REMEDIAL INVESTIGATION WORK PLAN

for

Former JML Optical, Inc.
678-690 Portland Avenue
City of Rochester, New York

CHA Project Number:17781.1002.1102

Prepared for:

690 Portland Avenue Company
820 Linden Avenue
Rochester, New York 14625-2710

Prepared by:

441 South Salina Street
Syracuse, New York 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

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LIST OF ACRONYMS & ABBREVIATIONS

AAI	All Appropriate Inquiry
ACM	Asbestos Containing Material
AMSL	Above Mean Sea Level
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
BCP	Brownfield Cleanup Program
BGS	Below Ground Surface
CAMP	Community Air Monitoring Program
CHA	Clough, Harbour & Associates LLP
CPP	Citizen Participation Plan
DOH	Department of Health
ELAP	Environmental Laboratory Accreditation Program
ENSR	ENSR/AECOM
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ESA	Environmental Site Assessment
FSP	Field Sampling Plan
HASP	Health and Safety Plan
IDW	Investigation Derived Waste
NYCRR	New York Code, Rules and Regulations
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NWI	National Wetlands Inventory
PID	Photoionization Detector
PPE	Personal Protection Equipment
PPM	Parts Per Million
QA/QC	Quality Assurance/Quality Control
RI	Remedial Investigation
SVOC	Semi-Volatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum
TCL	Target Compound List
TCLP	Toxicity Leaching Characteristic Procedure
TMP	Tax Map Parcel
TOGS	Technical & Operational Guidance Series
US	United States
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WP	Work Plan

1.0 INTRODUCTION

The 690 Portland Avenue Company has entered into a Brownfield Cleanup Agreement (BCA) and will initially conduct a Remedial Investigation (RI) at the former JML Optical Site (Property or Site), located at 690 Portland Avenue in Rochester, New York, through the New York State Department of Environmental Conservation's (NYSDEC) Brownfield Cleanup Program (BCP). The purpose of the program is to encourage voluntary remediation of brownfield sites for reuse and development. This includes conducting a complete characterization of the Site, including potential off-Site impacts. CHA has been retained to conduct the RI, which will identify environmental concerns, and to provide and evaluate remedial alternatives, if necessary.

CHA has prepared this Work Plan to be consistent with the guidance provided in 6 NYCRR Part 375.4 and with Draft DER-10 *Technical Guidance for Remedial Investigation and Remediation* issued by the Division of Environmental Remediation.

This Work Plan has been prepared to outline the procedures and protocols that will be utilized to conduct a comprehensive environmental RI that will provide the necessary field data to develop a remedial alternative for the Site that will best address the environmental conditions associated with the Site. The primary objectives of the RI include the following:

- Define the nature/extent of contamination,
- Identify any additional potential source areas,
- Assess impacts; and
- Provide additional data necessary for a Remedial Alternatives Analysis.

The data derived from the RI will facilitate an evaluation of the migration or possible future migration of identified contamination, identify potential routes of exposure and populations at risk, and provide the data necessary to develop remedial plans for the Site.

To facilitate performance of the field investigation and Site characterization activities in a manner consistent with NYSDEC protocols, CHA has also prepared the following Site specific documents, which make up the RI Work Plan Documents Package:

1. Field Sampling Plan (FSP) (Appendix A);
2. Health and Safety Plan (HASP) (Appendix B); and
3. Quality Assurance Project Plan (QAPP) (Appendix C).

These documents are integral to this Work Plan and are referenced throughout this report. Copies of these documents are included as Appendices A through C of this RI Work Plan. The Citizen Participation Plan has previously been submitted to the NYSDEC under separate cover.

2.0 SITE BACKGROUND

2.1 Site Description

The Site is an approximately 1.565-acre parcel of land located at 678-690 Portland Avenue in the City of Rochester, Monroe County, New York (Tax Map Parcel (TMP) No. 106.27-01-86). The Site is almost entirely covered with buildings or paved surfaces, except for a mowed grass area along the Portland Avenue entrance to the Site and a strip of grass along the eastern property (rear side of building). ILEX Optical constructed the first buildings on the Site in approximately 1930 and the most recent addition to the building was constructed on the south end of the Site around 1970.

The buildings on-site are currently unoccupied. The Site is located within a New York State "En-Zone" pursuant to Tax Law § 21(b)(6). There are no known easements on the Site and there are currently no environmental permits associated with the Site.

The site and neighboring properties are currently located in a Industrial (M-1) zoning district according to the City of Rochester Department of Community Development, Bureau of Building and Zoning, except for the parcel located immediately south of the Site (76 Fernwood Avenue), which is zoned Low Density Residential (R-1).

2.2 Utilities

The site is serviced by municipal water and sewer. No open floor drains or sumps were observed during the Labella Associates, P.C. (Labella) Phase I ESA. Floor drains were present historically, and while JML filled these drains in with concrete, the historical discharge location of the former drains was unknown, although it was the opinion of the contracted plumber, Diamond Plumbing, that the drains likely discharged to the municipal sewer. The remaining drains are reportedly connected to a public sanitary sewer system. CHA will verify the outlet of these drains using sewer dye tests as part of the Remedial Investigation. If it is determined that these drains do not drain into the municipal sewer, additional investigation will be performed near the outlets of these drains.

National Grid Company provides the subject property with electricity for power and the Site is heated by natural gas. Three (3) pole mounted transformers were identified on the site by the Labella Phase I ESA. They are located north of the boiler building. No further information on the transformers was available.

2.3 Site History

Based upon the historical research completed by Labella, the Site was undeveloped until approximately 1930 at which time ILEX Optical constructed the original portion of the building on the Site to commence lens manufacturing operations. In December of 1979, the 690 Portland Avenue Company purchased the property and JML Optical operated at the Site until November of 2005, at which time the JML manufacturing operations were relocated to Pittsford, New York. The Site has remained vacant and under the ownership of the 690 Portland Avenue Company since 2005.

Adjacent properties have also had a long history of industrial use. The parcel located at 42 Fernwood Avenue (south of the Site) has been identified as a source of chlorinated solvents migrating onto the

southern portion of the Site and the parcel located at 100 Fernwood Avenue (east of the Site) has been identified as a source of petroleum-related compounds migrating onto the eastern portion of the Site.

3.0 SITE SETTING

3.1 Surface Features

The Site is almost entirely covered with buildings or paved surfaces, except for a mowed grass area along the Portland Avenue entrance to the Site and a strip of grass along the eastern property (rear side of building).

In general, the Property is relatively flat and has an elevation of approximately 485± feet above mean sea level based upon the USGS topographic mapping of the area.

Wetlands delineation was not previously performed. However, a review of the *National Wetlands Inventory (NWI)* and the *New York State Freshwater Wetlands Map,* revealed that there are no protected federal or state wetlands on the Property or immediately adjacent to the Property.

3.2 Site Buildings

The occupied site is approximately 1.565 acres in size, and consists of three buildings which are generally one-story tall and are summarized as follows:

- **Building 1** – The main building is approximately 53,250 square feet in size and is constructed with concrete blocks walls and a slab-on-grade flooring system. There is an approximately 300 square foot basement under a portion of the building. A second floor level along the building façade to Portland Avenue was utilized as office space and the second level on the northernmost portion of the building was utilized for storage.

- **Building 2** – The second building is a former boiler house. The building is constructed with block walls and a concrete slab-on-grade and has a footprint of approximately 730 square feet. JML most recently used the building for storage.

- **Building 3** – The third building is an approximately 300 square foot building constructed with metal siding and a concrete slab-on-grade. The building is unheated and was formerly utilized by JML to store chemicals.

The three buildings are currently unoccupied.

3.3 Site Geology/Hydrogeology

Based upon borings installed at the Site by Labella, the soils beneath the Site consist of sand intermixed with medium to fine angular gravel with little to trace amounts of silt to a maximum depth of approximately 13 feet bgs, at which point bedrock was encountered. Based upon a network of groundwater monitoring wells installed at the Site, groundwater appears to be flowing in a northwesterly direction beneath the Site.

According to the United States Department of Agriculture (USDA) Soil Survey of Monroe County, New York, the surface soils at the site are mapped as smoothed urban land. Urban land is described as areas that have been so altered and obscured by urban works and structures that identification of the soils was not feasible. These areas are mainly in closely built-up parts of the City of Rochester.

According to New York State Geological Survey, Finger Lakes Sheet, the surficial geology in the area of the subject property consist of lacustrine silts and clays, which are described as laminated silts and clay with variable thicknesses (up to 150 feet) deposited in proglacial lakes. The bedrock beneath the site is mapped as Oak Orchard and Penfield Dolostone of the Lockport Group.

Based on static water level information collected during gauging events during 2005 and 2006, groundwater is estimated to be at a depth of approximately two to six feet below grade surface (bgs). Local groundwater flow beneath the site is inferred to be in a northerly to northwesterly direction

3.4 Surrounding Properties

The Site is located in an area of mixed uses, including a mixture of residential and industrial uses. Neighboring property uses are summarizes as follows:

North: The Site is bordered to the north by a paved parking lot owned by the City of Rochester. This parking lot was formerly a street named Ilex Place. There is a service station, an auto body repair shop and a two-family residential structure located north of the City parking lot.

East: The Site is bordered to the east by a vacant industrial building and associated parking lots. The site to the east was formerly operated under the name Vogt Manufacturing and is currently owned by 100 Fernwood Ave Associates. This site is currently listed as a NYSDEC Brownfield facility.

South: The Site is bordered to the south by a parking lot and a single family residence. A vacant industrial building (a NYSDEC Inactive Hazardous Waste Disposal Site (IHWDS) known as Preferred Electric Motors) is also located to the south of the property at 42 Fernwood Avenue.

West: The Site is bordered to the west by Portland Avenue. A paved parking lot, a vacant commercial building and a distribution facility are located along the west side of Portland Avenue, across from the main site entrance. There are also four residential properties located immediately adjacent to the west side of the Site.

4.0 PREVIOUS REPORTS

Labella was retained by the Rochester Economic Development Corporation to complete a Phase I Environmental Site Assessment (ESA) for the parcels located at 76 Fernwood Avenue and 690 Portland Avenue in February 2005 in accordance with the American Society for Testing and Materials (ASTM) Standard Practice E 1527-00; however only the 690 Portland Avenue parcel is the subject of this project.

Based upon the historical research completed by Labella, the Site was undeveloped until approximately 1930 at which time ILEX Optical constructed the original portion of the building on the Site to commence lens manufacturing operations. In December of 1979, the 690 Portland Avenue Company purchased the property and JML Optical operated at the Site until November of 2005, at which time the JML manufacturing operations were relocated to Pittsford, New York. The Site has remained vacant and under the ownership of the 690 Portland Avenue Company since 2005.

ILEX Optical and JML reportedly utilized several chemicals, including, but not limited to, trichloroethylene (TCE), acetone, and isopropyl alcohol (IPA) during the manufacturing and cleaning of specialty optical lenses. Additionally, a 5,000-gallon No. 2 fuel oil underground storage tank (UST) was once located between the boiler house and manufacturing building and utilized for the boilers. At the time of the tank removal in 1999, impacted soil and a sheen on the groundwater was observed in the excavation. Spill No. 9870600 was reported to the New York State Department of Environmental Conservation (NYSDEC) on March 29, 1999 based upon the contamination observed. Where possible, contaminated soils were reportedly excavated and disposed of off-site. Excavation closure samples were collected following the removal of the impacted soils and the NYSDEC later closed the spill report on August 15, 2005.

The primary recognized environmental conditions (RECs) identified in the Phase I ESA include the following:

1. At the time of the ESA, there was an open NYSDEC spill file for the Site (Spill No. 9870600), associated with subsurface petroleum contamination observed during the removal of a 5,000-gallon No. 2 fuel oil UST from the Site. While contaminated soils were reportedly excavated and disposed off-site, no analytical data had been provided to Labella to confirm that the release had been addressed to an extent deemed acceptable to the NYSDEC.

2. The Site had a long history of using chlorinated solvents, particularly TCE, in association with the manufacturing of specialty optical lenses. The building once had a number of individual floor drains and trench drains. JML filled these drains in with concrete and the remaining drains are reportedly connected to a public sanitary sewer system. The historical discharge location of the former drains is unknown. Furthermore, a sump of unknown origin was identified in the storage area of the main manufacturing building.

3. A NYSDEC IHWDS, known as Preferred Electric Motors, Inc., was identified approximately 40 feet south of the Site. Investigation of this site in 2000 revealed that on-site disposal of waste solvents had impacted the subsurface soil and groundwater quality beneath the site and that vapor intrusion was occurring in the structures adjacent to the site.

4. A NYSDEC BCP site, known as 100 Fernwood Avenue, is located immediately adjacent to the east side of the Site. While Labella could not identify the purpose of large soil stockpiles at the rear of the building at the time that the Phase I ESA was completed, they suspected that the soil pile was associated with an environmental cleanup of contaminated soils.

JML Optical, Inc. retained Labella to perform a Phase II ESA – Preliminary Site Characterization (PSC) in June of 2005 to investigate the identified RECs. The following conclusions were made in the PSC report:

1. Solvent-related compounds released at the Preferred Electric Motors, Inc. site appeared to have impacted the groundwater quality at the south end of the Site.

2. Petroleum-related compounds associated with the 100 Fernwood Avenue site appeared to have migrated onto the eastern side of the Site.

3. Petroleum-related contamination was identified to remain in the location of the former 5,000-gallon UST at concentrations above the applicable soil and groundwater standards/guidance values established by the NYSDEC.

4. It appeared that solvent-related compounds, primarily TCE, had been released in the sump located adjacent to the maintenance shop in the main building on the Site.

5. There was no significant evidence of metal contamination in the soil samples collected from the Site.

To further characterize the impacted areas identified in the Phase II ESA PSC, Labella conducted a Phase II ESA Supplemental Site Characterization (SSC) in June of 2006. The following conclusions were made in the SSC report:

1. Groundwater appears to flow in a northwesterly direction beneath the Site.

2. Solvent-related compounds released at the Preferred Electric Motors, Inc. site appeared to have impacted the groundwater quality at the south end of the Site.

3. Petroleum-related compounds associated with the 100 Fernwood Avenue site appeared to have migrated onto the Site and impacted the subsurface soil and groundwater quality along the eastern side of the Site.

4. A second groundwater sample was collected in the vicinity of the former UST on the western side of the site and revealed that only the petroleum-related compounds were detected at concentrations above the applicable NYSDEC groundwater standards.

5. Labella estimated that the extent of soil impacted with TCE in the area of the sump adjacent to the maintenance shop was limited to an area approximately 25-feet by 25-feet in size.

6. TCE contamination was identified in the former degreasing area located near the western end of the former manufacturing building.

5.0 PROPOSED REMEDIAL INVESTIGATION SITE ACTIVTIES

5.1 Key Project Personnel

Dr. Christopher Burns in CHA's Syracuse office will be assigned as the Project Manager. He will be responsible for delivery of CHA services and be the prime contact for communication. This project will be

managed and staffed from CHA's Syracuse office with management, technical, and support personnel located throughout the State, including Syracuse, Albany, and Rochester. CHA is licensed to provide professional engineering services in the State of New York by the New York State Education Department. Information provided in the QAPP identifies key personnel on the project.

5.2 Areas of Concern

Numerous soil and groundwater samples have been collected from the Site during the past environmental investigations. The samples have been analyzed for a variety of parameters including volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals.

The sampling data has confirmed the presence of petroleum-related contaminants, chlorinated solvents, and SVOCs in the soil and groundwater beneath the Site. It is suspected that the chlorinated solvents and some of the petroleum-related contaminants could be present in the soil gas beneath the site as well as adjacent parcels down-gradient of the site. Additional investigation will be required to confirm the presence or absence of vapor intrusion into on-Site buildings as well as adjacent structures. Specifically the areas of the former UST, the sump, and the TCE degreasers are of interest because contamination was found in these areas. The extent of the contamination needs to be fully characterized. Samples collected will be analyzed for VOCs, SVOCs, metals, polychlorinated biphenyls (PCBs), and pesticides. While no significant sources of PCBs or pesticides were identified at the site, it will be necessary to collect samples to verify the presence or absence in the subsurface soil and groundwater.

The main areas of concern (AOCs) identified by LaBella during the SSC include:

AOC #1: NYSDEC IHWDS to the South- Although TCE impacts to the soil and groundwater appear evident due to on-Site historical activities, a portion of the Property appears to be impacted by chlorinated solvents due to the 42 Fernwood Avenue (Preferred Electric Motors) site, an IHWDS, located to the south.

Given the assumed groundwater flow to the northwest, CHA recommends that additional soil sampling and well point installation occur on the southwest portion of the Site to further characterize the Property. Additionally, MW-1 and MW-2 will be re-sampled for VOCs, SVOCs, metals, PCBs, and pesticides. Limited work was completed in this area during the previous investigations which included the installation of monitoring well MW-1 and soil borings B-2 and B-11. Previous sampling of monitoring well MW-1 showed low levels of TCE in groundwater. Soil samples were not collected from B-2 and B-11 because no evidence of impairment was detected.

AOC #2: Brownfield Site to the East- An area of petroleum impacted soil and groundwater has been indentified along the eastern property line. The impacts related to the former Vogt Manufacturing (100 Fernwood Avenue) site appear to have migrated through soil and groundwater to impact the Property. CHA recommends re-sampling MW-4 for VOCs, SVOCs, metals, PCBs, and pesticides.

AOC #3- Former Sump Area. TCE impacts to the soil and groundwater have been identified during the previous subsurface work in the former sump area. Partial delineation of the contamination was performed, and Labella estimates that the contaminated area above NYSDEC standards is limited to an area 25 feet by 25 feet square in the vicinity of the sump. The soil samples collected within the area of the former sump area exceeded the NYSDEC cleanup standards for TCE and the groundwater sample collected from MW-5

exceeded the NYSDEC cleanup standards for TCE and vinyl chloride. A groundwater sample will be collected from MW-5 and analyzed for VOCs, SVOCs, metals, PCBs, and pesticides.

AOC #4- Former TCE Degreasers- TCE contamination in soil and groundwater has been identified in association with the former presence of degreasers. The most significantly impacted area is in the vicinity of B-25/MW-7. It is proposed to install a soil boring and well point northeast of this area to determine the extent of impact. Groundwater samples will be collected from existing monitoring wells MW-7 and MW-8 and analyzed for VOCs, SVOCs, metals, PCBs, and pesticides.

5.3 Scope of Work

The RI activities will include the installation of soil borings, well points, and soil vapor monitoring points to further characterize the Site. Additionally, groundwater samples will be collected from existing Site monitoring wells and analyzed for VOCs, SVOCs, metals, PCBs, and pesticides.

The field activities will be conducted in strict accordance with NYSDEC protocols, the FSP, and the HASP. Copies of these documents are included as Appendix A and B, respectively. A QAPP has also been prepared to ensure that specific data quality goals associated with the investigation activities are achieved and is included as Appendix C.

While the FSP describes the specific investigative procedures that are to be conducted during the field activities, the following sections of this Remedial Investigation Work Plan identify the specific location and rational for the sampling locations and sampling plan. The following sections outline the proposed investigation activities for the former JML Optical Site.

5.3.1 Soil Investigation

Prior to the start of subsurface work at the site, CHA will contact Dig Safe NY to locate public utilities present at the site. Final determination of the location of the borings and additional monitoring wells will be dependent upon the confirmed utility locations.

Direct-Push soil borings

As part of the RI, CHA will install eight (8) borings to refusal or ten feet bgs, whichever is encountered first, using track-mounted Geoprobe hydraulic-push equipment. Soil samples will be collected based on field observations during sampling (i.e., soil odors, soil discoloration) or elevated photoionization detector (PID) field screening results. In the absence of elevated PID readings or biased field observations, a sample will be collected at the six-inch interval above groundwater. Proposed sampling points are shown on Figure 3.

Each soil boring will be advanced utilizing a direct-push soil sampling method (e.g., Geoprobe^{TM}) to a depth of approximately ten (10) feet bgs or refusal. In the event that rock coring is required to advance a soil boring to the groundwater table, an addendum to this Work Plan will be issued at that time which proposes rock coring as the method for boring installation. If, during the advancement of the boring, native soils are not encountered within the first ten (10) feet, the depth of the soil borings may be increased to a maximum of twenty (20) feet in an attempt to encounter native soils. During advancement of each soil boring, continuous samples will be collected. Once the soil sample has been extracted from the ground, the core tube

will be cut along the length to expose the soil. Soils will be logged in the field using a modified soil classification method.

Subsurface soil samples will be identified with the following designation: B-(##) (depth interval in feet below grade) (e.g., B-01 (2-4')). One soil sample from each soil boring location will be submitted to an off-site NYSDOH ELAP-certified laboratory for analysis of the following: Target Compound List (TCL) VOCs via USEPA Method 8260, TCL SVOCs via USEPA Method 8270, Target Analyte list (TAL) Metals (including cyanide) by USEPA Methods 6010, 6020, 7470, and 9012A, PCBs via USEPA Method 8082, and pesticides via USEPA Method 8081. While no significant sources of PCBs or pesticides were identified at the site, it is recommended that samples be analyzed to verify the presence or absence in the subsurface soil and groundwater. Samples, including Quality Assurance/Quality Control samples, will be collected and analyzed in accordance with the FSP.

Soil samples selected for analysis will be labeled and packed on ice in a cooler. The soil samples intended for laboratory analysis will be logged onto a chain of custody record, and the custody-sealed cooler will be delivered via overnight courier to an off-site New York State Department of Health Environmental Laboratory Approval Program (NYSDOH ELAP)-certified laboratory for analysis.

5.3.2 Soil Vapor Investigation

Soils at the site are impacted, including some beneath existing structures, and soil vapor must be assessed as an environmental medium at the site. Soil vapor is the air found in the pore spaces between soil particles between the groundwater table and the ground surface. These gases may include vapor of hazardous chemicals such as VOCs and some SVOCs. Soil and groundwater at the site are impacted with chlorinated solvents and petroleum compounds and may be acting as sources for VOCs and SVOCs in soil gas. These vapors in soil gas can enter and accumulate in structures, adversely affecting indoor air quality. Soil vapor sampling and analysis at the Site will confirm or deny the presence of contaminated soil vapors to evaluate the potential for current off-site exposures.

A total of eight (8) interior sub-slab soil vapor sampling points will be installed in conjunction with the investigation at the Site. Four residential properties are located north-west of the Site and one (1) sub-slab soil vapor sampling point as well as one (1) indoor air sample will be located inside each residential structure. The sub-slab soil vapor and indoor air sampling of the adjacent residences will be performed during the 2009-2010 heating season. Ambient outdoor air samples will also be collected with the four (4) residential air samples. One representative ambient (outdoor) air sample may be appropriate if the adjacent residences are determined to be situated closely together, as long as the sampling is performed concurrently. This determination will be made in the field at the time of sampling. If only one ambient air sample is determined to be necessary, it shall be collected from a representative upwind, location, away from wind obstructions and at a height above the ground to represent breathing zones.

Four (4) sub-slab soil vapor sampling points will be located inside the current Site building to evaluate the potential for current exposure to impacted soil vapors as described below.

- One sub-slab soil vapor sampling point will be located inside the building, next to the area of the former UST;
- One sub-slab soil vapor sampling point will be located in the vicinity of the former sump;

- One sub-slab soil vapor sampling point will be located in the area of the former TCE degreasers; and
- One sub-slab soil vapor sampling point will be located in the basement.

At this time, only sub-slab soil vapor samples will be collected. However, during the 2009-2010 heating season, indoor air samples will be collected at each sub-slab soil vapor sampling point to quantify the actual indoor air quality relative to subsurface conditions. Proposed sub-slab soil vapor sampling points are shown on Figure 3. Details of the soil vapor sampling protocol are detailed in the FSP included in Appendix A.

Prior to sampling, a pre-sampling inspection will be performed to identify and minimize conditions that may interfere with testing, as described in section 2.1.1 of the NYSDOH Center for Environmental Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006). The inspection will evaluate the general layout and predicted air flows of the current site building, and a building inventory will be taken. The building inventory will identify potential air sampling interference by characterizing the occurrence and use of chemicals and products throughout the building (for example, containers of paint, polish, solvents, or gasoline stored in the building). The presence and description of odors will be noted and portable vapor monitoring equipment (for example, PIDs) readings will be recorded. The pre-sampling inspection will also include adequate photographic documentation of all products present.

During sampling, weather conditions, sampling depth, purge volumes, volume of vapor extracted, canisters used, vacuum before and after collection, and other observations will be recorded. After sample collection, canisters will be properly packed and shipped under chain of custody to the off-site NYSDOH ELAP-certified laboratory for analysis of VOCs via USEPA Method TO-15.

This portion of the investigation is contingent upon obtaining the permission of the owners/occupant of each residence.

5.3.3 Groundwater Investigation

Well installation

CHA will install eight (8) additional monitoring wells at the site to evaluate the presence of groundwater impacts associated with the former UST, former industrial use of the site, and potential off-site impacts. The wells will be installed in the same locations as some of the proposed soil borings. As noted above, in the event that rock coring is required to advance a soil boring to the groundwater table, an addendum to this Work Plan will be issued at that time which proposes rock coring as the method for boring installation. Each well will be constructed with one (1) inch diameter PVC well screen, screened in the first water bearing unit, and connected to an appropriate length of PVC riser to complete the well. A sandpack will be used and a bentonite seal will placed at the surface. Well locations in high traffic areas and/or interior locations will be finished with flush mount caps. The locations of the proposed groundwater monitoring wells are shown on Figure 3. A typical well construction diagram has been included as Appendix A.

A licensed surveyor will survey the horizontal and vertical locations of the monitoring wells.

The wells will be developed in accordance with the FSP such that the wells are in good hydraulic connection with the surrounding water bearing unit and development water will be containerized on-site until analytical results are available.

Groundwater sampling and analysis

Groundwater purging will be conducted with an adjustable rate peristaltic pump or disposable bailer, in accordance with the FSP. The wells will be purged three to five well volumes of standing water utilizing a peristaltic pump, inertial pump, or a small centrifugal pump and groundwater quality parameters (pH, temperature, conductivity, oxidation-reduction potential, and dissolved oxygen) will be recorded. One groundwater sample will be collected from each well and identified with the designation of the well from which the sample was collected (i.e., MW-4).

All existing on-site monitoring wells (MW-1 through MW-16 plus DEC MW-5) will also be sampled at this time. Documentation provided by LaBella indicates that thirteen (13) monitoring wells were installed on site, however during a site visit sixteen (16) monitoring wells were observed on site. CHA will re-sample all sixteen (16) of these known wells. All of the wells appear to be suitable for sampling, however if any of the existing wells are found to be unusable, the damaged wells will be re-installed at a location approved by the NYSDEC following the same procedures as the new monitoring wells described above. The replacement wells will then be sampled. The monitoring wells will be purged using low flow techniques and groundwater quality parameters will be recorded. The monitoring wells will be considered stabilized and ready for sample collection when the indicator parameters have stabilized in accordance with the FSP.

Samples will be analyzed by for TCL VOCs via USEPA method 8260, TCL SVOCs via USEPA method 8270, TAL Metals (including cyanide) by USEPA Methods 6010, 6020, 7470, and 9012A, PCBs via USEPA Method 8062, and pesticides via USEPA Method 8081.Quality Assurance/Quality Control (QA/QC) samples will be collected and analyzed in accordance with the FSP, included as Appendix A, and the QAPP, included as Appendix C.

Groundwater level measurements

Groundwater level measurements will be collected on at least two (2) separate occasions following installation and development: once immediately following development, and once immediately prior to groundwater sampling. Groundwater elevation measurements will be used with well elevation data to determine direction of groundwater flow.

5.4 Proposed Sampling and Analysis

Table 5-1 presents a summary of the proposed sampling and analysis plan. QA/QC samples will be collected according to the QAPP, included as Appendix C. Proposed sample locations are presented on Figure 3.

Sampling Rationale

Proposed sample locations are depicted on Figure 3. The sample identifications, depths (if applicable), analytical parameters, and detailed sampling rationale are presented on Table 5-1.

Table 5-1: Sampling Rationale

Sample ID	Matrix	Sample Depth	Sample Location	Analytical Parameters	Rationale
B-37	Soil	Location determined by CHA field staff based on field observations.	Off-site property located to the south. Located on the northeast corner of off-site property.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-37 is placed to minimize data gaps and provide a thorough understanding of the subsurface conditions south of the Site. A BCP site is located to the east and southeast of the Site.
B-38	Soil	Location determined by CHA field staff based on field observations.	Located south of the southwest corner of the Site building.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-38 is placed to minimize data gaps and provide a thorough understanding of the subsurface conditions south of the Site. An IHWDS is located southwest of the Site.
B-39	Soil	Location determined by CHA field staff based on field observations.	Southwest corner of property.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-39 is placed to minimize data gaps and provide a thorough understanding of the subsurface conditions west of the Site. An IHWDS is located southwest of the Site.
B-40	Soil	Location determined by CHA field staff based on field observations.	North of the former UST area.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-40 is placed northwest (downgradient) of the former UST area to assess any contamination in that area.
B-41	Soil	Location determined by CHA field staff based on field observations.	Located off-site, in between the garage and the second most southern residential property.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-41 is placed in between the garage and the second most southern residential property to assess subsurface soil conditions in that area.
B-42	Soil	Location determined by CHA field staff based on field observations.	Located southwest of the existing MW-9.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-42 is installed to assess to assess potential impact from the off-site property located at 100 Fernwood Avenue.
B-43	Soil	Location determined by CHA field staff based on field observations.	Located within Building 1 at the southern end.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-43 is installed inside the southern end of the building to assess impacts from former operations.

Sample ID	Matrix	Sample Depth	Sample Location	Analytical Parameters	Rationale
B-44	Soil	Location determined by CHA field staff based on field observations.	Located near the location of boring B-6 installed by LaBella.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	B-44 serves to determine the extent of any potential contamination spread to the western property line in that area.It also is installed to assess contamination due to high TCE levels in MW-5.
SV-1	Sub-Slab Soil Vapor	2 inches bgs	Beneath the concrete floor within the Site building, east of the former UST area.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the structure, specifically in the vicinity of the former UST area.
SV-2	Sub-Slab Soil Vapor	2 inches bgs	Beneath the concrete floor within the Site building, northwest of the former sump.	TCL VOCs	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the structure, specifically in the vicinity of the former sump.
SV-3	Sub-Slab Soil Vapor	2 inches bgs	Beneath the concrete floor within the Site building, in the area of the former TCE degreasers.	TCL VOCs	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the structure, specifically in the vicinity of the former TCE degreasers.
SV-4	Sub-Slab Soil Vapor	2 inches bgs	Beneath the concrete floor within the Site building, in the area of the former TCE degreasers.	TCL VOCs	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the structure, specifically in the basement.
SV-5A/B/C[1]	Sub-Slab Soil Vapor/Indoor Air/Outdoor Air	2 inches bgs (Sample A)	Off-site residential property	TCL VOCs	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the residential structure. Sample A is the sub slab sample, while Sample B represents the indoor air sample within the structure. Sample C is the outdoor air sample corresponding with the location.
SV-6A/B/C[1]	Sub-Slab Soil Vapor/Indoor Air/Outdoor Air	2 inches bgs (Sample A)	Off-site residential property	TCL VOCs	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the residential structure.. Sample A is the sub slab sample, while Sample B represents the indoor air sample within the structure. Sample C is the outdoor air sample corresponding with the location.
SV-7A/B/C[1]	Sub-Slab Soil Vapor/Indoor Air/Outdoor Air	2 inches bgs (Sample A)	Off-site residential property	TCL VOCs	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the residential structure.. Sample A is the sub slab sample, while Sample B represents the indoor air sample within the structure. Sample C is the outdoor air sample corresponding with the location.

Sample ID	Matrix	Sample Depth	Sample Location	Analytical Parameters	Rationale
SV-8A/B/C[1]	Sub-Slab Soil Vapor/Indoor Air/Outdoor Air	2 inches bgs (Sample A)	Off-site residential property	TCL VOCs	This SV monitoring point serves to assess the presence of soil vapor impacts beneath the residential structure. Sample A is the sub slab sample, while Sample B represents the indoor air sample within the structure. Sample C is the outdoor air sample corresponding with the location.
DEC MW-5	Groundwater	NA	DEC-5	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	Monitoring well DEC-5 is being re-sampled to provide additional data regarding alleged contamination from the Preferred Electrics Site, south of the facility, and the nature and extent of any contamination spread offsite of the JML property.
MW-1	Groundwater	NA	MW-1	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-1 is being re-sampled to assess potential migration of contaminants from the off-site property located at 42 Fernwood Avenue.
MW-2	Groundwater	NA	MW-2	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-2 is being re-sampled to assess potential migration of contaminants from the off-site property located at 42 Fernwood Avenue.
MW-3	Groundwater	NA	MW-3	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-3 is being re-sampled to assess potential impacts from the former UST.
MW-4	Groundwater	NA	MW-4	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-4 is being re-sampled to assess potential impacts from the off-site property located at 100 Fernwood Avenue and Building No. 3, as well as impacts from the neighboring Vogt Manufacturing site.
MW-5	Groundwater	NA	MW-5	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-5 is being re-sampled to assess potential impacts from the former sump.
MW-6	Groundwater	NA	MW-6	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-6 is being re-sampled to assess presence of groundwater impacts at the northern property boundary.
MW-7	Groundwater	NA	MW-7	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-7 is being re-sampled to assess potential impact from the former TCE degreaser.
MW-8	Groundwater	NA	MW-8	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-8 is being re-sampled to assess potential impact from the former TCE degreaser.
MW-9	Groundwater	NA	MW-9	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-9 is being re-sampled to assess potential impact from the off-site property located at 100 Fernwood Avenue.

Sample ID	Matrix	Sample Depth	Sample Location	Analytical Parameters	Rationale
MW-10	Groundwater	NA	MW-10	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-10 is being re-sampled to assess groundwater conditions in the area of the former sump.
MW-11	Groundwater	NA	MW-11	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-11 is being re-sampled to assess groundwater conditions at the northeast portion of the property.
MW-12	Groundwater	NA	MW-12	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-12 is being re-sampled to assess groundwater conditions in the north portion of the building.
MW-13	Groundwater	NA	MW-13	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-13 is being re-sampled to assess groundwater conditions in the north portion of the building.
MW-14	Groundwater	NA	MW-14	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-14 is being re-sampled to assesss groundwater conditions beneath the eastern end of the structure. This well was discovered during the June 4, 2009 site visit and was added to the sampling list.
MW-15	Groundwater	NA	MW-15	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-105 is being re-sampled. This well is intended to assess the extent of groundwater contamination in the presence of the former TCE degreaser. This well was discovered during the June 4, 2009 site visit and was added to the sampling list.
MW-16	Groundwater	NA	MW-16	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-16 is being re-sampled to assess groundwater conditions between the JML Optical Site and the Boiler House. This well was discovered during the June 4, 2009 site visit and was added to the sampling list.
MW-101	Groundwater	NA	B-37 converted to MW-101	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-101 is installed to assess the potential migration of contaminants from the off-site property located at 100 Fernwood Avenue. Additionally, this well is installed near the loading dock on the south side of the Property.
MW-102	Groundwater	NA	B-38 converted to MW-102.	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-102 is installed to assess the presence of groundwater impacts on the southwest corner of the site and assess the potential migration of contamination from the off-site property located at 42 Fernwood Avenue. It is located in the northwest corner of the 76 Fernwood Avenue parking lot.
MW-103	Groundwater	NA	B-39 converted to MW-103	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-103 is installed to assess the presence of groundwater impacts on the northwest corner of the site near Portland Avenue and assess the potential migration of contamination from the off-site property located at 42 Fernwood Avenue as well as potential migration of contaminants off site of the JML Optical Property.

Sample ID	Matrix	Sample Depth	Sample Location	Analytical Parameters	Rationale
MW-104	Groundwater	NA	B-40 converted to MW-104	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-104 is installed northwest of the former UST area to assess potential contamination migration former UST.
MW-105	Groundwater	NA	B-41 converted to MW-105	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-105 is installed between the garage and the southern residence to assess potential contamination migration from the Site.
MW-107	Groundwater	NA	B-42 converted to MW-106	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-106 is installed southwest of MW-9 to assess to assess potential impact from the off-site property located at 100 Fernwood Avenue.
MW-108	Groundwater	NA	B-43 converted to MW-107	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-107 is installed inside the southern end of the building to assess impacts from former operations.
MW-109	Groundwater	NA	B-44 converted to MW-108	TCL VOCs , TCL SVOCs, TAL Metals, PCBs, and pesticides	MW-108 serves to determine the extent of any potential contamination spread to the western property line in that area.It also is installed to assess contamination due to high TCE levels in MW-5.

Notes:

(1) One representative ambient (outdoor) air sample may be appropriate if the adjacent residences are determined to be situated closely together, as long as the sampling is performed concurrently. This determination will be made in the field at the time of sampling. If only one ambient air sample is determined to be necessary, it shall be collected from a representative upwind, location, away from wind obstructions and at a height above the ground to represent breathing zones.

5.4.1 Decontamination Procedure

Decontamination procedures related to the investigative activities at the Property are described in the FSP, included as Appendix A.

5.4.2 Investigation Derived Waste (IDW)

Investigation Derived Waste (IDW) generated during the investigation will include soil cuttings, samples not submitted for analysis, purge water, and decontamination water, as well as empty soil jars, personal protective equipment (PPE) and other project-related waste. Handling procedure for the IDW has been outlined in the FSP, included as Appendix A.

5.4.3 Survey

Following completion of the field investigation, each sample location, soil boring, and monitoring well will be surveyed for both vertical and horizontal location by a New York State licensed surveyor. Horizontal location will be measured to the nearest 0.10 of a foot and the vertical location will be measured to the nearest 0.01 of a foot. The surveyor will also complete a property survey and prepare Metes and Bounds for the property. The survey will be relative to a base map.

5.5 Reporting

Remedial Investigation Report

A Remedial Investigation Report (RI Report) will be prepared summarizing the information generated during implementation of this Work Plan. The report will be prepared in accordance with 6 NYCRR Part 375.4, the *NYSDEC Environmental Restoration Projects Procedures Handbook* and *Draft DER-10 Technical Guidance for Remedial Investigation and Remediation*.

The report will also include the following information and data pertaining to the Site:

- Boring/ monitoring well installation/soil vapor/field sampling logs
- Analytical data tables presenting the analytical results for the soil, groundwater, and soil vapor samples including comparisons to appropriate standards, criteria, and guidance (e.g., 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives and NYSDEC Groundwater Standards; although New York State currently does not publish any standards, criteria, or guidance values for concentrations of volatile chemicals in subsurface vapors, it is anticipated that site-specific standards will be generated by the State based on anticipated future use of the site)
- A narrative that summarizes the results of the investigation including a discussion of the physical and analytical results.
- A groundwater flow map.
- A geological cross section showing the extent of horizontal contamination in the area affected by impacts from the neighboring Vogt facility extending through the sump area and through the area of the former UST. A similar cross section for the Preferred electrics impacted area will also be provided.

- Spider diagrams (small boxes showing contaminant concentrations with arrows pointing to each sample location) showing the concentrations of contaminants of concern (if present).
- Color (or other shading technique) figures showing soil (or soil vapor) contamination concentrations (if present).

6.0 SAMPLING, ANALYSIS, AND MONITORING PLAN

The work described in this Work Plan for the RI will be done in accordance with the FSP. The FSP contains quality assurance/quality control protocols for field sampling, chain of custody, laboratory analysis, and reporting. Data validation requirements are also specified in the FSP. The FSP has been provided in Appendix A.

7.0 HEALTH AND SAFETY PROTOCOLS

The site-specific HASP was prepared following an assessment of known physical and chemical hazards present at the site and an evaluation of the risks associated with the assessment and remedial actions. Available site information was examined and adequate warnings and safeguards for field personnel were selected and implemented. All CHA field personnel and are required to review and sign the HASP before entering the field. Subcontractors to CHA are required to provide their own HASP. The site specific HASP for CHA staff has been provided in Appendix B.

8.0 CITIZEN PARTICIPATION ACTIVITIES

The Brownfield Program includes an active role for Citizen Participation during the execution of the project. As part of that effort, CHA has developed a CPP. The CPP enables citizens to become informed and participate more fully in the decision making process that may affect their neighborhood. NYSDEC requires several opportunities for citizen involvement during the investigation and cleanup of Brownfield sites. The CPP has previously been provided under separate cover.

9.0 SCHEDULING

9.1 SCHEDULE

The following table provides an estimated schedule for completion of the Former JML Optical Site. The overall progress of the project will be dependent upon a number of factors including, but not limited to, NYSDEC review and approval timeframes, time of year at which the final design documents are complete, weather conditions at the time of remedial construction, etc.

Table 9-1: Project Schedule

Description	Estimated Start	Estimated Finish
Execution of BCP Agreement	October 2008	January 2009
Remedial Investigation Work Plan Scoping Meeting & Development	January 2009	January 2009
Comment Period & Review of Work Plan	January 2009	July 2009
Remedial Investigation	August 2009	November 2009
Review & Approval of Investigation Report	November 2009	December 2009
Remedial Alternatives Analysis	January 2010	February 2010
NYSDEC Selection of Proposed Remedy	February 2010	March 2010
Public Comment Period on Proposed Remedy	March 2010	April 2010
ROD Issued & Remedial Design Completed	May 2010	July 2010
Review & Approval of Remedial Design	July 2010	August 2010
Preparation of Contract Documents and Bidding Phase	August 2010	September 2010
Remedial Construction	October 2010	November 2010
Administrative Tasks (e.g. Institutional Controls)	November 2010	December 2010
Certificate of Closure Obtained	December 2010	January 2011

10.0 REFERENCES

Labella Associates, P.C., *Phase I Environmental Site Assessment for 76 Fernwood Avenue and 690 Portland Avenue, Rochester, New York 14621*, February 2006

Labella Associates, P.C., *Phase II Environmental Site Assessment Preliminary Site Characterization for JML Optical Inc., 690 Portland Avenue, Rochester, New York 14621*, June 2005

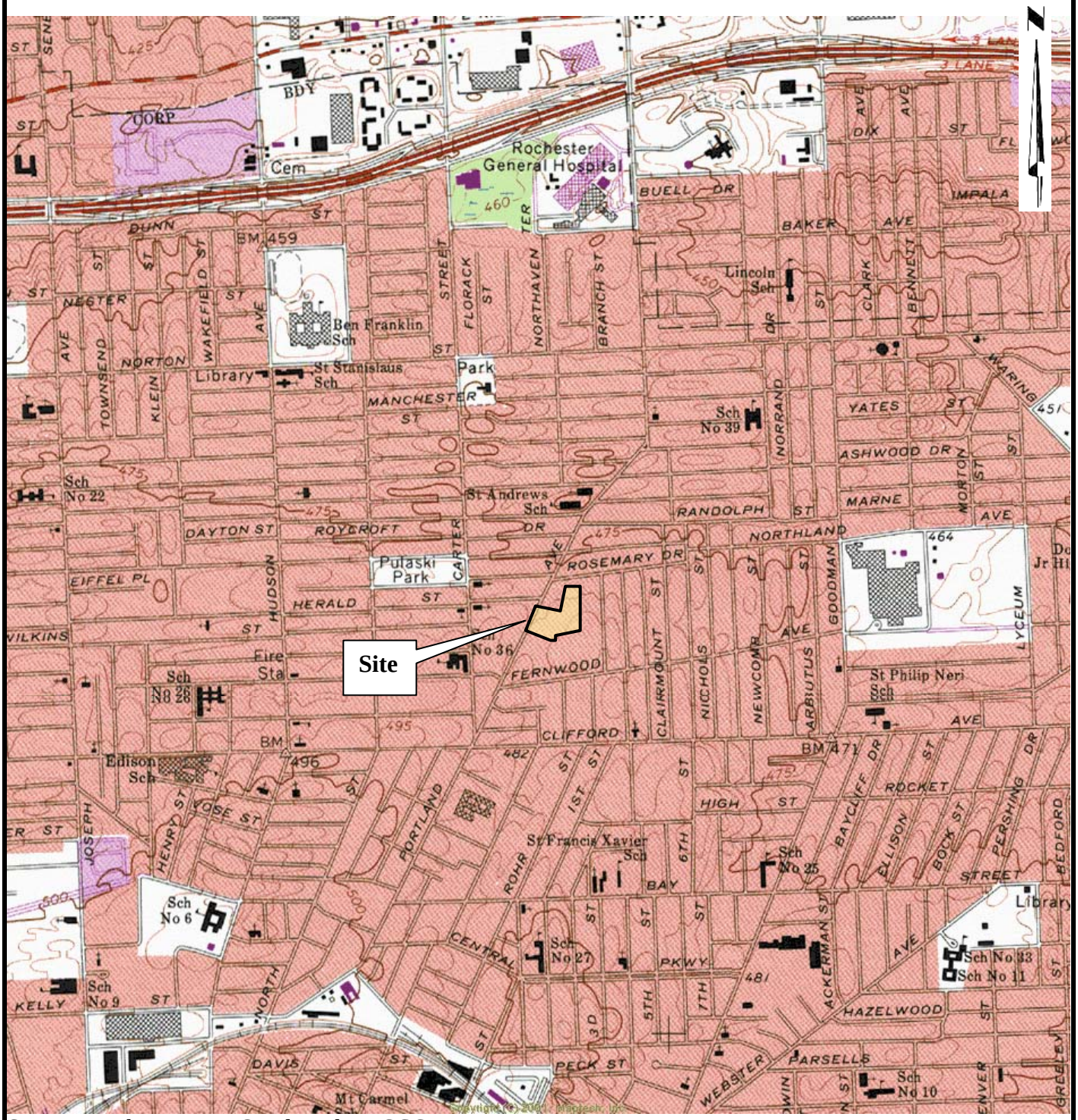
Labella Associates, P.C., *Phase II Environmental Site Assessment Supplemental Site Characterization for JML Optical Inc., 690 Portland Avenue, Rochester, New York 14621*, June 2006

6 NYCRR Part 375.4 Environmental Remedial Program, December 14, 2006

NYSDOH Center for Environmental Health, Bureau of Environmental Exposure Investigation, *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, October 2006

Draft DER-10; Technical Guidance for Remedial Investigation and Remediation, NYSDEC DER, December 2004

FIGURES



Source: Rochester East Quadrangle, USGS

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FIGURE 1
SITE LOCATION MAP

JML Optical Site
678-690 Portland Avenue
CITY OF ROCHESTER
MONROE COUNTY, STATE OF NEW YORK

Project: 17781

Date: 1/13/09

Drawing Not to Scale

CHA
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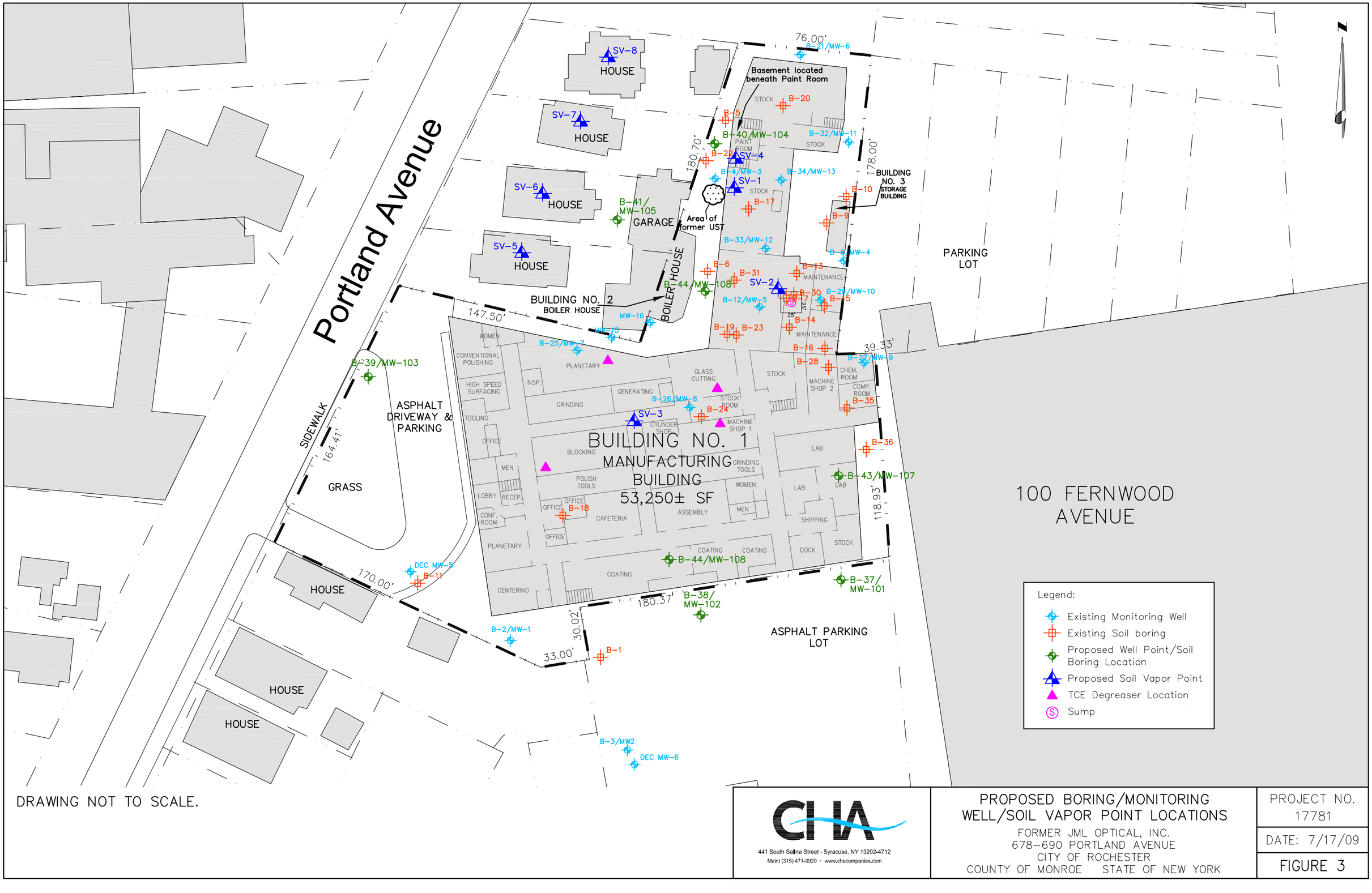
FIGURE 2
AERIAL PHOTOGRAPH
JML Optical Site
690 Portland Avenue
CITY OF ROCHESTER
MONROE COUNTY, STATE OF NEW YORK

Project: 17781

Date: 1/13/09

Drawing Not to Scale



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PROPOSED BORING/MONITORING WELL/SOIL VAPOR POINT LOCATIONS

FORMER JML OPTICAL, INC.
678-690 PORTLAND AVENUE
CITY OF ROCHESTER
COUNTY OF MONROE STATE OF NEW YORK

PROJECT NO. 17781

DATE: 7/17/09

FIGURE 3

File: K:\17781\REPORTS\WORK PLAN\WORK PLAN\FIGURE 3- BORING LOCATIONS_REV_1.DWG Saved: 6/11/2009 3:51:58 PM PLotted: 7/17/2009 4:21:50 PM User: Newell, Sarah

APPENDIX A

FIELD SAMPLING PLAN

for

Former JML Optical, Inc.
678-690 Portland Avenue
City of Rochester, New York

CHA Project Number:17781.1002.1102

Prepared for:

690 Portland Avenue Company
820 Linden Avenue
Rochester, New York 14625-2710

Prepared by:

441 South Salina Street
Syracuse, New York 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

July 24, 2009

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FIGURES

1.0 INTRODUCTION

This Appendix presents the Field Sampling Plan (FSP) for the former JML Optical (Site or Property) in Rochester, New York. This report outlines the protocols which will be followed during the following activities and has been prepared as an appendix to the Remedial Investigation (RI) Work Plan for the project. Proposed sampling locations for associated with the field activities are included as Figure 1. In general, the following activities will be conducted as part of the site investigation activities:

- Installation of soil borings, soil vapor extraction points, and monitoring wells;
- Collection of subsurface soil samples;
- Sampling of monitoring wells;
- Equipment cleaning; and
- Waste Handling.

The balance of this plan is made up of five (5) additional sections. Each of these sections is identified below:

Section 2.0: General Sampling Protocols
Section 3.0: Subsurface Investigation
Section 4.0: Groundwater Sampling
Section 5.0: Equipment Decontamination
Section 6.0: Waste Handling

2.0 GENERAL SAMPLING PROTOCOLS

The Sampling approach and rationale for sample collection is described in the RI Work Plan and the sampling activities will be conducted in a manner to protect both workers and the general public in accordance with the Health and Safety Plan (HASP), found in Appendix D of the RI Work Plan.

The Data Quality Objectives for the project and the quality assurance and quality control procedures for the project are described in the Quality Assurance Project Plan (QAPP), found in Appendix C of the RI Work Plan.

2.1 SAMPLE DESIGNATION

Subsurface soil samples will be identified with the following designation: B-(##) (depth interval in feet below grade) (e.g., B-01 (2-4')).

Monitoring wells will be identified with the following designation: MW-(##) and labeled sequentially.

Soil vapor samples will be identified with the following designation: SV-(##) and will be labeled sequentially.

2.2 SAMPLE HANDLING

A new pair of disposable latex gloves will be used at each location to be sampled for chemical analyses. Additional glove changes will be undertaken as conditions warrant.

Sample containers will be new and delivered from the laboratory prior to the sampling event. Sample containers will come with the proper volume of chemical preservative appropriate for the type of analysis.

After sample collection, the sample containers will be logged onto a chain of custody record described in Section 6 of the Quality Assurance Project Plan. The sample containers will be placed on ice and/or ice packs in laboratory- supplied rigid coolers after collection and labeling. Remaining space will be filled with packing material to cushion the containers during transportation or shipment. The cooler will then be sealed with packing tape. Coolers will be shipped via an overnight carrier to an off-site New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory for analysis. For this project CHA staff will hand deliver the sample coolers to the TestAmerica Service Center in Syracuse, NY, or a TestAmerica Courier will pick up the sample coolers on site and transport them to TestAmerica Buffalo.

Samples will remain under the control of CHA's field representative until relinquished to the laboratory or commercial courier under chain-of-custody (see QAPP).

2.3 FIELD DOCUMENTATION

Pertinent field survey and sampling information shall be recorded in a logbook or on field logs during each day of the field effort. Detailed soil boring and monitoring well installation logs will be completed.

At a minimum, entries in a logbook shall include:

- Date and time of starting work;
- Names of all personnel at site;
- Weather conditions
- Purpose of proposed work effort;
- Sampling equipment to be used and calibration of equipment;
- Description of work area;
- Location of work area, including map reference;
- Details of work effort, particularly any deviation from the field operations plan or standard operating procedures;
- Field observations;
- Field measurements (e.g., pH);
- Field laboratory analytical results;
- Daily health and safety entries, including levels of protection;
- Type, number, and location of samples;
- Sampling method, particularly deviations from the standard operating procedures;
- Sample location and number; and
- Sample handling, packaging, labeling, and shipping information (including destination).

During soil vapor sampling, weather conditions, sampling depth, purge volumes, volume of vapor extracted, canisters used, vacuum before and after collection, and other observations will be recorded.

In addition to keeping logs, photographs will be taken to provide a physical record to augment the fieldworker's written observations. For each photograph taken, several items shall be recorded in the field logbooks:

- Date and time;
- Name of photographer;
- General direction faced and description of the subject

Additional protocols specific to each sampling method are presented in the following sections.

3.0 SUBSURFACE INVESTIGATION

3.1 Soil Borings

As part of the RI, CHA will install eight (8) borings to refusal or ten feet below ground surface (bgs), whichever is encountered first. Soil samples will be collected based on field observations during

sampling (i.e., soil odors, soil discoloration) or elevated photoionization detector (PID) field screening results.

One soil sample from each soil boring location will be submitted to an off-site NYSDOH ELAP-certified laboratory for analysis of the following: Target Compound List (TCL) Volatile Organic Compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method 8260, TCL semi-volatile organic compounds (SVOCs) via USEPA Method 8270, polychlorinated biphenyls (PCBs) via USEPA method 8082, Target Analyte List (TAL) Metals (including cyanide) by USEPA Methods 6010, 6020, 7470, and 9012A, and pesticides via USEPA method 8085.

Each soil boring will be advanced utilizing a direct-push soil sampling method (e.g., Geoprobe™) to a depth of approximately ten (10) feet bgs or refusal. In the event that rock coring is required to advance a soil boring to the groundwater table, an addendum to this Work Plan will be issued at that time which proposes rock coring as the method for boring installation. If, during the advancement of the boring, native soils are not encountered within the first ten (10) feet, the depth of the soil borings may be increased to a maximum of twenty (20) feet in an attempt to encounter native soils. During advancement of each soil boring, continuous samples will be collected. Soils will be logged in the field using a modified soil classification method.

Immediately upon opening the macro-core soil sampler, a PID or equivalent meter will be used to obtain readings along the length of the soil sample. Soil samples for laboratory analysis will be collected from each borehole in accordance with the following protocols:

1. A sample will be collected from the unsaturated interval which indicates the highest potential for the presence of contamination as determined by the highest PID or equivalent meter reading, and/or visual observation, or,

2. From the deepest unsaturated interval which indicates a potential for contamination, or

3. In the instance where elevated PID meter readings, or visible contamination are not present, a sample from the interval immediately above the water table may be collected for laboratory analysis.

The samples for laboratory analysis will be collected from the middle of the core of the sample using a decontaminated stainless steel trowel or spoon or a disposable polyethylene sampling scoop. The samples will be placed directly into the laboratory sample jars, filling the jar for VOC analysis first, allowing no headspace.

3.2 Monitoring Well Installation Procedures

As described in the Work Plan, CHA will install eight (8) one-inch monitoring wells at the site to evaluate the presence of groundwater impacts associated with the former underground storage tank (UST), former industrial use of the site, and potential off-site impacts. As part of the well, the proposed soil borings will be converted to monitoring wells. As noted above, in the event that rock coring is required to advance a soil boring to the groundwater table, an addendum to this Work Plan will be issued at that time which proposes rock coring as the method for boring installation. Each

well will be constructed with PVC 0.010-inch slot well screen screened in the first water bearing unit, and connected to an appropriate length of PVC riser to complete the monitoring well. The length of the screen will be determined in the field based on the depth to groundwater. The locations of the proposed wells are shown on Figure 1. A typical well construction log has been included as Appendix A.

Groundwater purging will be conducted with an adjustable rate peristaltic pump or disposable bailer, in accordance with the FSP. The monitoring well will be purged three to five well volumes of standing water utilizing a peristaltic pump, inertial pump, or a small centrifugal pump and groundwater quality parameters (pH, temperature, conductivity, oxidation-reduction potential, and dissolved oxygen) will be recorded using a multi-parameter water quality monitoring instrument with continuous readout display. Turbidity will be measured either using the multi-parameter instrument or with a separate turbidity meter. One groundwater sample will be collected from each monitoring well and identified with the designation of the well from which the sample was collected (i.e., MW-4).

3.3 Soil Vapor Investigation

A total of eight (8) sub-slab interior soil vapor sampling points will be installed in conjunction with the investigation at the Site. Four residential properties are located north=west of the Site and one (1) sub-slab soil vapor sampling point as well as one (1) indoor air sample will be located inside each property. The sub-slab soil vapor and indoor air sampling of the adjacent residences will be performed during the 2009-2010 heating season. Outdoor air sampling, as recommended by the NYSDOH guidance documents for soil vapor sampling, will occur at the same time as the sub-slab and indoor air sampling at the residences. One representative ambient (outdoor) air sample may be appropriate if the adjacent residences are determined to be situated closely together, as long as the sampling is performed concurrently. This determination will be made in the field at the time of sampling. If only one ambient air sample is determined to be necessary, it shall be collected from a representative upwind, location, away from wind obstructions and at a height above the ground to represent breathing zones.

Four (4) sub-slab soil vapor sampling points will be located inside the current Site building to evaluate the potential for current exposure to impacted soil vapors as described below.

- One sub-slab soil vapor sampling point will be located inside the building, next to the area of the former UST;
- One sub-slab soil vapor sampling point will be located in the vicinity of the former sump;
- One sub-slab soil vapor sampling point will be located in the area of the former TCE degreasers; and
- One sub-slab soil vapor sampling point will be located in the basement area.

At this time, only sub-slab samples will be collected within the JML Optical building. This sub-slab sampling will occur at the same time the soil and groundwater investigations occur on the Property. However, during the 2009-2010 heating season, indoor air samples will be collected at each sub-slab soil vapor sampling point to quantify the actual indoor air quality relative to subsurface conditions. As previously mentioned, the off site soil vapor and indoor/outdoor air sampling at the residences

will be performed at a later date so that it can be performed during the heating season. Proposed soil vapor sampling points are shown on Figure 1, however the exact locations within the off-site residences will be verified with NYSDOH prior to sampling.

Soil vapor samples will be collected in accordance with the NYSDOH Center for Environmental Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006).Prior to installation of each sub-grade probe, the building floor slabs will be inspected for penetrations. The probes will be installed at a location where the potential for ambient air infiltration is minimized. A one-inch diameter hole will be drilled into the concrete and will be set at a depth no further than two inches into the sub-slab material. A 3/8-inch outside diameter by ¼-inch inside diameter stainless steel or metal pipe will be inserted into the hole and coarse sand will be added to cover about one inch of the probe tip. Finally, cement will be used to create a surface seal to prevent ambient air infiltration.

Shortly after the installation of the probe, one to three (1-3) implant volumes (i.e., the volume of the sample probe and tube) will be purged prior to sample collection, to ensure representative samples. Flow rates for purging and collection will not exceed 0.2 liters per minute, to minimize outdoor air infiltration during sampling. Samples will be collected using six liter Summa® canisters, and a tracer gas will be used to monitor potential outside air infiltration. Canisters will be analyzed via USEPA Method TO-15.

For locations within the residential structures, indoor and outdoor ambient air samples will be collected to quantify the indoor air quality relative to subsurface conditions. The indoor sample will be collected using six liter Summa® canisters that are individually certified clean and calibrated with sampling flow rates that do not exceed 0.2 liters per minute. The duration of the indoor air sampling event will not exceed eight hours and the height of the inlet sampling tube will be positioned within the breathing zone roughly three to five feet above the floor. Outdoor air samples will be collected at upwind locations free of any wind obstructions. This portion of the investigation is contingent upon obtaining the permission of the owners/occupants of each residence, which according to preliminary discussions will not present a hindrance to the investigation.

Prior to sampling, a pre-sampling inspection will be performed to identify and minimize conditions that may interfere with testing, as described in section 2.1.1 of the NYSDOH Center for Environmental Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006). The inspection will evaluate the general layout and predicted air flows of the current site building, and a building inventory will be taken. The building inventory will identify potential air sampling interference by characterizing the occurrence and use of chemicals and products throughout the building (for example, containers of paint, polish, solvents, or gasoline stored in the building). The presence and description of odors will be noted and portable vapor monitoring equipment (for example, PIDs) readings will be recorded. The pre-sampling inspection will also include adequate photographic documentation of products present.

4.0 GROUNDWATER SAMPLING

Groundwater samples will be collected from proposed wells MW-101 through MW-108, as well as all existing on-site monitoring wells (MW-1 through MW-16 and DEC MW-5). These samples will

be collected within 24 hours after the well installation activities are completed. Bottle requirements and handling procedures are presented in the QAPP. Sampling protocols are presented in the following sub-sections.

4.1 Water Level Measurements

Groundwater level measurements will be collected on at least two (2) separate occasions following installation and development: once immediately following development, and once immediately prior to groundwater sampling. During one round of measurements, groundwater levels will also be collected from available wells at the Vogt site and the Preferred Electric site, assuming NYSDEC provides access to the wells and survey information for the top of well elevations. Groundwater elevation measurements will be used with well elevation data to determine direction of groundwater flow.

The water level in all monitoring wells will be measured to the nearest 0.01-foot using a Solinst electronic water level meter and recorded prior to the collection of any samples. Using the well riser elevations and depth to groundwater measurements, CHA will record the water level elevations and construct a groundwater potentiometric surface map. The well depth and depth to water data will be used to calculate the volume of water in the well casing. Water level measuring equipment that comes in contact with well water will be cleaned in accordance with Section 5.0 to minimize the potential for cross-contamination.

4.3 Well Sampling

1. Monitoring well sampling will be carried out according to the following protocol:

2. Personnel involved in well purging will wear a new pair of disposable latex gloves for each well.

3. Purging will be considered complete when three (3) to five (5) well volumes have been evacuated from the monitoring well. In the event that recharge is insufficient to conduct the purging protocol described, the well will be bailed/pumped to dryness and a sample will be collected when the monitoring well has sufficiently recovered.

4. Acceptable methods of water extraction during purging include bailers, peristaltic pumps, bladder pumps, Waterra® pumps, and centrifugal pumps. The purging method selected will be based upon the well depth, the water level in the well, and the recharge characteristics.

5. Water extraction equipment will be cleaned in accordance with the protocols presented in Section 5.0.

6. Monitoring wells will be sampled using either a bottom filling, dedicated polyethylene bailer attached to a nylon or polypropylene rope or a peristaltic pump. A new, disposable bailer and length of rope will be used at each well. If a peristaltic pump is used, new tubing (poly and silicone) will be used at each well.

7. Sufficient groundwater will be collected for chemical analysis. Groundwater samples will be collected in containers as specified in the QAPP. Sample preservation details are addressed in the QAPP. The order for sample collection is as follows:

    - VOCs;
    - SVOCs;
    - Metals.
    - Herbicides/Pesticides
    - PCBs

8. Purge water that does not indicate the presence of contamination based on visual and olfactory characteristics will be discharged to the ground surface immediately adjacent to the monitoring well from which it was extracted. In the event that the purge water exhibits physical evidence of contamination (e.g. odor, sheen, etc.), it will be collected and stored for future disposal/treatment.

9. Sample preservation details are presented in the QAPP. Sample containers will be prepared by the laboratory, and will be pre-labeled and pre-preserved.

10. Calibration of all field instruments will be conducted in accordance with the manufacturer's instructions.

11. One blind duplicate sample (CHA-#) will be collected at a frequency of 1 in 10 investigative samples.

5.0 EQUIPMENT DECONTAMINATION

The required decontamination procedure for all manual sampling equipment used to collect samples for chemical analysis is:

1. Disassemble equipment, as required.

2. Remove gross contamination from the equipment by brushing and then rinsing with tap water.

3. Wash with Alconox and tap water.

4. Rinse with tap water.

5. Rinse with distilled water.

6. Air dry equipment.

7. Field personnel will use a new pair of outer gloves before handling sample equipment after it is cleaned.

8. If equipment is not to be used again immediately, it will be wrapped in aluminum foil.

Decontaminated equipment will be placed on polyethylene sheeting in order to avoid contacting a contaminated surface prior to use.

6.0 WASTE HANDLING

It is anticipated that excavated soils will be used to backfill each borehole (with the exception of the monitoring wells). However, in the event that gross contamination is identified, soil will be stockpiled on polyethylene sheeting and covered in a predetermined staging area. In the event that the quantity of material is relatively small, potentially impacted soils will be placed in 55-gallon DOT approved drums and stored on-Site for future disposal/treatment.

Purge water that does not indicate the presence of contamination based on visual and olfactory characteristics will be discharged to the ground surface immediately adjacent to the monitoring well from which it was extracted. In the event that the purge water exhibits physical evidence of contamination (e.g. odor, sheen, etc.), it will be collected and stored for future disposal/treatment.

Gloves, personal protection equipment, sampling materials, etc. will be collected daily and disposed of as solid waste.

FIGURES

Portland Avenue

SV-8
HOUSE
SV-7
HOUSE
SV-6
HOUSE
SV-5
HOUSE
B-41/
MW-105
GARAGE
BOILER HOUSE
BUILDING NO. 2
BOILER HOUSE
B-44/MW-108
MW-16
MW-15
147.50'
76.00'
B-21/MW-6
Basement located beneath Paint Room
STOCK
B-20
B-5
B-40/MW-104
PAINT ROOM
B-32/MW-11
STOCK
B-2
SV-4
B-4/MW-3
B-34/MW-13
SV-1
STOCK
180.70'
178.00'
BUILDING NO. 3 STORAGE BUILDING
B-10
B-17
B-9
Area of former UST
B-33/MW-12
B-8/MW-4
PARKING LOT
B-6
B-31
B-13
MAINTENANCE
SV-2
B-12/MW-5
B-30
B-29/MW-10
B-15
25'
25'
B-14
B-19
B-23
MAINTENANCE
B-16
39.33'
B-27/MW-9
B-28
CHEM. ROOM
COMP. ROOM
B-35
B-25/MW-7
B-39/MW-103
WOMEN
CONVENTIONAL POLISHING
PLANETARY
MW-14
INSP.
HIGH SPEED SURFACING
GENERATING
GLASS CUTTING
STOCK
MACHINE SHOP 2
GRINDING
B-26/MW-8
STOCK ROOM
TOOLING
SV-3
B-24
CYLINDER SHOP
MACHINE SHOP 1
OFFICE
BLOCKING
BUILDING NO. 1
MANUFACTURING
BUILDING
53,250± SF
LAB
B-36
MEN
POLISH TOOLS
GRINDING TOOLS
WOMEN
LAB
LAB
B-42/MW-106
LOBBY
RECEP.
OFFICE
OFFICE
B-18
CAFETERIA
ASSEMBLY
MEN
SHIPPING
118.93'
CONF. ROOM
OFFICE
PLANETARY
COATING
COATING
DOCK
STOCK
B-43/MW-107
COATING
CENTERING
B-37/
MW-101
B-38/
MW-102
180.37'
30.02'
33.00'
B-2/MW-1
B-1
ASPHALT PARKING LOT
SIDEWALK
164.41'
ASPHALT DRIVEWAY & PARKING
GRASS
DEC MW-5
B-11
170.00'
HOUSE
HOUSE
HOUSE
B-3/MW2
DEC MW-6

100 FERNWOOD AVENUE

Legend:
- Existing Monitoring Well
- Existing Soil boring
- Proposed Well Point/ Soil Boring Location
- Proposed Soil Vapor Point
- TCE Degreaser Location
- Sump

DRAWING NOT TO SCALE.

CHA
441 South Salina Street · Syracuse, NY 13202-4712
Main: (315) 471-3920 · www.chacompanies.com

PROPOSED BORING/MONITORING WELL/SOIL VAPOR POINT LOCATIONS

FORMER JML OPTICAL, INC.
678-690 PORTLAND AVENUE
CITY OF ROCHESTER
COUNTY OF MONROE STATE OF NEW YORK

PROJECT NO. 17781

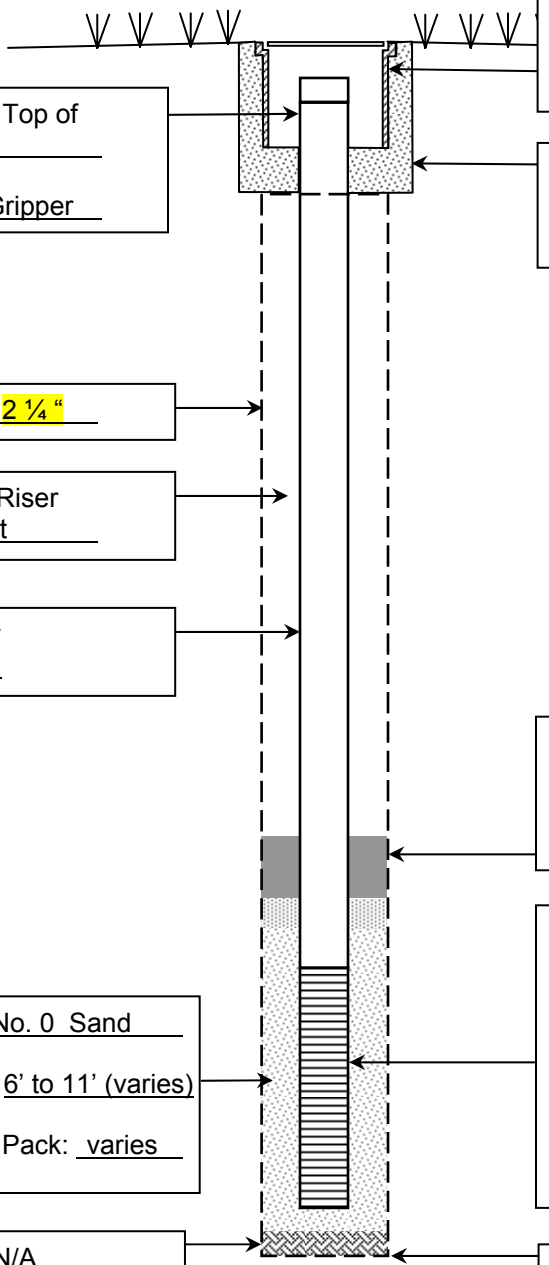
DATE: 6/11/09

FIGURE 1

APPENDIX A: WELL CONSTRUCTION LOG

WELL CONSTRUCTION LOG

PROJECT & LOCATION: Former JML Optical Inc., Rochester, NY	BORING NO.
CLIENT: 690 Portland Avenue Company	WELL NO.
CONTRACTOR:	PROJECT NO.:
	SHEET NO.: 1 OF 1
	ELEVATION:
	START DATE: TIME:
	FINISH DATE: TIME:
	DRILLER:
	INSPECTOR:



Type of Protective Casing: Steel

Inside Dia. Of Casing: ~5”

Depth Below Ground of Casing: ~6”

Depth Below Ground to Top of Riser Pipe: ~3”

Type of Cap: Locking Gripper

Type of Surface Seal: Concrete

Thickness of Surface Seal: ≥2’

Diameter Borehole: 2 ¼ “

Type of Backfill Around Riser Pipe: Concrete/Grout

Inside Diameter of Riser Pipe: 1”

Type of Bentonite Seal: bentonite chips or equivalent

Thickness of Bentonite Seal: ≥6”

Type of Screen: PVC

Screen Diameter: 1”

Screen Slot Size: 0.010”

Length of Screen: 5’ to 10’ (varies)

Depth to Bottom of Screen: varies

Type of Sand Pack: No. 0 Sand

Thickness of Sand Pack: 6’ to 11’ (varies)

Depth to Bottom of Sand Pack: varies

Backfill (if any): N/A

Depth to Bottom of Borehole: varies

APPENDIX B

SITE INVESTIGATION
HEALTH & SAFETY PLAN

Former JML Optical, Inc.
678-690 Portland Avenue
City of Rochester, New York

CHA Project Number: 17781.1002.1102

Prepared on behalf of:

690 Portland Avenue Company
820 Linden Avenue
Rochester, New York 14625-2710

Prepared by:

441 South Salina Street
Syracuse, New York 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

June 5, 2009

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DISCLAIMER

This Site Health & Safety Plan (HASP) has been written for the use of CHA and their employees. Properly trained and experienced CHA subcontractors may also use it as a guideline document. However, CHA does not guarantee the health and safety of any person entering the site.

Due to the potentially hazardous nature of the project and the activity occurring thereon, it is not possible to discover, evaluate and provide protection for all possible hazards, which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at the project. The health and safety guidelines in this plan were prepared specifically for this project and should not be used on any other project without prior research by trained health and safety specialists.

CHA claims no responsibility for the use of this Plan by others. The Plan is written for the specific site conditions; purpose, dates, and personnel specified and must be amended if these conditions change.

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FIGURES

LIST OF ACRONYMS & ABBREVIATIONS

AMSL	Above Mean Sea Level
CAMP	Community Air Monitoring Program
CFR	Code of Federal Regulations
CHA	Clough Harbour & Associates LLP
CNS	Central Nervous System
CVS	Cardiovascular System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations & Emergency Response
HSC	Health & Safety Coordinator
IDLH	Immediately Dangerous to Life and Health
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OCDWEP	Onondaga County Department of Water Environment Protection
OCRRA	Onondaga County Resource Recovery Agency
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Level
PID	Photoionization Detector
PPE	Personal Protective Equipment
PPM	Parts per Million
REL	Recommended Exposure Limit
RI	Remedial Investigation
SCBA	Self-Contained Breathing Apparatus
SHSO	Site Health & Safety Officer
TLV	Threshold Limit Value
TWA	Time Weighted Average
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Chemical

1.0 INTRODUCTION

The following Health and Safety Plan (HASP) has been created for the protection of CHA staff on the Former JML Optical site located at 678-690 Portland Avenue in the City of Rochester, Monroe County, New York (Site or Property), as shown on Figure 1. The assignments associated with this project require CHA employees to perform tasks where personal safety could be compromised due to chemical, physical, and biological hazards. While conducting fieldwork, CHA employees may be exposed to chemical contaminants including a wide variety of organic compounds and heavy metals. Additionally, CHA employees may be exposed to physical hazards, including but not limited to, heavy machinery, excavations, and trip/fall hazards.

The requirements and guidelines in this HASP are based on a review of available information and an evaluation of potential on-site hazards from previous studies and information available to date. The plan procedures will be updated as additional information becomes available with regard to the actual site conditions.

This HASP will be discussed with site personnel and will be available on-site for review while work is underway. Personnel conducting site activities must be familiar with the procedures, requirements and provision of this plan, and in the event of conflicting plans/requirements, personnel must implement those safety practices which afford the highest level of protection. CHA personnel will report to the CHA Health and Safety Coordinator (HSC) in matters of health and safety. While the HSC is responsible for ensuring compliance with this HASP and stopping work when necessary, the Field Team Leader is responsible for implementation of this HASP into daily site activities.

Non-intrusive activities within CHA's scope of work are those that do NOT have the potential to jeopardize the health and safety of site workers, the public, or the environment with respect to site contaminants. Intrusive activities within CHA's scope of work are those that have the potential to cause health and safety concerns to site workers, the public, or the environment. These activities and any non-intrusive activities conducted in an Exclusion Zone require training per 29 CFR 1910.120 *Hazardous Waste Operations and Emergency Response, Final Rule*, which govern work on hazardous waste sites.

2.0 GENERAL SITE INFORMATION

CHA Project Number: 17781

Client

Client Contact: Mr. Michael E. McCusker
820 Linden Avenue
Rochester, New York 14625
Phone: (585) 248-8900
Fax: (585) 248-8924
e-mail: mikem@jmloptical.com

Site Name: Former JML Optical Site

Site Address:	678-690 Portland Avenue, Rochester NY	
Work Tasks/Duration:	-Subsurface Investigation(s)	Beginning March 2009
	-Soil Boring Installation/ Temporary Well Installation	Approximately 3 days
	-Surveying Services	Approximately 1 day
	-TemporaryWell sampling	Approximately 1 day
Subcontractor(s):	A subcontractor will be utilized to provide drilling services related to the installation of borings and monitoring wells for the site investigation.	

3.0 EMERGENCY CONTACTS

Ambulance:	**911**
Police Department:	**911**
Fire Department:	**911**
Hazardous Materials Response:	**911**
Poison Control:	1-800-336-6997
Utility Clearance:	1-800-DIG-SAFE (1-800-344-7233)
NYSDEC Spills Hotline:	1-800-457-7362 (24 hours a day)
CHA Contact:	Dr. Christopher Burns, P.G. (315) 471-3920 – Office (315) 322-1567 - Cell
Client Contact:	Mr. Michael E. McCusker Phone: (585) 248-8900 Fax: (585) 248-8924 e-mail: mikem@jmloptical.com

Nearest Hospital:	Rochester General Hospital 1425 Portland Ave, Rochester, NY 14621 (585) 922 - 4000

Directions to Hospital:

1. Head **northeast** on **Portland Ave** toward **Willite Dr**
   After 1.1 mile, destination will be on the left

NOTE: Map to the hospital provided as Figure 2.

4.0 KEY PERSONNEL

4.1 Off-Site Personnel

Title:	**Senior Level Management**
Description:	Responsible for defining project objectives, allocating resources, determining the chain of command, and evaluating program outcome.
Contact:	Christopher Burns, Ph.D., P.G. @ (315) 471-3920

Title:	**Project Team Leader/Scientific Advisor**
Description:	Reports to upper level management, has authority to direct response operations, assumes total control over site activities. Guides the Project in scientific matters.
Contact:	Christopher Burns, Ph.D., P.G. @ (315) 471-3920

Title:	**CHA Company Health & Safety Coordinator**
Description:	Overall responsibility for implementing company-wide health and safety standards, procuring appropriate personal protective clothing and equipment, staff training, etc.
Contact:	David Taillon, P.E. @ (518) 453-4500

4.2 On-Site Personnel

The proposed scope of work includes the installation of soil borings, temporary well points, and soil vapor monitoring points to further characterize the Site. Additionally each temporary well point will be surveyed. The following project teams have been developed to complete each task.

4.2.1 Site Investigation

Title:	**Site Health & Safety Officer (SHSO)**
Description:	Advises the field team on all aspects of health and safety issues, recommends
Contact:	Kathryn Flood @ (315) 380-7331 (Cell)

Title:	**Field Team Leader**
Description:	Responsible for field team operations.
Contact:	Kathryn Flood @ (315) 380-7331 (Cell)

Title:	**Work Party**
Description:	Performs field operations
Contact:	Danielle Benati @ (315) 471-3920 (Office)

4.2.2 Survey

Title:	**Site Health & Safety Officer**
Description:	Advises the field team on all aspects of health and safety issues, recommends stopping work if any operation threatens worker or public health and safety.
Contact:	Matthew L. Murphy @ (585) 262-2640

Title:	**Field Team Leader**
Description:	Responsible for field team operations.
Contact:	Matthew L. Murphy @ (585) 262-2640

Title:	**Work Party**
Description:	Performs field operations
Contact:	Matthew L. Murphy @ (585) 262-2640

4.3 As-Needed Personnel

Title:	Fire Department
Description:	Responds to fires, performs rescues, and maintains hazardous material responders.
Contact:	911

Title:	Hazardous Chemical Cleanup Contractor
Description:	Contaminant control methods and emergency response.
Contact:	Environmental Products & Services of Vermont, Inc. (315) 451-6666

5.0 SITE ENTRY

5.1 Objectives

The objectives of the site entry are to complete site investigation activities at the former JML Optical Site in Rochester, NY. The tasks previously identified require entry to the Site by CHA personnel. The tasks that will be completed include subsurface drilling, temporary well installation, soil vapor sampling, and survey services.

5.2 Safety Meetings

To ensure that the HASP is being followed, the task SHSO shall conduct a safety meeting prior to entry to the site or the initiation of any site activity, if any conditions change, and before each work day.

5.3 Safety Training

The task SHSO will confirm that every person assigned to a task has had adequate training for that task and that the training is up-to-date by checking with the CHA HSC. On-site CHA staff working on this project shall have a minimum of a 40-hour initial Hazardous Waste Operations and Emergency Response (HAZWOPER) training and a current 8-hour refresher course. Additionally, CHA will confirm that subcontractor's on-site personnel have the HAZWOPER training and a current 8-hour refresher course.

Training will have been conducted and certified in accordance with the Occupational Safety and Health Administration (OSHA) regulations as outlined in 29 Code of Federal Regulations (CFR) 1910.120.

5.4 Medical Surveillance

On-site CHA personnel (including CHA subcontractors) will have had a medical surveillance physical consistent with OSHA regulations in 29 CFR 1910.120 and performed by a qualified occupational health physician. The SHSO shall confirm prior to initiation of work on this Site that every person assigned to a task has had an annual physical, has passed the medical examination and has been determined medically fit by the occupational health physician for this type of work.

5.5 Site Mapping

An aerial photograph of the site is included as Figure 3.

6.0 SITE CHARACTERIZATION

6.1 Site Description

The Site is an approximately 1.565-acre parcel of land located at 678-690 Portland Avenue in the City of Rochester, Monroe County, New York (Tax Map Parcel No. 106.27-1-86). The Site is almost entirely covered with buildings or paved surfaces, except for a mowed grass area along the Portland Avenue entrance to the Site and a strip of grass along the eastern property (rear side of building). ILEX Optical constructed the first buildings on the Site in approximately 1930 and the most recent addition to the building was constructed on the south end of the Site around 1970. The buildings are generally one-story tall and are summarized as follows:

- **Building 1** – The main building is approximately 53,250 square feet in size and is constructed with concrete block walls and a slab-on-grade flooring system. There is an approximately 300 square foot basement under a portion of the building. A second floor level along the building façade to Portland Avenue was utilized as office space and the second level on the northernmost portion of the building was utilized for storage.

- **Building 2** – The second building is a former boiler house. The building is constructed with concrete block walls and a concrete slab-on-grade and has a footprint of approximately 730 square feet. The building was most recently used for storage.

- **Building 3** – The third building is an approximately 300 square foot building constructed with metal siding and a concrete slab-on-grade. The building is unheated and was formerly utilized to store chemicals.

The three buildings are currently unoccupied. The site is located within a New York State "En-Zone" pursuant to Tax Law § 21(b)(6). There are no known easements on the Site and there are currently no environmental permits associated with Site.

6.2 Neighboring Properties

The Site and neighboring properties are currently located in an Industrial (M-1) zoning district according to the City of Rochester Department of Community Development, Bureau of Building and Zoning, except for the parcel located immediately south of the Site (76 Fernwood Avenue), which is zoned Low Density Residential (R-1). Neighboring property uses are summarizes as follows:

North: The Site is bordered to the north by a paved parking lot owned by the City of Rochester. This parking lot was formerly a street named Ilex Place. There is a service station, an auto body repair shop and a two-family residential structure located north of the City parking lot.

East: The Site is bordered to the east by a vacant industrial building and associated parking lots. The site to the east was formerly operated under the name Vogt Manufacturing and is currently owned by 100 Fernwood Ave Associates. This

site is currently listed as a New York State Department of Environmental Conservation (NYSDEC) Brownfield facility.

South: The Site is bordered to the south by a parking lot and a single family residence. A vacant industrial building (a NYSDEC Inactive Hazardous Waste Site known as Preferred Electric Motors) is also located to the south of the property at 42 Fernwood Avenue.

West: The Site is bordered to the west by Portland Avenue. A paved parking lot, a vacant commercial building and a distribution facility are located along the west side of Portland Avenue, across from the main site entrance. There are also four residential properties located immediately adjacent to the west side of the Site.

6.3 Site Topography

Local groundwater flow beneath the site is inferred to be in an northerly to northwesterly direction. In general, the Property has an elevation of approximately 485± feet above mean sea level based upon the USGS topographic mapping of the area.

6.4 Meteorological Data

The fieldwork is expected to be conducted from February 2009 through May 2009. The weather and temperature throughout a portion of the work period is expected to be cold, as is typical in the winter months. Prior to each day's activities, the daily forecast will be monitored for indications of adverse work conditions. If poor weather hinders the continuation of the day's activities or poses unsafe work conditions, the Field Team Leader may stop work for the day.

7.0 HAZARD EVALUATION

7.1 Physical Hazards

Physical hazards such as the following may be encountered on site:

- Slip/trip/fall (e.g. from mud, debris, steep topography, ice, etc.)
- Ultraviolet rays
- Lifting strains (e.g. from generators, drums, equipment)
- Heavy machinery and vehicles (e.g. drill rigs)
- Flying debris (e.g. debris from drilling equipment)
- Noise (e.g. elevated noise levels associated with drilling equipment)
- Heat/cold stress

7.2 Biological Hazards

- Biological hazards are not expected to pose a risk to employees on the site.

7.3 Chemical Hazards

Hazardous Material Types: Liquid _X_ Solid _X__ Sludge _____ Gas _X_

7.3.1 Dispersion Pathways

The potential exposure mechanism that can transport particulates and contaminants of concern from the areas of the investigation and monitoring activities to other areas of the Site as well as beyond the boundaries of the Site are:

- Contact with contaminated groundwater or soil
- Projection of contaminated material in air
- Failure to adhere to decontamination procedures
- Failure to adhere to Standard Operating Procedures

Nuisance dust can be a problem at any site that involves intrusive investigation activities. Dust will be controlled to the extent feasible to prevent the public from being unnecessarily concerned and to further reduce the nuisance dust hazard to Site personnel. Nuisance dust will be controlled by utilizing appropriate dust suppression techniques. The primary effect of nuisance dust is irritation of the eyes, nose, and throat when concentrations approach the OSHA exposure limits. Exposure limits are not anticipated to be exceeded during this project.

7.4 Hazard Identification & Control

Hazard controls generally consist of the following specific safety procedures: training, engineering controls, air monitoring, and personal protection equipment (PPE) selection. CHA employees are required to use the PPE appropriate to their work task and potential exposures as outlined in the HASP. The levels of PPE assigned to each activity are based on available information on the estimation of potential exposure associated with each work task.

AFFECTED PERSONNEL	TASK/ OPERATION	HAZARDS	HAZARD CONTROL
Exclusion Zone Personnel	Boring/temporary well installation & sampling of soil and temporary wells	Vehicular Traffic Mechanical Drill Rig	- Wear reflective vest - Use cones & signs to delineate work zone
Exclusion Zone Personnel	Boring/temporary well installation & sampling of soil and temporary wells	Potential Exposure to VOCs, SVOCs, heavy metals, polychlorinated biphenyls (PCBs), pesticides.	Exposure to chemical hazards: - Stand upwind when possible - Minimize direct contact - Avoid walking through discolored areas, puddles, leaning on drums or contacting anything that may; be contaminated. - Don appropriate PPE - Level D PPE work as a minimum - >10 parts per million (ppm) organic vapor for 5 minutes, upgrade to Level C. - >200 ppm organic vapor for 5 minutes upgrade to Level B
Exclusion Zone Personnel	Boring/temporary well installation & sampling of soil and temporary wells	Miscellaneous physical hazards including noise and physical contact hazards	- Don appropriate PPE when working around drilling equipment • Hard Hat • Safety Glasses • Hearing Protection
Exclusion Zone Personnel	Boring/temporary well installation & sampling of soil and temporary wells	Inclement weather	- Cease site activities during electrical storm - Cease site activities in extreme temps
Exclusion Zone Personnel	Boring/temporary well installation & sampling of soil and temporary wells	Back Injury	- Use mechanical lifting device when possible - Use buddy system when lifting heavy or awkward objects - Do not jerk or twist body while lifting

8.0 HAZARD/TASK ANALYSIS

8.1 Site Activities

Potential hazards that may be associated with potential on-Site activities are listed in the following table:

Hazards:	Precaution
1) Skin and/or eye contact with contaminated soil and/or groundwater, decontamination solutions, and sample preservation agents. 2) The inhalation of volatile organic vapors during site activities. 3) The inhalation of contaminated dusts and other airborne particles during Site activities.	- Wear the required PPE when conditions or activities indicate the need for it. - Avoid walking through puddles, and contacting other potential sources of contaminants such as drums. - Keep airborne dust levels to a minimum by wetting down surfaces.
Physical injuries, such as abrasions, insect bites, back injuries, slips, trips, falls.	- Avoid slippery surfaces when possible. - Practice safe lifting techniques. - Know the location of other Site workers at all times, especially before moving and/or starting up heavy equipment such as a drill rig or truck. - Be observant of possible insect nesting areas. - Have a first aid kit on hand.
Heat and cold stress	- Dress appropriately, wear dry clothing. - Take frequent breaks during extreme weather conditions. - Refer to the section on heat stress or cold stress, as appropriate for additional precautions.
Fire	- Have a fire extinguisher on hand. - Keep ignition sources away from flammable materials and atmospheres.
Security	- Stay alert to neighborhood activities

8.2 Specific Tasks

The hazards associated with specific Site tasks are described below:

Hazards:	Precaution
Soil Boring/Temporary Well Installation & Sample Collection	
Inhalation of and skin contact with contaminants in soil and groundwater.	- Conduct air monitoring specified in Section 9.0 and abide by all action levels. - Stand upwind to reduce inhalation hazard. - Wear respiratory protection when conditions indicate the need for it. - Wear chemical resistant gloves and safety glasses to prevent skin/eye contact.
Contact with overhead power lines and/or buried utilities/debris while drilling.	- Do not move drill rig when mast is up. - Do not drill within 20 feet of overhead power lines. - Call a utility locator to check for location of underground utilities. - Use common sense when choosing drilling locations.
Noise exposure and contact with moving parts of drill rig and/or flying debris	- Wear hearing protection if you must shout to hear someone who is standing one foot or less away. - Do not stand unnecessarily close to the drill rig when it is operating. - Know the location of the emergency shut-off switch. - Wear a hard hat

9.0 AIR MONITORING & ACTION LEVELS

9.1 Air Monitoring Equipment

The following environmental monitoring instruments shall be used on site at the specified intervals.

Photoionization Detector (PID)

A PID with a 10.6 eV lamp shall be used during tasks that require any intrusive activities and/or as ordered by CHA personnel. The PID will be utilized at the start of all intrusive activities, whenever obvious contamination is noted, and at least every 15 to 30 minutes through the duration of the intrusive activities. PID measurements shall be taken in the breathing zone of on-Site personnel, in low areas where flammable vapor may accumulate, in the headspace of soil and water samples, downwind of intrusive activities, and around the perimeter of the exclusion zone, as appropriate.

The PID shall be calibrated daily following manufacturers recommendations. Calibration data shall be recorded in daily logs by the contractor.

Dust

Dust levels shall be visibly monitored. If it appears dust levels are increasing, a particulate meter shall be utilized following the manufacturer's recommendations.

Temperature

Ambient temperature should be monitored throughout the work day for potential heat stress or cold stress conditions. Based upon observed weather forecasts, a thermometer shall be utilized to monitor on-Site temperatures whenever the expected low temperature for the day is anticipated to be less than 20° Fahrenheit or the anticipated high temperature is anticipated to be in excess of 90° Fahrenheit.

9.2 Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. Each action level is determined by the concentration level (above background level) and the ability of the PPE to protect against that specific contaminant. The action levels are based on concentrations in the breathing zone.

Should action levels be reached, work operations shall cease until further evaluation is performed and safe levels are prevalent. If ambient levels are measured which exceed the action levels in areas accessible to the public or unprotected personnel, necessary site control measures (barricades, warning signs, and mitigative actions, etc.) must be implemented before commencing activities at the specific work site. If through engineering controls and monitoring, safe levels (below action levels) cannot be achieved, an upgrade in PPE shall be mandated by the task SHSO, or operations shall cease in that portion of the site. The action levels at the Site are as follows:

- VOCs (PID monitor) = consistent readings of >5 ppm sustained for 5 minutes
- Atmospheric gases (Quad Alarm)
  - Combustible gases = >10% lower explosive limit (LEL), requires a Self-Contained Breathing Apparatus (SCBA)
  - Oxygen = 19.5%-23.5%, above or below requires a SCBA
  - Carbon Monoxide = >35ppm, requires a SCBA
  - Hydrogen Sulfide = >10ppm, requires a SCBA
- Temperature = body core temperature of < 36ºC (96.8ºF) for cold stress

9.3 Community Air Monitoring Requirements

No significant air monitoring is anticipated to be necessary to implement this work plan. Soil disturbance during the subsurface investigation will be minimal. Borings advanced as part of the investigation are small in diameter and will not generate significant spoils. In addition, stakes and markers utilized during survey services will cause little disturbance; therefore, no significant migration of fugitive dust is expected. Should there be visible evidence of fugitive dust leaving the

Site; the contractor will be required to implement one or more of the following techniques to control dust, in accordance with the New York State Department of Health's (NYSDOH's) *Generic Community Air Monitoring Plan (CAMP)*:

- Applying water on haul roads.
- Wetting equipment and excavation faces.
- Spraying water on equipment during excavation and dumping.
- Restricting vehicle speeds to ten miles per hour or less.
- Covering excavated areas and material after excavation activity ceases.
- Reducing the excavation size and/or number of excavations.
- Hauling materials in properly tarped and watertight containers.

If odors are noted by workers during the advancement of the borings, temporary well points, or soil vapor monitoring points, CHA subcontractors will immediately cease activity until directed to resume activity by the SHSO. The task SHSO will obtain a PID instrument to conduct on-Site monitoring and the following action levels will be implemented for further work at the Site:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 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 can 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 are 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 can 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 in the downwind work area perimeter exceeds the upwind perimeter concentration by more than 25 ppm, the Major Vapor Emission Response Plan will be initiated. Under this plan, the following actions will be taken:

    1. Work will be halted.

    2. Emergency Response Contacts identified in the Site-Specific HASP, including the local police and fire departments, will be contacted by the Site Safety Officer.

    3. The NYSDEC and the client will be notified of the situation.

    4. Air monitoring will be conducted at 15 minute intervals at a 20-foot offset from the exclusion zone. If two successive readings are measured by the field instrument and documented, the work may resume following the previously described monitoring plan.

9.4 Environmental Sampling

Environmental Sampling is fully discussed in the Work Plan/Field Sampling Plan associated with this project.

10.0 PERSONAL PROTECTIVE EQUIPMENT

10.1 General Information

The purpose of personal protective clothing and equipment is to shield or isolate individuals from the chemical and physical hazards that may be encountered during work activities. The level of protection required must correspond to the level of hazard known, or suspected, in the specific work area.

There are four basic levels (A, B, C, and D) of personal protection as established by the United States Environmental Protection Agency (USEPA). Level A provides the highest level of protection and Level D provides the lowest.

- ***Level D*** will consist of field clothes, outer gloves (if soil/water contact is likely), steel toe and shank safety boots, safety glasses (for splash hazards), and a hard hat (if overhead hazards are present).

- ***Modified Level D*** will consist of Tyvek© coverall, safety glasses (for dust/splash hazards) outer gloves with disposable inner gloves, steel toe and shank work boots, overboots if free product is encountered or as otherwise specified, hearing protection and, if overhead hazards are present, such as during drilling, a hard hat. Safety glasses must also be worn.

- ***Level C*** will consist of the same equipment as listed for modified Level D with the addition of a full-faced air purifying cartridge equipped respirator.

- ***Level B***, if required for working on this project site, consists of the same equipment as listed for Level C with the substitution of a full-faced SCBA in place of a full-faced air purifying respirator.

- ***Level A*** is not anticipated for this project.

When wearing Level C, B, or A, all junctures between the chemical protective coverall (i.e., Tyvek© suit) and boots, gloves, and respirator must be taped. The suit must be placed over the boots and gloves. When taping, remember to leave a tab for easy removal. Stress spots in the suit must also be taped, such as under the arms, down the zipper, and up or across the back.

PPE has been selected consistent with the hazards associated with the expected field activities. PPE is available in various sizes to provide a good fit for all personnel. PPE must be stored in a clean

location with access by Site workers. Site workers are responsible for maintenance and storage of equipment at the Site.

10.2 Task Specific Requirements

Based on evaluation of the potential hazards for the Site, the initial levels of PPE have been designated as a Level D based on the potential route of contact and the potential contaminants. In this plan, Modified Level D is presented as a modified protection level which consists of, at a minimum, hard hat, safety glasses, work boots, long pants , latex/nitrile gloves, and other weather appropriate clothing. Respiratory protection and an upgrade in PPE to Level C shall be incorporated only where required by Site conditions. CHA notes the following additional requirements:

- A hard hat is required when personnel are working around heavy machinery or vehicle (e.g. drilling operations) or when working in the right-of-way or an adjacent roadway and increased visibility is necessary.
- Safety glasses are required when personnel are working around heavy machinery or vehicle (e.g. drilling operations) where there is a potential for debris to fly into worker's eyes.
- A reflective safety vest must be worn while working within the right-of-way or an adjacent roadway or when increased visibility is necessary.
- Tyvek© suites and latex/nitrile gloves are only required to be worn during intrusive activities when soil and water samples are being handled. Tyvek© suits and gloves are not required for non-intrusive activities (e.g. survey services and utility feasibility study).
- Hearing protection shall be required at the discretion of the SHSO, but at a minimum, must be utilized by on-Site personnel when the drill rig hammer is being utilized to advance the soil sampler.
- No changes to the specified levels of PPE shall be made without first obtaining approval of the SHSO and the Project Team leader. If action levels are reached, work shall cease and the SHSO and his advisors shall perform further evaluations. If necessary, an upgrade in PPE shall be mandated.
- If an upgrade to Level C PPE is required, air purifying respirators equipped with organic vapor/acid gas/HEPA cartridges will be utilized. Organic vapor/acid gas/HEPA cartridges are the appropriate canister for use with the involved substances. Respirators used will be approved by the National Institute for Occupational Safety and Health (NIOSH) and/or the Mine Safety and Health Administration (MSHA) and their use shall be consistent with OSHA regulations in 29 CFR 1910.134. On-site personnel wearing a respirator shall have respirator clearance from a qualified occupational health physician. In addition, the respirator wearers on site shall perform qualitative fit tests to ensure proper fit of the face seal of the respirator. Inspection logs shall be completed, signed and kept with the HASP. Filter cartridges used shall be of the same manufacturer as the respirator and shall be changed on a daily basis at a minimum and/or if breathing becomes difficult. Air purifying respirators shall not be used if any of the following conditions exist:

    - Oxygen deficiency
    - Immediately Dangerous to Life or Health (IDLH) concentrations of specific substances

- Entry into an unventilated or confined area which has not been characterized
- Presence or potential presence of unidentified contaminants
- Contaminant concentrations are unknown or exceed designated maximum use specifications
- Identified gases or vapors have inadequate warning properties
- High relative humidity, may reduce protection offered by sorbent

- The need for Level A or Level B PPE is not anticipated for tasks covered by this HASP. Should Level C PPE be deemed insufficient based upon the conditions encountered in the field, work activities will temporarily cease and the HASP will be updated prior to continuing on-Site activities.

Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of the SHSO and task manager based upon air monitoring results and the following.

Reasons to upgrade:

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas, vapor or dust emission.
- Change in work task that will increase the exposure or potential exposure with hazardous materials.

Reasons to downgrade:

- New information indicating that the situation is less hazardous than was originally suspected.
- Change in site conditions that decrease the potential hazard.
- Change in work task that will reduce exposure to hazardous materials.

11.0 SITE CONTROL MEASURES

11.1 Work Zones

Site work zones will be clearly marked as applicable and discussed with on-Site personnel. CHA's subcontractor(s) will be responsible for delineating and maintaining the work zones. Site work zones shall consist of the exclusion, support, and contamination reduction zones as required. Because there will be minimal disturbance to the project site under pre-design programming tasks for the wetlands delineation, the survey services and the utility feasibility study, a delineated exclusion zone is not required to be designated as part of these tasks.

The **exclusion zone** is the zone which contamination is most likely to be encountered. For the drilling activities the exclusion zone is considered to be a 30 foot radius surrounding the drill rig. Flow of personnel and equipment into and out of the zone will be monitored throughout the investigation. While in the exclusion zone personnel must wear the specified PPE.

Borings will be backfilled upon completion of the borehole with soil cuttings generated during drilling operations, unless the augers are advanced through an aquitard. If an aquitard layer is

penetrated during the drilling activities, the boring will be grouted to the existing ground surface and the soil cuttings will be spread out in the area adjacent to the completed borehole.

The **contamination reduction zone** will be outside the exclusion zone for any boring/well location. Personnel working inside the exclusion zone will decontaminate or dispose of soiled clothing in the contamination reduction zone each time the exclusion zone is exited, if the clothing worn becomes soiled. Appropriate equipment, supplies, and personal PPE will be made available in the contamination reduction zone to facilitate the protection and decontamination of personnel working in the exclusion zone.

A s**upport zone** will be established in close proximity to the contamination reduction zone on the eastern portion of the landfill just outside the landfill gates. This area will be used for operational direction and support facilities, emergency response, supplies/equipment, and worker rest areas.

11.2 Communication

Communication shall be accomplished by a combination of person to person verbal correspondence, the use of cellular phones, and by verbal signals or hand signals depending on the pre-design programming task. Communication procedures will be reviewed at the Safety Meeting before entering the exclusion zone.

11.3 Site Security Measures

The contamination reduction zone and support zone shall be clearly marked as appropriate and reviewed at the Safety Meeting. Personnel shall report to the field team leader upon entering and exiting the Site so that everyone will be accounted for.

12.0 DECONTAMINATION

Decontamination activities will be performed on-Site. No decontamination other than small hand tools/equipment is anticipated.

12.1 PPE

At a minimum, non-disposable personnel protective clothing will be decontaminated by first washing the soiled items with a non-phosphate detergent and potable water mixture, followed by potable water and distilled water rinses. Disposable/expendable PPE and clothing will be placed into plastic trash bags for off-site disposal. At a minimum, equipment that comes into contact with contaminated soil and groundwater will be decontaminated with a high-pressure steam cleaner.

12.2 Small Equipment & Hand Tools

Small hand tools and equipment (e.g. hand augers, split spoon soil samplers, etc.) will be decontaminated as appropriate, but, at a minimum, prior to removal from the Site. The recommended decontamination procedure for equipment used during the performance of the pre-design programming tasks is:

- Wash and scrub with distilled water and low phosphate detergent
- Distilled water rinse

12.3 Heavy Equipment

Heavy equipment is anticipated to be utilized only during the site investigation. It is anticipated that the drilling rig (including tools, sampling equipment, etc.) will be decontaminated by the drilling subcontractor given that it will come into contact with potentially contaminated materials. Decontamination of the equipment will take place prior to demobilization of the rig and in the contamination reduction zone. Wash water generated from the steam cleaning operations will be allowed to percolate into the existing soils.

13.0 HAZARD COMMUNICATION

In compliance with 29 CFR 1910.1200, hazardous materials brought on-site by any personnel (CHA or contractors) shall be accompanied with an appropriate Material Safety Data Sheet (MSDS). The SHSO provided by the Contractor shall be responsible for maintaining the MSDSs on-Site, reviewing them for hazards that working personnel may be exposed to, and evaluating their use on-Site with respect to compatibility with other materials including personal protective equipment, and their hazards. Should the SHSO deem the material too hazardous for use on-Site, the party responsible for bringing the material on-Site shall remove it from the Site.

14.0 CONFINED SPACE

Confined space entry is not anticipated during this project; however, in the event that a confined space entry is necessary then all confined space entry procedures, techniques, and equipment shall be consistent with OSHA regulations in 29 CFR 1910.146.

15.0 EMERGENCY PROCEDURES

On-site emergencies can range in intensity from minor to serious conditions. Various procedures for responding to Site emergencies are listed in this section. The designated SHSO is responsible for contacting local emergency services in emergency situations (however, others must assume responsibility if the situation warrants). An injured person shall be accompanied by another worker at all times.

The following emergency procedures will be used by on-Site personnel. The SHSO shall be notified of any on-Site emergencies and be responsible for ensuring that the appropriate measures are followed. Non-emergencies will be treated on site and documented and then directed to seek further medical attention. Occupational injuries and illnesses will be reported, recorded, and investigated.

CHA personnel will be equipped with a cellular telephone for communication. Other emergency equipment, including a first aid kit will be on-site at all times. In the case of a medical emergency, CHA personnel and contractor SHSO will communicate to determine the nature of the emergency

and the location. After it is determined whether there is an actual emergency, he/she will instruct someone to call for an ambulance. Cellular telephones will to be used to place such a call.

If an emergency evacuation of the Site must take place, all personnel on-Site will immediately stop work, shut off all equipment, and assemble at the entrance to the Site. After assembly of all personnel, the Site will be evacuated using vehicles parked in the support zone. All vehicles will be parked facing out to enable a quick exit from the Site. If time permits, as determined by the SHSO, emergency decontamination will take place. This will consist of a wash and rinse of overboots, removal of disposable clothing, and washing of hands and face. If the head count reveals someone is still on site, the SHSO and his/her assistant will look for the person(s), using appropriate personal protection.

15.1 Personnel Injury

Upon notification of personnel injury the nature of the injury will be assessed, the appropriate first aid shall be initiated and, if necessary, contact shall be made for an ambulance and with the designated medical facility. If the injury increases the risk to others, activities on-site will stop until the added risk is removed or minimized.

15.2 Fire/Explosion

Upon notification of fire or explosion, Site personnel shall assemble at a safe distance upwind of the involved area. The SHSO shall alert the appropriate fire department.

15.3 PPE Failure

If any Site worker experiences a failure or alteration of PPE that affects the protection factor that person and his/her buddy shall immediately exit the exclusion zone. Re-entry shall not be permitted until the equipment has been repaired or replaced.

15.4 Chemical Exposure

If any site worker experiences adverse effects due to chemical exposure, the appropriate first aid procedures shall be followed according to the MSDS for that chemical. The person shall at a minimum be moved to fresh air. Whenever possible, personnel should be decontaminated before administering first aid.

Workers should go to the support zone as soon as any of the follow acute symptoms of exposure are experienced:

- Rotten egg odor (indicates hydrogen sulfide)
- Sweet almond-like odor (indicates cyanide presence)
- Headache
- Nausea or vomiting
- Fatigue
- Weakness
- Confusion
- Dizziness
- Irritation of eyes, nose, throat
- Dermatitis
- Chills

- Chest tightness
- Cough
- Muscle spasms
- Staggered gait
- Increased salivation
- Indigestion
- Diarrhea
- Irritability
- Metallic taste in mouth

15.5 Spill Containment

If on-site work results in the accidental spill or release of oil or hazardous materials, containment to the extent possible will be required by on-site personnel (in proper PPE). Containment should include the use of absorbent pads or materials, diking with soils, covering and/or diverting spills from sewers, drains, surface water bodies, etc. For spills that cannot be controlled by on-site personnel or are above the reportable quantities, the SHSO or designee will secure the area and notify the NYSDEC Spills hotline and notify appropriate emergency personnel through the 9-1-1 system.

16.0 EMERGENCY MEDICAL CARE

16.1 Nearest Hospital

See Section 3.0 for directions to the nearest hospital.

16.2 On-Site First Aid

A first aid kit shall be maintained and stored within the Contamination Reduction Zone. General first aid procedures are identified in the list below:

Skin/Eye Contact: Flush eyes and/or skin thoroughly with water for 15 minutes. Remove contaminated clothing. If skin was contacted with a dry material, brush it off first, then flush with water. Seek medical attention if irritation develops.

Ingestion: Do not induce vomiting. Call the Poison Control Center. Tell them what was swallowed, if possible. Follow instructions. Arrange for transport of the victim to the hospital by calling for an ambulance.

Inhalation: Remove person from contaminated environment without risking your own safety. DO NOT ENTER A CONFINED SPACE UNLESS WEARING LEVEL B AND A STANDBY PERSON IS PRESENT. DO NOT ENTER EXCLUSION ZONE UNLESS WEARING ONE LEVEL HIGHER PROTECTION THAN VICTIM WAS WEARING. Administer CPR, if necessary. Bring victim to hospital or call ambulance.

Injuries: Do not move a victim who may have a back injury. Cover them with coats, blankets, or other appropriate items to keep them warm. Call an ambulance.

Apply pressure to bleeding wounds. If the victim is able, have the victim apply pressure to the wound. If they are not able, wear gloves to protect from exposure to blood. Put gauze bandages or other clean cloth over the wound. Do not remove blood-soaked bandages or cloth - instead put additional bandages or cloths over the blood-soaked bandages. Elevate the limb with the injury above the heart.

Administer CPR if victim does not have a pulse and if you are currently certified in CPR. Have someone call for an ambulance immediately if there is any possibility that the victim is having or had a heart attack.

Shock is likely to develop in any serious injury or illness. The following are signals of shock: restlessness or irritability; altered consciousness; pale, cool, moist skin; rapid breathing; and/or rapid pulse. In the event of shock, do the following: Immediately have someone call for an ambulance; have the victim lie down; elevate legs 12 inches unless you suspect head, neck, or back injuries; if victim is cool, cover the victim to prevent chilling; do not give the victim anything to drink, even if thirsty.

Collapses: If Site personnel have unexplainably collapsed, personnel must evacuate work area. Rescue personnel must don a level of protection higher than the victim was in before evacuating victim from work area. Confined space rescue always requires Level B protection. No one will re-enter the work area until the cause has been determined and the SHSO has determined that the area is safe to re-enter.

16.3 Heat & Cold Stress

16.3.1 Heat Stress

Heat Stress Symptoms and Remedies

Acclimatization and frequent rest periods must be established for conducting activities where heat stress may occur. Symptoms of heat stress and appropriate responses include:

- Heat Rash - redness of skin. Remedy - frequent rest and change of clothing.
- Heat Cramp - painful muscle spasms in hands feet, and/or abdomen. Remedy - administer lightly salted water (1/4 teaspoon per gallon) orally unless there are medical restrictions.
- Heat Exhaustion - clammy, moist, pale skin; dizziness, nausea rapid pulse, fainting. Remedy - remove to cooler area and administer fluids orally or have physician administer saline solution intravenously.
- Heat Stroke - hot dry skin; red, spotted or bluish; high body temperature of 104°F or greater, mental confusion, loss of consciousness, convulsions or coma. Remedy

-immediately cool victim by immersion in cool water. Wrap in wet sheet while fanning, sponge with cool liquid. While fanning, treat for shock. Call for an ambulance. DO NOT DELAY TREATMENT. COOL BODY WHILE AWAITING AMBULANCE.

Heat Stress – Precautions

Precautions to take to reduce the possibility of heat stress include the following:

- Avoid caffeine and alcohol both during work hours and 24 hours before on-site activity.
- Drink water before feeling thirsty.
- Watch for signs and symptoms of heat stress.
- Rest in cool/dry areas, such as air conditioned vehicle or building or in the shade.
- Use cooling devices such as water sprays or fans to cool off.

16.3.2 Cold Stress

Cold Stress Symptoms

Cold Stress symptoms may include any or all of the following:

- Excessive fatigue
- Irritability
- Euphoria
- Drowsiness
- Uncontrollable shivering
- Frost nip
- Medical assistance is necessary if these symptoms persist.

Cold Stress Treatment

Cold stress and frostbite emergency care:

- Remove the patient to a warm, dry place.
- If clothing is wet, remove and replace with dry clothing.
- Keep patient warm. Re-warming of the patient should be gradual to avoid heat stroke symptoms.
- Dehydration or the loss of body fluids may result in cold injury due to a significant change in blood flow to the extremities. If patient is conscious and alert, warm sweet drinks should be provided.
- Extremities affected by frostbite should be gradually warmed up and returned to normal temperature. Moist compresses should be applied; begin with lukewarm compresses and slowly increase the temperature as changes in skin temperature are detected.
- Keep patient warm and calm, remove to a medical facility as soon as possible.

Cold Stress – Prevention

- Take breaks in heated shelters at frequent intervals when working in temperatures below 20°F, including wind chill.

- Remove outer layer of clothing when entering the shelter. Loosen other layers to allow sweat to evaporate.
- Drink warm, sweet liquids or soups to reduce possibility of cold injury. Avoid caffeine and alcohol.

17.0 STANDARD OPERATING PROCEDURES

The following standard operating procedures shall be implemented during this project:

- All construction activities shall be performed in compliance with all OSHA Construction Industry Standards and Regulations. Following the procedures, requirements, and provisions of this plan, personnel who may be potentially exposed to hazardous materials or wastes shall be in compliance with federal/state regulations, OSHA 29 CFR 1910.120.

- Horseplay will NOT be tolerated under any circumstances.

- Work conducted on-site shall be coordinated through the Project Team Leader and the SHSO.

- Minimize contact with hazardous substances.

- Use remote sampling, handling, and container-opening techniques whenever possible.

- Any drum or tank discovered on-site shall not be sampled, opened, or handled until an appropriate task-specific plan for unknown drum/tank sampling has been implemented.

- Samples from areas known, or suspected, to be contaminated with hazardous substances shall be handled with appropriate personal protective equipment.

- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in evacuation of site personnel and reevaluation of the hazards and the level of protection. Contact the Company Health and Safety Coordinator to determine the appropriate actions to take.

- Protect monitoring and sampling instruments by bagging.

- Wear disposable outer garments and use disposable equipment where appropriate.

- Use proper dressing procedures before entering the Exclusion Zone and use all fasteners (zippers, snaps, buttons, etc.).

- PPE and skin surfaces should be checked for cuts and/or punctures.

- Equipment used in Site operations shall be properly cleaned and maintained in good working order. Equipment shall be inspected for signs of defect and/or contamination before and after use.

- Do not eat, smoke, chew gum, or drink on site. Avoid any practice that may increase the probability of hand-to-mouth transfer and ingestion of material. Avoid any application of cosmetics. Personnel shall wash thoroughly before initiating any of the aforementioned activities.

- Avoid brushy areas to minimize allergic reactions to poison ivy, deer ticks, etc.

- Prescribed drugs should not be taken by personnel where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified person. Alcoholic beverages intake should be avoided.

- The "buddy system" must always be used and enforced. At a minimum, two persons who are in constant communication with each other shall be on site at all times during any activity conducted on-site in which the potential exists for exposure to hazardous materials, or accident or injury.

- Personnel entering the Contamination Reduction Zone and/or the Exclusion Zone must check in and out at the Access Control Points.

- Subcontractors shall abide by this Health & Safety Plan or provide one that is equivalent, at a minimum, to the conditions specified in this Health & Safety Plan.

- No workers with beards or heavy side burns are allowed to wear respirators.

18.0 CERTIFICATION & AGREEMENT

This agreement must be signed by all CHA employees, subcontractors, and visitors before conducting field activities at this site and/or entering the exclusion or decontamination zones.

I have read this Health and Safety Plan and I understand the requirements of the Plan. I will conduct work at this site in accordance with the requirements of the Health and Safety Plan.

Signature	Date	Company
Signature	Date	Company
Signature	Date	Company
Signature	Date	Company
Signature	Date	Company
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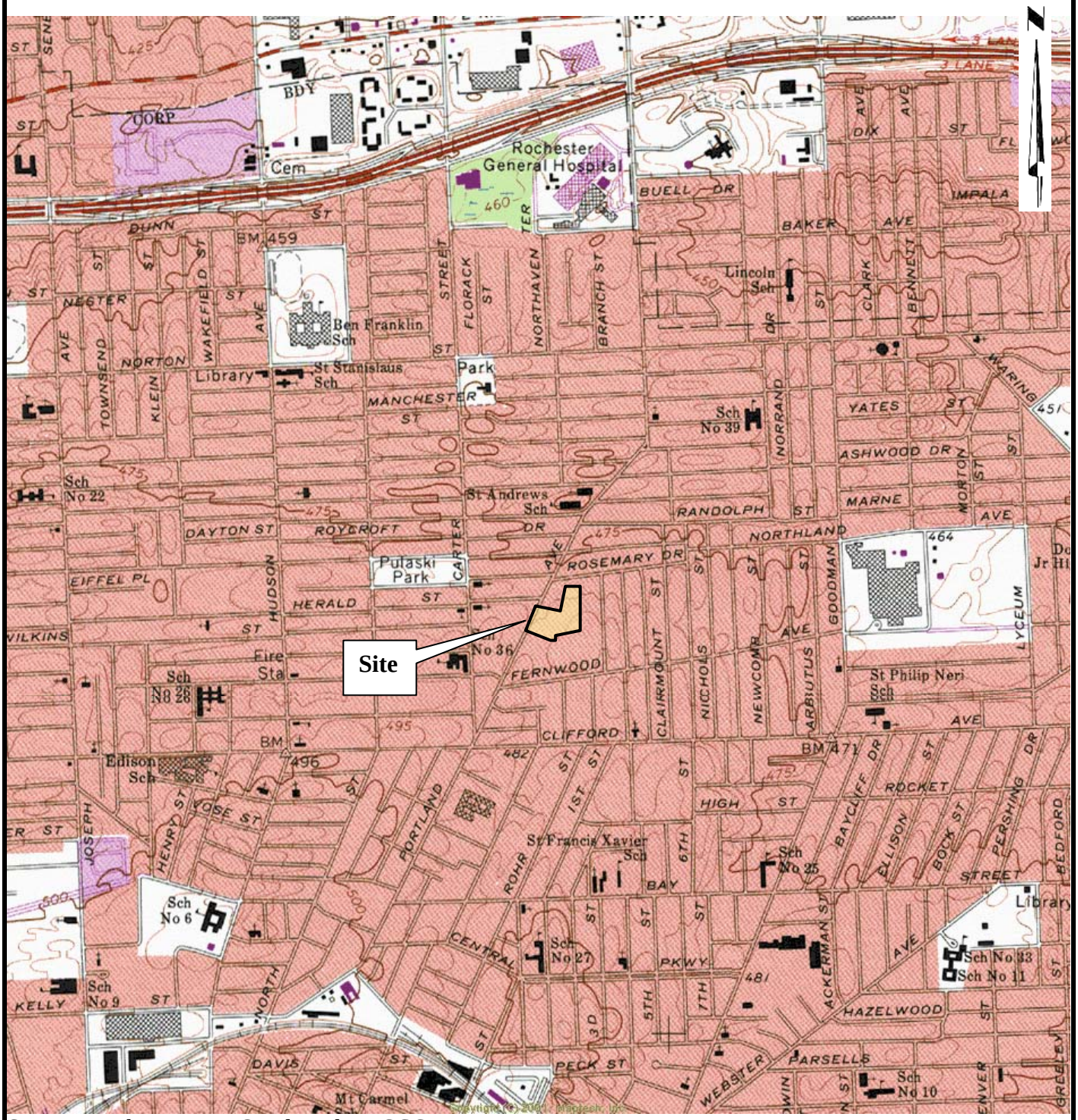
FIGURES



Source: Rochester East Quadrangle, USGS

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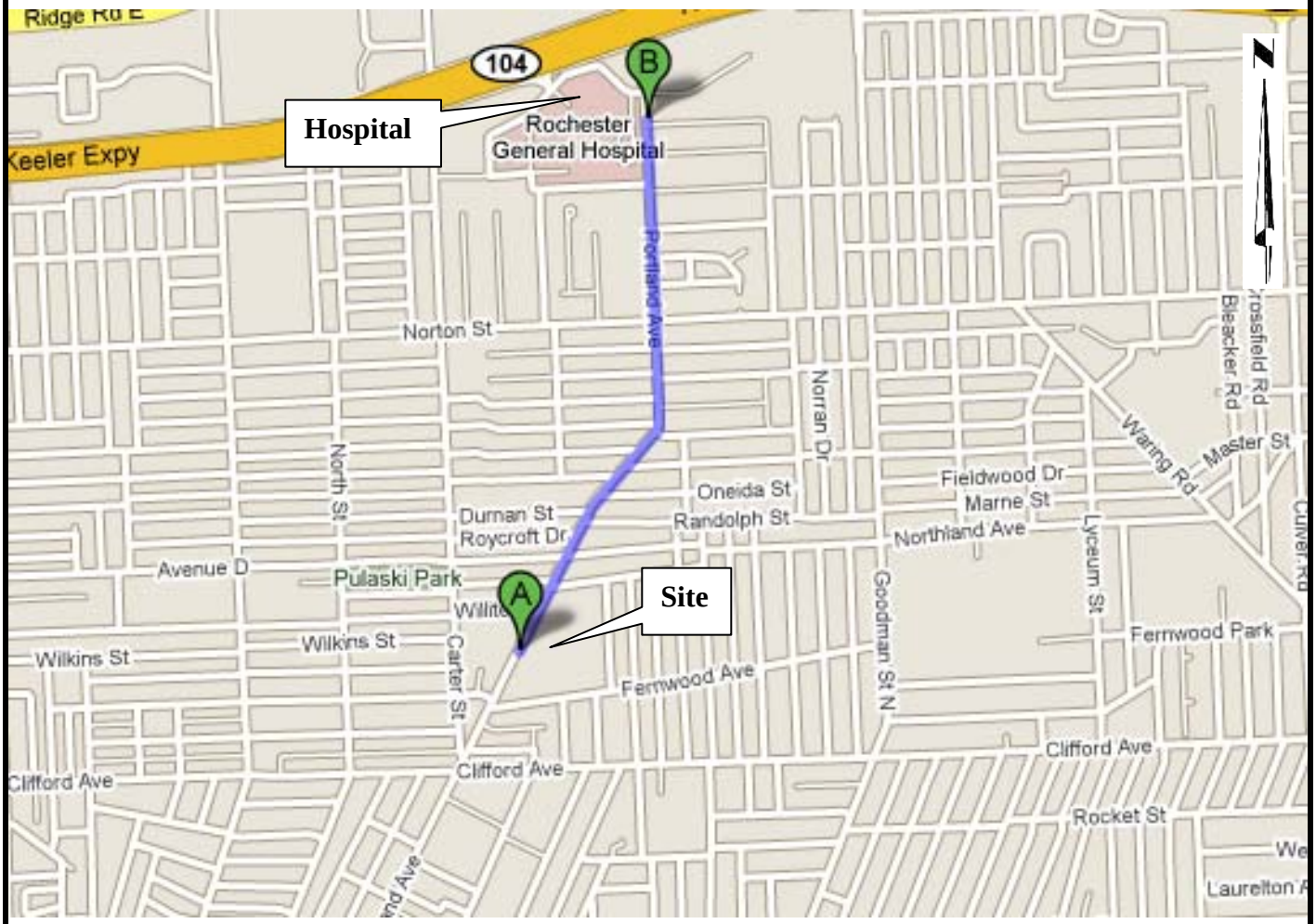
FIGURE 1
SITE LOCATION MAP

JML Optical Site
678-690 Portland Avenue
CITY OF ROCHESTER
MONROE COUNTY, STATE OF NEW YORK

Project: 17781

Date: 1/13/09

Drawing Not to Scale



Directions:

Turn right (heading NE) on Portland Avenue. After 1.1 miles the hospital will be on the left.

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FIGURE 2
Map to the Hospital
JML Optical Site
690 Portland Ave
CITY OF ROCHESTER
MONROE COUNTY, STATE OF NEW YORK

Project: 17781

Date: 12/17/08

Drawing Not to Scale

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FIGURE 3
AERIAL PHOTOGRAPH
JML Optical Site
690 Portland Avenue
CITY OF ROCHESTER
MONROE COUNTY, STATE OF NEW YORK

Project: 17781

Date: 1/13/09

Drawing Not to Scale

APPENDIX C

QUALITY ASSURANCE PROJECT PLAN

for

Former JML Optical, Inc.
678-690 Portland Avenue
City of Rochester, New York

CHA Project Number: 17781

Prepared for:

690 Portland Avenue Company
820 Linden Avenue
Rochester, New York 14625-2710

Prepared by:

441 South Salina Street
Syracuse, New York 13202
Phone: (315) 471-3920
Fax: (315) 471-3569

February 2, 2009

QUALITY ASSURANCE PROJECT PLAN (QAPP) FOR:

Former JML Optical Site
690 Portland Avenue, Rochester NY

Approved By: _____ Date: _____
Dr. Christopher Burns, P.G.
CHA Project Manager

Approved By: _____ Date: _____
Mr. Gary Bonarski
NYSDEC Project Manager

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1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the policies, organization, objectives, functional activities and specific Quality Assurance (QA) and Quality Control (QC) activities designed to achieve the specific data quality goals associated with the Remedial Investigation (RI) that will be conducted at the former JML Optical Site (BCP Site # C828151) located in Rochester, New York. The scope of work associated with the investigation activities and specific areas of concern that will be addressed are summarized in the Remedial Investigation Work Plan (Work Plan).

This QAPP has been prepared to identify procedures for sample preparation and handling, sample chain-of-custody, laboratory analyses, and reporting to be implemented during this investigation to ensure the accuracy and integrity of the data generated during the investigation.

A laboratory will be selected for the analyses of the samples upon approval of the QAPP. The laboratory will be certified under the New York State Department of Health' (NYSDOH) Environmental Laboratory Approval Program (ELAP). The name of selected analytical laboratory will be submitted to the New York State Department of Environmental Conservation (NYSDEC) for their information. The selected laboratory will be provided with a copy of this QAPP. Documented compliance with the QAPP will be a condition of their contract with CHA for all work completed during the course of the former JML Optical Site Remedial Investigation Program.

This QAPP consists of this Introduction as well as the following sections:

- Section 2.0, Project Description, provides a brief overview of the activities being conducted as part of this project.
- Section 3.0, Project Management, which presents the project organization and a brief description of key personnel and associated duties.
- Section 4.0, Quality Assurance Objectives for Measurement Data, outlines procedures for the handling of samples for laboratory analysis and reporting of data.
- Section 5.0, Sampling Procedures, sampling procedures such as holding times for given parameters and shipping methods are discussed.
- Section 6.0, Sample Custody and Document Control, describes chain-of-custody methods and documentation of samples in the lab.
- Section 7.0 outlines the calibration procedures and frequency for laboratory and field equipment.
- Section 8.0, discusses analytical procedures.
- Section 9.0, discusses data reduction, validation, assessment, and reporting.
- Section 10.0, Internal Quality Control Checks and Frequency, discusses procedures for checking the reproducibility of measurement both in the field and in the laboratory.
- Section 11.0 discusses performance and system audits and frequency for the contract laboratory.
- Section 12.0 discusses preventative maintenance for analytical instruments.
- Section 13.0 describes specific routine procedures for assessing data accuracy.
- Section 14.0 discusses corrective action for issues found through QC procedures.

- Section 15.0 outlines a quality assurance report produced for management.

2.0 PROJECT DESCRIPTION

2.1 General

The former JML Optical Site (Property or Site) consists of an approximately 1.565-acre parcel of land located at 678-690 Portland Avenue in the City of Rochester, Monroe County, New York (Tax Map Parcel (TMP) No. 106.27-01-86). The location of the Site is illustrated by Figure 1. The Site is almost entirely covered with buildings or paved surfaces, except for a mowed grass area along the Portland Avenue entrance to the Site and a strip of grass along the eastern property (rear side of building). ILEX Optical constructed the first buildings on the Site in approximately 1930 and the most recent addition to the building was constructed on the south end of the Site around 1970.

The buildings on-site are currently unoccupied. The Site is located within a New York State "En-Zone" pursuant to Tax Law § 21(b)(6). There are no known easements on the Site and there are currently no environmental permits associated with the Site.

The site and neighboring properties are currently located in a Industrial (M-1) zoning district according to the City of Rochester Department of Community Development, Bureau of Building and Zoning, except for the parcel located immediately south of the Site (76 Fernwood Avenue), which is zoned Low Density Residential (R-1).

CHA understands that this QAPP and subsequent reports will be required to be consistent with the guidance provided in 6 New York Codes Rules and Regulations (NYCRR) Part 375.4, and the guidance provided in NYSDEC Division of Environmental Remediation's *Municipal Assistance for Environmental Restoration Projects Procedures Handbook*. Additionally, this Work Plan and associated reports will also conform to the Draft DER-10 *Technical Guidance for Site Investigation and Remediation* issued by the Division of Environmental Remediation.

This QAPP has been prepared to outline the procedures and protocols that will be utilized to conduct a comprehensive environmental RI that will provide the necessary field data to develop a remedial alternative for the Site that will best address the environmental conditions associated with the Site. The primary objectives of this RI Work Plan include the following:

- Define the Nature/Extent of Contamination,
- Identify Additional Potential Source Areas,
- Assess Impacts; and
- Provide Additional Data Necessary for a Remedial Alternatives Analysis.

In general, the current Remedial Investigation program will include the following activities:

- Soil boring and temporary installation using direct push soil sampling (e.g. geoprobe) techniques;
- Groundwater sampling and subsurface soil sampling; and
- Soil vapor sampling.

The data derived from the RI will facilitate an evaluation of the migration or possible future migration of identified contamination, identify potential routes of exposure and populations at risk, and provide the data necessary to develop remedial plans for the Site.

2.2 Sampling Program

The sampling program to be implemented will include the collection and analyses of groundwater, subsurface soil, and soil vapor samples. Details regarding specific sampling activities are provided in the project Work Plan/Field Sampling Plan.

3.0 PROJECT MANAGEMENT

The RI program will be initiated by CHA. Dr. Christopher Burns in CHA's Syracuse office will be assigned as the Project Manager. He will be responsible for delivery of CHA services and be the prime contact for communication with the NYSDEC. This project will be managed and staffed from CHA's Syracuse office with management, technical, and support personnel located throughout the State, including Syracuse, Albany, and Rochester. CHA is licensed to provide professional engineering services in the State of New York by the New York State Education Department. Table 3-1 identifies key personnel assigned to the project and provides contact information.

Table 3-1: Key Project Personnel

Name	Address	Responsibilities
Gary Bonarski, NYSDEC, NYSDEC Project Manager	6274 East Avon-Lima Road Avon, NY 14414 Ph.: (585) 226-5328 gbonarski@gw.dec.state.ny.us	Mr. Bonarski will represent the NYSDEC in its review and oversight function, in its financial sponsorship, and as arbiter on technical matters
Michael E. McCusker, JML Optical Industries, Inc.	820 Linden Avenue Rochester, NY 14625 Ph: (585) 248-8900	Mr. McCusker will represent JML Optical Industries, Inc. in the review and oversight of the project, participate in citizen participation activities, and serve as the point of contact for JML Optical Industries, Inc.
Dr. Christopher Burns, P.G., CHA, Vice President, Project Manager	441 South Salina Street Syracuse, New York 13202 Ph. (315) 471-3920 cburns@chacompanies.com	Dr. Burns will oversee the project, provide quality control on documents and determinations and mentor the daily task manager.
Scott Smith, P.E., CHA	441 South Salina Street Syracuse, New York 13202 Ph. (315) 471-3920 ssmith@chacompanies.com	Mr. Smith will review contractor and subcontractor compliance with the FSP.
Kathryn E. Flood, CHA, Field Scientist, Health and Safety Officer	441 South Salina Street Syracuse, New York 13202 Ph. (315) 471-3920 kflood@chacompanies.com	Ms. Flood will supervise field investigation activities and will also serve as database manager. Ms. Flood will also prepare the site-specific Health and Safety Plan and serve as the Health and Safety point of contact for CHA staff.
Dave Taillon CHA	III Winners Circle Albany, New York 12205 Ph. (518) 453-4500 dtaillon@chacompanies.com	Mr. Taillon is the head of Health and Safety for CHA.
Jason Kacalski TestAmerica Project Manager	10 Hazelwood Drive, Suite 106 Amherst, NY 14228 Ph. (716) 691-2600 jason.kacalski@testamericainc.com	Mr. Kacalski will act as CHA's point of contact with the contracted laboratory.

Name	Address	Responsibilities
Margaret Rudzinski CHA Quality Assurance/Quality Control Officer	III Winners Circle Albany, New York 12205 Ph. (518) 453-4500 mrudzinski@chacompanies.com	Ms. Rudzinski will act as CHA's QA/QC Officer, which will include providing an internal audit of field sampling procedures, a review of laboratory activities and QA/QC, assistance in the preparation and review of final report, and providing technical representation for analytical activities.

4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall QA objective is to develop and implement procedures for sample preparation and handling, sample chain-of-custody, laboratory analyses and reporting, which will provide accurate data. Specific procedures to be followed for sampling, sample custody and document control, calibration, laboratory analyses and data reduction, validation, assessment and reporting are presented in Sections 5.0 through 9.0 of this QAPP.

The purpose of this Section is to define the goals for the level of QA effort; namely, accuracy; precision and sensitivity of analyses; and completeness, representativeness and comparability of measurement data from the analytical laboratories. QA objectives for field measurements are also discussed.

4.1 Level of QA Effort

To assess the quality of data resulting from the field sampling program, field duplicate samples, field blank samples, samples for laboratory matrix spike/matrix spike duplicate (MS/MSD) analyses, and trip blank samples will be collected (where appropriate) and submitted to the contract laboratory.

For field samples collected, field duplicate samples will be submitted at a frequency of one per 10 investigative samples or in the event that a sampling round consists of less than 10 samples, one field duplicate will be collected. Field blank samples will be collected at a frequency of one per sampling event. MS/MSD samples will be analyzed at a minimum frequency of one per 20 investigative samples. In the event that a sampling event consists of less than 20 samples, one MS/MSD sample will be collected. Trip blanks will be submitted with each cooler containing aqueous samples to be analyzed for volatile organic compounds (VOCs).

The sampling and analysis program is summarized below and lists the specific parameters to be measured, the number of samples to be collected and the level of QA effort required for each matrix.

Groundwater and subsurface soil samples will be analyzed for VOCs, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), priority pollutant metals, and pesticides. Field duplicate samples for subsurface soil matrices will be collected and analyzed as a check on the aggregate analytical and sampling protocol precision. Field blanks will be analyzed to check procedural contamination and/or ambient conditions and/or sample container contamination at the Site that may cause sample contamination. Matrix spike and matrix spike duplicate samples will be analyzed as a check on the analytical method's accuracy and precision. Trip blank samples (for VOC determinations only) will be shipped by the laboratory to the Site and back to the laboratory without opening in the field. The trip blank will provide a measure of potential cross-contamination of samples resulting from shipment, handling and/or ambient conditions at the Site.

4.2 Accuracy, Precisions and Sensitivity of Analyses

The fundamental QA objective with respect to the accuracy, precision and sensitivity of analytical data is to achieve the QC acceptance of each analytical protocol. The method(s) precision (relative percent difference of duplicate analysis) will be determined from the duplicate analyses of matrix

spike samples. A minimum of one sample per site will be spiked and analyzed in duplicate. Analysis will compare with the criteria presented in the appropriate methods identified in Section 8.0.

The method(s) accuracy (percent recovery) for water and soil samples will be determined by spiking selected samples (matrix spikes) with test compounds. Accuracy will be reported as the percent recovery of the test compound and will compare with the criteria given in the appropriate methods as identified in Section 8.0.

Project-specific accuracy and precision goals are identified in Section 13.0.

4.3 Completeness, Representativeness and Comparability

It is expected that all analyses conducted in accordance with the selected methods will provide data meeting QC acceptance criteria for 80 percent of all samples tested. Any reasons for variances will be documented.

The sampling program has been designed to provide data representative of Site conditions. During development of these networks, consideration was given to past disposal practices, existing data from past studies completed for the Site and the physical Site setting. The extent to which existing and planned analytical data will be comparable depends on the similarity of sampling and analytical methods. The procedures used to obtain the planned analytical data are documented in this QAPP. However, it may be necessary to verify similar documentation from previous analytical data to adequately establish comparability. Comparability of laboratory analyses will be ensured by the use of consistent units. Following completion of data collection, the existing data base will be evaluated for representativeness.

Project-specific completeness, representativeness and comparability goals are identified in Section 13.0.

4.4 Field Measurements

Field measurements and observations will assist in the interpretation of analytical results obtained. Therefore, it is important that these measurements and observations be as complete as possible. For each sample collected, the following shall be recorded in indelible ink on the field log sheet:

1) Site location identification;
2) Depth interval of sample;
3) Unique sample identification number;
4) Date and time of sample collection;
5) Weather conditions;
6) Designation as to the type of sample (soil, sediment, etc.);
7) Designation as to the means of collection (split spoon, etc.);
8) Brief description of the sample, including pH, specific conductivity and temperature of water samples;
9) Name of sampler;
10) Analyses to be performed on sample; and

11) Any other relevant comments such as odor, staining, texture, size of area sampled, etc.

The general QA objective for measurement data is to obtain reproducible and comparable measurements to a degree of accuracy consistent with the use of standardized procedures.

5.0 SAMPLING PROCEDURES

The procedures for collecting samples and for performing related field activities are described in detail in the Field Sampling Plan. Sample preservation methods and maximum sample holding times are summarized below for groundwater, subsurface soil samples, and soil vapor samples.

Table 5-1: Container, Preservation, and Packaging Requirements for the former JML Optical Site Remedial Investigation

Analysis	Recommended Volume and Container	Preservation	Max. Holding Times	Shipping Means	Packaging
Soil Samples					
VOCs via EPA 8260	4 oz glass wide	Cool to 4°C	14 days from sample collection	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
SVOCs via EPA 8270 B/N	4 oz glass wide	Cool to 4°C	14 days from sample collection. 40 days from extraction	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
TAL Metals incl. Cyanide via EPA 6010B, 6020, 7471A and 9012A	4 oz glass wide	Cool to 4°C	6 months from collection to analysis	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
PCBs via EPA 8082	4 oz glass wide	Cool to 4°C	14 days from sample collection. 40 days from extraction.	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
Pesticides via EPA 8081	4 oz glass wide	Cool to 4°C	14 days from sample collection. 40 days from extraction.	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
Groundwater Samples					
VOCs via EPA 8260	2-40ml voa	Cool to 4°C HCl to pH<2	7 days from verified time of sample receipt (VTSR) to analysis	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
SVOCs via EPA 8270 B/N	2-1 liter glass amber	Cool to 4°C	5 days from VTSR to extraction	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
TAL Metals incl. Cyanide via EPA 6010B, 6020, 7471A and 9012A	1- 8 oz plastic 1- 8 oz plastic	Cool to 4°C HNO3 to pH<2 NAOH Ph >12	6 months from collection to analysis	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
PCBs via EPA 8082	1-1 liter amber	Cool to 4°C	7 days from sample collection. 40 days from extraction.	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack

Analysis	Recommended Volume and Container	Preservation	Max. Holding Times	Shipping Means	Packaging
Groundwater Samples					
Pesticides via EPA 8081	1 – 1 liter amber	Cool to 4°C	7 days from sample collection. 40 days from extraction.	Hand Delivery/ FedEx Priority	Cooler with ice and Bubble Pack
Soil Vapor Samples					
VOCs via EPA TO-15	6-Liter Summa Canister	N/A	14 days from sample collection.	Hand Delivery/ FedEx Priority	Cooler with Bubble Pack

6.0 SAMPLE CUSTODY AND DOCUMENT CONTROL

6.1 Chain-Of-Custody

A Chain-of-Custody will be maintained to document the transfer of all samples. Each sample container will be properly sealed. Sample container labels will include sample number, place of collection and date and time of collection. Sample containers will be shipped to the Contract Laboratory at 4°C (±2°C) in sealed coolers.

Each sample cooler being shipped to the Contract Laboratory will contain an appropriately completed Chain-of-Custody form. One copy will be returned to CHA upon receipt of the samples by the laboratory. One copy will be returned to CHA with the data deliverables package.

Upon receipt of the cooler at the laboratory, it will be inspected by the designated sample custodian. The condition of the cooler and sample containers will be noted on the Chain-of-Custody record sheet by the sample custodian. The sample custodian will also document the date and time of receipt of the container and sign the form.

If damage or discrepancies are noticed, they will be recorded in the remarks column of the record sheet, and be dated and signed. Any damage or discrepancies will be reported to the lab supervisor who will inform the lab manager and QA Officer.

6.2 Sample Documentation in the Laboratory

Each sample or group of samples shipped to the laboratory for analysis will be given a unique identification number. The laboratory sample custodian will record the client name, number of samples and date of receipt of samples in the Sample Control Log Book.

The Contract Laboratory will be responsible for maintaining analytical log books and laboratory data as well as sample inventory on hand for submittal to CHA on an "as required" basis. Samples will be maintained by the laboratory for a period of 30 days, under the conditions prescribed by the appropriate USEPA methods, for additional analyses, if necessary. Raw laboratory data files will be inventoried and maintained by the Contract Laboratory for a period of five years, at which time CHA will advise them as to the need for additional storage.

6.3 Storage of Samples

Evidentiary files for the entire project will be inventoried and maintained by CHA and will consist of the following:

1) Project related plans;
2) Project log books;
3) Field data records;
4) Sample identification documents;
5) Chain-of-Custody records;
6) Report notes, calculations, etc.;

7) References, literature;
8) Miscellaneous - photos, maps, drawings, etc.; and
9) Copies of all final reports pertaining to the project.

The project file materials will be the responsibility of CHA's Project Manager with respect to document maintenance and management.

7.0 CALIBRATION PROCEDURES AND FREQUENCY

7.1 Instrument Calibration and Tuning

Calibration of instrumentation is required to ensure that the analytical system is operating correctly and functioning at the proper sensitivity to meet established reporting limits. Each instrument is calibrated with standard solutions appropriate to the type of instrument and the linear range established for the analytical method. The frequency of calibration and the concentration of calibration standards is determined by the manufacturer's guidelines, the analytical method, or the requirements of special contracts.

7.2 Field Instrument Calibration

Calibration of the field instruments will be completed prior to each day's use in accordance with the manufacturer's instructions. During groundwater sampling activities if the data indicates a change (>±10 percent) in pH and/or conductivity from the last location sampled, the field equipment will be recalibrated. The field equipment will be maintained, calibrated and operated in a manner consistent with the manufacturer's guidelines and United States Environmental Protection Agency (USEPA) standard methods. However, since the majority of field measurements will be limited to organic vapor readings (photoionization detector (PID) readings), pH, conductivity, turbidity, and depth (water level) the calibration procedures will be conducted, at a minimum frequency of once per day. Records of calibration, repair or replacement will be filed and maintained by the Field QC Coordinator.

8.0 ANALYTICAL PROCEDURES

8.1 Overview

Soil and groundwater samples collected for laboratory chemical analysis will be analyzed for VOCs via USEPA method 8260B, SVOCs via USEPA method 8270C, PCBs via USEPA method 8082, metals via USEPA methods 6010, 6020, 7470, and 9012A, and pesticides via USEPA method 8081.

8.2 Identification

Compounds which will be analyzed by Gas Chromatography/Mass Spectrometry (GC/MS) are identified by comparison of the sample mass spectrum with the mass spectrum of a standard of the suspected compound (standard reference spectrum). Mass spectra for standard references should be obtained on the user's GC/MS within the same 12 hours as the sample analysis. These standard reference spectra may be obtained through analysis of the calibration standards. The following criteria must be satisfied to verify identification: (1) elution of the sample component at the same. GC relative retention time (RRT) as the standard component; and (2) correspondence of the sample component and the standard component mass spectrum.

For GC determinations of specific analytes, the RRT of the unknown will be compared with that of an authentic standard. Since a true identification by GC is not possible, an analytical run for compound confirmation will be followed according to the specifications in the methods. Peaks must elute within daily retention time windows established for each indicator parameter to be declared a tentative or confirmed identification. Retention time windows are determined using standard protocols defined in each method.

8.3 Quantification

The procedures for quantification of analytes are discussed in the appropriate analytical methods.

For any analysis by GC/MS, estimation of concentration of an organic compound not contained within the calibration standard may be accomplished by comparing the mass spectral responses of the compound with that of an internal standard. This procedure is specified in the referenced USEPA methods.

8.4 Detection Limit Requirements

The data used to conduct the investigation will have targeted detection limits that are the lowest applicable limit for the appropriate method.

9.0 DATA REDUCTION, VALIDATION, ASSESSMENT AND REPORTING

9.1 General

The Contract Laboratory will perform analytical data reduction and validation in-house under the direction of the laboratory QA Officer. The laboratory's QA Officer will be responsible for assessing data quality and advising of any data which were rated "preliminary" or "unacceptable" or other qualifications based on the QC criteria outlined in the methods, which would caution the data user of possible unreliability.

Assessment of analytical and field data will include checks for data consistency by looking for comparability of duplicate analyses, laboratory QA procedures, adherence to accuracy and precision criteria, transmittal errors and anomalously high or low parameter values. The results of these data validations will be reported to the project managers, noting any discrepancies and their effect upon acceptability of the data.

9.2 Field Data

Raw data from field measurements and sample collection activities that are used in project reports will be appropriately identified and appended to the report. Where data have been reduced or summarized, the method of reduction will be documented in the report. Field data will be reviewed for anomalously high or low values that may appear to be inconsistent with other data.

Field sampling data will be reviewed by the CHA Quality Assurance/Quality Control Officer in order to ensure the following information has been properly documented:

- Sample identification;
- Source;
- Date and time of sampling;
- Sampling equipment;
- Person(s) collecting the sample; and
- Results of field monitoring and/or observations.

In addition, the field sampling data will be evaluated to ensure:

- The use of approved sampling and sample handling procedures;
- Proper packing/shipping procedures were used; and
- Proper Chain-of-Custody was maintained.

9.3 Laboratory Reporting

Reporting and deliverables will be in accordance with the NYSDEC September 1989 Analytical Services Protocol (ASP) (12/91 Revision), Category B. Reports will be received by CHA within 30 days of the last day of sampling.

Sample data and its corresponding QA/QC data, as specified in Category B, shall be maintained accessible to CHA either in hard copy or on disk.

9.4 Equis Data

CHA will request that the laboratory also provide the data in an Equis format. The data will be added into the Equis database maintained by CHA staff. From there the data can be processed and compared to existing standards using the Equis software.

9.5 Data Validation

A qualified third party will conduct an independent evaluation of data reduction and reporting by the laboratory. The data validation will be performed in accordance with the following documents: "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA 540/R-94-012, February 1994; and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", EPA 540/R-013, February 1994. Data analyzed using methods not covered in these documents will be validated using the general principles used in these documents, and the analytical requirements specified in the methods pertaining to USEPA Region 2 Data Validation.

10.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

10.1 Field QC

Quality control procedures for field measurements will be limited to checking the reproducibility of the measurement in the field by obtaining multiple readings and by calibrating the instruments (where appropriate).

Quality control of field sampling will involve collecting field duplicates, trip blanks, field blanks with the applicable site activities described in the Work Plan/Field Sampling Plan. Field QC samples are also discussed in Section 4.0.

10.2 Laboratory QC

Specific procedures related to internal laboratory QC samples (namely blanks, MS/MSD, surrogates and QC check samples) are described in the following subsections.

10.2.1 Blank Samples

A reagent blank will be analyzed by the laboratory at a frequency of one blank per 10 analyses, or in the event that an analytical round consists of less than 10 samples, one reagent blank will be analyzed. The reagent blank, an aliquot of analyte-free water or solvent, will be carried through the entire analytical procedure.

10.2.2 Matrix Spike/Matrix Spike Duplicates

An MS/MSD sample will be analyzed at a minimum frequency one sample for every 20 investigative sample that are collected. For sampling events consisting of less than 20 investigative samples, one MS/MSD sample will be collected. Acceptable criteria and compounds that will be used for matrix spikes are identified in the appropriate methods (see Section 8.0). Percent spike recoveries will be used to evaluate analytical accuracy while percent relative standard deviation or the relative percent difference (RPD) between matrix spike analyses will be used to assess analytical precision.

10.2.3 Surrogate Analyses

Surrogates are organic compounds which are similar to the analytes of interest, but which are not normally found in environmental samples. Surrogates are added to samples to monitor the effect of the matrix on the accuracy of the analysis. Every blank, standard and environmental sample analyzed by GC or GC/MS, including MS/MSD samples, will be spiked with surrogate compounds prior to sample preparation.

Surrogates will be spiked into samples according to the appropriate analytical methods. Surrogate spike recoveries will be compared with the control limits set by procedures specified in the method (or from laboratory specific control limits) for analytes falling within the quantification limits without dilution. Dilution of samples to bring the analyte concentration into the linear range of

calibration may dilute the surrogates out of the quantification limit; assessment of analytical quality in these cases will be based on the quality control embodied in the check and MS/MSD samples.

11.0 PERFORMANCE AND SYSTEM AUDITS AND FREQUENCY

For the purpose of external evaluation, performance evaluation check samples from the USEPA and various State agencies may be required to be analyzed periodically by the Contract Laboratory.

The QA Officer may carry out performance and/or systems audits to ensure that data of known or defensible quality are consistently produced during a program.

Systems audits are qualitative evaluations of components of field and laboratory quality control measurement systems. They determine if the measurement systems are being used appropriately. The audits may be carried out before all systems are operational, during the program, or after the completion of the program. Such audits typically involve a comparison of the activities given in the QAPP described herein, with activities actually scheduled or performed. A special type of systems audit is the data management audit. This audit addresses only data collection and management activities.

The performance audit is a quantitative evaluation of the measurements systems used for a monitoring program. It requires testing the measurement systems with samples of known composition or behavior to evaluate precision and accuracy. A performance audit may be carried out by or under the auspices of the QA Officer without the knowledge of the analyst during each sampling event for this program.

In addition, an external QA audit may be conducted by CHA prior to the analyses of any investigatory samples. It should be noted, however, that any external QA audits will only be performed if deemed necessary by either the CHA Project Manager or the CHA QA/QC Officer. The Contract Laboratory may also undergo QC audit(s) by the NYSDEC or NYSDOH, if so required.

12.0 PREVENTATIVE MAINTENANCE

12.1 Laboratory Preventative Maintenance and Corrective Action

The Contract Laboratory will be required to provide preventative maintenance for their instrumentation according to the manufacturer's guidelines and instrument manual. Each laboratory instrument has regularly scheduled maintenance to verify the tolerances for operation to comply with the NYSDOH ELAP requirements. The proper equipment operation and corrective action for instruments, if needed, will be determined by the laboratory's QA/QC Officer.

Instruments may also be serviced at other times due to failure. Requisite servicing beyond the abilities of laboratory personnel will be performed by the equipment manufacturer or their designated representative.

Daily checks of each instrument will be performed by the analyst who has been assigned the responsibility for that instrument. This will include changing GC inlet liners, tuning of the GC/MS, checking operation of data systems, checking for leaks, etc. Manufacturers' recommended procedures will be followed in every case.

12.2 Field Instrument Preventative Maintenance and Corrective Action

The field sampling team will be required to perform routine maintenance according to the field equipment manuals and document any deviance from the proper calibration tolerances. Each instrument is calibrated daily with standard solutions or gases established by the field analytical methods. The proper operation and corrective action for field instruments, if needed will be determined by the Technical Manager and field sampling team members.

13.0 PROCEDURES USED TO ASSESS PERFORMANCE

13.1 Precision

Precision will be assessed by comparing the analytical results between duplicate spike analyses. Precision as RPD will be calculated as follows:

$$\text{Precision} = \frac{[D_2 - D_1]}{(D_1 + D_2)/2} \times 100$$

D_1 = matrix spike recovery
D_2 = matrix spike duplicate spike recovery

Acceptance criteria for duplicate soil samples will be ≤30% RPD. Acceptance criteria for duplicate water samples will be ≤20% RPD between field and laboratory data.

Percent relative standard deviation or the RPD between matrix spike analyses will be used to assess laboratory analytical precision. Acceptable criteria and compounds that will be used are identified in the appropriate EPA methods.

13.2 Accuracy

Accuracy will be assessed by comparing a set of analytical results to the accepted or "true" values that would be expected. In general, MS/MSD and surrogate spike recoveries will be used to assess accuracy. Accuracy as percent recovery will be calculated as follows:

$$\text{Accuracy} = \frac{A-B}{C} \times 100$$

A = The analyte determined experimentally from the spike sample.
B = The background level determined by a separate analysis of the unspiked sample.
C = The amount of spike added.

Percent spike recoveries in MS/MSD and surrogate spike recoveries will be used to evaluate analytical accuracy. Acceptable criteria and compounds that will be used for matrix spikes are identified in the appropriate EPA methods.

The evaluation of accuracy of field measurements will be limited to checking the reproducibility of the measurement in the field by obtaining multiple readings and by calibrating the instruments (where appropriate).

13.3 Representativeness, Completeness and Comparability

Completeness is a measure of the amount of valid data obtained from a measurement system compared with the amount that was expected to be obtained under normal conditions.

To be considered complete, the data set must contain all QC check analyses verifying precision and accuracy for the analytical protocol. In addition, all data are reviewed in terms of stated goals in order to determine if the database is sufficient.

When possible, the percent completeness for each set of samples will be calculated as follows:

$$\text{Completeness} = \frac{\text{valid data obtained}}{\text{total data planned}} \quad \text{X 100 percent}$$

A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, site decisions may be based on any, or all of, the remaining, validated data. Representativeness will be addressed by collecting the samples as described in this document. Comparability will be addressed by collecting, analyzing, and reporting the data as described in this document.

13.4 Outliers

Procedures discussed previously will be followed for documenting deviations. In the event that a result deviates significantly from method established control limits, this deviation will be noted and its effect on the quality of the remaining data will be assessed and documented.

14.0 CORRECTIVE ACTION

The need for corrective action may be identified by system or performance audits or by standard QC procedures. The essential steps in the corrective action system will be:

1) Checking the predetermined limits for data acceptability beyond which corrective action is required;
2) Identifying and defining problems;
3) Assigning responsibility for investigating the problem;
4) Investigating and determining the cause of the problem;
5) Determination of a corrective action to eliminate the problem (this may include reanalysis or resampling and analyses);
6) Implementing the corrective action and evaluating the effectiveness;
7) Verifying that the corrective action has eliminated the problem; and
8) Documenting the corrective action taken.

For each measurement system, the Laboratory QA/QC Officer will be responsible for initiating the corrective action and the laboratory supervisor will be responsible for implementing the corrective action.

15.0 QUALITY ASSURANCE REPORT TO MANAGEMENT

The CHA Project Manager will receive reports on the performance of the measurement system and the data quality following each sampling round and at the conclusion of the project.

At a minimum, these reports will include:

1) Assessment of measurement quality indicators; (i.e. data accuracy, precision and completeness);
2) Results of systems audits; and
3) QA problems and recommended solutions.

CHA's QA/QC Officer will be responsible within the organizational structure for preparing these periodic reports. The final report for the project will also include a separate QA section which will summarize data quality information contained in the periodic QA/QC reports to management, and present an overall data assessment and validation in accordance with the data quality objectives outlined in this QAPP.

16.0 REFERENCES

"Preparation Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAM-005/80)". Office of Monitoring Systems and Quality Assurance Office of Research and Development, USEPB.

"NEIC Policies and Procedures (EPA-330/9-78-001-R" May 1979 (Revised February 1983)", National Enforcement Investigations Center, USEPB.

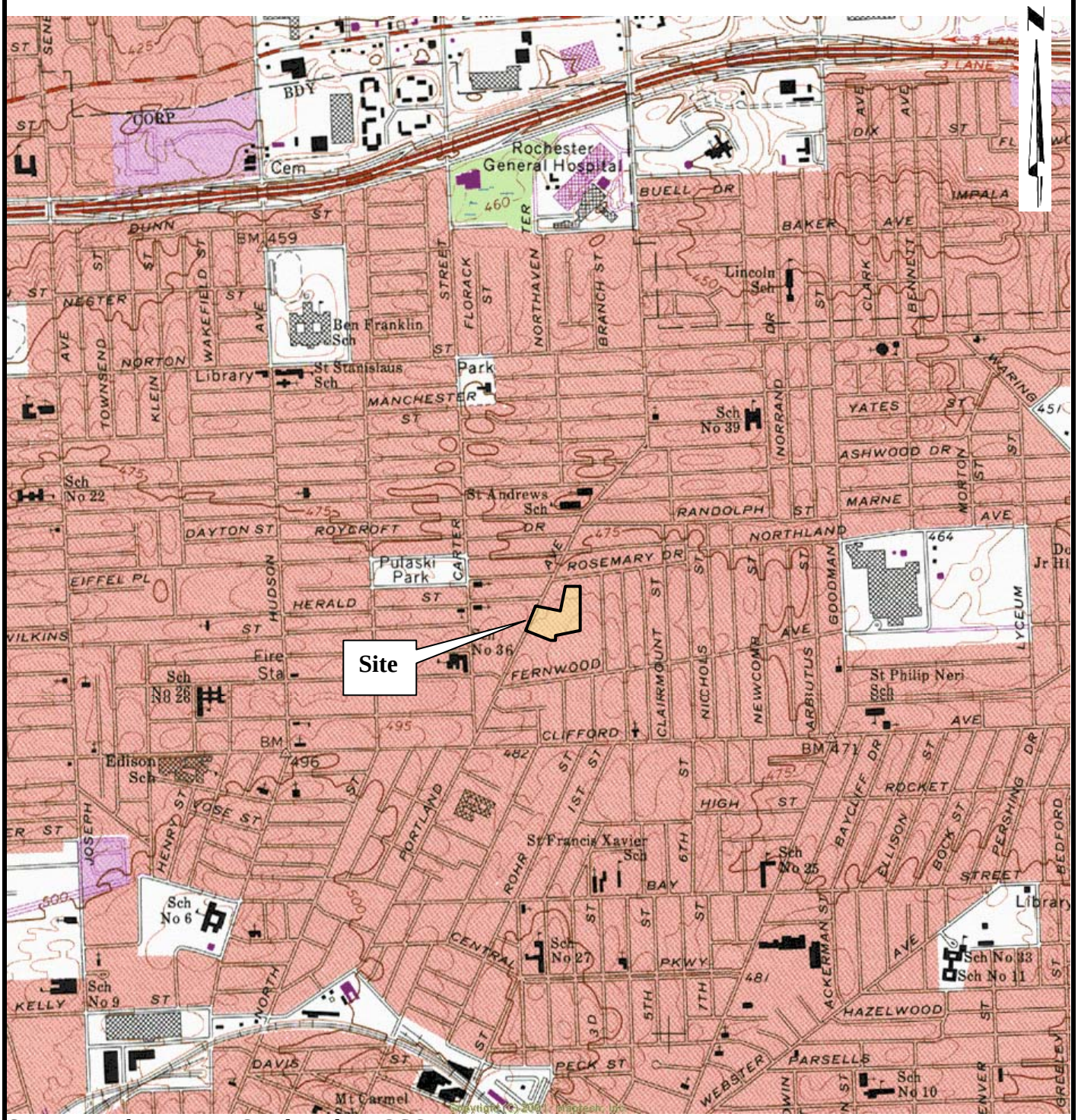
"RCHA Quality Assurance Project Plan Guidance", New York State Department of Environmental Conservation (NYSDEC), August 1989.

"Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Public Comment Draft", New York State Department of Health (NYSDOH), February 2005.

"U.S. EPA Region 2 Brownfields Project Planning Guidance, Volumes 1 and 2", U.S. EPA Region 2, May 2000.

"U.S. EPA OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)", EPA530-D-02-004, U.S. EPA, November 2002

FIGURES



Source: Rochester East Quadrangle, USGS

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441 South Salina Street, Syracuse, NY 13202-4712
Main: (315) 471-3920 • www.chacompanies.com

FIGURE 1
SITE LOCATION MAP

JML Optical Site
678-690 Portland Avenue
CITY OF ROCHESTER
MONROE COUNTY, STATE OF NEW YORK

Project: 17781

Date: 1/13/09

Drawing Not to Scale

CLOUGH HARBOUR & ASSOCIATES LLP