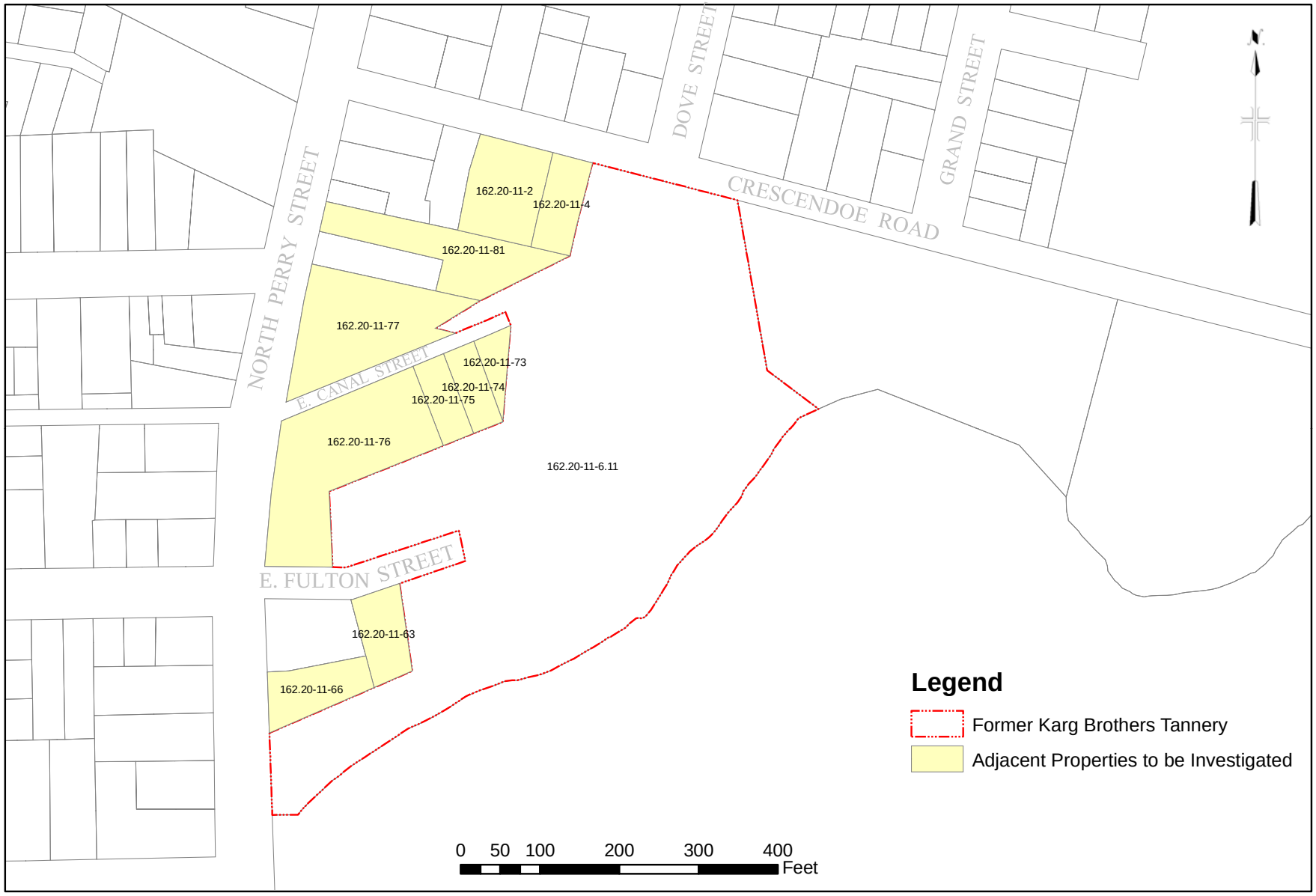
FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

LOCATION MAP

FIGURE 1



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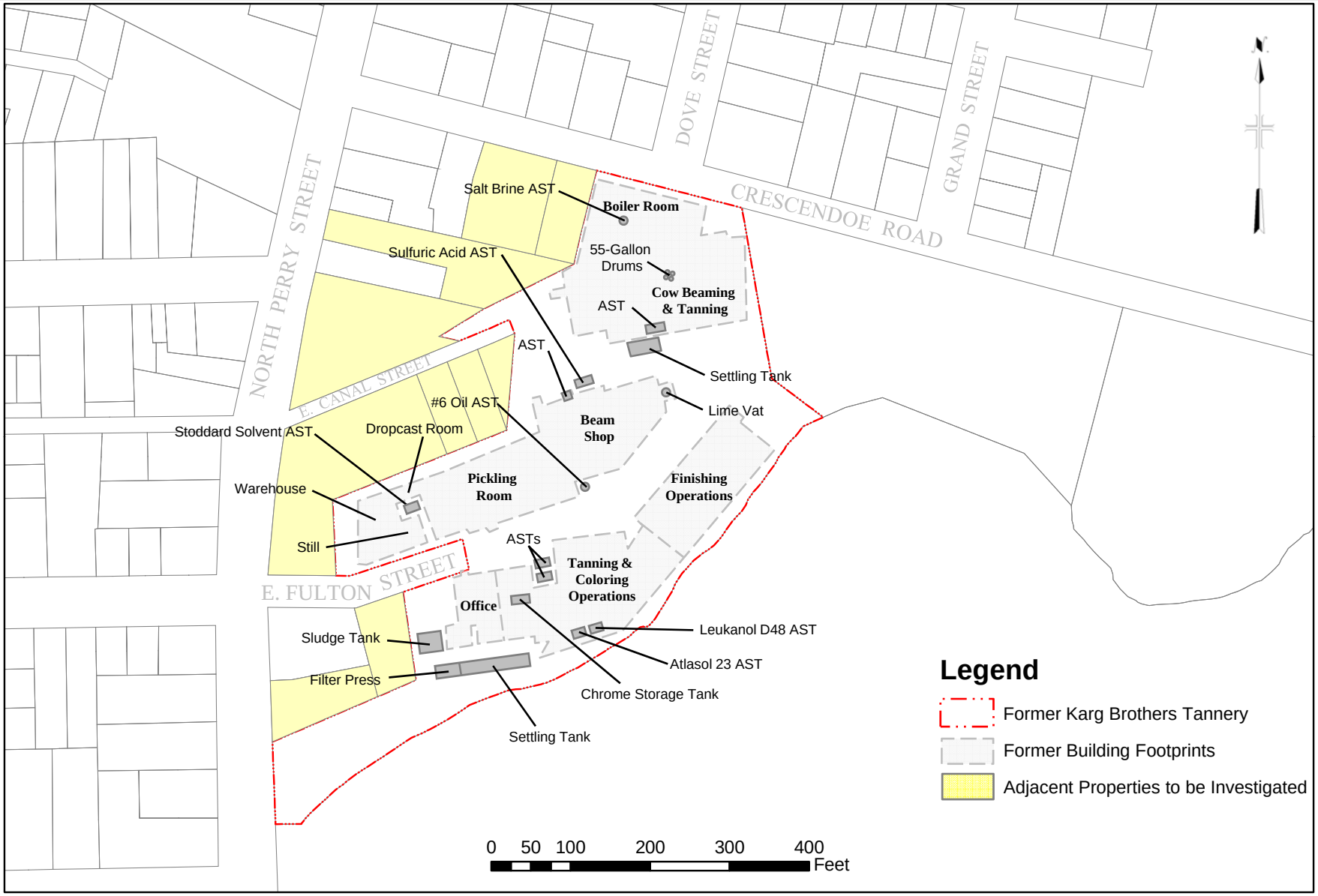
FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

TAX PARCEL MAP

FIGURE 2



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FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

FORMER SITE FEATURES

FIGURE 3

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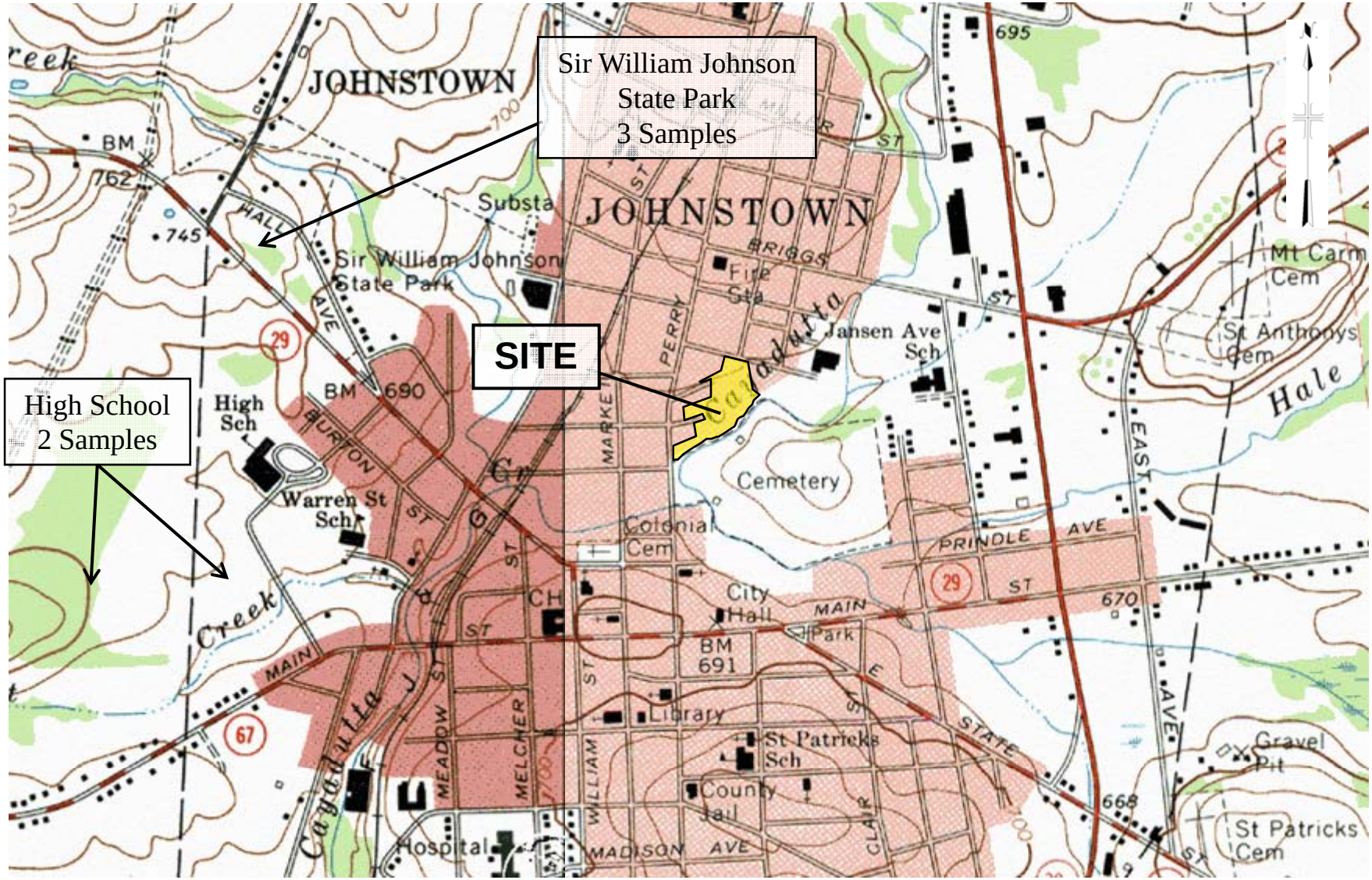
FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

AERIAL PHOTOGRAPH

FIGURE 4



SOURCE: U.S.G.S 7.5 MIN. PECK LAKE
AND GLOVERSVILLE QUADS

SCALE IN FEET

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FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

BACKGROUND SURFACE SOIL SAMPLING LOCATIONS

FIGURE 5

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FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

PROPSED INITIAL XRF SAMPLE LOCATIONS

FIGURE 6

City of Johnstown

33-41 E. Main St. • Johnstown, New York 12095

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ENVIRONMENTAL RESTORATION PROGRAM
PROJECT # E 518022

Appendix A:
Remedial Investigation/ Alternatives Analysis Quality Assurance Project Plan

Former Karg Brothers Tannery
Johnstown, New York

January 2009

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Contents

Figures

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Appendices

1. Introduction

1.1. Background/Objectives

The City of Johnstown (City), New York has received a grant under the New York State Department of Environmental Conservation (NYSDEC) Environmental Restoration Program (ERP) to conduct a Remedial Investigation/Alternatives Analysis (RI/AA) for the Former Karg Brothers Tannery and adjacent properties in Johnstown, New York to support economic development through the identification, assessment, cleanup, and redevelopment of Brownfields properties.

The site, located in the north-central portion of the City of Johnstown (Figure 1), consists of the former Karg Brothers Tannery property with an area of approximately 5.3 acres, and the ten adjacent properties shown on Figure 2 with a total land area of approximately 2.6 acres. The former Karg Brothers facility was constructed in the early 1900s and operated until its closure in 1995, at which time it treated approximately 5,000 hides each day, consisting of degreasing, pickling, beaming, tanning, and finishing of cow, deer, and sheep hides. At present, the ground cover largely consists of the remaining concrete slabs of the former buildings that were removed during the USEPA Removal Action, with remaining areas covered by gravel, asphalt, or grass (Figures 3 and 4). Adjacent parcels are either undeveloped or residential, with the exception of two abandoned gasoline stations on either side of East Fulton Street.

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 former Karg Brothers Tannery 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 accordance with the USEPA SW846 analytical methodologies and the NYSDEC Analytical Services Protocol (ASP), 1989, Revised 1991, and subsequent revisions. A laboratory certified by the New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) and the NYSDEC for ASP analyses will be utilized to analyze all samples collected during the Remedial Investigation (RI).

The methods and procedures presented in this site-specific QAPP are in accordance with Draft DER-10 Technical Guidance for Site Investigation and Remediation (DER-10), and

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

1.2. Project Organization and Responsibility

The City has entered into a State Assistance Contract with the NYSDEC for the execution of the Project. 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 Contract. 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 5. The responsibilities for key Malcolm Pirnie staff positions are summarized below:

- ***Bruce Nelson – Project Manager***: Responsible for planning and implementation of the Remedial Investigation/Alternatives Analysis (RI/AA) on behalf of the City.

- ***Stefan Bagnato – Field Team Leader***: Directs all field activities. Assists Project Manager with implementation of RI/AA activities. Ensures that Health and Safety procedures are observed in the field.

- ***Richard Brownell - Technical Director***: Responsible for independent technical review of project scope, objectives, quality, and reports.

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

- ***Charles Myers – 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 will be selected in accordance with the provisions of the State Assistance Contract.

2. Quality Assurance Objectives

2.1. Data Requirements/Levels of Concern

The purpose of the Remedial Investigation/Alternatives Analysis (RI/AA) is to characterize the nature and extent of contaminants at the site in accordance with the RI/AA Work Plan. RI/AA analytical sampling results will be used to assess 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***: 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs).

The SCGs for this project are presented in Appendix A. Data gathered during the RI 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 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. Further, the investigation will assess whether potential groundwater contaminants have traveled off-site. Potential exposure scenarios include incidental contact or ingestion of surface soil containing metals or semi-volatile organic compounds (SVOCs) at concentrations greater than 6 NYCRR Part 375 SCOs, and incidental contact of construction workers with subsurface soil and groundwater containing volatile organic compounds (VOCs), SVOCs, and metals present at concentrations greater than 6 NYCRR Part 375 SCOs 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, subsurface soil, and groundwater samples obtained through laboratory analysis using USEPA SW846 analytical protocols and validated by a third party data validator through the preparation of a Data Usability Summary Report (DUSR).

2.2.4. Study Boundaries

The sample population will include groundwater and soil collected at the former Karg Brothers Tannery and adjacent off-site properties identified in the Work Plan, in addition to off-site background surface soil.

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 ensure that the data collected during the investigation is of sufficient quality to support the critical decision, all analytical work shall be conducted using USEPA SW846 analytical methods in accordance with NYSDEC ASP, 1989, Revised 1991, and subsequent revisions. Table 1 lists the methods that will be used for this project. To measure and control the quality of analysis and to ensure that the DQOs are met, certain QA parameters are defined and utilized in data analysis activities in 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 RPDs for this project will be in accordance with ASP protocol requirements and current laboratory acceptance ranges.

- ***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. Accuracy criteria for this project will be in accordance with ASP protocol requirements.

- ***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 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 RI will be sensitive enough to meet SCG criteria.

2.3. Data Quality Objectives

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 and 3.

2.3.1. Air

Air monitoring will be performed during all ground intrusive RI 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 (HASP) and Community Air Monitoring Plan (CAMP). 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.

VOCs will be monitored on a continuous basis during drilling activities. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. VOC monitoring will be conducted using a MiniRae 2000 photoionization detector (PID). The PID will be calibrated at least daily using the span calibration gas recommended by the manufacturer. The PID will calculate 15-minute running average concentrations. These averages will be compared to the action levels specified in Table 4.

Particulate concentrations will be monitored continuously at the downwind perimeter of the each work area during all ground intrusive activities. Real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) will be used for the particulate monitoring. The equipment will be equipped with an audible alarm to indicate exceedance of the action levels summarized below. Any fugitive dust migration will also be visually assessed during all work activities. Action levels for PPE requirements and stop work determinations are presented in Table 4.

2.3.2. Groundwater

Groundwater will be sampled and analyzed to characterize the nature and extent of groundwater contamination both on and off-site. Field instrumentation will be used during sampling activities to ensure the collection of 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 extent of groundwater contamination, to aid in determining contaminant source locations, and to determine if any SCGs have been exceeded. 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.

2.3.3. Soil

The objective of the soil sampling program is to assess background conditions and evaluate the extent of metals in on- and off-site soil. 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 deliverables are capable of producing high quality data characterized by rigorous QA/QC protocols and documentation. Soil sample analyses are summarized in Table 3. All surface soil samples will be critical samples for the evaluation of potential risks to human health and the environment.

3. Field Investigation Procedures

3.1. Sampling Procedures and Equipment

The field investigation procedures that will be followed during this RI/AA 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 re-used. 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 pre-designated 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 submersible 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 re-used).

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. Soil Sampling

3.1.2.1. Soil Sampling Objectives

Soil samples will be collected to:

- Assess background conditions;
- Evaluate the extent of metals in on- and off-site soil; and
- Assess potential impacts to groundwater and off-site surface water.

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.
- Roll of polyethylene sheeting.
- Stainless steel spatula or spoon.
- Stainless steel trowel.
- Stainless steel bowl.
- Latex gloves (disposable).
- Neoprene gloves.
- Certified, pre-cleaned sample containers.
- Aluminum foil.
- Field logbook and pen.
- Decontamination equipment.

3.1.2.3. Soil Sampling Procedures – Hollow Stem Auger Drilling

A two-inch diameter split-spoon sampler will be driven into the subsurface to create a borehole approximately 2.25 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 inspector will characterize the soil samples and record his/her observations on a field boring log.

After soil characterization and logging, the soil cores 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.

Any 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 ensure that soil sampled is representative of the accurate depth interval.

3.1.2.4. Soil Sampling Procedures – Direct Push

A concrete coring device or apparatus sufficient to penetrate four to six inches of asphalt or concrete may be required to advance the soil borings in certain areas of the site. Following the opening of the soil boring hole a Macro-Core soil sampler will be driven into the subsurface to create a borehole approximately 1-1/2 inch to two inches in diameter. Subsurface soil samples will be removed from the borehole in four-foot intervals in plastic tubes. The total number of four-foot tubes collected from each soil boring will be dependent on the final depth of the boring. A qualified inspector will characterize the soil samples and record his/her observations on a field boring log.

After soil characterization and logging, the plastic tube will be cut along its length and the soil core will be screened for VOCs using a PID. The criteria for PID sensitivity shall be the same as that discussed in Section 2.3. 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.

3.1.2.5. Soil Sampling Procedures - Surface Soil

The upper two inches of soil, excluding vegetative cover, will be collected using a stainless steel trowel and transferred into a stainless steel bowl. A qualified inspector will characterize the soil samples and record his/her observations in the field log. After soil characterization, the soil will be homogenized for analyses. The location(s) for collection of field duplicates, field blanks, and matrix spike/matrix spike duplicate samples shall be determined in the field.

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 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 fluids shall be handled in accordance with Section 3.5, 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 such that the well screen intersects the water table to allow for an evaluation of the presence or absence of Light Non-Aqueous Phase Liquids (LNAPL).

Clean filter pack sand will then be poured into the annular space between the hollow stem augers and the monitoring well assembly as the augers are 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 augers 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 3 to 5 percent bentonite powder.

The PVC riser will be sealed at the ground surface with Portland cement and will be capped with a locking expansion cap. Each well will be completed at the surface with a steel flush-mounted cover and concrete pad.

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.
- Deionized Water.
- Low Phosphate Detergent.

3.1.4.3. Measurement Procedure

At each monitoring well, the expansion 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 2.3), 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.
- Bottom-filling PVC bailer.
- Bailer cord.
- Temperature, pH, dissolved oxygen, specific conductivity and turbidity meters.
- Photoionization Detector.
- Field logbook and field logs.
- Roll of polyethylene sheeting.
- Decontamination equipment.

3.1.5.3. Development Procedure

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.
- Peristaltic pump.
- Teflon-lined polyethylene tubing and foot-valve.
- Temperature, pH, dissolved oxygen, specific conductivity and turbidity meters.
- Photoionization Detector.
- 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). 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 expansion 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 peristaltic pump. The tubing will be lowered into the water column to a maximum depth of two feet above the bottom of the well. 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 in accordance with 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. Metals;

5. Natural Attenuation Parameters (NAP); and

6. Geochemical Parameters

NAP includes carbon dioxide, methane, dissolved organic carbon, nitrate, nitrite, sulfate, ferrous iron, and alkalinity. Geochemical parameters include Total Kjeldahl Nitrogen, hardness, total dissolved solids, and total organic carbon.

The sample bottles will be pre-preserved by the laboratory. The preservation requirements are presented in Table 5. 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.

3.1.7. Hydraulic Conductivity Test Procedures

3.1.7.1. Testing Objectives

Rising and falling head hydraulic conductivity tests will be conducted at selected monitoring wells to aid in estimating groundwater flow rates.

3.1.7.2. Testing Equipment

The following equipment will be needed to perform hydraulic conductivity testing:

- Data logger and transducer.
- Electronic water level indicator.
- Field log book and pen.
- PVC or stainless bailer.
- PVC Slug.

3.1.7.3. Testing Procedures

Equipment being introduced into the well to conduct hydraulic conductivity tests will be decontaminated using the procedures outlined in the Section 3.1.1. Water levels will also be measured prior to conducting the test and recorded in the field log book.

Hydraulic conductivity testing will only be conducted on wells which have achieved static equilibrium after development or purging.

Water level fluctuations will be monitored using either a water level probe to record the water level change, or a pressure transducer linked to a data logger. The method of measurement is similar for both cases in that they both measure the change in water levels from a static condition after an initial perturbation. The static water level will be taken and recorded on the field log before conducting the test.

When using a data logger and transducer, the transducer will be placed approximately 5 to 10 feet below the static water level (where possible) and a solid slug will be added to the well. After the slug is added to the well, the water level will rise. If the data logger is used, the pressure above the transducer will change and the pressure change will be recorded. This change in pressure will be calculated internally to true water levels based on the original static water level entered. If a transducer and data logger are used, the frequency of readings will follow a logarithmic scale as shown below:

ELAPSED TIME	**INTERVAL**
0-5 seconds	0.5 seconds
5-20 seconds	1.0 seconds
20-120 seconds	5.0 seconds
2-10 minutes	30 seconds
10-100 minutes	2 minutes
100-1,000 minutes	10 minutes

The test will continue until either the water level recovers fully to static, until approximately 70 percent of the original static level is reached, or for a total of two hours, whichever comes first. Upon completion of the falling head test, the slug will be removed from the well to conduct the rising head test, after which the water level will rise. The frequency of readings will follow the same logarithmic scale as shown above. The test will continue until either the water level recovers fully to static, until approximately 70 percent of the original static level is reached, or for a total of two hours, whichever comes first.

If a water level probe is used in place of the pressure transducer and data logger, manual readings of water level change will be recorded. The readings will be collected on a separate logarithmic time scale and recorded on field logs.

The data collected will be reduced and analyzed using analytical methods such as Bouwer and Rice, 1976 and Bouwer 1989.

3.2. Field Quality Control Samples

Quality control procedures will be employed to ensure 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 and 3.

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 aqueous 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-free 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 MS/MSD 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 MS/MSD 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 four components as described below. Identification numbers for soil boring samples will also have a fifth component.

- ***Project Identification***: The first component consists of a one-letter designation, which identifies the project site. For this project, the one-letter designation will be K for Karg Brothers.

- ***Property Identification***: The second component, which identifies the property from which the sample was collected, will consist of a two-digit number corresponding to the property numbers shown on Figure 6.

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

    - XRF – X-Ray Fluorescence Sample

    - SS – Surface Soil

    - SB – Soil Boring

    - MW - Monitoring well (Groundwater Sample)

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

- ***Sample Identification***: The fifth 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:

K-03-XRF-06:	XRF sample location number six from property number three.
K-00-SB-2-10	Soil boring location number 2 from property number 00, 10 feet below ground surface.
K-00-MW-3-MSD:	Monitoring well groundwater sample, property number 00, monitoring well location three, matrix spike duplicate.
K-00-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. 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, Malcolm Pirnie 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 must 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 which 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.N.-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 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 U.N.-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.

Containerized materials will be labeled 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.

4. Sample and Document Custody Procedures

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, 051125.

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.

5. Calibration Procedures and Frequency

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 following table 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
Soil Screening	Innov-X Handheld XRF
	Mini Rae Photoionization Detector
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	MIE DataRam Dust Monitor
	Mini Rae Photoionization Detector

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 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.

6. Analytical Procedures

Environmental samples collected for laboratory analysis during the RI/AA will be analyzed by a NYSDEC ASP-certified laboratory for metals, VOCs, and SVOCs using USEPA SW846 analytical methodologies accompanied by NYSDEC ASP Category B deliverables for all samples. Table 1 summarizes the analytical procedures and their sources that will be utilized for this site. The analytical methods listed in Table 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 standard operating procedures (SOPs) used for the analysis of metals (Methods 6010C, 7470A, and 7471B), VOCs (Method 8260B), and SVOCs (Method 8270D) for the selected analytical laboratory will be submitted upon laboratory selection.

7. Data Reduction, Validation, and Reporting

7.1. Introduction

The purpose of this section is to ensure that the large amounts of data produced by the laboratory are presented 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 ensures 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 (mg/l) or milligrams per kilogram (mg/kg), parts per million (ppm), micrograms per liter (µg/l) or micrograms per kilogram (µg/kg), and parts per billion (ppb). 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 accuracy and precision protocols performed on the appropriate QA samples, in accordance with ASP requirements.

Field sample precision will be assessed through analysis of duplicate samples and relative percent difference (RPD) calculations. Accuracy will be assessed through the analysis of check standards and the calculation of the percent recovery (%R) of spikes. 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 NYSDEC as part of the corresponding RI 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# HW-2 Rev. 13).*
- *USEPA Region 2 Validating Volatile Organic Compounds by SW-846 Method 8260B (SOP# HW-24 Rev. 2).*
- *USEPA Region 2 Validating Semi-volatile Organic Compounds by SW-846 Method 8270 (SOP# HW-22 Rev. 3).*

7.5. Reconciliation with Data Quality Objectives

Calculations and determinations for data precision, accuracy and completeness will be performed in accordance with ASP protocol requirements by the contract laboratory. Following data reporting by the contract laboratory, a third party data validator will review the data packages, compare to ASP and project requirements, determine data usability, and make recommendations. 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 Remedial Investigation Report. Corrective action procedures are discussed further in Section 12.

8. Internal Quality Control Checks

8.1. Introduction

In order to monitor the quality of the analytical data generated for this focused 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	5%

	precision.	
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. Because field measurements are generally easy to repeat, measurements should be repeated as necessary so the data are as complete as possible. The QC results are used as an indication of data quality and reliability when the data are being reviewed.

8.3. Laboratory Quality Control

The scope and description of QC samples and QC methods are well detailed in the applicable USEPA SW846 methodologies for the particular analysis. The methodologies for organic and inorganic analyses describe the type of QC samples and required QC methods, and the required frequency of analysis. QC limits have been established for standards, blanks, duplicates, matrix spikes, and surrogates, and are contained in the methodologies. QC data will be reviewed by Malcolm Pirnie personnel to assess the validity of the data and determine if the DQOs have been met.

9. Quality Assurance Audits

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:

- Sample collection and analytical activities.
- Equipment calibration techniques and records.
- Decontamination and equipment cleaning.
- Equipment suitability and maintenance/repair.
- Background and training of personnel.
- Sample containers, preservation techniques and chain-of-custody.
- 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

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.

10. Preventative Maintenance

10.1. 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 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. Keeping records of all maintenance performed under his care. Sending out equipment for service/repair. Maintaining adequate supply of spare parts.
Field Personnel	Maintenance of all equipment located on-site on a regular basis and after each use. Keeping supply of spare parts on-hand.

10.3. Preventative Maintenance Program

The preventative maintenance program consists of three parts, normal upkeep, service and repair, and formal recordkeeping. Normal upkeep consists of daily procedures that

include cleaning, lubrication and checking the batteries of the equipment. The following is a partial list of normal upkeep procedures and a partial list of important spare parts:

- Normal upkeep for environmental monitoring equipment performed daily or after each use:

    1. Cleaning.
    2. Lubrication of moving parts.
    3. Check/charge battery.
    4. Inspect for damage.
    5. Check for operation problems.
    6. Inspect all hoses and lines.

- Partial list of important spare parts for environmental monitoring instruments planned for use at the site:

    1. Fuses.
    2. Mini rae-UV lamp.
    3. Probes.
    4. Spare battery.

The normal upkeep is performed daily after each use and includes inspecting for damage, signs of problems, and charging the batteries if necessary. Specific equipment upkeep procedures are described in the SOP for each instrument in Appendix C.

Minor service and repair will be performed by the Equipment Manager who is trained in the service and repair of field instruments. Equipment in need of major or more complex repair and service will be sent to the manufacturer.

All maintenance, servicing and repair of equipment shall be recorded and kept on file. Field personnel shall record maintenance and instrument problems in the field instrument log books. These will ultimately be kept on file by the Field Team Leader. The Equipment Manager shall keep a record of all equipment released to the field and a record of all maintenance and service on file.

10.4. Laboratory Instrument Maintenance

Preventative maintenance procedures will be clearly defined and written for each measurement system. Maintenance activity, preventative or repair, will be documented on standard forms, which are maintained in log books. Written procedures will include maintenance schedules, problem identification procedures, space for describing problems and repair notes, and failure analysis protocols. Service contracts and regularly scheduled in-house maintenance will be included, along with a list of critical spare parts. Laboratory instrument maintenance and calibration and corrective action procedures are incorporated in the SOPs listed in Section 6.0.

10.5. Rental Equipment

Rental equipment will be obtained only from known, reputable rental suppliers. The equipment will require a pre-receipt to verify accuracy, maintenance and upkeep of the equipment.

11. Data Assessment

11.1. 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 support those decisions. The levels of quality needed to support the various project decisions have been 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 1 – 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 10 calendar days to produce the documentation necessary to remove the deficiencies.

11.2.2. Task 2 – 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 6010B and 7470A/7471B, 8260B, and 8270D; 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. USEAP SW846 protocols.

2. Data Validation standard operating procedures (SOPs) such as:

- *USEPA Region 2 Evaluation of Metals Data for the Contract Laboratory Program (SOP# HW-2 Rev. 13).*
- *USEPA Region 2 Validating Volatile Organic Compounds by SW-846 Method 8260B (SOP# HW-24 Rev. 2).*
- *USEPA Region 2 Validating Semi-volatile Organic Compounds by SW-846 Method 8270 (SOP# HW-22 Rev. 3).*

11.3. Reports

The Validator shall submit a Data Usability Summary 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. 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.

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 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 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 that 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 Johnstown 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 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 Representative.

13. Quality Assurance Reports to Management

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 management at any time.

14. References

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City of Johnstown
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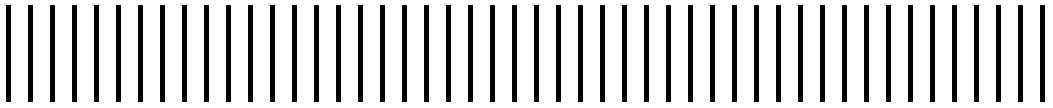
QAPP

Figures



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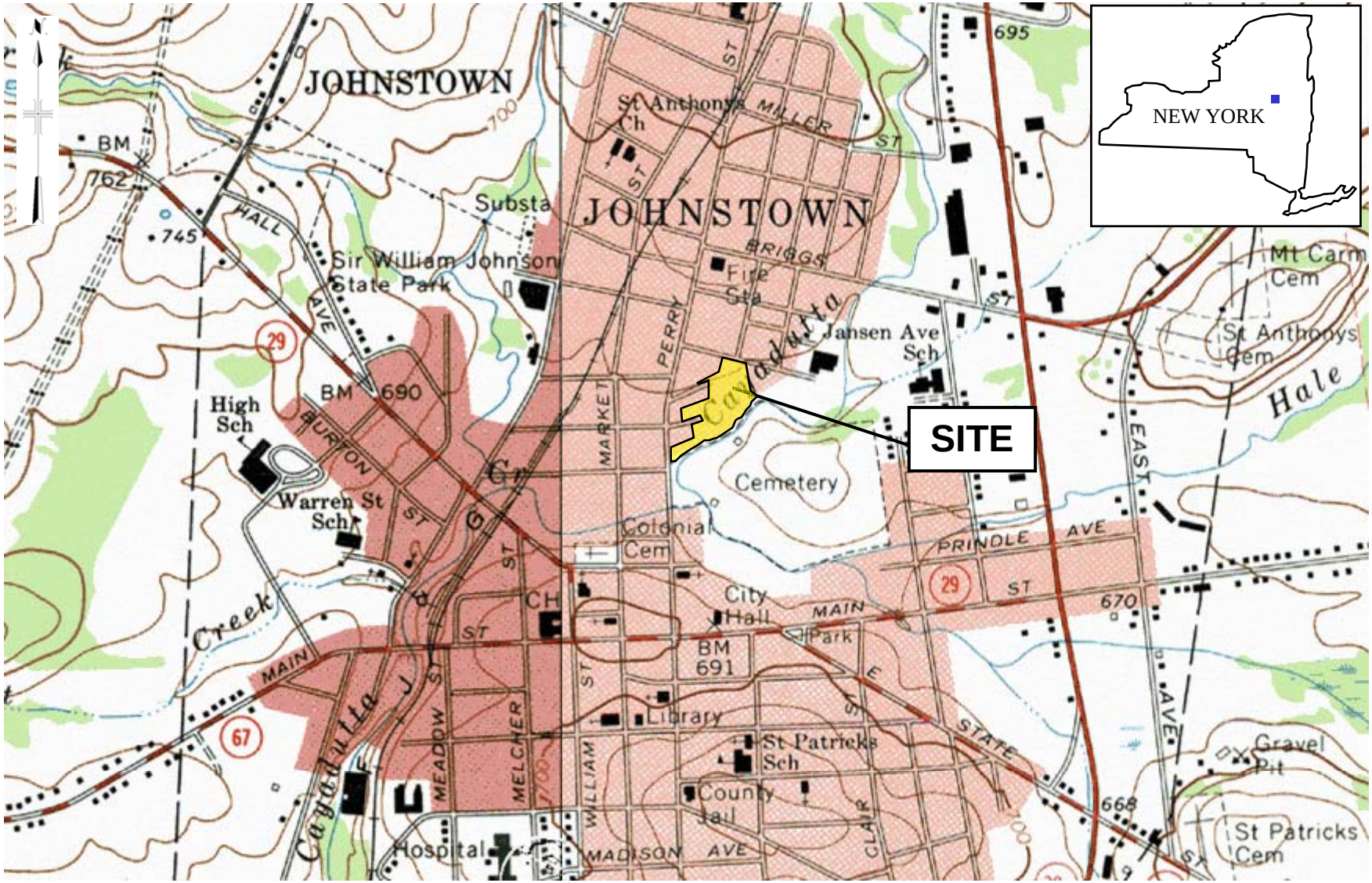

SOURCE: U.S.G.S 7.5 MIN. PECK LAKE AND GLOVERSVILLE QUADS

SCALE IN FEET

0 500 1000 2000

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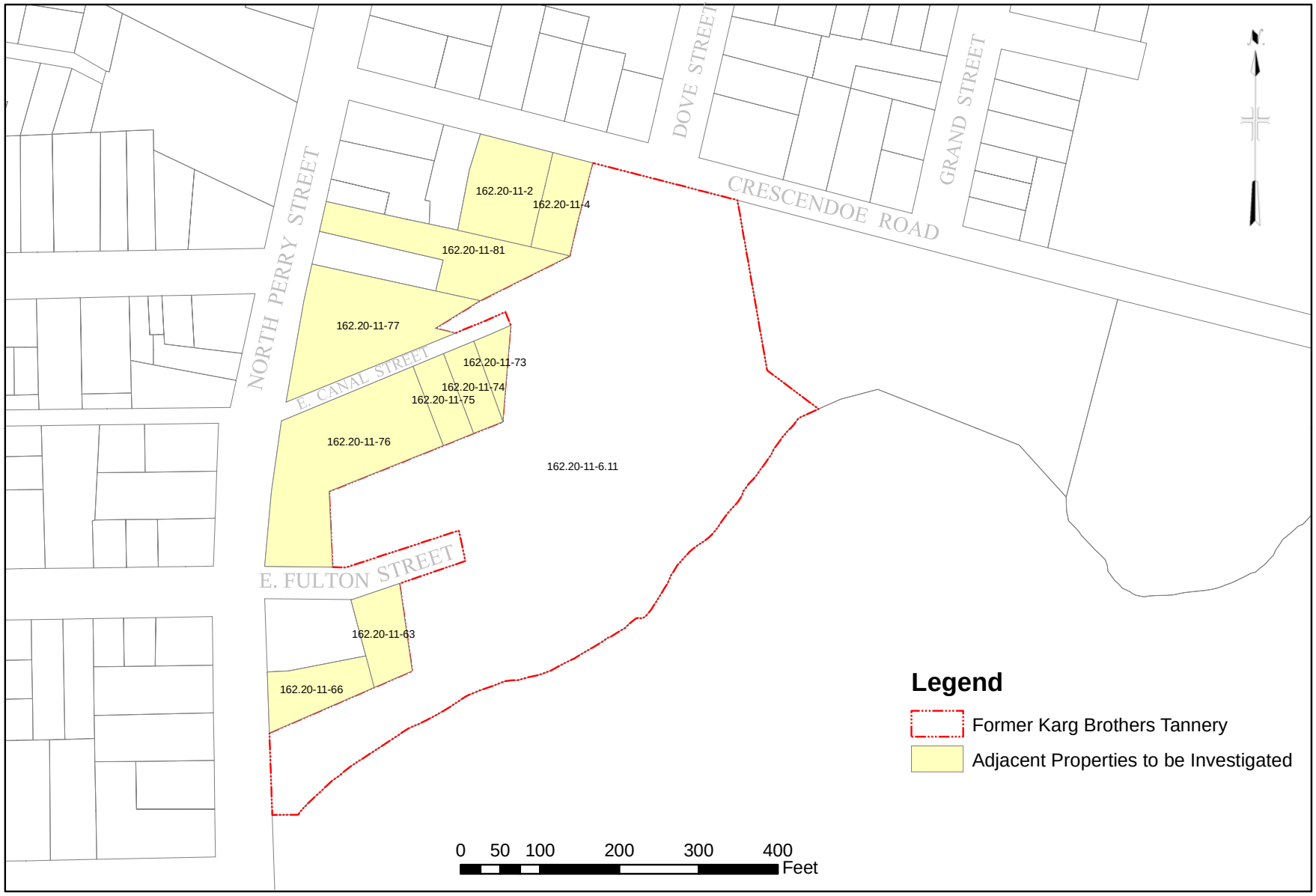
FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

LOCATION MAP

FIGURE 1



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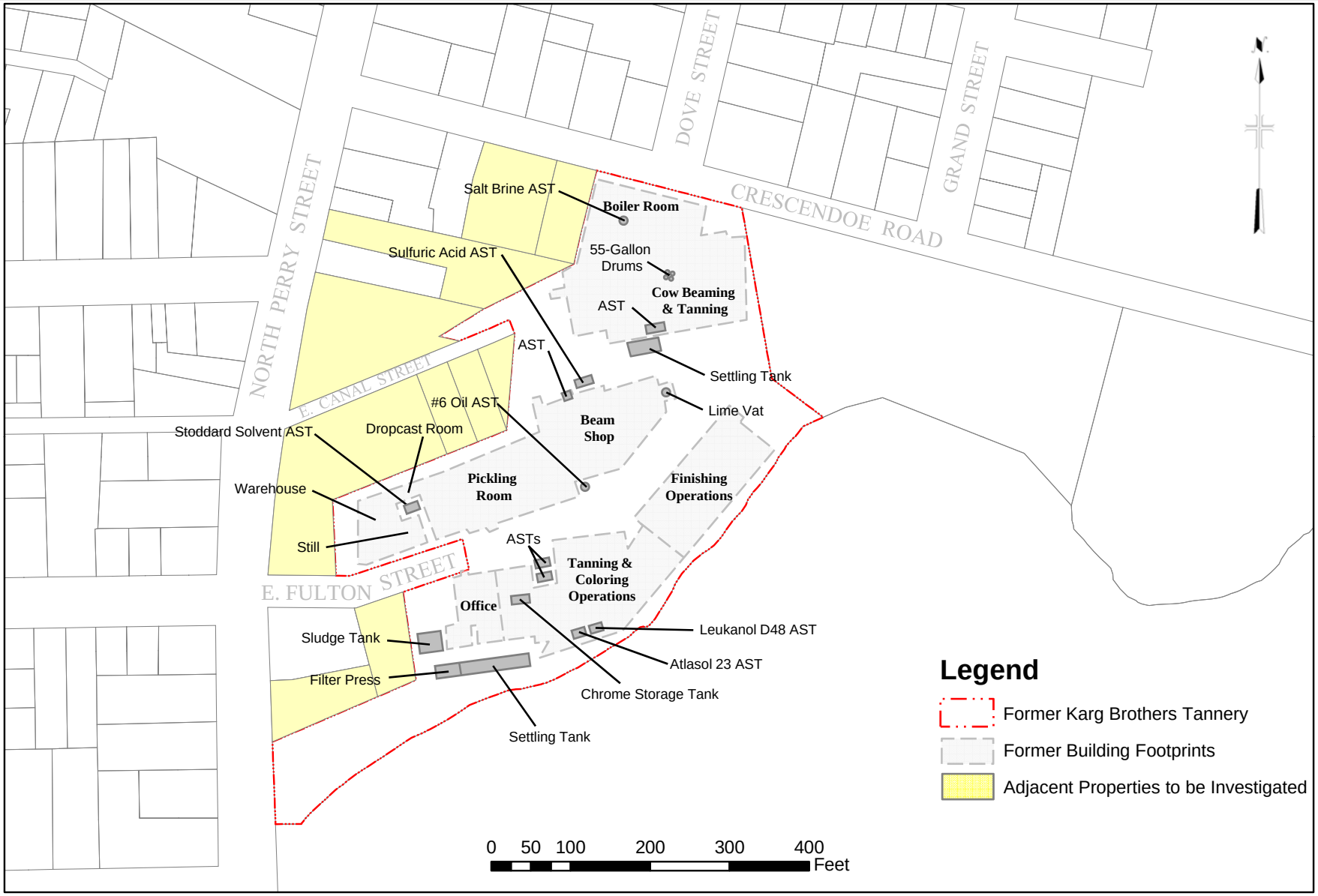
FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

TAX PARCEL MAP

FIGURE 2



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FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

FORMER SITE FEATURES

FIGURE 3

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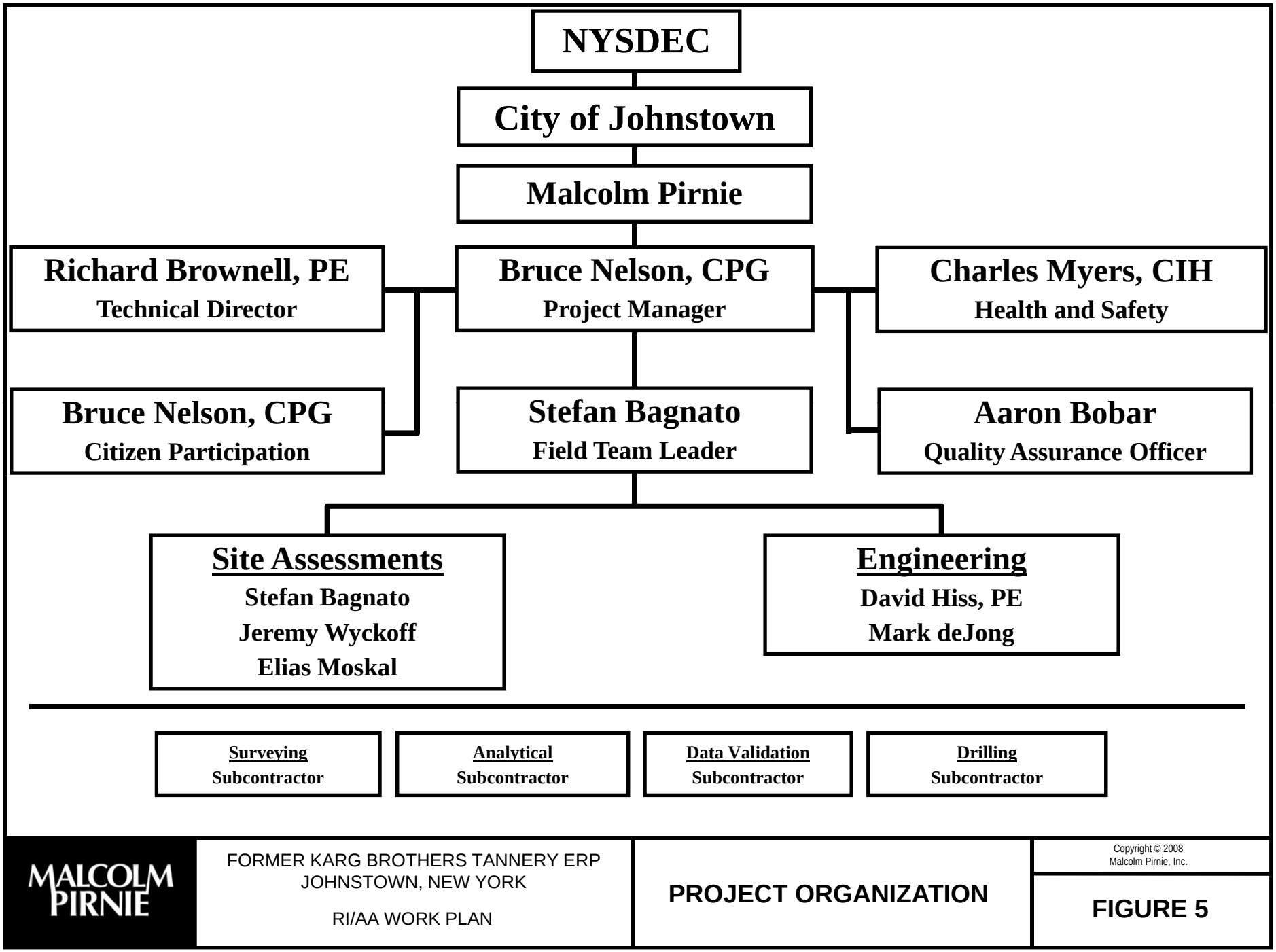
FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

AERIAL PHOTOGRAPH

FIGURE 4



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FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

PROJECT ORGANIZATION

FIGURE 5

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FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

AERIAL PHOTOGRAPH

FIGURE 6

City of Johnstown
Remedial Investigation/Alternatives Analysis
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Tables

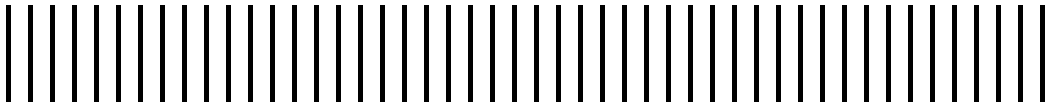

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TABLE 1
SUMMARY OF SAMPLE ANALYSIS METHODS
FORMER KARG BROTHERS TANNERY ERP
CITY OF JOHNSTOWN, NEW YORK

Analyte(s)	Matrix	Method(s)
Target Analyte List (TAL) metals + cyanide	soil/water	SW-846 6010C/7470A/7471B
TCL + TICs Volatile Organic Compounds	soil/water	SW-846 8260B
TCL + TICs Semi-Volatile Organic Compounds	soil/water	SW-846 8270D

TABLE 2
SUMMARY OF AQUEOUS SAMPLES
FORMER KARG BROTHERS TANNERY ERP
CITY OF JOHNSTOWN, NEW YORK

Sample Type	Total Samples	ANALYSIS		
		Metals + Cyanide	TCL VOCs	TCL SVOCs
INVESTIGATIVE SAMPLES				
Groundwater	8	8	8	8
QA/QC SAMPLES				
Field Duplicates	1	1	1	1
Matrix Spikes	1	1	1	1
Matrix Spike Duplicates	1	1	1	1
Trip Blanks	-	-	1	-
TOTALS	11	11	12	11

TABLE 3
SUMMARY OF SURFACE AND SUBSURFACE SOIL SAMPLES
FORMER KARG BROTHERS TANNERY ERP
CITY OF JOHNSTOWN, NEW YORK

Sample Type	Total Samples	ANALYSIS		
		TAL of 23 Metals + Cyanide	TCL VOCs + TICs	TCL SVOCs + TICs
INVESTIGATIVE SAMPLES				
Background Surface Soil Samples	5	5	-	-
Surface Soil Samples	30	30	-	-
Subsurface Soil Boring Samples	50	50	50	50
QA/QC SAMPLES				
Field Duplicates	11	5	3	3
Matrix Spikes	11	5	3	3
Matrix Spike Duplicates	11	5	3	3
Field Blanks	8	5	-	3
TOTALS	126	105	59	62

TABLE 4
AIR MONITORING REQUIREMENTS
FORMER KARG BROTHERS TANNERY ERP
CITY OF JOHNSTOWN, NEW YORK

Analyte	**Instrument**	**Action Level**	**Description**
VOCs	Photoionization	0-5 ppm*	No Action
		5-25 ppm*	Halt work, take corrective action to lower emissions below 5 ppm.
		>25ppm*	Stop Work
Respirable Dust	Mini-RAM	0-0.1 mg/m^3*	No Action
		>0.1 mg/m^3*	Employ dust suppression techniques to keep particulates <0.15 mg/m^3*.
		>0.15 mg/m^3*	Stop Work and re-evaluate activities.

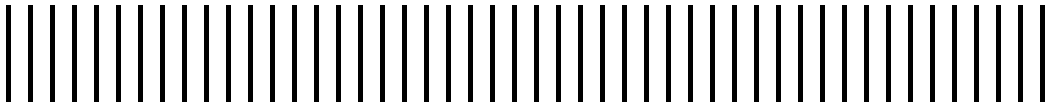
*Sustained measurement above background in breathing zone.

TABLE 5
SAMPLE CONTAINER, PRESERVATION, AND HOLDING TIME REQUIREMENTS
FORMER KARG BROTHERS TANNERY ERP
CITY OF JOHNSTOWN, NEW YORK

Matrix	Analysis	Container	Preservation	Holding Time
Soil	TCL+TICs Volatiles	1 - 4 oz. glass	Cool to 4 deg. C	14 days
	TCL+TICs Semi-Volatiles	1 - 4 oz. glass	Cool to 4 deg. C	7 days
	TAL Metals	1 - 8 oz. glass	Cool to 4 deg. C	180 days
Groundwater	TCL+TICs Volatiles	2 - 40 ml glass w/ septum cap	HCl, Cool to 4 deg. C	14 days
	TCL+TICs Semi-Volatiles	2 - 2 liter amber glass	Cool to 4 deg. C	7 days
	TAL Metals	1 liter polyethylene	HNO_3, Cool to 4 deg. C	180 days

City of Johnstown
Remedial Investigation/Alternatives Analysis
QAPP

Appendix A:
Standards Criteria and Guidance Values



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State Standards Criteria and Guidance Values (SCGs)
Former Karg Brothers Tannery ERP
City of Johnstown, New York

	6 NYCRR Part 375 Soil Cleanup Objectives							
	Unrestricted Use Soil Cleanup Objective	**Residential Soil Cleanup Objective**	**Restricted-Residential Soil Cleanup Objective**	**Commercial Soil Cleanup Objective**	**Industrial Soil Cleanup Objective**	**Protection of Ecologial Resources Soil Cleanup Objective**	**Protection of Groundwater Soil Cleanup Objective**	**NYSDEC Class GA Standard**
	mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**ug/L**
VOCs								
1,1,1-Trichloroethane	0.68	100	100	500	1,000	NS	0.68	5
1,1-Dichloroethane	0.27	19	26	240	480	NS	0.27	5
1,1-Dichloroethene	0.33	100	100	500	1,000	NS	0.33	5
1,2,4-Trimethylbenzene	3.60	47	52	190	380	NS	3.6	5
1,2-Dichlorobenzene	1.1	100	100	500	1,000	NS	1.1	NS
1,2-Dichloroethane	0.02	2.3	3.1	30	60	60	0.02	NS
1,3,5-Trimethylbenzene	8.4	47	52	190	380	NS	8.4	5
1,3-Dichlorobenzene	2.4	17	49	280	560	NS	2.4	NS
1,4-Dichlorobenzene	1.8	9.8	13	130	250	20	1.8	NS
2-Butanone (MEK)	0.12	100	100	500	1,000	100	0.12	NS
Acetone	0.05	100	100	500	1,000	2.2	0.05	NS
Benzene	0.06	2.9	4.8	44	89	70	0.06	1
Carbon Tetrachloride	0.76	1.4	2.4	22	44	NS	0.76	NS
Chlorobenzene	1.1	100	100	500	1,000	40	1.1	NS
Chloroform	0.37	10	49	350	700	12	0.37	NS
cis-1,2-Dichloroethene	0.25	59	100	500	1,000	NS	0.25	NS
Ethylbenzene	1	30	41	390	780	NS	1	5
Isopropylbenzene	NS	NS	NS	NS	NS	NS	NS	5
m,p-Xylene	NS	NS	NS	NS	NS	NS	NS	5
Methyl tert-butyl ether	0.93	62	100	500	1,000	NS	0.93	10
Methylene Chloride	0.05	51	100	500	1,000	12	0.05	5
n-Propylbenzene	3.9	100	100	500	1,000	NS	3.9	NS
sec-Butylbenzene	11	100	100	500	1,000	NS	11	NS
tert-Butylbenzene	5.9	100	100	500	1,000	NS	5.9	NS
Tetrachloroethene	1.3	5.5	19	150	300	2	1.3	NS
Toluene	0.7	100	100	500	1,000	36	0.7	5
trans-1,2-Dichloroethene	0.19	100	100	500	1,000	NS	0.19	NS
Trichloroethene	0.47	10	21	200	400	2	0.47	NS
Vinyl Chloride	0.02	0.21	0.9	13	27	NS	0.02	NS
Xylene (Total)	0.26	100	100	500	1,000	0.26	1.6	NS
SVOCs								
2,4-Dimethylphenol	NS	NS	NS	NS	NS	NS	NS	1
Acenaphthene	20	100	100	500	1,000	20	98	NS
Acenaphthylene	100	100	100	500	1,000	NS	107	NS
Anthracene	100	100	100	500	1,000	NS	1,000	NS
Benzo(a)anthracene	1	1	1	5.6	11	NS	1	NS
Benzo(a)pyrene	1	1	1	1	1.1	2.6	22	NS
Benzo(b)fluoranthene	1	1	1	5.6	11	NS	1.7	NS
Benzo(g,h,i)perylene	100	100	100	500	1,000	NS	1,000	NS
Benzo(k)fluoranthene	0.8	1	3.9	56	110	NS	1.70	NS
bis(2-Ethylhexyl)phthalate	NS	NS	NS	NS	NS	NS	NS	50
Chrysene	1	1	3.9	56	110	NS	1.00	NS
Dibenzo(a,h)anthracene	0.33	0.33	0.33	0.56	1.1	NS	1,000	NS
Diethylphthalate	NS	NS	NS	NS	NS	NS	NS	50
Di-n-butylphthalate	NS	NS	NS	NS	NS	NS	NS	50
Fluoranthene	100	100	100	500	1,000	NS	1,000	NS
Fluorene	30	100	100	500	1,000	30	1,000	NS
Indeno(1,2,3-cd)pyrene	0.5	0.5	0.5	5.6	11	NS	8.2	NS
Naphthalene	12	100	100	500	1,000	NS	12	10
Pentachlorophenol	0.8	2.4	6.7	6.7	55	0.8	0.8	NS
Phenanthrene	100	100	100	500	1,000	NS	1,000	NS
Phenol	0.33	100	100	0.5	1	30	0.33	NS
Pyrene	100	100	100	500	1,000	NS	1,000	NS
Metals								
Arsenic	13	16	16	16	16	13	16	25
Barium	350	350	400	400	10,000	433	820	1,000
Beryllium	7.2	14	72	590	2,700	10	47	NS
Cadmium	2.5	2.5	4.3	9.3	60	4	7.5	5
Chromium, hexavalent	1	22	110	400	800	1	19	50*
Chromium, trivalent	30	36	180	1,500	6,800	41	NS	50*
Copper	50	270	270	270	10,000	50	1,720	NS
Cyanide, total	27	27	27	27	10,000	NS	40	NS
Iron	NS	NS	NS	NS	NS	NS	NS	300
Lead	63	400	400	1,000	3,900	63	450	25
Magnesium	NS	NS	NS	NS	NS	NS	NS	35,000**
Manganese	1,600	2,000	2,000	10,000	10,000	1,600	2,000	300
Mercury	0.18	0.81	0.81	2.8	5.7	0.18	0.73	0.7
Nickel	30	140	310	310	10,000	30	130	100
Selenium	3.9	36	180	1,500	6,800	3.9	4	10
Silver	2	36	180	1,500	6,800	2	8.3	50
Sodium	NS	NS	NS	NS	NS	NS	NS	20,000
Thallium	NS	NS	NS	NS	NS	NS	NS	0.5**
Zinc	109	2,200	10,000	10,000	10,000	109	2,480	2,000**

State Standards Criteria and Guidance Values (SCGs)
Former Karg Brothers Tannery ERP
City of Johnstown, New York

	6 NYCRR Part 375 Soil Cleanup Objectives							
	Unrestricted Use Soil Cleanup Objective mg/kg	**Residential Soil Cleanup Objective** mg/kg	**Restricted-Residential Soil Cleanup Objective** mg/kg	**Commercial Soil Cleanup Objective** mg/kg	**Industrial Soil Cleanup Objective** mg/kg	**Protection of Ecologial Resources Soil Cleanup Objective** mg/kg	**Protection of Groundwater Soil Cleanup Objective** mg/kg	**NYSDEC Class GA Standard** ug/L
PCBs/Pesticides								
2,4,5-TP Acid (Silvex)	3.8	58	100	500	1,000	NS	3.8	NS
4,4'-DDE	0.0033	1.8	8.9	62	120	0.0033	17	0.2
4,4'-DDT	0.0033	1.7	7.9	47	94	0.0033	136	0.2
4,4'-DDD	0.0033	2.6	13	92	180	0.0033	14	0.3
Aldrin	0.005	0.019	0.097	0.68	1.4	0.14	0.19	NS
alpha-BHC	0.02	0.097	0.48	3.4	6.8	0.04	0.02	NS
beta-BHC	0.036	0.072	0.36	3	14	0.6	0.09	NS
Chlordane (alpha)	0.094	0.91	4.2	24	47	1.3	2.9	0.05
delta-BHC	0.04	100	100	500	100	0.04	0.25	NS
Dibenzofuran	7	14	59	350	1,000	NS	210	NS
Dieldrin	0.005	0.039	0.2	1.4	2.8	0.006	0.1	0.004
Endosulfan I	2.4	4.8	24	200	920	NS	102	NS
Endosulfan II	2.4	4.8	24	200	920	NS	102	NS
Endosulfan sulfate	2.4	4.8	24	200	920	NS	1,000	NS
Endrin	0.014	2.2	11	89	410	0.014	0.06	5
Heptachlor	0.042	0.42	2.1	15	29	0.14	0.38	0.04
Heptachlor epoxide	NS	NS	NS	NS	NS	NS	NS	0.03
Lindane	0.1	0.28	1.3	9.2	23	6	0.1	NS
Methoxychlor	NS	NS	NS	NS	NS	NS	NS	35
Toxaphene	NS	NS	NS	NS	NS	NS	NS	0.06
Total PCBs	0.1	1	1	1	25	1	3.2	0.09

Notes
NS - Not specified.
* Applies to total chromium
**Guidance Value
See Technical Support Document

City of Johnstown
Remedial Investigation/Alternatives Analysis
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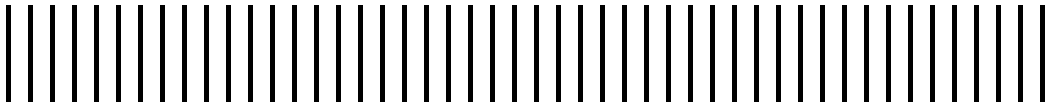
Appendix B:
Field Forms



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MALCOLM PIRNIE

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: _____ DATE: _____

PROJECT NAME: _____

PROJECT NUMBER: _____

SAMPLERS: _____

A: Total Casing and Screen Length: _____

B: Casing Internal Diameter: _____

C: Water Level Below Top of Casing: _____

D: Volume of Water in Casing: _____

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

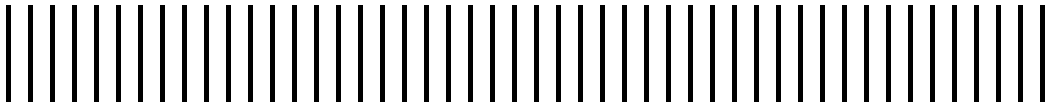
v = 0.0408 ( )^2 x (-) = _____ gal.

PARAMETER	ACCUMULATED VOLUME PURGED											
Time												
Gallons												
Well Volume												
Conductivity (mohm/cm)												
Dissolved Oxygen												
REDOX (mV)												
pH												
Temperature (^{o}C)												
Turbidity												
Salinity												
TDS												

Notes: _____

City of Johnstown
Remedial Investigation/Alternatives Analysis
QAPP

Appendix C:
Instrument Specifications



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MALCOLM PIRNIE

MiniRAE 2000

Portable Handheld VOC Monitor

The rugged **MiniRAE 2000** is the smallest pumped handheld volatile organic compound (VOC) monitor on the market. Its Photoionization Detector's (PID) extended range of 0-10,000 ppm makes it an ideal instrument for applications from environmental site surveying to HazMat/Homeland Security.

Key Features

Proven PID technology The patented 3D sensor provides a 3-second response up to 10,000 ppm and sets a new standard for resistance to moisture and dirt.

Self-cleaning lamp and sensor Our patented self-cleaning lamp and sensor minimize the need for maintenance and calibration.

The MiniRAE 2000 lamp and sensor can be taken apart in seconds for easy maintenance without any tools!

Measure more chemicals than with any other PID With over 100 Correction Factors built into the **MiniRAE 2000** memory and the largest printed list of Correction
Factors in the world (300+), RAE Systems offers the ability to accurately measure more ionizable chemicals than any other
PID. When a gas is selected from the MiniRAE 2000's library, the alarm points are automatically loaded into the meter.

User friendly screens make it easy to use for simple applications and flexible enough for sophisticated operations.

Drop-in battery When work schedules require putting in more than the 10 hours supplied by the standard NiMH battery, the drop-in alkaline pack supplied with every MiniRAE 2000 lets you finish the job.

Rugged Rubber Boot The standard rubber boot helps assure that the MiniRAE 2000 survives the bumps and knocks of tough field use.

Strong, built-in sample pump draws up to 100 feet (30m) horizontally or vertically.

Tough flexible inlet probe

Large keys operable with 3 layers of gloves.

Easy-to-read display with backlight.

Stores up to 267 hours of data at one minute intervals for downloading to PC (with the datalogging option).

3-year 10.6 eV lamp warranty

Applications

HazMat/Homeland Security

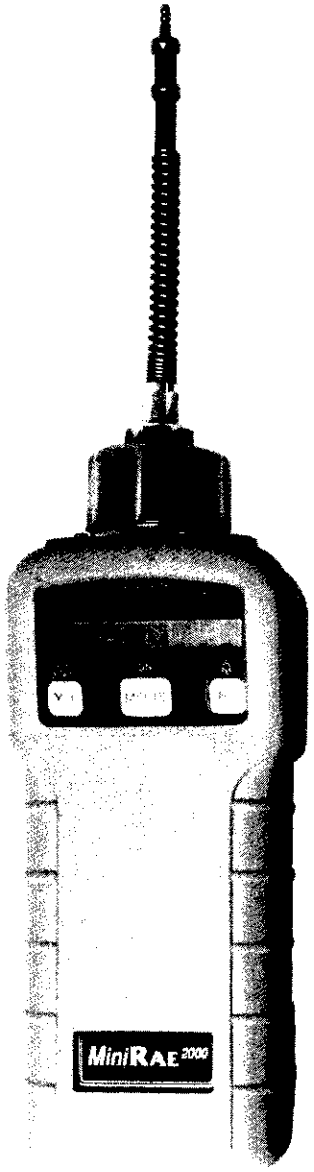
- Initial PPE (personal protective equipment) assessment
- Leak detection
- Perimeter establishment and maintenance
- Spill delineation
- Decontamination
- Remediation

Industrial Hygiene/Safety

- Confined Space Entry (CSE)
- Indoor Air Quality (IAQ)
- Worker exposure studies

Environmental

- Soil and water headspace analysis
- Leaking underground storage tanks
- Perimeter fenceline monitoring
- Fugitive emissions (EPA Method 21)
- Vapor recovery breakthrough
- Landfill monitoring



ATEX

ISO 9001 CERTIFIED

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rev12_ 04.05

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Tel: 852.2669.0828

RAE SYSTEMS

Specifications*

Default Sensor Settings**

Gas Monitor (ppm)	Range (ppm)	Resolution Time (T90)	Response
VOCs	0 - 999 ppm	0.1 ppm	< 3 sec
	100 - 10,000 ppm	1 ppm	< 3 sec

Detector Specifications

Size	8.2"L x 3.0"W x 2.0"H (21.8 x 7.62 x 5.0 cm)
Weight	20 oz with battery pack (553g) w/o rubber boot
Sensor	Photoionization sensor with standard 10.6 eV or optional 9.8eV or 11.7 eV UV lamp
Battery	• Rechargeable, external, field replaceable Nickel-Metal-Hydride (NiMH) battery pack • Alkaline battery holder (for 4 AA batteries)
Operating Period	10 hours continuous operation
Display	Large LCD, backlight activated manually, with alarms or darkness
Keypad	1 operation and 2 programming keys
Direct Readout	• VOCs as ppm by volume • High and low values • STEL and TWA (in hygiene mode) • Battery and shut down voltage
Alarms	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 automatic reset or latching with manual override • Optional plug-in pen size vibration alarm • User adjustable alarm limits
Calibration	Two point field calibration of zero and standard reference gas. Calibration memory of 8 calibration gases, alarm limits, span values and calibration date
Datalogging	Optional 267 hours (at one minute intervals) with date/time. Header information includes monitor serial number, user ID, site ID, date and time
Sampling Pump	• Internal, integrated flow rate 400 cc/min • Sample from 100' (30m) horizontally or vertically
Low Flow Alarm	Auto shut-off pump at low flow condition
Communication	Download data and upload instrument set-up from PC through RS-232 link to serial port
Temperature	14° to 104°F (-10° to 40°C)
Humidity	0% to 95% relative humidity (non-condensing)
EM/RFI	Highly resistant to EMI /RFI. Compliant with EMC Directive 89/336/EEC
IP-rating	IP-55: protected against dust, protected against low pressure jets of water from all directions
Hazardous Area Approval	• US and Canada: UL and cUL, Classified for use in Class I, Division 1, Groups A, B, C and D hazardous locations • Europe: ATEX II IG EEx ia IIC T4
Attachment	Durable bright yellow rubber boot w/belt clip & wrist strap
Warranty	Lifetime on non-consumable components (per RAE Systems Standard Warranty), 3 years for 10.6.V PID lamp, 1 year for pump and battery

* On going projects to enhance our products means that these specifications are subject to change

** Performance based on isobutylene calibration

MiniRAE 2000 and Accessories

Monitor only includes:

- 10.6eV, 9.8eV or 11.7eV as specified
- RAE Systems UV lamp: 10.6eV, 9.8eV or 11.7eV as specified
- 5-inch Flex-I-Probe
- External filter
- Rubber boot with belt clip
- Alkaline battery adapter
- Tool kit
- Lamp cleaning kit
- Nickel-Metal-Hydride battery
- 120/230 V AC/DC wall adapter (if specified)
- Operation and maintenance manual

Monitor with accessories kit adds:

- Hard transport case with pre-cut foam
- 5 porous metal filters and O-rings
- Organic vapor zeroing adapter
- Gas outlet port and tubing

Optional calibration kit adds:

- 10 ppm isobutylene calibration gas, 34L
- Calibration regulator and flow controller

Datalogging monitor adds:

- ProRAE Suite software package for Windows 98, NT, 2000 and XP
- Computer interface cable

Optional Guaranteed Cost of Ownership Program:

- 4-year repair and replacement guarantee
- Annual maintenance service

DISTRIBUTED BY:

MiniRAE 2000

RAE Systems Inc.
3775 North First Street, San Jose, CA • 95134 • USA
Tel: 877.723.2878 • Fax: 408.952.8480
Email: raesales@raesystems.com • www.raesystems.com

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Horiba

Model U-22
Water Quality Monitoring System

The Horiba U-22 Monitoring System offers laboratory quality measurements in a portable package ready for use in tough field conditions.

The versatility & monitoring capabilities of the U-22 make it an excellent choice in lake, well, groundwater, ocean sewer and irrigation water applications

FEATURES

-- Fits in two inch wells
-- Up to one month data logging
-- Measurement at depths as low as 100 meters
-- Measures 10 parameters simultaneously; pH, DO, Conductivity, Salinity, TDS, Seawater specific gravity, Temperature, Depth, and ORP
-- Automatic one point or manual two point calibration
-- Immersed sensor detection
-- Large digit LCD

SPECIFICATIONS

PARAMETERS	MEASURING PRINCIPLE	RANGE	RESOLUTION	REPEATABILITY	ACCURACY
pH · Two point calibration · Automatic Temp. Compensation	Glass Electrode Method	pH 0~14	0.01 pH	+/- 0.05 pH	+/- 0.1 pH
Dissolved Oxygen · Salt correction (0 to 40ppt/automatic) · Automatic Temp Compensation	Diaphragm gavanic battery method	0~19.99 mg/L	0.01 mg/L	+/- 0.1 mg/L	+/- 0.2 mg/L
Conductivity · Auto Range · Automatic Temp conversion (25° C) · SI units	4 AC Electrode Method	0 ~ 9.99 S/m	0.1% F.S	+/- 1%	+/- 3%
Salinity	Conductivity Conversion	0~4 %	0.01%	+/- 0.1%	+/- 0.3%
TDS Conversion factor setting	Conductivity Conversion	0 ~ 99.9 g/L	0.1% F.S	+/- 2g/L	+/- 5g/L
Seawater Specific Gravity ·Display σt, σo, σ15	Conductivity Conversion	0~50σt	0.1σt	+/-2σt	+/-5σt
Temperature	Thermistor Method	0~55°C	0.01°C	+/-0.3°C	+/-1.0°C
Turbidity Unit Selection	Penetration and scattering method	0~800 NTU	0.1 NTU	+/-3%	+/-5%
Water Depth	Pressure Method	0~100m	1m	+/-3%	+/-5%
ORP	Platinum Electrode Method	+/-1999mV	1mV	+/-5mV	+/-15mV

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Braddock, PA 15104

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Visit us soon on the web
www.
fieldenvironmental.com

Inquiries and orders
800-393-4009

Phone: 800-242-3910
www.ashtead-technology.com

Innov-X XT-260-440 PMI Analyzer

This handheld, high-performance x-ray fluorescence (XRF) analyzer available to hire from Ashtead Technology utilizes a rugged x-ray tube instead of radioactive isotopes. The x-ray tube provides tremendous analytical, cost and ease-of-use advantages over conventional portable systems containing radioactive sources. The Innov-X XT-Series handheld analyzer is designed for flexibility and adaptability. For more information on hire or rental prices of this XRF unit please contact your local office or click quotation for a full quotation.

Key Features

Flexible, Friendly Software: Choose from three operating modes for full chemistry analysis, grade identification and Pass/Fail sorting.

Cost-effective: No resourcing costs, no licensing fees. Miniature x-ray tube technology eliminates the hassles and costs of dealing with radioactive materials.

Design: Solid ergonomics and a tapered snout for difficult testing locations and welds.

Analytically Smart: Auto-compensation for irregular or small samples including welding rods, fasteners and turnings.

Fast: Grade ID, chemistry in as little as 2-3 seconds.

Elements and Alloys Analysed: The standard package of elements includes: Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Hf, Ta, W, Re, Zr, Nb (Cb), Mo, Pb, Ag, Sn, Pd

Applications

Can be used for: alloy analysis for quality control, non-destructive testing, positive materials identification or metal recycling ; environmental metals analysis of soil, sediment, filter and wipe media; as well as general XRF applications including powders, liquids and coatings.

Technical Specifications

Title	Value
Alloy Families	Iron Base - Stainless, Cr/Moly steels, some low-alloy steels Nickel Base - Ni alloys and Ni/Co superalloys Cobalt Base Titanium Base Copper Base - Brasses, Bronzes and Copper/Nickel alloys Miscellaneous High temperature alloys (Molybdenum, Tungsten alloys). Aluminum alloys - limited to sorting a certain wrought alloys by series.
Soils, Liquids, Filter and Wipe Samples:	In-situ or bagged sample testing for rapid screening of metal contaminants in soil Prepared sample testing for analytical-grade accuracy. Automated analysis of dust wipes, 25 mm, 37 mm diameter sampling filters.

*personal*DataRAM™

Hand-Held Real-Time Aerosol Monitor/Data Logger

Indoor Air Quality Monitoring • Walk-Through Surveys
Personal Exposure Monitoring • Time and Motion Studies • Workplace and Plant Monitoring
Remediation Site Worker Surveillance • Remote Alarming
Mobile Monitoring in Vehicles and Aircraft • Unattended Long-Term Monitoring

The World's Smallest, Most Versatile Real-Time Aerosol Monitor

Measures Airborne Particulates Concentration in Real Time

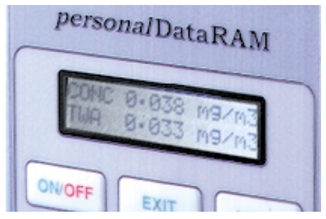
With conventional air quality monitoring methods, you won't find out until tomorrow that you have reached dangerous levels or are out of compliance today. In contrast, the *personal*DataRAM™ alerts you to a problem within seconds and allows you to take immediate corrective action. It then stores this information in detail for subsequent retrieval/printout/graphing through a computer.

The world's smallest and most versatile direct reading personal aerosol monitor, the *personal*DataRAM measures mass concentrations of dust, smoke, mists, and fumes in real time, and sounds an on-board audible alarm whenever a user-defined level is exceeded. Integral large-capacity data logging capability permits storage of up to 10,000 data points in 10 discrete tags. Each tag stores up to 1,000 averages plus maximum and STEL values. When you begin a run, the instrument automatically tags and time stamps the data collected.

The *personal*DataRAM is ideal for personal/breathing zone monitoring, plant walk-through surveys, remediation site worker exposure monitoring, and indoor air quality monitoring.

Highest Performance of Any Real-Time Personal Particulate Monitor

With a measurement range from 0.001 to 400 mg/m^3 (auto-ranging), an optically feedback-stabilized sensing system, ultra-low power consumption (negligible internal heating), and rigid all-metal construction, the *personal*DataRAM sets new standards for sensitivity, long-term stability, and reliability. These capabilities allow its use in many applications where such compact monitors were previously considered unsuited.



Easy-to-Read Two-Line Display

The *personal*DataRAM's two-line LCD readout continuously displays both real-time and time-averaged (TWA) concentration values, updated every second. Other screens are easily selected by scrolling through a simple user-friendly menu and following prompts. Self-diagnostics continually monitor the unit's operation and flag any problems. LCD screens which indicate remaining memory, battery status, optical background level, as well as any electronic malfunctions can also be selected.

Only four tactile-feedback keys (including ON/OFF) are required to perform all operations and commands.

Extremely Compact and Rugged Design

Palm-sized, the *personal*DataRAM weighs only ½ kilogram (18 oz) and can be attached to a belt or a shoulder strap (see Accessories), hand held, operated on a table top, or mounted on a tripod.

The *personal*DataRAM's rugged, yet attractive, brushed extruded aluminum case is designed to protect the unit's optics and electronics in even the harshest industrial environments. Heavy-duty molded bumpers shield the monitor from inadvertent mishandling and moderate impact. The absence of any moving parts (e.g. pumps, motors, valves, etc.) and the use of low-power semiconductor components throughout ensures long life and failure-free operation.

Sensing Principle Achieves High Correlation With Gravimetric Measurements

The *personal*DataRAM is a light-scattering photometer (i.e. nephelometer), which incorporates a pulsed, high output, near-infrared light emitting diode source, a silicon detector/hybrid preamplifier, collimating optics, and a source reference feedback PIN silicon detector. The intensity of the light scattered over the forward angle of 45˚ to 95˚ by airborne particles passing through the sensing chamber is linearly proportional to their concentration. The *personal*DataRAM's optical configuration produces optimal volume response to particles in the size range of 0.1 to 10 µm, achieving high correlation with standard gravimetric measurements of the respirable and thoracic fractions.

Passive Air Sampling Is Silent and Reliable

The *personal*DataRAM's passive air sampling technique has been thoroughly field-proven since 1980 by thousands of MIE MINIRAMs, the unit's precursor. Air surrounding the monitor circulates freely through the open sensing chamber by natural convection, diffusion, and background air motion. With this passive nephelometric sampling method, concentration measurements do not depend on the air velocity through the sensing chamber.

Interfaces With a PC for Easy Programming and Downloading

The *personal*DataRAM is easily programmed from any IBM-compatible personal computer. Using the pDR-COM software provided with the unit, operating parameters such as logging period, display averaging time, alarm level and mode, etc., can be changed before the next run. Once configured for a test, the *personal*DataRAM will retain the setup information until you edit it again.

Using the pDR-COM software, logged data can be downloaded to a PC for direct tabular and graphic display, and/or printout. These data can also be imported into most common spreadsheet programs by following the instructions provided.

Other commands such as enable/disable logging and alarms, review of program parameters, and review of maximum/STEL data are entered directly through the *personal*DataRAM's keyboard.

Simple Zeroing and Calibration

Each *personal*DataRAM comes gravimetrically calibrated (NIST traceable) in mg/m^3 using standard SAE Fine (ISO Fine) test dust. Zeroing with particle-free air is accomplished quickly and effectively under field conditions using the zeroing kit included. Special firmware controls an automatic calibration check referenced to the optical background set at the factory. Gravimetric field calibration can be performed by comparison with a filter sampler and by programming of the calibration constant.

Four Power Options

The *personal*DataRAM can be powered by:

- A replaceable 9V alkaline "transistor" battery which provides up to 18 hours of operation
- AC line power and a universal voltage power supply (included) for long-term, continuous monitoring
- An optional rechargeable, sealed nickel-metal-hydride battery pack that attaches rigidly to the *personal*DataRAM's base, providing up to 48 hours of operation between charges
- Any external DC source (7 to 9V), such as a lantern battery.

For maximum flexibility, power sources can be changed even while operating the unit.

Maintenance, Service, and Factory Support

The *personal*DataRAM has no moving parts to wear out. (Only the 9V battery needs to be replaced.) Instructions for simple and easy periodic cleaning of the sensing chamber are provided. Routine factory check-out and calibration are recommended on a 2-year cycle.

MIE's experienced technical/applications support can provide expert advice and practical solutions to aerosol-related problems. This invaluable resource is available to customers for the life of our instruments, many of which have been in field use for more than a quarter of a century.

Accessories for Enhanced Functionality and Performance

The *personal*DataRAM comes with several standard accessories. They include:

- Universal voltage power supply/charger
- Digital communications cable
- pDR-COM software disk
- Zeroing kit
- Belt clip kit
- Instruction manual
- Carrying case

Optional accessories include:

- Rechargeable (NiMH) battery pack
- Active sampling adapter kit
- Shoulder strap
- Remote alarm unit
- Multiple set carrying case

The active sampling adapter kit is designed for extractive sampling applications such as duct, stack, or chamber monitoring, where the *personal*DataRAM must be outside of the environment to be measured.

Safety Approvals and Certifications

The *personal*DataRAM is classified for intrinsically safe use in hazardous locations Class 1, Division 1, Groups A, B, C, & D. In addition, it meets US FCC and European CE rules.

MIE

Specifications

Concentration measurement range (auto-ranging)[1]: 0.001 to 400 mg/m^3

Scattering coefficient range: 1.5 x 10^{-6} to 0.6 m^{-1} (approximately) @ λ=880 nm

Precision/repeatability (2-sigma)[2]:
±10 µg/m^3 for 1-second averaging
±1.5 µg/m^3 for 60-second averaging

Accuracy[1]: ±5% of reading ± precision

Resolution: 0.1% of reading or 0.001 mg/m^3, whichever is larger

Particle size range of maximum response: 0.1 to 10 µm

Concentration display updating interval: 1 second

Alarm level adjustment range[3]: selectable over entire measurement range

Alarm averaging time[3]: real-time (1 to 60 seconds) or STEL (15 minutes)

Data logging averaging periods[3]: 1 second to 4 hours

Total number of data points in memory: 10,000

Number of data tags: 10 (1,000 data points per tag)

Logged data:
- Each data point: average concentration, time/date, and data point number
- Run summary: overall average and maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date of occurrence, averaging (logging) period, calibration factor, and tag number

Elapsed time range: 30 days maximum

Time keeping and data retention: > 10 years

Readout display: LCD 16 characters (4 mm height) x 2 lines

Serial interface: RS232, 4800 baud

Computer requirements: IBM-compatible PC, 286 or higher; Windows™ 3.1, 3.11, or '95; 2 MB memory or more; hard drive; 3.5" or 5.25" floppy drive; VGA or higher resolution monitor

Power:
- Internal battery: 9V alkaline, 16-hour run time (typical)
- AC source: universal voltage adapter (included) 100-250 volts, 50-60 Hz (CE marked)
- Optional battery pack: rechargeable NiMH, 48-hour run time (typical)

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

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

Dimensions: 153 mm (6.0 in) H x 92 mm (3.6 in) W x 63 mm (2.5 in) D

Weight: 0.5 kg (18 oz)

Standard accessories included: zeroing kit, belt clip set, PC communications software disk, RS232 communications cable, universal voltage AC adapter, carrying case, and manual

[1]Referred to gravimetric calibration with SAE Fine test dust (mmd = 2 to 3 µm, σg = 2.5, as aerosolized)
[2]At constant temperature
[3]User selectable

MIE

Thermo Andersen

500 Technology Court
Smyrna, GA 30082 USA
TEL: (800) 241-6898 or (770 319-9999
FAX: (770) 319-0336

pDR 2/97 10M: Edit 1/22/02 jwj

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City of Johnstown

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NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ENVIRONMENTAL RESTORATION PROGRAM
PROJECT # E 518022

Appendix B:
Remedial Investigation/ Alternatives Analysis Health & Safety Plan and Community Air Monitoring Plan

Former Karg Brothers Tannery
Johnstown, New York

January 2009

Prepared By:

Malcolm Pirnie, Inc.

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

2384015

MALCOLM PIRNIE

MALCOLM PIRNIE

HEALTH AND SAFETY PLAN

All requirements of the Pirnie Health and Safety Program are Incorporated into this Document by Reference

PROJECT NAME:	Former Karg Brothers Tannery - ERP
SITE ADDRESS:	Johnstown, New York
PIRNIE PROJECT AND TASK NUMBER:	2384015
CLIENT ORGANIZATION:	City of Johnstown
CLIENT ON-SITE CONTACT NAME:	Chad Kortz & Kevin Jones
CLIENT SITE CONTACT PHONE #:	(518) 736-4014
CLIENT OFF-SITE CONTACT NAME:	Chad Kortz & Kevin Jones
CLIENT OFF-SITE CONTACT PHONE #:	(518) 736-4014

( ) AMENDMENT TO EXISTING APPROVED HASP | **EXISTING HASP AMENDMENT NUMBER**

SITE TYPE: *Check as many as applicable. Add more if needed.*

Active ( ) Secure ( ) Enclosed space ( ) Uncontrolled ( ) Recovery ( ) Unknown ( ) Other *(Specify)* (X) former tannery
Inactive (X) Unsecured ( ) Landfill ( ) Industrial ( ) Well Field ( ) Military ( ) Other *(Specify)* ( )

EMERGENCY CONTACTS	PHONE
Water Supply:	NA
Electric Supply:	NA
EPA Release Report #:	NA
Pirnie H&S Emergency #:	800-478-6870 914-557-0004
Facility Management:	NA
Other (Specify):	NA
MEDICAL EMERGENCY	**PHONE**
Hospital Name:	Nathan Littauer Hospital
Hospital Address:	90 E. State St. Gloversville, NY
Name of Contact at Hospital:	
Name of 24 Hour Ambulance:	Johnstown Area Vol. Amb. Corps

EMERGENCY CONTACTS	NAME	PHONE
Health and Safety Director:	Chuck Myers	(914) 641-2610
Project Manager:	Bruce Nelson	(518) 782-2115
Site Safety Coordinator:	Stefan Bagnato	(518) 782-2126
Client contact:	Chad Kortz	(518) 736-4014
Other (Specify):	Kevin Jones	(518) 736-4014
State Spill Number:	NYS Spill Hotline	1-800-457-7362
Fire Department:	Johnstown Fire Dept.	(518) 736-4076 or 911
Police Department:	Johnstown Police Dept.	(518) 736-4021 or 911
State Police:	NYS Police	911
Health Department:	Saratoga County Public Health	(518) 584-7460
Poison Control Center:	Upstate NY PCC	1-800-222-1222
Occupational Physician:		

Route and distance to hospital:

See Figure 2. NY Route 50 southeast to Saratoga Springs, ~11.5 miles, 17 minutes.

HEALTH AND SAFETY PLAN APPROVALS *Not valid if not signed by Corporate H&S*

	PRINTED NAME	SIGNATURE
Prepared by:	**Stefan Bagnato**	
PM Signature:	**Bruce Nelson**	
Corporate H&S	**Chuck Myers**	
Local H&S Coordinator	**Aaron Bobar**	

OBJECTIVES OF FIELD WORK: *(e.g. collect surface soil samples)*

1. Surface Soil Screening/Sampling
2. Subsurface Soil Sampling
3. Groundwater Monitoring Well Installation
4. Groundwater Sampling
5.
6.

SITE HISTORY: *Summarize known hazardous conditions. Include spills, previous investigations or agency actions, known injuries, etc.*

Former tannery operated for ~100 years, building taken down by USEPA in Emergency Removal Action. Known metals contamination in soil including Cr, As, Hg.

SAFETY NARRATIVE: *Summarize Below*

The site, located in the north-central portion of the City of Johnstown (Figure 1), consists of the former Karg Brothers Tannery property with an area of approximately 5.3 acres, and the ten adjacent properties shown on Figure 2 with a total land area of approximately 2.6 acres. The site and adjacent properties will be investigated by Malcom Pirnie on behalf of the City of Johnstown under the NYS Environmental Restoration Program (ERP) to evaluate the magnitude and extent of contaminants associated with former tannery operations.

MALCOLM PIRNIE

HEALTH AND SAFETY PLAN

All requirements of the Pirnie Health and Safety Program are Incorporated into this Document by Reference

PERSONNEL AND RESPONSIBILITIES: NAMES, OF	TRAINING	PROJECT OR SITE RESPONSIBILITIES	TASKS
Stefan Bagnato	OSHA HAZWOPER 40 hr. training + current 8 hr. refresher	Field Team Leader, Site Invesitgation	1,2,3,4
Jeremy Wyckoff	OSHA HAZWOPER 40 hr. training + current 8 hr. refresher	Site Investigation	1,2,3,4
Elias Moskal	OSHA HAZWOPER 40 hr. training + current 8 hr. refresher	Site Investigation	1,2,3,4
Christine Thomas	OSHA HAZWOPER 40 hr. training + current 8 hr. refresher	Site Investigation	1,2,3,4

HAZARDS OF CONCERN: *Check as many as applicable.*

Animal/ Plants	(X)	Dust, Harmful	( )	Animal/ Plants	( )	Falling Objects	( )	Ionizing Radiation	( )	Oxygen Deficient	( )	Traffic (Struc by)	(X)		
Asbestos/ Lead	( )	Dust, Nuisance	( )	Asbestos/ Lead	( )	Heat Stress	( )	Light Radiation *(i.e., Welding, High Intensity)*	( )	Poor Visibility	( )	Other: (Print)			
Biological	( )	Electrical	( )	Biological	( )	Heavy Equipment	( )	Limited Contact	( )	Powered Platforms	( )	_____	( )		
Chemical Exposure *(See Section 5B/5C)*	(X)	Excavations *(See Section 13)*	( )	Chemical Exposure *(See Section 5B/5C)*	( )	Heavy Lifting	( )	Motorized Traffic	( )	Radiological	( )	_____	( )		
Cold Stress	( )	Explosive/ Flamable	( )	Cold Stress	( )	Heavy Machinery	( )	Moving Parts (LO/TO)	( )	Rolling Objects	( )	_____	( )		
Confined Space *(See Section 12)*	( )	Extreme Cold	( )	Confined Space *(See Section 12)*	( )	Hot Work	( )	Noise (>85cB)	( )	Scaffolding	( )	_____	( )		
Demolition	( )	Fall, >6' Vertical	( )	Demolition	( )	Hunting Season	( )	Non-Ionizing Radiation	( )	Sharp Objects	( )	_____	( )		
Drilling	(X)	Falling Objeccts	( )	Drilling	( )	Immersion	( )	Organic Chemicals	( )	Slips & Falls	(X)	_____	( )		
Drum Handling	( )	Heat Stress	( )	Drum Handling	( )	Inorganic Chemicals	( )	Overhead Objects	( )	Terrain	(X)	_____	( )		

HEALTH AND SAFETY PLAN

All requirements of the Pirnie Health and Safety Program are Incorporated into this Document by Reference

DESCRIPTION OF SITE AND TOPOGRAPHICAL FUTURES:

Include location of principal operations and unusual features (containers, buildings, dikes, power lines, hill slopes, rivers, etc.)

Site consists of a vacant former tannery with only concrete building slabs remaining, and 10 adjacent properties, see Figures 1 and 2.

SURROUNDING POPULATION: (X) Residential (X) Commercial ( ) Urban
( ) Rural ( ) Industrial ( ) Other

ANTICIPATED ON SITE CHEMICALS AND ESTIMATED QUANTITY

Solids: *(Quantitiy/ Concentration)*		**Sludge:** *(Quantitiy/ Concentration)*		**Solvents:** *(Quantitiy/ Concentration)*		**Oils:** *(Quantitiy/ Concentration)*		**Others:** *(Quantitiy/ Concentration)*	
Flyash	_____	Pigments	_____	Ketones	_____	Oily Wastes	_____	Acids	_____
Mill or Mine Tailings	_____	Metal Sludges	_____	Aromatics	_____	Gasoline	_____	Pickling Liquiors	_____
Asbestos	_____	POTW Sludge	_____	Hydrocarbons	_____	Diesel Oil	_____	Caustics	_____
Ferrous Smelter	_____	Distillation Bottoms	_____	Alcohols	_____	Lubricants	_____	Pesticides	_____
Non-Ferrous Smelter	_____	Aluminum	_____	Halogenated	_____	Polynuclear Aromatics	_____	Dyes or Inks	_____
Metals	See Page 5	Other - Specify	_____	Esters	_____	PCBs	_____	Cyanides	_____
Dioxins	_____	_____	_____	Ethers	_____	Heating Oil	_____	Phenols	_____
Other - Specify	_____	_____		Other - Specify	_____	Other - Specify	_____	Halogens	_____
_____	_____	_____	_____	_____	_____	_____	_____	Other - Specify	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____		_____	_____	_____

ANTICIPATED WASTE TYPES: ( ) Liquid ( ) Sludge ( ) Unknown
( ) Solid ( ) Gas ( ) Other, specify

FACILITY'S PAST AND PRESENT DISPOSAL METHODS AND PRACTICES, IF APPLICABLE:

KNOWN CONTAMINANTS	HIGHEST OBSERVED CONCENTRATION *WHICH MEDIA?*	8 HR TIME WEIGHTED AVERAGE IN AIR **(PEL/TLV)** *SPECIFY UNITS*	IDLH *SPECIFY UNITS*	WARNING CONCENTRA-TION IF ANY *SPECIFY UNITS*	SYMPTOMS & EFFECTS OF ACUTE EXPOSURE	MEDIA	PHOTO-IONIZATION POTENTIAL *(FOR VOCs)*
Chromium	1,290 mg/kg (soil)	PEL - 1 mg/m3	25 ug/m3		Irritation at the site of contact, irritation of the gastrointestinal tract, impairment of olfactory sense, and discoloration (yellowing) of teeth and tongue.	S	
Arsenic	206 mg/kg (soil)	PEL - 10 ug/m^3	100 mg/m^3		Gastrointestinal, cardiovascular and respiratory, and neurologic symptooms	S	
Mercury	22 mg/kg (soil)	TLV - 0.1 mg/m3	28 mg/m^3		Pulmonary and central nervous system effects	S	

NA = Not Available **NE = None Established** **U = Unknown**

S = Soil SW = Surface Water SD = Sediments
A = Air GW = Ground Water OFF = Off-Site
W = Waste L = Lagoons
D = Drums TK = Tanks

Attach a Material Safety Data Sheet for each chemical you will use at the site

MALCOLM PIRNIE

HEALTH AND SAFETY PLAN

All requirements of the Pirnie Health and Safety Program are Incorporated into this Document by Reference

SPECIFIC TASK DESCRIPTIONS	TASK - SPECIFIC HAZARDS	CONTROL MECHANISM
1. Surface Soil Screening/Sampling	CHEMICAL EXPOSURE (See Section 5B/5C) OTHER: Other:	Work practices, PPE
2. Subsurface Soil Sampling	CHEMICAL EXPOSURE (See Section 5B/5C) DRILLING NOISE (> 85 dB) Other:	Work practices, PPE
3. Groundwater Monitoring Well Installation	CHEMICAL EXPOSURE (See Section 5B/5C) DRILLING NOISE (> 85 dB) Other:	Work practices, PPE
4. Groundwater Sampling	CHEMICAL EXPOSURE (See Section 5B/5C) Other:	Work practices, PPE
5.	Other:	
6.	Other:	
SPECIALIZED TRAINING REQUIRED: OSHA 40 hr. HAZWOPER	**SPECIAL MEDICAL SURVEILLANCE REQUIREMENTS:** OSHA Medical Monitoring	

OVERALL HAZARD EVALUATION: ( ) High ( )Medium (X) Low ( ) Unknown (Evaluate each hazard)

1. Low
2. Low
3. Low
4. Low
5.
6.

JUSTIFICATION: (i.e., why is this task a low or medium or high hazard?)

1. Minimal contact
2. Minimal contact
3. Minimal contact
4. Minimal contact
5.
6.

FIRE/EXPLOSION POTENTIAL ( ) High ( )Medium (X) Low ( ) Unknown

MALCOLM PIRNIE

HEALTH AND SAFETY PLAN

All requirements of the Pirnie Health and Safety Program are Incorporated into this Document by Reference

PROTECTIVE EQUIPMENT *Specify by task. Indicate type and/or material, as necessary. Group tasks if possible. Use copies of this sheet if needed.*

TASK 1

LEVEL: D - Modified ( ) Contingency (X) Primary

Respiratory (X) Not needed
( ) SCBA
( ) Airline
( ) Full Face
Specify Cartridge _____
( ) Escape Mask
( ) Other

Head and Eye ( ) Not needed
(X) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other

Boots ( ) Not needed
(X) Leather/Steel-Toe
( ) Rubber Overboots
(X) Steel Shank

Prot. Clothing (X) Not needed
( ) Fully Encapsulating Suit
( ) Splash Suit
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Reflective Vest
( ) Other (specify) _____

Gloves ( ) Not needed
(X) Nitrile
( ) Work Gloves
( ) Latexs
( ) Viton
( ) Other (specify) _____

MISC: Specify below
( ) Insect Repellent
( ) USCG Personal Flotation Device
( ) Hearing (specify NRR)_____
( ) Sun Screen
( ) Other (specify) _____

TASK 2

LEVEL: D - Modified ( ) Contingency (X) Primary

Respiratory (X) Not needed
( ) SCBA
( ) Airline
( ) Full Face
Specify Cartridge _____
( ) Escape Mask
( ) Other

Head and Eye ( ) Not needed
(X) Safety Glasses
( ) Face Shield
( ) Goggles
(X) Hard Hat
( ) Other

Boots ( ) Not needed
(X) Leather/Steel-Toe
( ) Rubber Overboots
(X) Steel Shank

Prot. Clothing (X) Not needed
( ) Fully Encapsulating Suit
( ) Splash Suit
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Reflective Vest
( ) Other (specify) _____

Gloves ( ) Not needed
(X) Nitrile
( ) Work Gloves
( ) Latexs
( ) Viton
( ) Other (specify) _____

MISC: Specify below
( ) Insect Repellent
( ) USCG Personal Flotation Device
(X) Hearing (specify NRR)__31_____
( ) Sun Screen
( ) Other (specify) _____

TASK 3

LEVEL: D - Modified ( ) Contingency (X) Primary

Respiratory (X) Not needed
( ) SCBA
( ) Airline
( ) Full Face
Specify Cartridge _____
( ) Escape Mask
( ) Other

Head and Eye ( ) Not needed
(X) Safety Glasses
( ) Face Shield
( ) Goggles
(X) Hard Hat
( ) Other

Boots ( ) Not needed
(X) Leather/Steel-Toe
( ) Rubber Overboots
(X) Steel Shank

Prot. Clothing ( ) X
( ) Fully Encapsulating Suit
( ) Splash Suit
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Reflective Vest
( ) Other (specify) _____

Gloves ( ) Not needed
(X) Nitrile
( ) Work Gloves
( ) Latexs
( ) Viton
( ) Other (specify) _____

MISC: Specify below
( ) Insect Repellent
( ) USCG Personal Flotation Device
(X) Hearing (specify NRR)_31____
( ) Sun Screen
( ) Other (specify) _____

TASK 4

LEVEL: D - Modified ( ) Contingency (X) Primary

Respiratory (X) Not needed
( ) SCBA
( ) Airline
( ) Full Face
Specify Cartridge _____
( ) Escape Mask
( ) Other

Head and Eye ( ) Not needed
(X) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other

Boots ( ) Not needed
(X) Leather/Steel-Toe
( ) Rubber Overboots
(X) Steel Shank

Prot. Clothing (X) Not needed
( ) Fully Encapsulating Suit
( ) Splash Suit
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Reflective Vest
( ) Other (specify) _____

Gloves ( ) Not needed
(X) Nitrile
( ) Work Gloves
( ) Latexs
( ) Viton
( ) Other (specify) _____

MISC: Specify below
( ) Insect Repellent
( ) USCG Personal Flotation Device
( ) Hearing (specify NRR)_____
( ) Sun Screen
( ) Other (specify) _____

PROTECTIVE EQUIPMENT *Specify by task. Indicate type and/or material, as necessary. Group tasks if possible. Use copies of this sheet if needed.*

TASK 5

LEVEL: A - B - C - D - Modified ( ) Primary ( ) Contingency

Respiratory ( ) Not needed
( ) SCBA
( ) Airline
( ) Full Face
Specify Cartridge _____
( ) Escape Mask
( ) Other

Head and Eye ( ) Not needed
( ) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other

Boots ( ) Not needed
( ) Leather/Steel-Toe
( ) Rubber Overboots
( ) Steel Shank

Prot. Clothing ( ) Not needed
( ) Fully Encapsulating Suit
( ) Splash Suit
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Reflective Vest
( ) Other (specify) _____

Gloves ( ) Not needed
( ) Nitrile
( ) Work Gloves
( ) Latexs
( ) Viton
( ) Other (specify) _____

MISC: Specify below
( ) Insect Repellent
( ) USCG Personal Flotation Device
( ) Hearing (specify NRR)_____
( ) Sun Screen
( ) Other (specify) _____

TASK 6

LEVEL: A - B - C - D - Modified ( ) Primary ( ) Contingency

Respiratory ( ) Not needed
( ) SCBA
( ) Airline
( ) Full Face
Specify Cartridge _____
( ) Escape Mask
( ) Other

Head and Eye ( ) Not needed
( ) Safety Glasses
( ) Face Shield
( ) Goggles
( ) Hard Hat
( ) Other

Boots ( ) Not needed
( ) Leather/Steel-Toe
( ) Rubber Overboots
( ) Steel Shank

Prot. Clothing ( ) Not needed
( ) Fully Encapsulating Suit
( ) Splash Suit
( ) Tyvek Coverall
( ) Saranex Coverall
( ) Reflective Vest
( ) Other (specify) _____

Gloves ( ) Not needed
( ) Nitrile
( ) Work Gloves
( ) Latexs
( ) Viton
( ) Other (specify) _____

MISC: Specify below
( ) Insect Repellent
( ) USCG Personal Flotation Device
( ) Hearing (specify NRR)_____
( ) Sun Screen
( ) Other (specify) _____

MONITORING EQUIPMENT: Specify by task. Indicate type as necessary. Attach additional sheets if needed.			
INSTRUMENT	**ACTION GUIDELINES**		**COMMENTS**
Combustible Gas Indicator	0-10% LEL 10-25% LEL >25% LEL	*No explosion hazard* *Potential explosion hazard. Reconsider Work Plan. Proceed Cautiously* *Explosion hazard. Evacuate Immediately. Warn Others.*	(X) Not Needed ( ) Not Needed
Oxygen Indicator	19.5-23.5 % < 19.5% >23.5 %	*Oxygen normal* *Oxygen deficient. Evacuate Immediately. Warn Others.* *Explosion hazard. Evacuate Immediately. Warn Others.*	(X) Not Needed
Radiation Survey Meter	3 x Background: >2mR/hr:	*Notify RSO if unanticipated. Withdraw and await instructions* *Establish Rad Exclusion Zone*	(X) Not Needed
Photoionization Detector ___10.6__eV Lamp Type___MiniRAE2000_____	See Community Air Monitoring Plan	*See Community Air Monitoring Plan*	( ) Not Needed
Flame Ionization Detector Type_____	0-3 units over ambient 3-5 units over ambient >5 units over ambient	*0-3 meter units over background, continue work* *If sustained for 5 minutes--reconsider work plan. Proceed with caution.* *If sustained for 5 minutes--evacuate or don respiratory protection*	(X) Not Needed
Single Gas Type_____	*Specify:*		(X) Not Needed
Respirable Dust Monitor Type____MIE personalDataRAM_____	See Community Air Monitoring Plan	*See Community Air Monitoring Plan*	( ) Not Needed
Other *Specify:* Type_____	*Specify:*		(X) Not Needed
Other *Specify:* Type_____	*Specify:*		(X) Not Needed

DECONTAMINATION PROCEDURES

ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, & SUPPORT ZONES

Personnel Decontamination	**Exclusion Zone**	**Sampling Equipment Decontamination**
Summarize below or attach diagram.	*Summarize below or attach diagram.*	*Alconox Wash and Scrub* Tap Water Rinse Deionized Water Rinse
(X) Not Needed		(X) Not Needed
Containment and Disposal Method		**Containment and Disposal Method**

HAZARDOUS MATERIALS TO BE BROUGHT ONSITE

Preservatives		*Decontamination*		*Calibration*	
( ) Hydrochloric Acid	( ) Zinc Acetate	(X Alconox ™	( ) Mineral Spirits	( ) 100 ppm isobutylene	( ) Hydrogen Sulfide
( ) Nitric Acid	( ) Ascorbic Acid	( ) Liquinox ™	( ) Hexane	( ) Methane	( ) Carbon Monoxide
( ) Sulfuric Acid	( ) Acetic Acid	( ) Acetone	( ) Isopropanol	( ) Pentane	( ) pH Standards
( ) Sodium Hydroxide	( ) Other:	( ) Methanol	( ) Nitric Acid	( ) Hydrogen	( ) Conductivity
		( ) Methanol	( ) Other:	( ) Propane	( ) Other:

SITE MAP: *Show Exclusion Zone, Contamination Reduction Zone, and Support Zones. Indicate Evacuation and Reassembly Points*

HEALTH AND SAFETY PLAN SIGNATURE FORM

Pirnie Health and Safety Plan

All on-site Pirnie personnel must sign this form indicating receipt of the HASP. Keep this original on site as part of the permanent project files. Send a copy to the Health and Safety Lead for your BU.

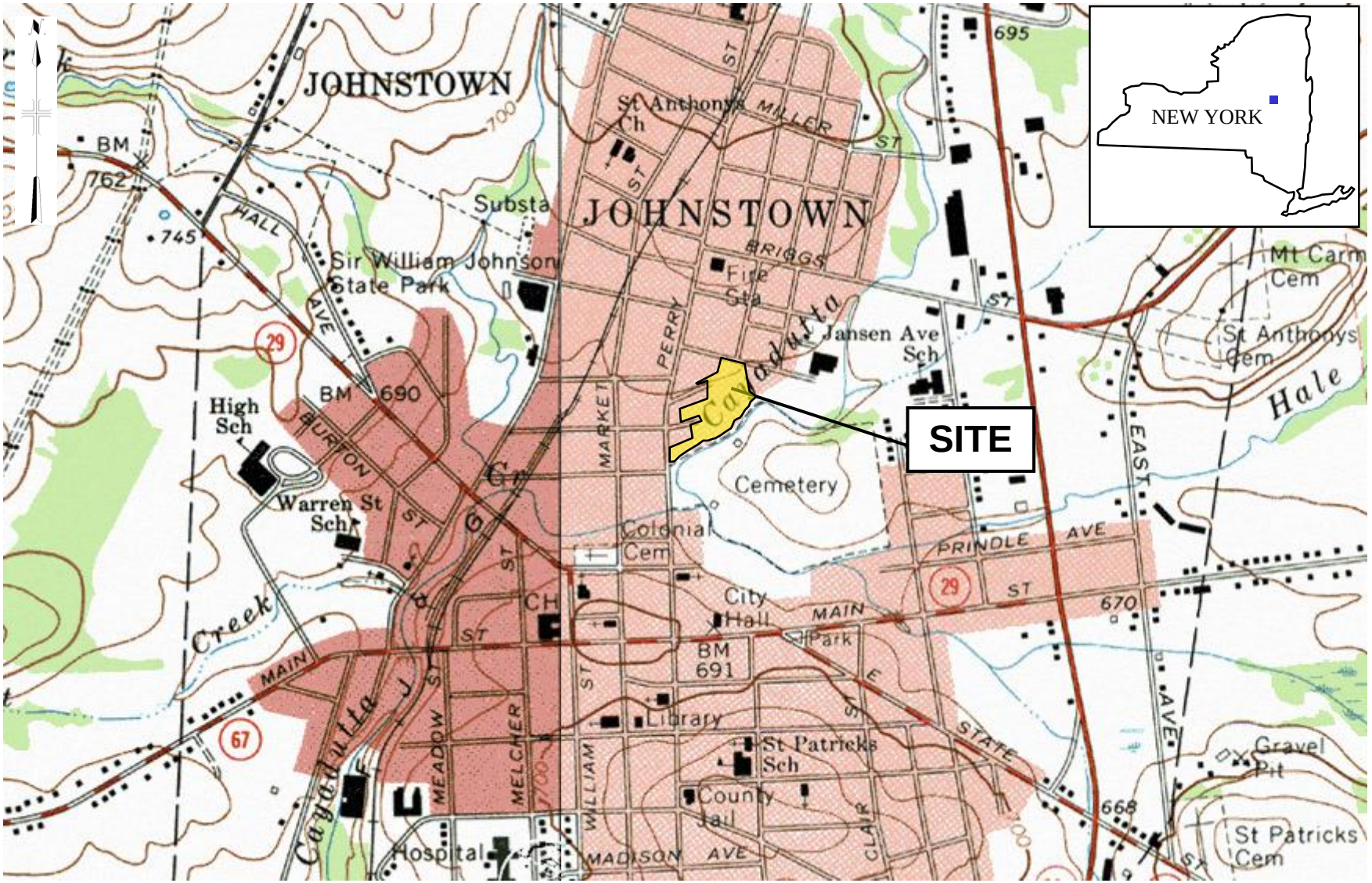
SITE NAME Former Karg Brothers Tannery ERP

SITE LOCATION: Johnstown, NY

CERTIFICATION:

I understand that I am responsible for my safety and that of others. I agree to comply with the provisions of this HASP for work activities on this project. I agree to report any injuries, illnesses or exposure incidents to the Field Team Leader.

PRINTED NAME	SIGNATURE	DATE



SOURCE: U.S.G.S 7.5 MIN. PECK LAKE AND GLOVERSVILLE QUADS

SCALE IN FEET

0 500 1000 2000

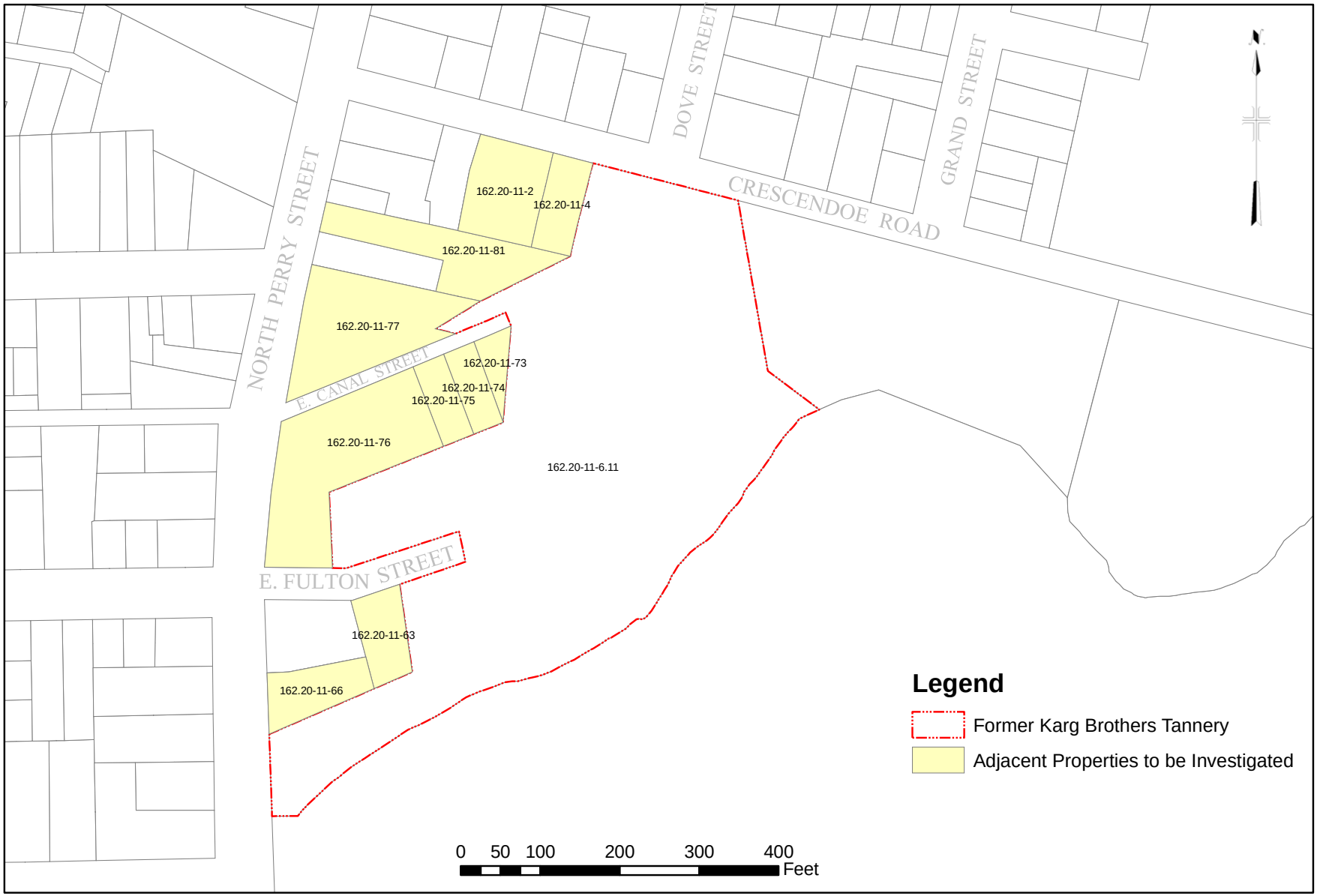
MALCOLM PIRNIE

FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

LOCATION MAP

FIGURE 1



MALCOLM PIRNIE

FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

TAX PARCEL MAP

FIGURE 2

Source: Mapquest.com

MALCOLM PIRNIE

FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

HOSPITAL ROUTE

FIGURE 3

Directions from Karg Brothers Site, Johnstown, NY to Nathan Littauer Hospital, Gloversville, NY

1: Start out going NORTH on N PERRY ST. 0.2 mi

2: Turn RIGHT onto BRIGGS ST. 0.5 mi

3: Turn LEFT onto N COMRIE AVE/ NY-30A/ MAYOR HARVEY W MANSFIELD HWY. Continue to follow NY-30A. 4.8 mi

4: Turn LEFT onto E STATE ST. 0.2 mi

6: End at Nathan Littauer Hospital 90 E State St Gloversville, NY 12078

Estimated Time: 9 minutes Estimated Distance: 5.79 miles

COMMUNITY AIR MONITORING PLAN
REMEDIAL INVESTIGATION/ALTERNATIVES ANALYSIS
FORMER KARG BROTHERS TANNERY,
JOHNSTOWN, NEW YORK

To provide a measure of protection for any potential downwind receptors, and to confirm that work activities do not generate airborne contaminants, Malcolm Pirnie will conduct continuous monitoring for volatile organic compounds (VOCs) and particulate matter (dust) during all ground intrusive activities at the site. Monitoring will be conducted at the upwind and downwind perimeters of each work area.

VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

Volatile organic compounds (VOCs) will be monitored on a continuous basis during drilling activities. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. VOC monitoring will be conducted using a MiniRae 2000 photoionization detector (PID). The PID will be calibrated at least daily using the span calibration gas recommended by the manufacturer. The PID will calculate 15-minute running average concentrations. These averages will be compared to the action levels specified below.

Action Levels

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential

receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, all work activities will be stopped.

All 15-minute average readings will be recorded and be available for review by the New York State Department of Environmental Conservation (NYSDEC) or the NYS Department of Health (DOH). Instantaneous readings, if any, used for decision purposes will also be recorded.

PARTICULATE MONITORING, RESPONSE LEVELS, AND ACTIONS

Particulate concentrations will be monitored continuously at the upwind and downwind perimeter of the each work area during all ground intrusive activities. Real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) will be used for the particulate monitoring. The equipment will be equipped with an audible alarm to indicate exceedance of the action levels summarized below. Any fugitive dust migration will also be visually assessed during all work activities.

Action Levels

- If the downwind PM-10 particulate level is 0.1 milligrams per cubic meter (mg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 0.15 mg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 0.15 mg/m^3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 0.15 mg/m^3 of the upwind level and in preventing visible dust migration.

All particulate monitoring measurements readings will be recorded and made available for NYSDEC and NYSDOH review.

City of Johnstown

33-41 East Main Street • Johnstown, New York 12095

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ENVIRONMENTAL RESTORATION PROGRAM
PROJECT # E 518022

Appendix C:
Remedial Investigation/ Alternatives Analysis Citizen Participation Plan

Former Karg Brothers Tannery
Johnstown, New York

January 2009

Prepared By:

Malcolm Pirnie, Inc.

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

2384015

Contents

Figures

Appendices

1. Introduction

This Citizen Participation Plan (CPP) has been developed to provide an outline and guidance for citizen participation for the City of Johnstown's New York State Department of Environmental Conservation (NYSDEC) Environmental Restoration Program (ERP) grant which will be used to continue the investigations begun at the former Karg Brothers Tannery by the United States Environmental Protection Agency's (USEPA's) Emergency Removal Action conducted at the site, in addition to investigating adjacent off-site properties, and, if necessary, to plan and conduct environmental cleanup activities on these sites. The CPP was prepared in accordance with USEPA guidelines, New York State regulations (6 NYCRR Part 375), the NYSDEC guidance document, New York State Inactive Hazardous Waste Site Citizen Participation Plan (August, 1988), and NYSDEC Municipal Assistance for Environmental Restoration Projects Procedures Handbook.

Citizen participation activities are planned to promote communication, understanding and involvement between the surrounding community, the City of Johnstown, and the NYSDEC. The citizen participation activities are intended to address the following questions:

- What concerns does the public have about the Project?
- Who is interested in or affected by the Project?
- What are the potential opportunities for redevelopment of properties in the Project area?
- What information does the public need to know about the Project?
- What information can the public contribute to the Project?

A critical part of the success of any public program is gaining the trust of the public. Through this CPP, the City of Johnstown and the NYSDEC are committed to an interactive citizen participation program in support of the Project.

2. Project Background

The City of Johnstown was awarded a grant under the New York State ERP to further investigate the former Karg Brothers Tannery and adjacent off-site properties in the central portion of the City (Figures 1 and 2). Under the New York State ERP, the City proposes to collect soil and groundwater samples from the site and adjacent properties to evaluate the extent of contamination associated with the former tannery operations and, if necessary, determine the most cost-effective and appropriate remediation of these properties. This grant's activities will also help mitigate potential health and environmental hazards. Citizen participation in this process is essential for successfully creating a sustainable, community-based, Brownfields Redevelopment Program. The City of Johnstown plans to redevelop the site for potential uses ranging from passive recreational to commercial, based on outside developer interest and the needs of the City and community.

3. Education and Participation of Stakeholders

Community support is essential for successful Brownfields redevelopment. Community support can only be obtained by making all pertinent information available, and actively seeking community involvement. Public participation is vital for the success of this project, as the Brownfields are part of the community. Mechanisms that the City will use to involve the community in the Project will include:

- Fact sheets;
- Media exposure through press releases, newspaper articles, and/or radio and television reports;
- Public meetings and information sessions; and
- Compilation of a list of interested parties and the establishment of a document repository for project information.

3.1. Document Repository

All project-related documents will be made available for public review and comment at document repositories. Document repositories will be established at the following locations:

- Johnstown Public Library; and
- Johnstown City Engineer's Office, City Hall.

Specific information for each document repository is presented in Appendix A. It is anticipated that the following documents will be prepared:

- Work Plan.
- Remedial Investigation/Alternatives Analysis.
- Proposed Remedial Action Plan.
- Record of Decision.

3.2. Potentially Affected/Interested Public

A preliminary project contact list has been developed to ensure that potentially interested parties are aware of Project activities. The contact list, which is presented in Appendix B, contains local, state, and federal government officials; local media outlets (newspaper, radio, and television); and interested residents and community groups who have participated in previous community outreach sessions conducted by the City. This contact list will be updated throughout the Project to include other interested and/or affected parties. The adjacent/affected property owner and resident portion of the list is maintained confidentially in project files, not in the CPP or repositories. If interested in receiving fact sheet announcements please contact the NYSDEC project manager to be added to the contact list.

3.3. Citizen Participation Activities

To educate stakeholders about Brownfields site identification, investigations, remediation, and redevelopment, the City will conduct environmental education outreach meetings at key points throughout the Project. Notice of the meetings will be mailed to potentially interested parties listed in Appendix B. Specific outreach activities that will be conducted include:

- A fact sheet which will briefly describe the site, RI/AA objectives and activities planned for the RI/AA will be mailed to the Contact List (Appendix B) upon submission of the Final Work Plan for the site.

- In addition, the fact sheet will indicate the location of the local document repository and identify appropriate points of contact.

- Upon completion of project activities, the NYSDEC will prepare the Proposed Remedial Action Plan (PRAP) which will summarize the remedial options for the site and propose a specific remedial alternative for implementation. A copy of the PRAP will be placed in the local document repository for public review. A fact sheet mailing to the project Contact List (Appendix B) and adjacent/affected properties will announce the 45-day public comment period prior to implementing the proposed remedial alternative. The PRAP announcement will also announce the public meeting that will be held during the comment period to review the PRAP and to address any questions or concerns. This meeting will be attended by representatives of the City of Johnstown and the NYSDEC.

- Following the selection of the remedial alternative for the site, the NYSDEC will prepare the Record of Decision (ROD). A copy of the ROD will be placed in the local document repository and a fact sheet briefly describing the selected remedy will be mailed to the Contact List (Appendix B). The fact sheet will also indicate

the location of the local document repository and identify appropriate points of contact.

3.4. Project Contacts

Project Related Questions
Alicia Thorne, P.E., Project Manager
New York State Department of
Environmental Conservation – Region 5
1115 NYS Route 86, P.O. Box 296
Ray Brook, New York 12977
Phone: (518) 897-1242
Email: ajthorne@gw.dec.state.ny.us

Health Related Questions
Deanna Ripstein, Project Manager
New York State Department of Health
Bur. of Environmental Exposure Investigation
547 River Street, Room 300
Troy, New York 12180
Phone: (518) 402-7870
Email: dmr13@health.state.ny.us

4. Schedule

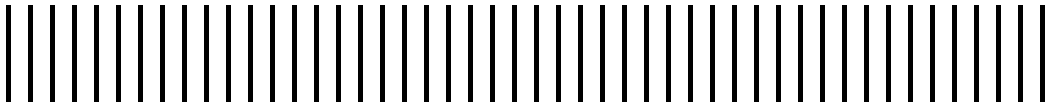
The estimated project schedule is presented in the following milestone schedule:

Anticipated Project Schedule	**Day(s)**
Final Work Plan Approval	0
Bidding	1 – 20
Award of Contract	21 - 35
Remedial Investigation	36 – 115
RI/AA Reporting	116 - 150
NYSDEC Review and PRAP Development	151 – 180
Public Comment	181 - 226
ROD	227 - 250

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

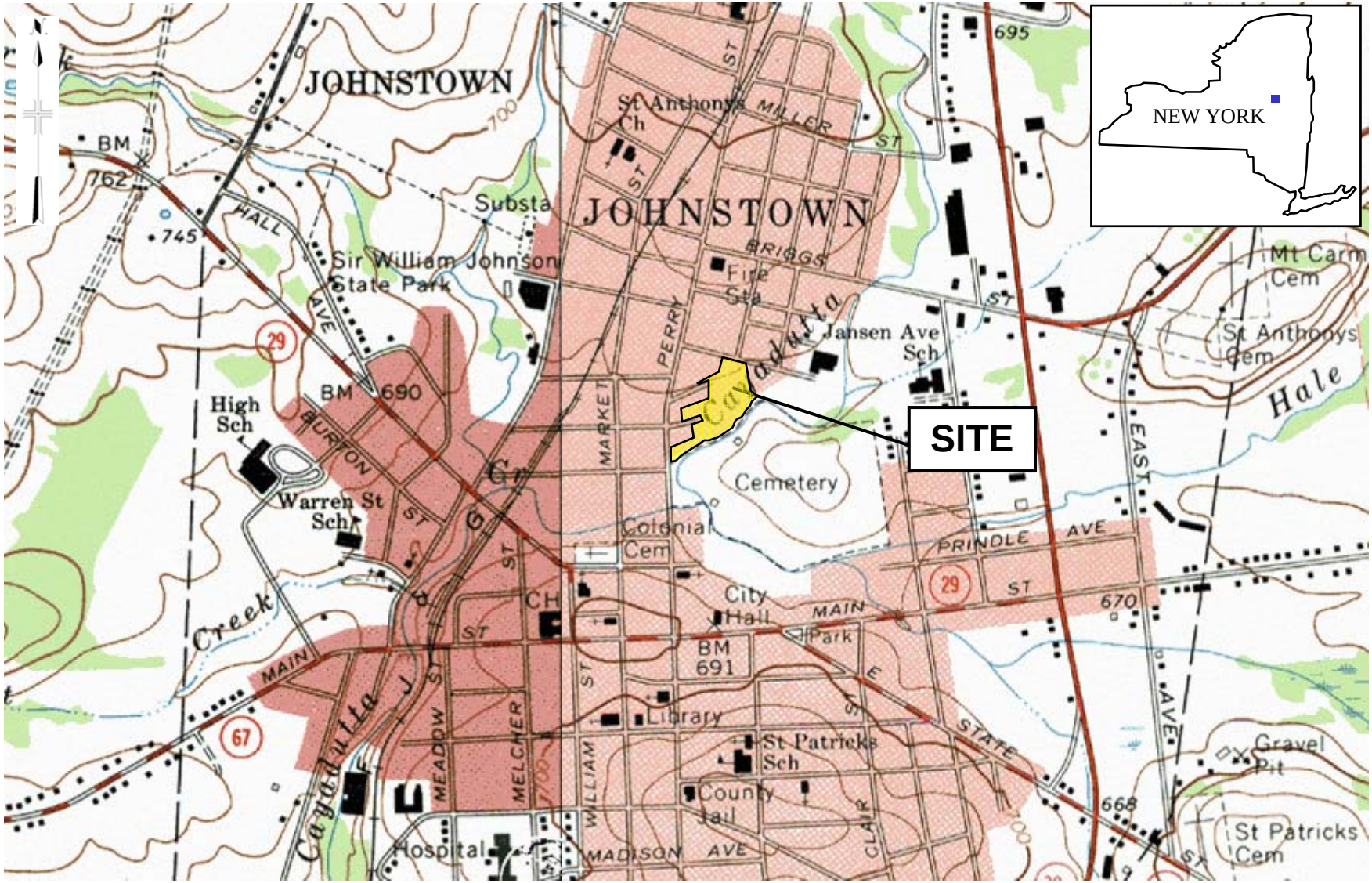
City of Johnstown
Remedial Investigation/Alternatives Analysis
CPP

Figures



2384015 / ALB

MALCOLM PIRNIE



SOURCE: U.S.G.S 7.5 MIN. PECK LAKE AND GLOVERSVILLE QUADS

SCALE IN FEET

0 500 1000 2000

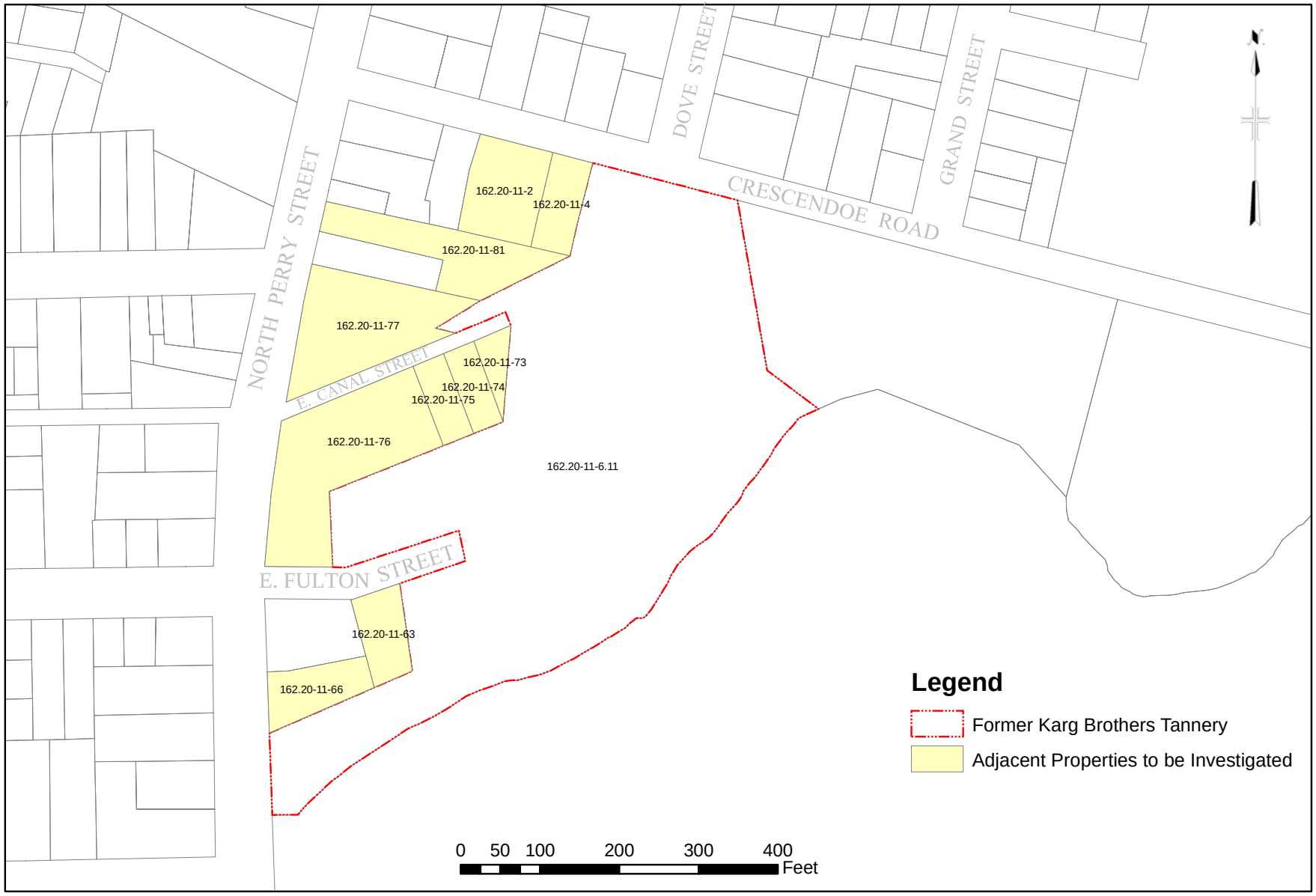
MALCOLM PIRNIE

FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

LOCATION MAP

FIGURE 1



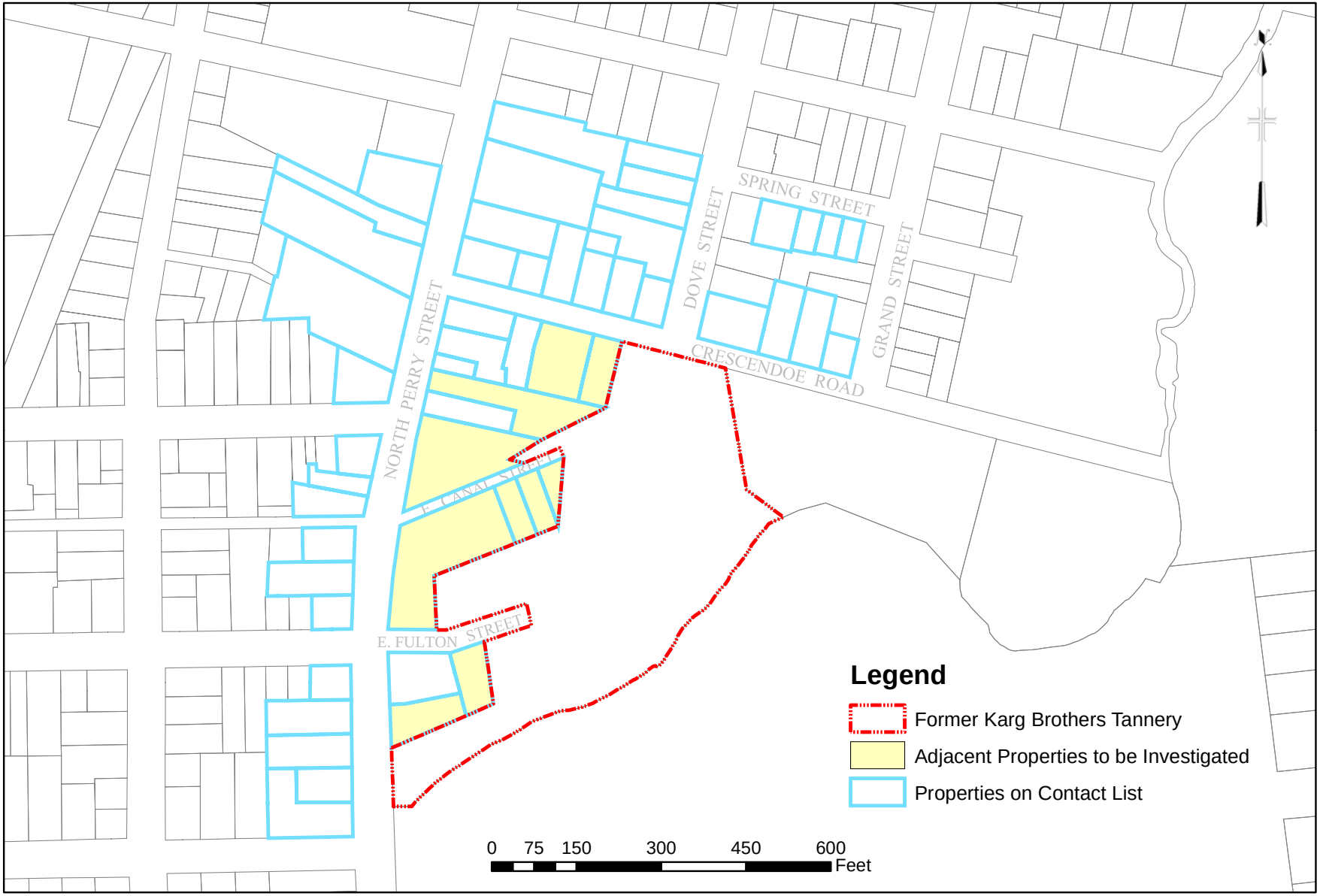
MALCOLM PIRNIE

FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

TAX PARCEL MAP

FIGURE 2



MALCOLM PIRNIE

FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

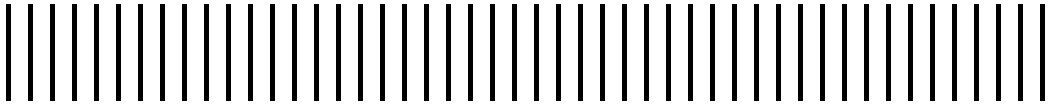
RI/AA WORK PLAN

CITIZEN PARTICIPATION CONTACT LIST

APPENDIX B

City of Johnstown
Remedial Investigation/Alternatives Analysis
CPP

Appendix A:
Document Repositories



2384015 / ALB

MALCOLM PIRNIE

APPENDIX A

LOCATION FOR DOCUMENT REPOSITORY

- City Hall
  City Engineer's Office
  33-41 E. Main Street
  Johnstown, NY 12095
  Phone: (518) 736-4014
  Business Hours: Monday – Friday 8 am – 4 pm

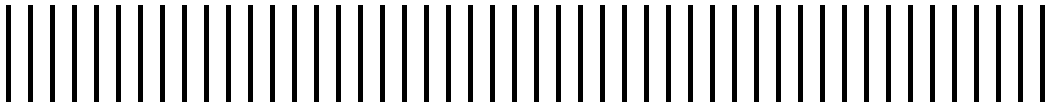
- Johnstown Public Library
  38 South Market Street
  Johnstown, New York 12095
  Phone: (518)762-8317 Fax: (518)762-9776
  Hours of Operation:

WINTER HOURS (September-May)		SUMMER HOURS (June-August)
Sunday	1 pm - 4 pm	Closed
Monday	1 pm - 8 pm	10 am - 8 pm
Tuesday	10 am - 8 pm	10 am - 8 pm
Wednesday	10 am - 8 pm	10 am - 8 pm
Thursday	1 pm - 8 pm	12 pm - 8 pm
Friday	10 am - 5 pm	10 am - 5 pm
Saturday	10 am - 1 pm	Closed

- New York State Department Of Environmental Conservation
  Region 5 – Warrensburg Office
  232 Golf Course Road
  Warrensburg, NY 12885
  Telephone: (518) 623-1238
  Hours of Operation: Monday-Friday 8:30am - 4:45pm

City of Johnstown
Remedial Investigation/Alternatives Analysis
CPP

Appendix B:
Contact List



2384015 / ALB

MALCOLM PIRNIE

APPENDIX B

CONTACT LIST

Adjacent Property Owners
The adjacent/affected property owners and resident portion of the list is maintated confidentially in project files, not in this CPP or repository

Ms. Nina Lathers
225 N. Perry Street
Johnstown, NY 12095

Mr. Timothy Schmidtman
223 N. Perry Street
Johnstown, NY 12095

Mr. Eric Sweet
221 N. Perry Street
Johnstown, NY 12095

Mr. Donald Erickson
215 N. Perry Street
Johnstown, NY 12095

Joann Enterprises, Inc.
2609 State Highway 30A
Fonda, NY 12068

Mr. Steven Willett
230 N. Perry Street
Johnstown, NY 12095

Mr. Keith L. Dwyer
9 Dove Street
Johnstown, NY 12095

Mr. Richard Robbins
9 Crescendoe Road
Johnstown, NY 12095

Ms. Marion Schuyler
7 Crescendoe Road
Johnstown, NY 12095

Ms. Kinda M. Keeler
11 Crescendoe Road
Johnstown, NY 12095

Mr. Mark Frazier
9 Smith Street
Johnstown, NY 12095

Ms. Barbara Jeffery Fisher
17 Crescendoe Road
Johnstown, NY 12095

Mr. Gary L. Luck
19 Crescendoe Road
Johnstown, NY 12095

Mr. Charles Rebecca
P.O. Box 140
Johnstown, NY 12095

Ms. Rene Zidich Randy
402 County Highway 116
Johnstown, NY 12095

McCloskey Comm. Service Corp.
40 N. Main Street
Johnstown, NY 12095

Mr. James Subik
State Highway 10
Caroga Lake, NY 12032

Ms. Susan Whitman
2-4 Crescendoe Road
Johnstown, NY 12095

Mr. Alan F. Mikucki
Rd#1 Box 465-G Kunkle PT
Mayfield, NY 12117

Adjacent Property Owners (cont'd)

Mr. William F. Wigand III
216 N. Perry Street
Johnstown, NY 12095

Mr. Roy Nellis
214 N. Perry Street
Johnstown, NY 12095

Ms. Margaret L. Joyal
211 N. Perry Street
Johnstown, NY 12095

Ms. Maureen Vanskiver
209 N. Perry Street
Johnstown, NY 12095

Mr. Barry L. Bump Sr.
RR #3 Box 126
Gloversville, NY 12078

Mr. Michael J. Clukey
128 N. Perry Street
Johnstown, NY 12095

Ms. Patricia Halley
127 ½ N. Perry Street
Johnstown, NY 12095

MJW Properties
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Pleasant Valley, NY 12569

Mr. Robert S. Jewell
411 Bridge Street
Northville, NY 12234

Ms. Cheryl E. Auty
P.O. Box 633
Johnstown, NY 12095

Mr. Edward D. Valachovic Sr.
206 Burton Street
Johnstown, NY 12095

Mr. Joseph F. Bonville Jr.
P.O. Box 222
Johnstown, NY 12095

Lexington Hostels Fund, Inc.
123 N. Perry Street
Johnstown, NY 12095

Mr. Earl G. Johnson Jr.
6 Spring Street
Johnstown, NY 12095

Ms. Diana Klein
8 Spring Street
Johnstown, NY 12095

Ms. Liza Uhlinger
10 Spring Street
Johnstown, NY 12095

Mr. Gary Joseph Buboltz
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Mr. Francis Dwyer
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Senator Hillary R. Clinton (D)
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Representative Michael R. McNulty (D)
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Washington, DC 20515
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State of New York

Senator Hugh T. Farley (R-C)
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Assemblyman Marc Bulter (R-C-I)
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Senator Carl L. Marcellino, Chairman
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Senator Kemp Hannon, Chairman
Health Committee
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Albany, NY 12247
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State of New York (Continued)

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Assemblyman Richard N. Gottfried,
Chairman
Health Committee
Legislative Office Building
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Johnstown City Hall
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Johnstown, NY 12095
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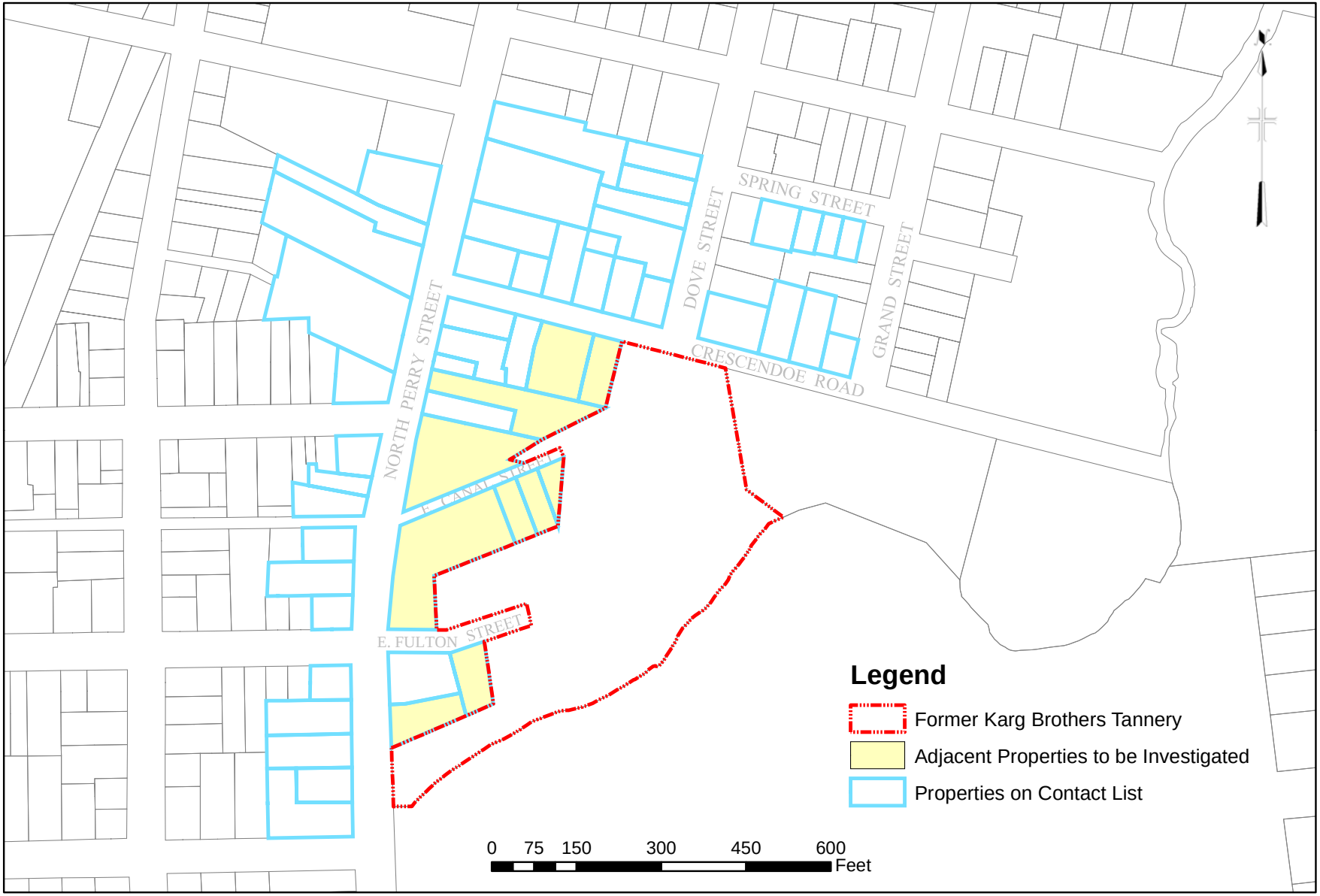
Mayor: Sarah J. Slingerland

Council Members: Bryan Marcucci
Cynthia Lakata
Christopher Foss
Brett Preston
Kay B. Cole



MALCOLM PIRNIE

FORMER KARG BROTHERS TANNERY ERP
JOHNSTOWN, NEW YORK

RI/AA WORK PLAN

CITIZEN PARTICIPATION CONTACT LIST

APPENDIX B