Brownfield Investigation Work Plan

Celi Drive Site
Town of Dewitt
Onondaga County, New York
Brownfield Program

January 2006

ERM Project Number 0032572

Prepared for:
General Super Plating Co., Inc.
5762 Celi Drive
Dewitt, NY 13214

Prepared By:
Environmental Resources Management
5788 Widewaters Parkway
DeWitt, New York 13214

TABLE OF CONTENTS

TABLES

FIGURES

LIST OF APPENDICES

ABBREVIATIONS AND ACRONYMS

ASP	Analytical Services Protocol
BGS	Below Ground Surface
BSS	Bridge Street Swale
DUSR	Data Usability Summary Report
ERM	Environmental Resources Management
DGI	Data Gap Investigation
DGIWP	Data Gap Investigation Work Plan
GSP	General Super Plating Co., Inc.
HASP	Health and Safety Plan
mg/kg	milligrams per kilogram (parts per million)
mg/l	milligrams per liter (parts per million)
MSL	Mean Sea Level
ND	Not Detected
NIMO	Niagara Mohawk Utility Corporation
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OCWWTF	Onondaga County Waste Water Treatment Facility
OSHA	Occupational Safety and Health Administration
POTW	Publicly Owned Treatment Works
ppb	parts per billion
ppm	parts per million
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RDA	Roof Drain Area
RDI	Remedial Design Investigation
RSCO	Recommended Soil Cleanup Objective
SVOC	Semivolatile Organic Compound
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target Analyte List
TCL	Target Compound List
TOGS	Technical Operations Guidance Series
µg/kg	micrograms per kilogram (parts per billion)
µg/L	micrograms per liter (parts per billion)
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound

1.0 INTRODUCTION

On 10 May 2005, the New York State Department of Environmental Conservation (NYSDEC) advised General Super Plating Co., Inc. (GSP) that a potential release had occurred at the GSP facility located at 5762 Celi Drive in East Syracuse, New York (GSP Facility) (Figure 1). As requested, GSP collected soil and surface water samples on and off-site. The samples confirmed that a release had occurred and Environmental Resources Management (ERM) was retained to assist GSP with the identification of the source, to direct abatement activities and to investigate the extent of affected media.

A summary of all investigatory and abatement activities performed in response to the release was submitted by ERM to the NYSDEC as part of the Brownfield Application package entitled the "Comprehensive Site Report", dated November 2005.

In November 2005, GSP submitted an application to the New York State Brownfield program as a participant and is awaiting approval of the application following public comment, which will include this Work Plan.

Site activity to date is sufficient to develop a conceptual model of Site conditions, however, some additional Site investigation is necessary to further evaluate the lateral and vertical extent of affected media in the affected areas, and to provide additional information required to design appropriate remedial actions consistent with Brownfield requirements and prior discussions with NYSDEC representatives.

Due to geographic location and proximity of the source area up gradient of the affected areas, ERM proposes to complete the investigation and remediation in three phases from up gradient to down gradient as presented in the summary of Areas of Concern (AOC) presented below.

Phase I

AOC 1: Affected soil located beneath the GSP manufacturing building.

Investigate and remediate, as necessary, the affected soil beneath the concrete slab of the GSP industrial facility.

AOC 2: Affected soil located in the swale immediately east of the GSP manufacturing building (GSP Swale)

Investigate and remediate, as necessary, the affected soil in the

GSP Swale.

AOC Site Ground Water: Affected Site Ground water

Investigate and remediate, as necessary, affected ground water identified onsite.

Phase 2

AOC 3: The water and sediment in the buried culvert emanating from the GSP Swale

Investigate and remediate, as necessary, the buried culvert area located immediately north of the GSP Swale to the Bridge Street Swale (BS Swale). The buried culvert directs storm water northward for approximately 750 feet, under Bridge Street and into the BS Swale.

Phase 3

AOC 4: The affected surface water, sediment and soil in the BS Swale.

Investigate and remediate, as necessary, the drainage ditch on Bridge Street. The area to be investigated and remediated terminates at a point east of the BS Swale along the Route #690 off ramp and west at a point before an existing gravel roadway.

The remainder of this report summarizes the Site description and history, data gap investigation objectives and scope, and a schedule of proposed activity.

The previous Site investigations, including soil, sediment, surface water and ground water sampling have identified inorganic constituents at concentrations exceeding the DRAFT Part 375-3 standards; the NYSDEC Recommended Soil Cleanup Objectives (RSCOs) as presented in NYSDEC's Technical and Administrative Guidance Memorandum Number 4046 (TAGM-4046), and/or NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, October 1993 (TOGS 1.1.1). Based on the data collected during these previous Site investigations, chromium (Cr) has been identified as the primary constituent of concern (COC) at the Site. Additionally, copper (Cu), nickel (Ni), zinc (Zn), and cyanide (Cn^-) have also been identified.

Additional samples were collected during the previous investigations, as requested by the NYSDEC, for the "full-suite" of Target Compound List (TCL) and Target Analyte List (TAL), including polychlorinated biphenyl (PCB) and cyanide. No constituents other than the inorganic COCs identified above were identified as a concern in the GSP Swale or the BS Swale during these previous investigations.

As part of GSP's Brownfield cleanup at the Site, GSP intends to implement this Work Plan, evaluate remedial options for the Site, and to preserve the Site for active continued use and future expansion.

1.1 DATA GAP INVESTIGATION APPROACH

The overall objective of the Brownfield Investigation is to complete a Data Gap Investigation to identify the lateral and vertical extent of affected media at concentrations greater than clean-up objectives and evaluate the feasibility of remediating the affected media to appropriate standards, criteria and guidance (SCGs) as specified in the draft Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER 10), and/or applicable regulations.

Investigative activities in this data gap investigation will be conducted from "inside out" to determine the limits of affected media. All samples will be described by a field geologist including the screening of soil samples for VOCs. Soil and water samples will be collected for the identified chromium (Cr) COC, as well as Cu, Ni, Zn, and CN^-. Additional ground water monitoring wells will be installed and sampled accordingly.

Results of this investigation and the presentation of interim remedial actions will be presented in an investigative report following completion of each Phase of the work as set forth in this Work Plan and consistent with the Work Schedule attached as Appendix A.

GSP proposes to implement a remedial strategy that seeks to confirm the extent of affected soil and ground water, to remove or stabilize in-place COCs to protect human health and the environment, and to implement passive and active engineering and institutional control measures to ensure protection of human health and the environment and consistent with the industrial use of the property.

2.0 SITE HISTORY AND DESCRIPTION

The Celi Drive Site is located at 5762 Celi Drive, East Syracuse, Onondaga County, New York as shown on the Site Location Map, Figure 1. The Site consists of an approximately 47,089-square foot (s.f.) building situated on approximately 1.3-acres of land. As evident in Figure 2, the Site is located in a small cluster of industrial and commercial properties east of Erie Boulevard and north of Towpath Road.

The GSP facility houses plating processes, storage areas and a waste water treatment system which discharges to the Onondaga County Waste Water Treatment Facility (OCWWTF) pursuant to an authorized permit. The majority of the operations consist of metal plating on plastic and metal substrates.

Topographic map coverage of the Site and vicinity is provided by the United States Department of Transportation 7.5-minute topographic map for Syracuse East quadrangle, New York, dated 1990 (see Figure 1). The average ground surface elevation of the Site is approximately 420-feet above mean sea level (MSL). The topography of the Site and surrounding area is generally flat with surface water drainage to the north. The affected areas are shown on the aerial photograph on Figure 3.

Soil in the immediate vicinity of the Site is classified as Urban Land (Ub) in the *Soil Survey of Onondaga County, New York*, produced by the United States Department of Agriculture (USDA) Natural Resources Conservation Service, dated October 1977. Ub consists of large built-up areas that have been so altered or obscured by urban works and structures that identification for the soils is not feasible.

Typical soils in the area of the GSP Swale, located east of the facility, generally consist of black organic rich silt and clay underlain by fill and native glacial silt and clay. A gray, fine to coarse sand with gravel and silt has been identified beneath the clay horizon.

2.1 AOC 1

AOC 1 is comprised of the soil beneath the GSP facility as shown on Figure 4. The release occurred from a chrome equalization tank immediately affecting the soil in the sub-slab environment. The soil in this area is completely covered by the concrete slab of the floor of the GSP Facility.

2.2 *AOC 2*

AOC 2 is located in the GSP Swale, east of the GSP Facility as shown on Figure 5. The GSP Swale was affected by the chromium release, which drained under the building into the Site surface water drainage system.

2.3 *AOC SITE GROUND WATER*

Previous investigations conducted after the reported release, identified limited areas of affected ground water along the east wall of the GSP Facility proximal to the release zone (Figure 6). Ground water was monitored at 11 locations including the source area. Two down gradient monitoring wells, installed as part of the release investigation, confirmed that affected ground water is limited to the areas proximal to the release.

2.4 *AOC 3*

AOC 3 includes the buried culvert pipe that runs from the GSP Swale, immediately east of the GSP facility, to where it empties into the BS Swale (Figure 3). The AOC includes the water and any sediment that may have accumulated in the buried piping.

2.5 *AOC 4*

The buried culvert discharges to a constructed drainage ditch that flows northward for approximately 1,000-feet from Bridge Street to the Bridge Street exit ramp of Route 690 (Figure 7). There is a relatively shallow and nearly dry easterly extension of the BS Swale along the Route 690 off the ramp that extends to Bridge Street. The westward reach of the swale enters a culvert pipe near a gravel driveway.

2.6 *CONSTITUENTS OF CONCERN*

Extensive investigations, including soil, sediment, surface water and ground water sampling were conducted during the summer of 2005. The investigations have identified chromium (Cr) as the primary inorganic COC. Other COCs identified include Cu, Ni, Zn and CN^-.

3.0 OBJECTIVE, SCOPE, RATIONALE AND PROPOSED REMEDIAL DESIGN

3.1 CLEANUP OBJECTIVES

The following cleanup goals will be applied to the affected media during the investigation and remediation.

Onsite and offsite soil cleanup objectives will be developed in a manner consistent with Track 4 clean-up objectives as described in Draft Part 375-3 New York State regulations. This is consistent with the anticipated land use criteria of restricted industrial. As a generic objective suitable for the design of the data gap investigation, the Track 2-Restricted Industrial standards will be used as a guide to estimate areas requiring additional investigation and remediation onsite.

Onsite and offsite ground water standards will be the ambient water standards as presented in NYSDEC Division of Water Technical and Operational Guidance Series (1.1.1) Ambient Water Quality Standards and Guidance Values, October 1993 (TOGS 1.1.1)

3.2 PHASE 1 – AOC 1, AOC 2, and AOC Site Ground Water

In order to facilitate the Brownfield Site investigation and remediation from an up gradient to down gradient direction, this investigation will address AOC 1 (the soil beneath the GSP facility), AOC 2 including the soil in the GSP Swale east of the building, and AOC Site Ground Water during Phase 1 activities.

During previous investigations, it was determined that failure of the commercially installed lining of the chrome equalization tank was the source of the release. The release occurred to the sub-slab area of the GSP facility and then moved progressively down gradient to the BS Swale. The most reasonable approach to investigate and clean up the affected media is to conduct Site activity beginning with the affected media at the source area, consecutively working in a down gradient direction to the BS Swale.

3.2.1 PHASE 1 - REMEDIAL DESIGN OPTIONS

AOC 1: A review of all analytical data (soil and ground water) associated with the sub-slab area described in the Comprehensive Site Report indicate Cr as the primary COC with Ni, Zn, and Cn^- also present, but at levels below the Track 2 Restricted Industrial clean-up objective (see

Figure 4) identified in Draft Part 375-3, Table 375-3.8(b). Additional soil remediation is not required to meet these draft standards.

AOC 2: AOC 2 encompasses land that is primarily on, but also off the Site. Suitable Track 4 cleanup goals will be developed for this area of the Site.

A review of analytical data associated with GSP Swale as described in the Comprehensive Site Report indicates the COCs exceed generic TAGM 4046 RSCOs and acceptable regulatory levels as identified in Table 375-3.8(a). Additional soil sampling will be implemented to evaluate the appropriate remedial action(s). Some soil excavation and off-site disposal are proposed remedial action for this area. Additional soil sampling will be required in this area to further define the area requiring remediation.

AOC Site Ground Water: Eight temporary and three permanent monitoring wells have been installed at the Site under the direction of the NYSDEC. The wells were installed across the Site in presumed up and down gradient areas to identify ground water quality and flow direction. The wells demonstrate that Site ground water flows in a north/northwest direction across the Site (Figure 6). The results of ground water sampling have been presented in the Comprehensive Site Report and indicate that COC affected ground water is limited to the area proximal to the source.

Additional ground water investigation will be conducted to confirm the apparent lateral extent of affected ground water. Due to the demonstrated, and expected, immobility of the COC in ground water, ground water and use limitation and monitoring is the proposed remedial action for Site ground water.

3.3 PHASE 2 - AOC 3

AOC 3: AOC 3 is the buried culvert pipe that runs from the GSP Swale east of the GSP facility as far as the south side of Bridge Street approximately 750-feet north of the Site. Sampling has been conducted in AOC 3 where the buried culvert pipe empties into the BS Swale. The results indicate that the water, and most likely any accumulated sediment in the culvert is affected and will be addressed during the investigation and remediation program.

3.3.1 PHASE 2 - REMEDIAL DESIGN OPTIONS

High pressure washing, or "hydro-lancing" of the buried culvert is the proposed remedy for ACO 3. The remedial goal of the pressure washing will be to remove all affected surface water and contained sediment for

off-site disposal.

3.4 PHASE 3 – AOC 4

AOC 4 is the BS Swale beginning where the buried culvert of AOC 3 empties on the north side of Bridge Street, northward along the constructed swale towards the Bridge Street off-ramp of Route 690, and east and west along the exit ramp from Bridge Street to a gravel roadway.

Previously presented sediment and soil data in the Comprehensive Site Report indicate that COCs are present at levels exceeding generic TAGM 4046 RSCOs and acceptable regulatory levels in the Draft Part 375-3 regulations. Additional soil and sediment sampling will be conducted in this area to define the vertical and lateral extent of affected media and develop Track 4 cleanup goals.

3.4.1 PHASE 3 - REMEDIAL DESIGN OPTIONS

A review of all analytical data associated with BS Swale as presented in the Comprehensive Site Report indicate that chromium (Cr) is the primary COCs, and to a lesser degree, Cu, Ni, Zn, and CN^- are present at levels exceeding generic RSCOs in TAGM 4046 and acceptable regulatory levels as identified in draft Part 375-3-8, Table 375-3.8(a).

Additional soil and sediment sampling will be conducted in AOC 4 to evaluate potential remedial action(s) and develop cleanup goals as required under Track 4 standards. Sediment and soil excavation and off-site disposal are the expected remedial action for this area. Additional soil sampling will be conducted in this area to further define the area requiring remediation.

4.0 DATA GAP INVESTIGATION FIELD ACTIVITIES PLAN

The following investigation and filed activities plan is consistent with ongoing discussions and meetings with the NYSDEC, and is designed to fill in "data gaps" required to complete the Site characterization, and assist with the design of remedial action under the Brown Fields Program.

4.1 PHASE 1- AOC 1, AOC 2, and AOC SITE GROUND WATER

AOC 1:
Anticipated Remedial Action

No remedial action is anticipated beneath the GSP facility.

Additional Investigation

No additional borings or samples are proposed in the sub-slab area of the Site. As previously presented, laboratory data from this area demonstrate that all concentrations are below the generic Track 2 Restricted Industrial clean-up objectives as identified in Draft 375-3.8 Table 375-3.8(b).

AOC 2:
Anticipated Remedial Action

It is anticipated that the GSP Swale will require excavation to a depth of up to 6-feet below grade (or the ground water table whichever is shallowest). The affected soil will be appropriately containerized and transported for off-site disposal. The anticipated remedy will accomplish the removal of all affected soil above the water table with concentrations greater than the developed Track 4 standards. The excavation will be backfilled with "clean" backfill derived from commercial offsite source.

Additional Investigation

Twelve additional soil borings will be completed along the GSP Swale area to further delineate the lateral extent of COCs as shown on Figure 5. Each additional boring will be advanced to a total depth of 8-feet below grade. The borings will be advanced directly to 4-feet below grade without sampling, and then continuously sampled to from 4 to 8- feet below grade in two-foot increments. Each two-foot increment will be described and sub-sampled and shipped to the laboratory for analyses of the COCs. Table 1 provides a summary of proposed sampling and analysis.

AOC Site Ground Water:
Anticipated Remedial Action

The ground water remedial action will include the placement of ground water use limitations and monitoring of selected monitoring wells.

Additional Investigation

Four additional monitoring wells are proposed at the locations presented on Figure 6. These four wells will be developed and sampled along with all existing Site monitoring wells. All the ground water samples at each location will be containerized, labeled and shipped to the laboratory for analysis of the COCs.

4.2 PHASE 2 – AOC 3

AOC 3:
Anticipated Remedial Action

The anticipated remedial action for AOC 3 is the pressure washing, appropriate containerization and off-site disposal of affected water and sediment in the buried culvert pipe. The remedy will accomplish the complete removal of all affected water and sediment.

Additional Sampling

No additional soil and/or ground water sampling is expected in this area as all waters associated with the culvert are enclosed in concrete and/or metal conduits from the GSP Swale to Bridge Street.

4.3 PHASE 3 – AOC 4

Anticipated Remedial Action

Following a review of the additional samples, including the vertical profiles compiled from the sediment coring, all affected sediment accumulated in the constructed swale will be stabilized and/or dewatered as necessary, excavated, containerized and disposed off-site. Following the removal of affected sediment, all affected soil underlying the sediment will be removed and transported off-site for disposal.

Additional Investigation

Six sediment cores and 11 additional soil borings will be installed along the BS Swale area to further delineate the extent COCs in soil and develop

a vertical profile of affected sediment as shown on Figure 7. The sediment cores will be obtained from the middle of the constructed ditch with a manually operated sediment coring device. The core will extend from the sediment/water interface to the soil immediately below the sediment/soil interface. Samples at each location will be containerized, labeled and shipped to the laboratory for analysis of the COCs.

The eleven soil borings will be sampled at the near surface (0 to 2-inches) below grade; shallow-subsurface (12 to 14-inches) below grade and at the termination of the boring from 22 to 24-inches below grade. All the samples at each location will be containerized, labeled and shipped to the laboratory for analysis of the COCs.

5.0 SAMPLING PROTOCOLS

5.1 SOIL AND SEDIMENT SAMPLING

All applicable soil and sediment sampling procedures noted in the Site Specific Quality Assurance Project Plan (QAPP) as presented in Attachment B will be followed during collection of soil and sediment samples.

All intrusive work will be performed in accordance with the Remedial Action Health and Safety Plan (HASP) as presented in Attachment C. All ERM subcontractors will be advised of ERM's HASP during Site activities. The HASP described, among other things, discusses safety responsibilities, safety equipment and procedures, equipment decontamination, medical surveillance, training, levels of personal and respiratory protection, Site perimeter air monitoring, and emergency response procedures. All requirements of the NYSDEC Community Air Monitoring Program (CAMP) will be followed during Site construction activity.

5.2 MONITORING WELL INSTALLATION PROCEDURES

ERM's drilling subcontractor will file a request through Dig Safely New York for subsurface utility clearance of member companies. ERM will contract with a private utility location service to facilitate the identification, location, and marking of privately owned subsurface utilities, if necessary.

The conceptual location of these new wells has previously been shown on Figure 6. However, actual locations may vary based on subsurface conditions encountered in the field. ERM will discuss well locations with the NYSDEC prior to installation of these wells.

An ERM geologist will oversee the installation of all permanent monitoring wells at the Site. Permanent monitoring wells will be installed in a manner such that the top of the screened interval will be located approximately 2-feet above the top of the water bearing sand and gravel unit with a minimum screen length of 10-feet. This construction will allow for representative sampling of this sand and gravel unit (this geologic unit where metals-affected ground water has been encountered during previous investigations). All monitoring wells shall be constructed with 2-inch inside diameter, threaded flush joint, Schedule-40 PVC casing and 0.010-inch factory slotted screens. Solvents shall not be used to field weld the Schedule-40 PVC riser piping.

Morie #1 sand or equivalent will be used to install a sand filter pack around the screened interval. The sand filter pack will be installed to a height of one foot above the top of each well screen. During the installation of the sand pack, the sand will be tamped down using a weighted tape measure to minimize the potential for bridging, and to ensure the proper placement and thickness of the sand. A 2-foot thick seal of pre-hydrated bentonite chips or bentonite slurry will be installed above each sand filter pack. Once the bentonite seal is in place, the remaining annular space shall be backfilled with cement-bentonite grout. Grout shall be added as required so the top of the grout shall settle at an elevation approximately one foot below ground surface. All wells will be constructed in general accordance to the diagram in Figure 8.

A permanent reference mark will be installed at the top of each well casing to provide a datum for water level measurements. Each well will be fitted with a flush-mounted steel protective casing cemented in place. A locking expansion well cap will be provided for each well. Keyed-alike locks will be installed for each new well and each existing well.

ERM's geologist will measure new well locations in the field using a measuring tape and will record relevant information in the field notebook. Well locations and elevations will be measured and recorded by a New York-licensed surveyor, with a planned horizontal and vertical accuracy of ± 0.1 feet and ± 0.01 feet, respectively.

All newly installed monitoring wells will be developed by suction lift pumping using a peristaltic pump, submersible pumping, or by surging and bailing to facilitate the removal of fine-grained material from the well, restoration of the hydraulic properties of the surrounding geologic formation, and collection of representative ground water samples. Any tubing used during well development shall be dedicated to the respective well. If submersible pumps are used for well development, each pump shall be dedicated to the respective well or shall be thoroughly cleaned between wells. If the surging and bailing technique is used for well development, surging and bailing equipment (i.e. disposable polyethylene bailers) shall be dedicated to each respective well.

ERM will attempt to develop each well to the point that the turbidity of the recovered ground water is less than 50 NTUs. The field parameters pH, conductivity and temperature will also be measured during well development activities. Development activities will cease when the turbidity has dropped below 50 NTUs and/or field parameters have stabilized as follows for three consecutive readings:

- ±0.1 for pH;
- temperature ±0.1 degree C; and
- ±10% for specific conductance (conductivity).

Stabilization may be used to evaluate the effectiveness of well development procedures if there is no significant decrease in turbidity. Well development will not be performed for a period greater than one hour.

5.3 MONITORING WELL SAMPLE COLLECTION PROCEDURE

All applicable soil and sediment sampling procedures noted in the Site Specific Quality Assurance Project Plan (QAPP) as presented in Attachment B will be followed during collection of soil and sediment samples.

5.4 LABORATORY ANALYSES

Soil/Sediment Sampling: ERM will obtain soil/sediment samples at sample locations previously discussed. Since significant decisions will be made based upon the results of these soil and sediment sample analyses, Analytical Services Protocol (ASP), Category B Deliverables and a Data Usability Summary Report will be prepared to document the Quality Assurance/Quality Control will be performed on the data package. All soil/sediment samples will be collected for parameters listed in Table 1 according to procedures outlined above.

Table 1 - Soil/Sediment Analyses

Analysis	Method
Total Chromium, Nickel, Copper and Zinc	EPA Method 200.7
Total Cyanide (TCN)	10-204-00-1-A/SW-846 9012A
Hexavalent Chromium	SM3500CrD/7196A

Ground Water Sampling: Following well development, ERM will sample the monitoring well locations. Since significant decisions will be made based upon the results of the monitoring well sample analyses, Analytical Services Protocol (ASP), Category B Deliverables and a Data Usability Summary Report will be prepared to document the Quality Assurance/Quality Control will be performed on the data package. All groundwater samples will be collected for parameters listed in Table 2 according to procedures outlined above.

Table 2 - Ground Water Analyses

Analysis	Method
Total Chromium, Nickel, Copper and Zinc	EPA Method 200.7
Total Cyanide (TCN)	10-204-00-1-A/SW-846 9012A
Hexavalent Chromium	SM3500CrD/7196A

5.5 DATA EVALUATION

Once all the results of field testing and sample analyses have been received, the data will be reviewed, tabulated and mapped. The review will include a Data Usability Analysis. The data will then be used to accurately assess the limits and quantity of affected soil and to determine a feasible Site remediation strategy plan. Consistent with Draft DER 10 requirements, the data will be used to prepare an analysis of remedial alternatives. The data will be sufficient to evaluate remedies according to the following criteria: protection of public health; compliance with SCGs; long-tern effectiveness; reduction of toxicity, mobility, or volume; short-term effectiveness; implementability; cost and community acceptance. Ground water data will be evaluated with respect to T.O.G. 1.1.1, and soil samples will be initially evaluated with respect to draft NYCRR Part 375, Tables 375-3.8(a) and (b).

A Data Gap Summary Report will be prepared based on all collected data as the results of each Phase of the investigation are completed. Summaries and conclusions will be developed and Interim Remedial Measures (IRMs) will be prepared as each Phase of the investigation proceeds.

6.0 DOCUMENTATION PROCEDURE

Thorough, detailed documentation of project activities is required for the development of an IRM(s) during each Phase of the Data Gap Investigation. ERM will maintain complete documentation of all project activities so that decision processes, actions and results can be recreated as needed. As such, a history of the project will be maintained.

All applicable documentation procedures noted in the Site Specific Quality Assurance Project Plan (QAPP) as presented in Attachment B will be followed during collection of soil, sediment and ground water samples and the installation of monitoring wells.

7.0 WORK SCHEDULE

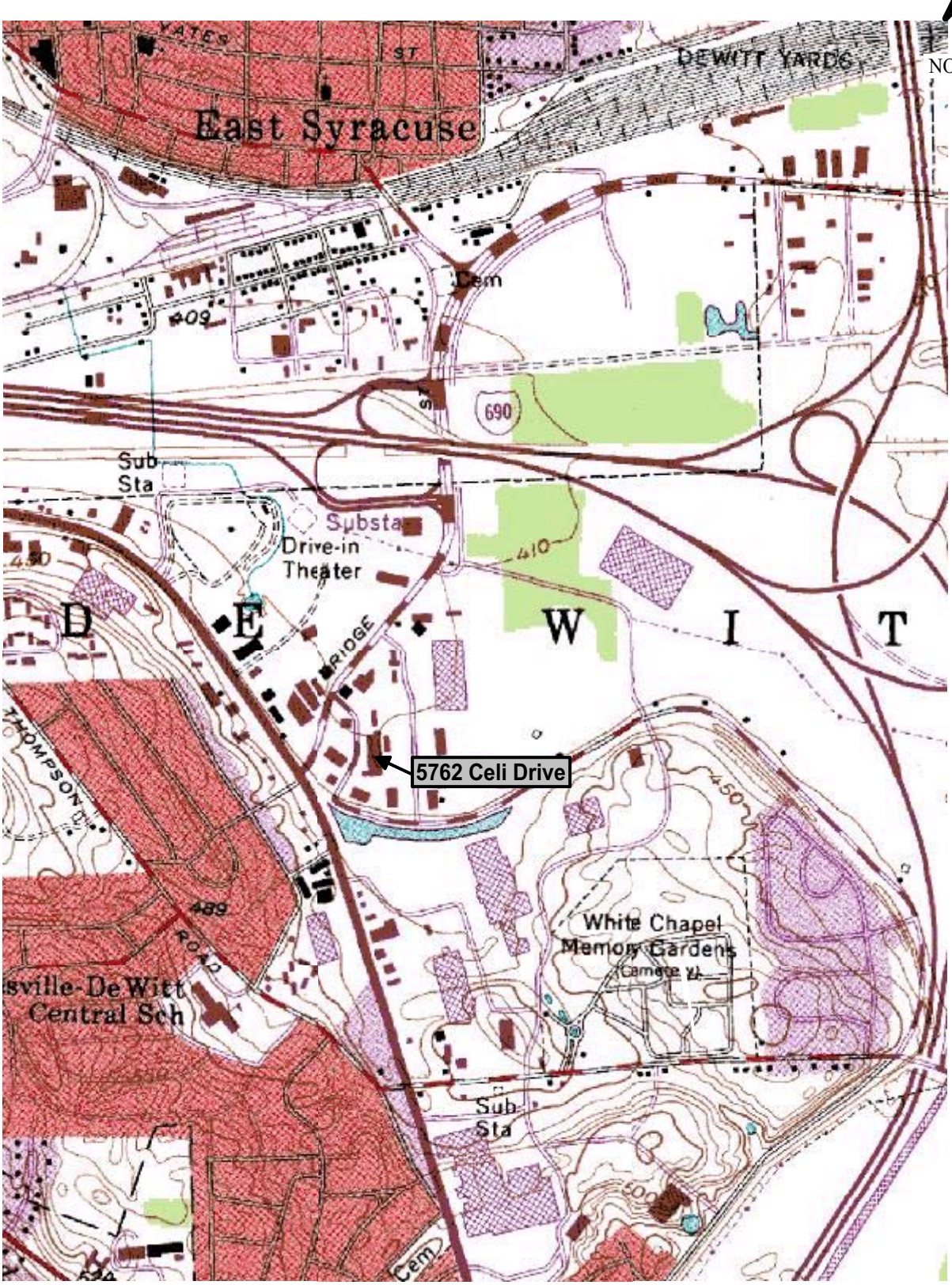
ERM plans to initiate the Data Gap activities in the first quarter of 2006. In general, the schedule will allow for a phased approach to the field characterization and data evaluation followed by a phased remedial program evaluation. Construction activities (Phased IRMs) are tentatively scheduled to begin in the fourth quarter of 2006. The implementation of a Ground Water Monitoring program is tentatively scheduled for the third quarter of 2006. A Site completion Report is tentatively scheduled for the fourth quarter of 2007. Actual projected Site closure is tentatively projected for the fourth quarter of 2008. The Brownfield Investigation and Remediation Schedule are presented in Appendix A.

Tables

Table 1. Summary of Proposed Sampling and Analytical

AOC	Number of Locations	Number of Samples	Matrix	Sample Depth (ft)	Analytical Parameters	Method	Sampling Method
2	12	24	Soil	4-6 and 6-8	Total Chromium, Nickel, Copper and Zinc	EPA Method 200.7	Soil Boring
					Total Cyanide (TCN)	10-204-00-1-A/SW-846 9012A	
					Hexavalent Chromium	SM3500CrD/7196A	
Site Ground Water	7	7	Water	Screened Interval	Total Chromium, Nickel, Copper and Zinc	EPA Method 200.7	Low Flow Sampling using stainless steel bladder pumps with associated control box(es) equipped with Teflon bladders and dedicated Teflon lined polypropylene tubing.
					Total Cyanide (TCN)	10-204-00-1-A/SW-846 9012A	
					Hexavalent Chromium	SM3500CrD/7196A	
4	6	24	Sediment Cores	Sediment/Water Interface,Sediment, Sediment/Soil Interface and Soil Beneath the Sediment	Total Chromium, Nickel, Copper and Zinc	EPA Method 200.7	Sediment Core
					Total Cyanide (TCN)	10-204-00-1-A/SW-846 9012A	
					Hexavalent Chromium	SM3500CrD/7196A	
4	11	33	Soil	0 to 2-inches, 12 to 14-inches, and 22 to 24-inches	Total Chromium, Nickel, Copper and Zinc	EPA Method 200.7	Soil Boring
					Total Cyanide (TCN)	10-204-00-1-A/SW-846 9012A	
					Hexavalent Chromium	SM3500CrD/7196A	

Figures



Brownfield Program - Celi Drive Site
Site Location Map

PREPARED FOR: GSP

ERM

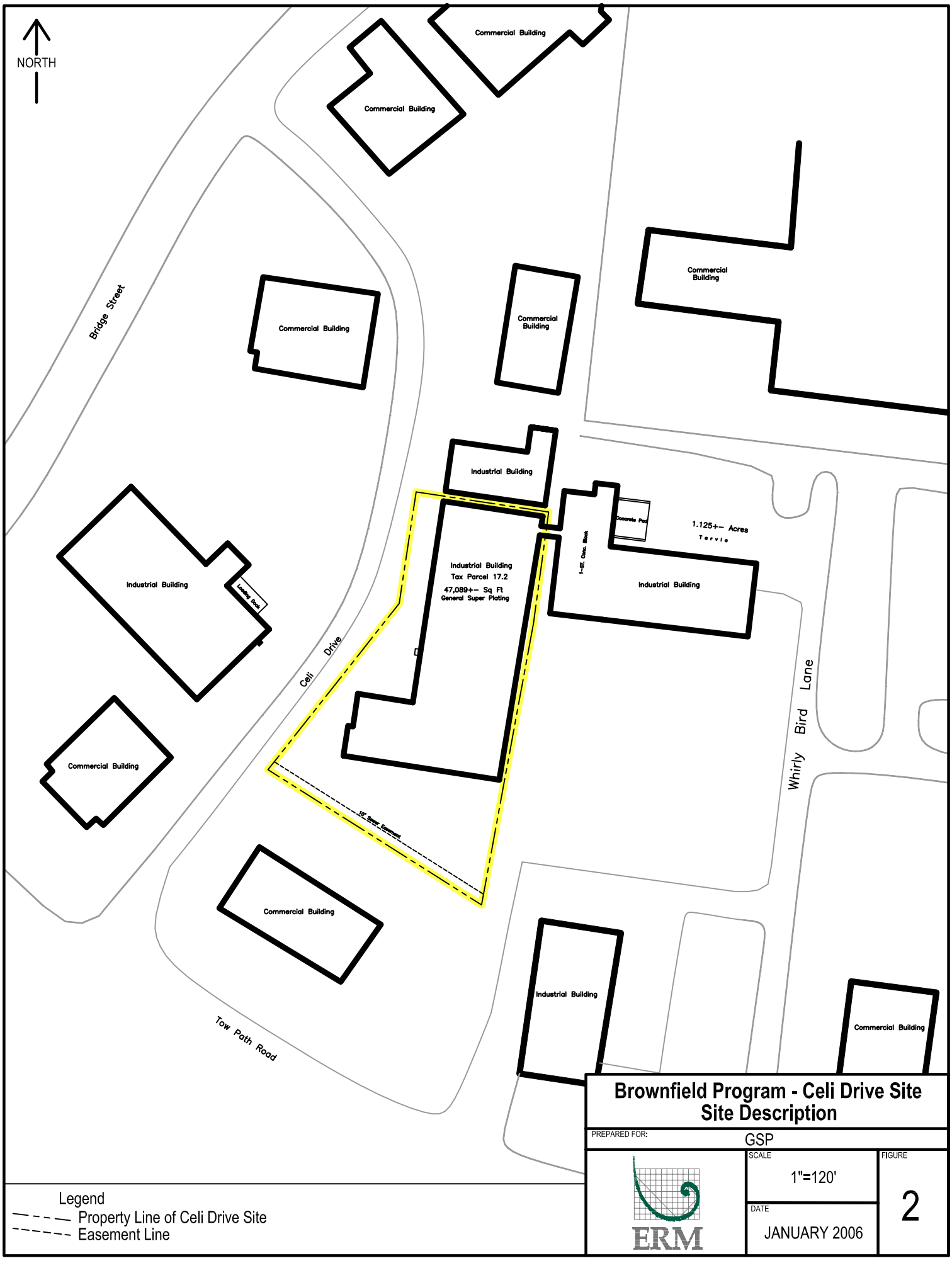
SCALE: 1" ~ 2000'

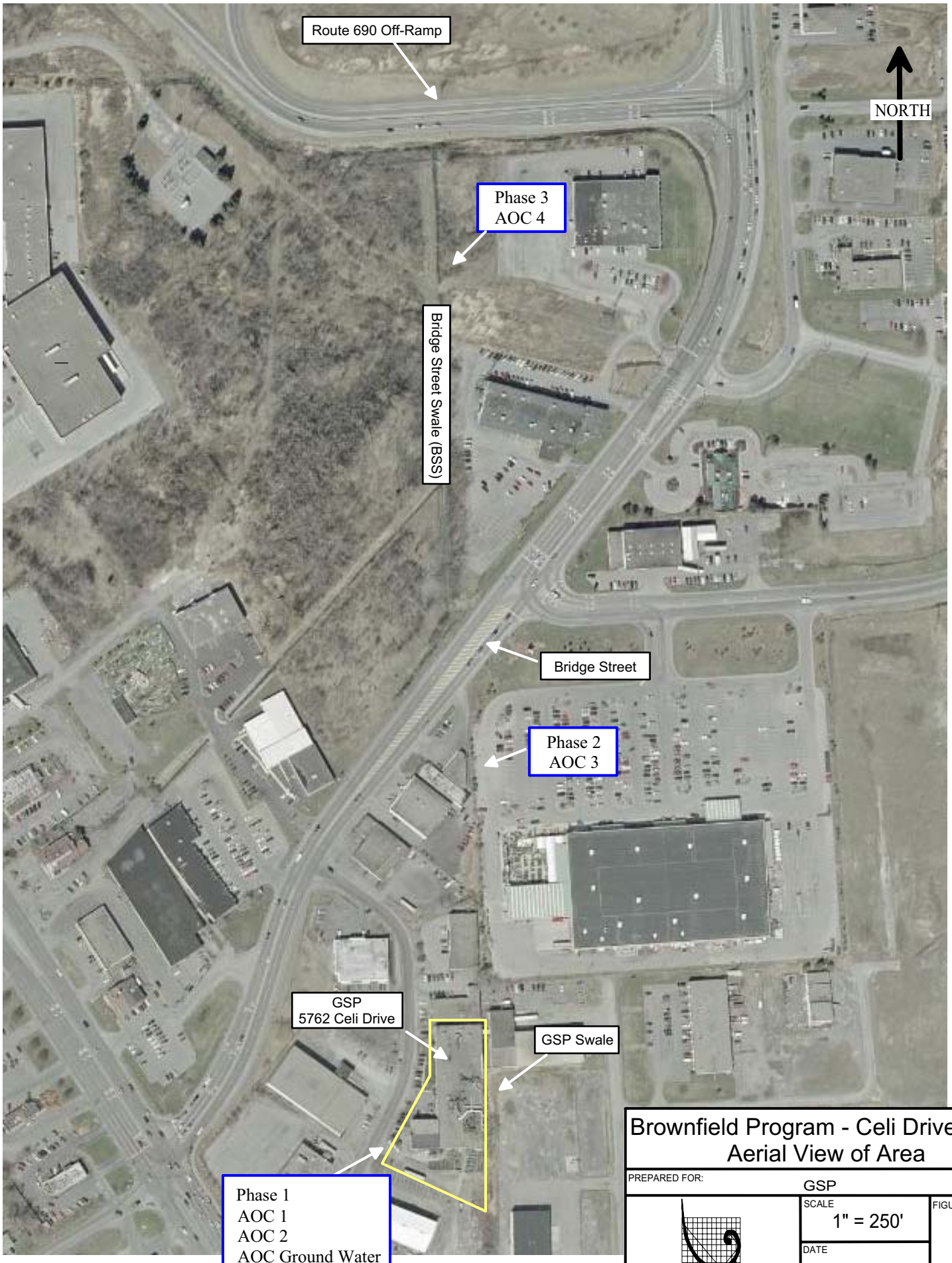
DATE: JANUARY 2006

FIGURE: 1

SOURCE: USGS 7/1/1978

ENVIRONMENTAL RESOURCES MANAGEMENT


NORTH
Commercial Building
Commercial Building
Commercial Building
Bridge Street
Commercial Building
Commercial Building
Commercial Building
Industrial Building
Industrial Building
Leaders Point
Industrial Building
Tax Parcel 17.2
47,089+- Sq Ft
General Super Plating
Concrete Pad
1-55' Conc. Block
1.125+- Acres
Tervis
Industrial Building
Celi Drive
Whirly Bird Lane
Commercial Building
10' Sewer Easement
Commercial Building
Industrial Building
Commercial Building
Tow Path Road
Legend
Property Line of Celi Drive Site
Easement Line
Brownfield Program - Celi Drive Site
Site Description
PREPARED FOR: GSP
ERM
SCALE 1"=120'
DATE JANUARY 2006
FIGURE 2



Brownfield Program - Celi Drive Site
Aerial View of Area

PREPARED FOR: GSP

ERM

SCALE: 1" = 250'

DATE: JANUARY 2006

FIGURE: 3

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	10.5	57.8	ND	33.8	41.2
12" - 18"	41.5	137	ND	109	671

B-5

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	546	132	1.7	969	745
12" - 18"	51.9	51.7	ND	54.3	46.6

B-1/TW-1

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	10.9	54.1	ND	32.3	37.5
12" - 18"	7.3	63.9	ND	27.6	36.1

B-6

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	15.9	61.2	ND	13.4	21.3
12" - 18"	21.5	16	ND	14.1	ND

B-2

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	21.2	13	ND	18.7	27.7
12" - 18"	169	11.9	ND	124	29.2

B-7

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	19.1	113	1.7	29.3	30.3
12" - 18"	13.7	25.2	ND	16.4	34.1

B-3

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	1,300	87,400	ND	5,780	41.8
12" - 18"	9.3	92	ND	1,300	16

B-4/TW-2

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	22.9	59.8	ND	18.5	34.4
12" - 18"	338	855	ND	412	52.9

B-8

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	13	12.7	ND	10.5	ND
12" - 18"	16.4	20.4	ND	19.6	40.5

B-11

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	398	1,260	ND	495	58.6
12" - 18"	24.1	60.7	ND	33.9	31

B-12/TW-4

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	18	73.1	ND	40.1	39.7
12" - 18"	10.9	56.1	ND	35.7	44

B-9/TW-3

Depth	Cr	Cu	CN-	Ni	ZN
0" - 6"	65.5	55.3	ND	78.5	41.6
12" - 18"	34	102	2.82	560	65.7

B-10

Legend
B-8 Sub-Slab Boring Location
Monitoring Well Location

NORTH

Scale 10'

Brownfield Program - Celi Drive Site
AOC-1 - Sub-Slab Sampling Locations

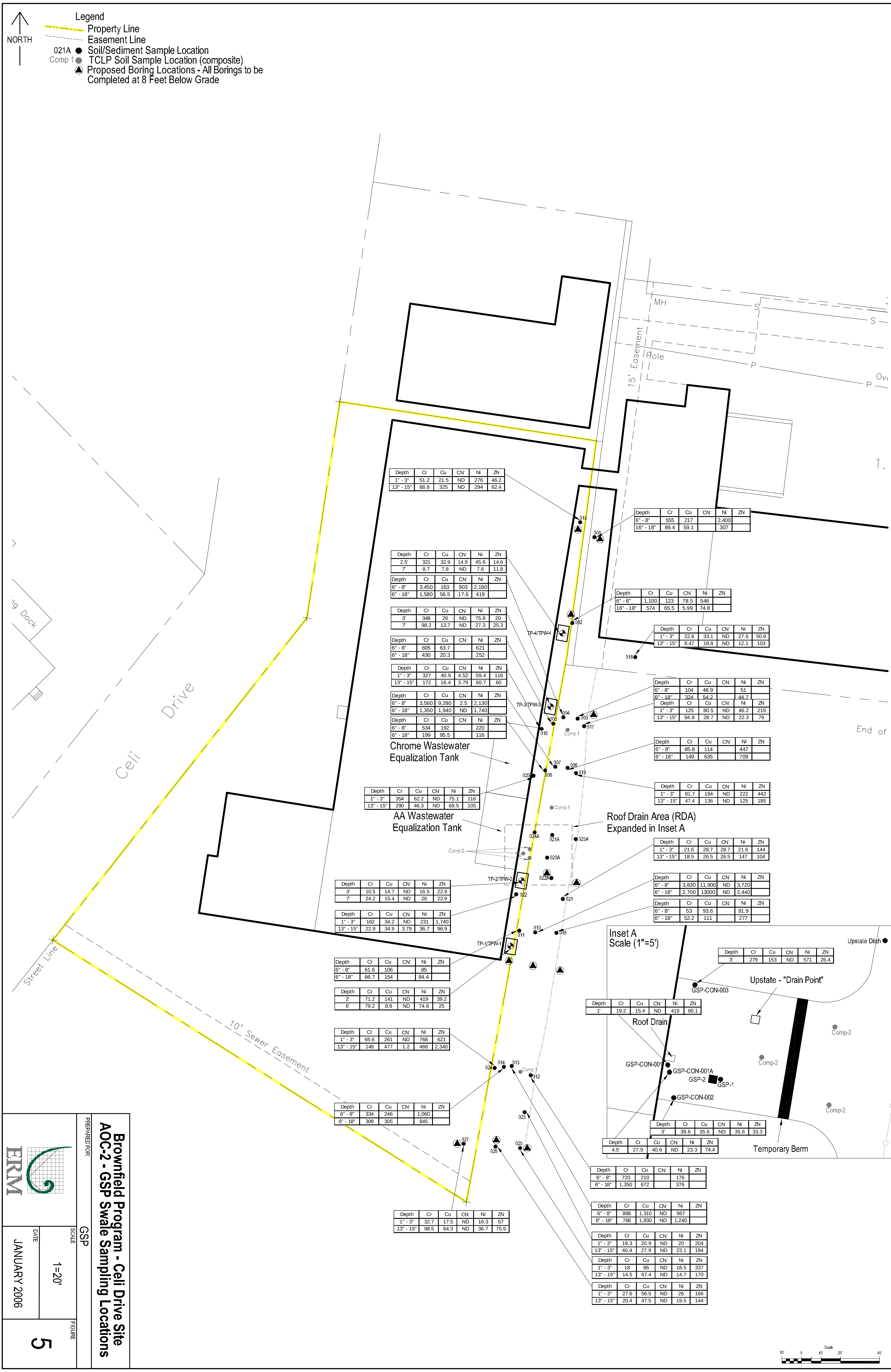
PREPARED FOR: GSP

ERM

SCALE 1=10'

DATE JANUARY 2006

FIGURE 4



Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	51.2	21.5	ND	276	46.2
13" - 15"	88.8	325	ND	294	62.4

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	555	217		2,400	
16" - 18"	89.4	59.1		307	

Depth	Cr	Cu	CN$^-$	Ni	ZN
2.5'	321	32.9	14.9	45.6	14.6
7'	8.7	7.8	ND	7.6	11.8

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	3,450	163	903	2,180	
6" - 18"	1,580	56.5	17.6	419	

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	1,100	123	78.5	546	
16" - 18"	574	65.5	5.99	74.8	

Depth	Cr	Cu	CN$^-$	Ni	ZN
3'	348	26	ND	75.8	20
7'	98.2	13.7	ND	27.3	25.3

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	22.6	33.1	ND	27.6	50.6
13" - 15"	8.47	18.8	ND	12.1	103

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	605	63.7		621	
6" - 18"	430	20.3		252	

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	327	40.9	4.52	59.4	116
13" - 15"	172	16.4	3.79	60.7	60

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	104	48.9		51	
6" - 18"	324	54.2		44.7	

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	125	80.5	ND	46.2	219
13" - 15"	94.8	28.7	ND	22.3	79

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	3,560	9,280	2.5	2,130	
6" - 18"	1,350	1,940	ND	1,740	

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	534	192		220	
6" - 18"	199	95.5		116	

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	85.8	114		447	
6" - 18"	149	635		709	

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	354	62.2	ND	75.1	116
13" - 15"	290	46.3	ND	69.5	105

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	81.7	194	ND	222	442
13" - 15"	47.4	136	ND	125	185

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	21.6	28.7	28.7	21.6	144
13" - 15"	18.5	26.5	26.5	147	104

Depth	Cr	Cu	CN$^-$	Ni	ZN
3'	10.5	14.7	ND	16.5	22.9
7'	24.2	15.4	ND	26	22.9

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	3,830	11,900	ND	3,720	
6" - 18"	2,700	13000	ND	2,440	

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	162	34.2	ND	231	1,740
13" - 15"	22.9	34.9	3.79	36.7	96.9

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	53	93.6		91.9	
6" - 18"	52.2	111		277	

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	61.6	106		85	
6" - 18"	66.7	154		84.4	

Depth	Cr	Cu	CN$^-$	Ni	ZN
2'	71.2	141	ND	419	39.2
6'	79.2	8.9	ND	74.6	25

Depth	Cr	Cu	CN$^-$	Ni	ZN
3'	279	153	ND	571	26.4

Depth	Cr	Cu	CN$^-$	Ni	ZN
1'	19.2	15.4	ND	419	60.1

Depth	Cr	Cu	CN$^-$	Ni	ZN
3'	38.6	35.6	ND	35.6	33.3

Depth	Cr	Cu	CN$^-$	Ni	ZN
4.5'	27.9	40.6	ND	23.3	74.4

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	65.6	261	ND	768	621
13" - 15"	149	477	1.2	468	2,340

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	334	246		1,060	
6" - 18"	309	305		845	

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	32.7	17.5	ND	16.3	57
13" - 15"	98.5	64.3	ND	36.7	75.9

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	720	210		176	
6" - 18"	1,350	672		376	

Depth	Cr	Cu	CN$^-$	Ni	ZN
6" - 8"	868	1,310	ND	967	
6" - 18"	768	1,830	ND	1,240	

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	19.3	20.9	ND	20	204
13" - 15"	40.4	27.9	ND	23.1	194

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	18	86	ND	18.5	337
13" - 15"	14.5	67.4	ND	14.7	170

Depth	Cr	Cu	CN$^-$	Ni	ZN
1" - 3"	27.6	56.5	ND	26	166
13" - 15"	20.4	47.5	ND	19.5	144

Brownfield Program - Celi Drive Site
AOC-2 - GSP Swale Sampling Locations

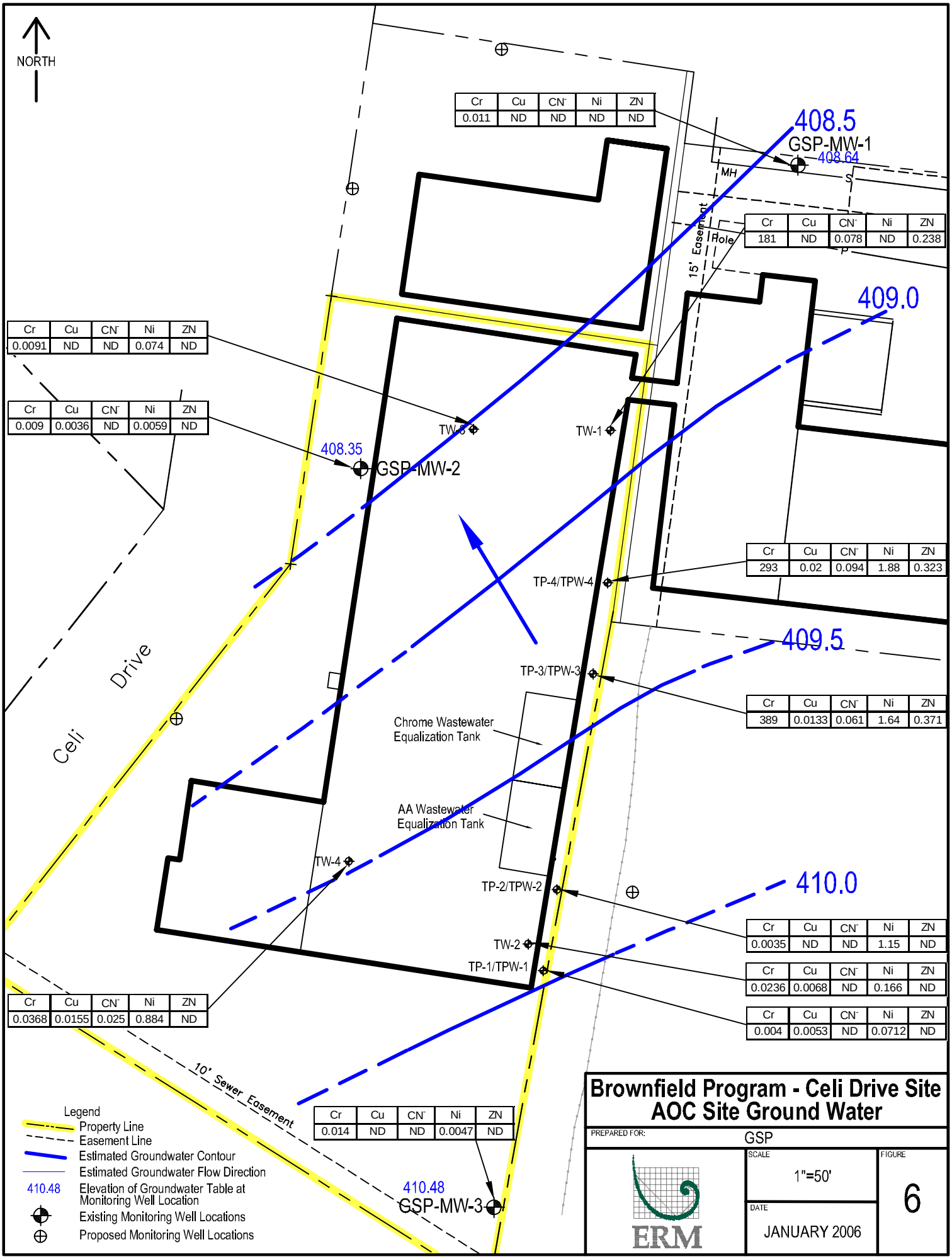
ERM

PREPARED FOR: GSP

SCALE: 1=20'

DATE: JANUARY 2006

FIGURE: 5


NORTH
Cr | Cu | CN- | Ni | ZN
0.011 | ND | ND | ND | ND
408.5
GSP-MW-1
408.64
MH
15' Easement
Pole
Cr | Cu | CN- | Ni | ZN
181 | ND | 0.078 | ND | 0.238
409.0
Cr | Cu | CN- | Ni | ZN
0.0091 | ND | ND | 0.074 | ND
Cr | Cu | CN- | Ni | ZN
0.009 | 0.0036 | ND | 0.0059 | ND
TW-3
TW-1
408.35
GSP-MW-2
Cr | Cu | CN- | Ni | ZN
293 | 0.02 | 0.094 | 1.88 | 0.323
TP-4/TPW-4
409.5
TP-3/TPW-3
Cr | Cu | CN- | Ni | ZN
389 | 0.0133 | 0.061 | 1.64 | 0.371
Celi Drive
Chrome Wastewater Equalization Tank
AA Wastewater Equalization Tank
TW-4
TP-2/TPW-2
410.0
Cr | Cu | CN- | Ni | ZN
0.0035 | ND | ND | 1.15 | ND
TW-2
TP-1/TPW-1
Cr | Cu | CN- | Ni | ZN
0.0236 | 0.0068 | ND | 0.166 | ND
Cr | Cu | CN- | Ni | ZN
0.004 | 0.0053 | ND | 0.0712 | ND
Cr | Cu | CN- | Ni | ZN
0.0368 | 0.0155 | 0.025 | 0.884 | ND
10' Sewer Easement
Cr | Cu | CN- | Ni | ZN
0.014 | ND | ND | 0.0047 | ND
410.48
GSP-MW-3
Legend
Property Line
Easement Line
Estimated Groundwater Contour
Estimated Groundwater Flow Direction
410.48 Elevation of Groundwater Table at Monitoring Well Location
Existing Monitoring Well Locations
Proposed Monitoring Well Locations
Brownfield Program - Celi Drive Site
AOC Site Ground Water
PREPARED FOR: GSP
ERM
SCALE 1"=50'
DATE JANUARY 2006
FIGURE 6

NORTH

Depth	Cr	Cu	Ni	ZN	CN-
3" - 6"	465	547	190	NA	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	21.7	38.4	19.8	1.93

Depth	Cr	Cu	Ni	ZN	CN-
3" - 6"	69	207	78.5	NA	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	31.6	112	96.4	1.74
13" - 16"	16.2	27.6	28.8	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	15.1	41.7	28.8	ND
13" - 16"	17	47.5	32.3	ND

Core 6
220
CB
221
NYS Rte. 690
219
(Sample collected at culvert pipe under Route 690 1/4 mile west of BSS)
Core 5
208
207
206
229
105
230

Depth	Cr	Cu	Ni	CN-
3" - 6"	14.8	36.6	22	ND

Depth	Cr	Cu	Ni	ZN	CN-
1" - 3"	8.66	18	12.2	64	ND
13" - 15"	8.5	18.6	11.9	71.5	ND

Depth	Cr	Cu	Ni	ZN	CN-
1" - 3"	6.92	8.41	8.39	42.9	ND
13" - 15"	8.27	23.8	11.4	45.7	1.72

Commercial Building

Depth	Cr	Cu	Ni	CN-
3" - 6"	11.8	23.4	14.2	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	17.2	22.9	18.8	1.34
13" - 16"	17.1	23.8	17.6	2.41

Bridge Street Swale

Depth	Cr	Cu	Ni	CN-
3" - 6"	137	450	219	ND

209
210
211

Depth	Cr	Cu	Ni	ZN	CN-
1" - 3"	9.17	11.1	11.5	32.7	ND
13" - 15"	11.4	9.85	12.2	45.7	ND

Core 4
205
204
223
222
203
104

Depth	Cr	Cu	Ni	ZN	CN-
1" - 3"	11.4	14.4	12	62.8	ND
13" - 15"	10.8	14.3	9.33	48.1	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	8.1	10.7	11.2	ND
13" - 16"	6.7	10.3	10.3	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	29.5	83	22	ND
13" - 16"	58	121	40.9	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	12.9	16.7	13.2	ND
13" - 16"	11.4	19.4	12.9	ND

Bridge Street

Edge of Woods

Commercial Building

Depth	Cr	Cu	Ni	CN-
3" - 6"	363	384	244	4.53
13" - 16"	251	318	225	4.32

Depth	Cr	Cu	Ni	CN-
3" - 6"	118	311	127	ND

Depth	Cr	Cu	Ni	ZN	CN-
1" - 3"	6.24	5.47	6.32	46	ND
13" - 15"	5.51	8.33	7.24	30.6	ND

201
202
200
103
228
Core 3
226
225
224
227
102

Depth	Cr	Cu	Ni	CN-
3" - 6"	174	227	175	ND
13" - 16"	59	162	76	ND

Depth	Cr	Cu	Ni	ZN	CN-
1" - 3"	53.4	90.4	67.5	163	ND
13" - 15"	25.2	57.5	36.5	87.8	ND

Depth	Cr	Cu	Ni	ZN	CN-
0" - 2"	22.7	31.9	19.5	100	ND

Depth	Cr	Cu	Ni	ZN	CN-
0" - 2"	15.5	24.4	15.3	109	ND

Depth	Cr	Cu	Ni	ZN	CN-
0" - 2"	38.6	73.7	26.6	269	1.72

Depth	Cr	Cu	Ni	CN-
3" - 6"	257	763	262	ND
12" - 16"	74.3	149	99.8	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	321	1150	412	4.13

Depth	Cr	Cu	Ni	CN-
6" - 12"	966	4350	927	2.66

Depth	Cr	Cu	Ni	CN-
3" - 6"	20.1	42.7	41.5	ND
13" - 16"	26.7	66.8	51.6	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	36.3	185	25	ND
13" - 16"	17.3	105	13.5	ND

Depth	Cr	Cu	Ni	ZN	CN-
0" - 2"	45.5	81.9	14.3	385	15.7
13" - 15"	12.1	44.9	8.88	74.3	ND

214
213
212
231
101
217
Core 2
216
215
232
218

Upstate "Bridge Street Swale"

Depth	Cr	Cu	Ni	CN-
3" - 6"	731	7170	2330	ND

106

Depth	Cr	Cu	Ni	ZN	CN-
0" - 2"	21.8	88.1	24.3	164	ND
13" - 15"	11.3	76.5	13.3	80.9	ND

Depth	Cr	Cu	Ni	CN-
3" - 6"	10.8	109	13.7	ND
13" - 16"	6.7	15.5	9.4	ND

Core 1
Edge of Pavement / Guardrail

Legend
- Property Line
- Easement Line
- 200 ● Soil/Sediment Sample Location
- 101 □ Surface Water Sample Location
- ▲ Proposed Sediment Core Locations
- ⊗ Proposed Sampling Location and Number

Scale
20' 0 20' 40' 80'

Brownfield Program - Celi Drive Site
AOC-4 - Bridge Street Swale
Sampling Locations

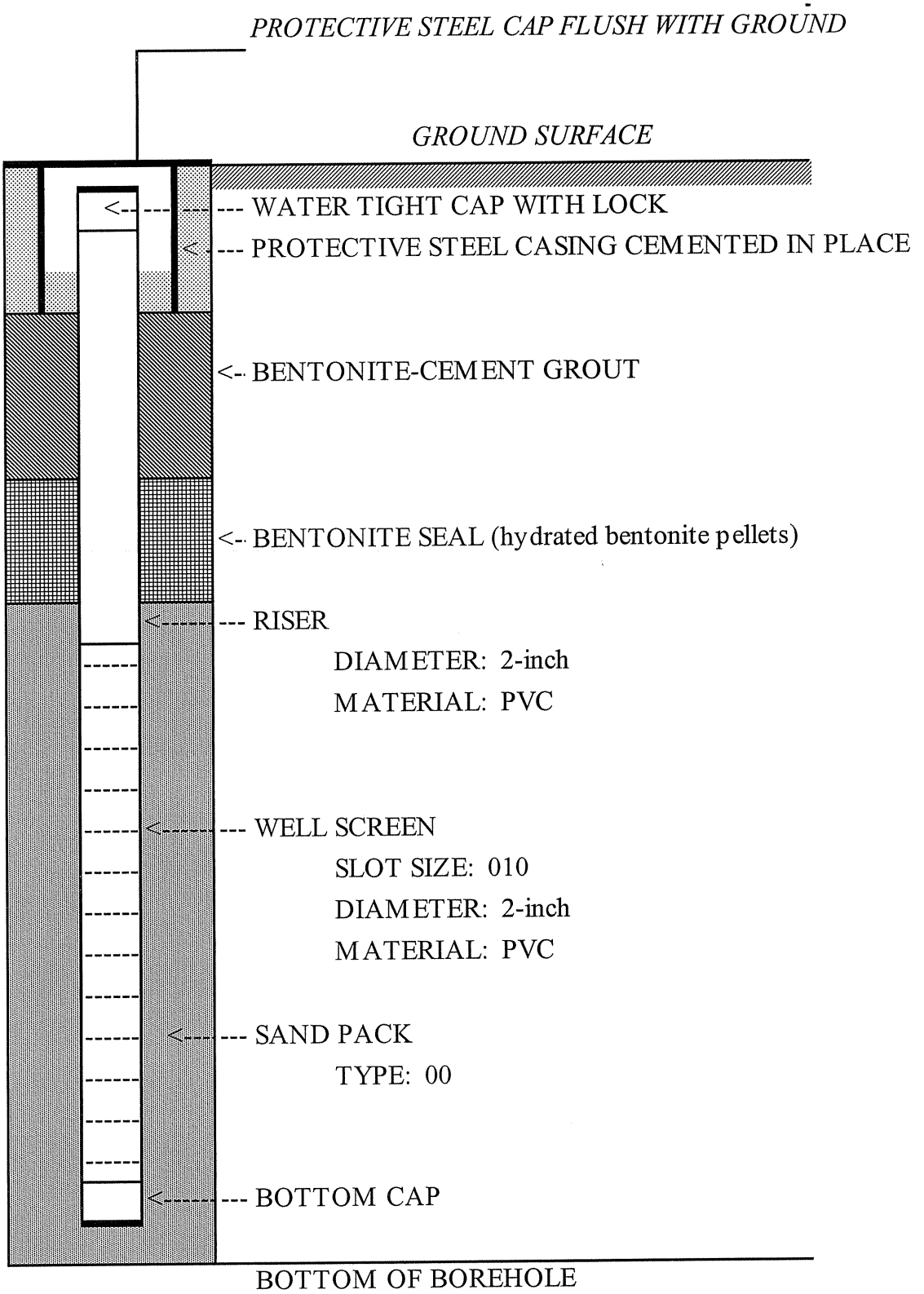
PREPARED FOR: GSP

ERM

SCALE: 1=40'

DATE: JANUARY 2006

FIGURE: 7



Brownfield Program - Celi Drive Site
Monitoring Well Detail

PREPARED FOR: GENERAL SUPER PLATING CO., INC.

ERM

SCALE: NTS

DATE: JANUARY 2006

FIGURE: 8

Appendix A

Remediation Schedule

Brownfield Investigation and Remediation Schedule
Celi Drive Site, Dewitt, NY

ACTIVITY	4th Qtr 2005	1st Qtr 2006	2nd Qtr 2006	3rdQtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Non-Construction Activities													
Finalize Brownfield Application													
Prepare Data Gap Investigation Work Plan													
NYSDEC Review of Data Gap Work Plan													
Conduct Data Gap Investigation													
Investigation Complete													
Prepare IRM Phase I Work Plan													
NYSDEC Review Phase I Work Plan													
Prepare IRM Phase II Work Plan													
NYSDEC Review Phase II Work Plan													
Prepare IRM Phase III Work Plan													
NYSDEC Review Phase III Work Plan													
Construction Activities													
Initiate Phase I IRM													
Complete Phase I IRM													
Initiate Phase II IRM													
Complete Phase II IRM													
Initiate Phase III IRM													
Complete Phase III IRM													
Construction Complete													
Ground Water Activities													
Review Ground Water Requirements													
Prepare Ground Water Management Plan													
NYSDEC Review													
Implement Ground Water Plan													
Ground Water Monitoring Program													
Reports and Administrative Actions													
Prepare Phase I and II IRM Completion Reports													
Prepare Phase III IRM Completion Report													
NYSDEC Review													
Draft Environmental Easement													
Submit Final Engineering Report													
NYSDEC Review													
Site Closure													

Appendix B

Quality Assurance Project Plan

QAPP

General Super Plating Co., Inc.

Site-Specific
Quality Assurance Project Plan

Celi Drive Site
Town of Dewitt
Onondaga County, New York
NYSDEC Spill Number 00550288

January 2005

ERM Project Number 0032572

Environmental Resources Management
5788 Widewaters Parkway
Dewitt, New York 13214
(315) 445-2554

TABLE OF CONTENTS

TABLES

APPENDICES

1.0 INTRODUCTION

Remediation activities are planned for General Super Plating Co., Inc. (GSP) at their Facility located at 5762 Celi Drive, East Syracuse, Onondaga County, New York (the Site, Figure 1). The facility consists of approximately 48,000-square feet (s.f.) situated on approximately 1.3-acre of land. This document presents quality assurance/quality control (QA/QC) protocols developed for the remediation phase of the project.

Planned remedial activities are presented separately in the Brownfield Investigation Work Plan (BIWP) dated January 2006. The BIWP will delineate the extent of Site contamination and will specify interim remedial measures (IRMs) to be performed as part of a Brownfield agreement between GSP and the New York State Department of Environmental Conservation (NYSDEC) under the Brownfield Program. IRMs will be implemented at the Site covering the areas of concern (Phases 1, 2 and 3 as identified in the BIWP) that have been identified from previous Site investigations. This Quality Assurance Project Plan (QAPP) presents the project quality objectives and procedures to be utilized in performing the Data Gap Investigation and implementation of the IRM activities and to meet the remedial objectives, reporting requirements, and schedule of the project.

2.0 REMEDIAL GOALS

The remedial objectives selected for the Site will be developed in a manner consistent with Track 4 cleanup objectives described in Draft Part 375-3.

3.0 QUALITY ASSURANCE OBJECTIVES

3.1 DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) are qualitative and quantitative criteria required to support the decision making process. DQOs define the uncertainty in a data set and are expressed in terms of precision, accuracy, representativeness, completeness and comparability (PARCC). The DQOs apply to both characterization and confirmation samples at the Site. These parameters are defined as follows:

- ***Precision:*** a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of standard deviation. Various measure of precision exists depending upon the prescribed similar conditions.

- ***Accuracy:*** the degree of agreement of a measurement (or an average of measurements) with an accepted reference or "true value". Accuracy is one estimate of the bias in a system.

- ***Representativeness:*** expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.

- ***Completeness:*** a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions.

- ***Comparability:*** expresses the confidence with which one data set can be compared to another data set.

It is the responsibility of the field team to collect representative and complete samples. It is the responsibility of the field screening chemist (if applicable) and/or the analytical laboratory to analyze these samples using accepted protocols resulting in data that meet PARCC standards.

3.2 FIELD SAMPLING QUALITY OBJECTIVES

The objectives with respect to field sampling and testing activities are to maximize the confidence in the data in terms of PARCC. Internal QC checks in the field may be utilized during this investigation through the use of field duplicates or other methods as presented below.

- **Field Duplicates** - One of every 20 soil samples collected in the field will be accompanied by a blind duplicate sample. The duplicate will be prepared by homogenizing the sample and preparing two identical sample aliquots for analysis (grab samples will be used for VOC analysis). The duplicate sample will be assigned a fictitious sample number which will be recorded in the field notebook. Analysis of duplicate samples will determine the precision of analytical techniques.

- **Trip Blank** - A trip blank consists of analyte-free water sealed in 40-milliliter (ml) fluorocarbon resin-lined septum vials, which will accompany ground water sample containers from the laboratory to the field. Trip blanks will be returned with the field samples back to the laboratory. Trip blanks are analyzed if VOCs are sampled for and are used to evaluate whether cross-contamination of ground water samples occurred during shipment or storage of samples, or if atmospheric contamination has compromised sample containers. Trip blanks are utilized on a frequency of one per day on days when ground water samples are collected for VOC analyses.

Precision will be calculated as relative percent difference (RPD) if there are two analytical points, and percent relative standard deviation (%RSD) if there are more than two analytical points. Through the submission of field QC samples, the distinction may be made between analytical problems, sampling technique considerations, and sample matrix variability. This distinction will be made by the data reviewer based on industry guidelines and professional judgment.

The DQO for completeness of all data to be collected during the investigation is 100%. In the event that 100% data completeness is not obtained due to inaccessibility of sampling points or other field conditions, the effect that the missing data will have on the project objectives will be evaluated. If necessary, corrective action will be

initiated to resolve any data gaps that develop as a result of less than 100% data completeness.

Every effort will be made to obtain valid data for all sampling points, particularly those identified by the Field Team Leader as critical points. In this regard, sampling points identified as critical will be selected for QC sampling (duplicate sample collection) at the frequency specified.

In order to establish a degree of comparability, such that observations and conclusions can be directly compared with all historical data, standardized methods of field analysis, sample collection, holding times, sample preservation and standard units of measurement for data will be used. In addition, field conditions will be documented and considered when evaluating data to determine the effects of sample characteristics on analytical results. Whenever possible, the same sampling team will obtain all samples on consecutive days to reduce inconsistencies which may be caused by technique and time variables.

3.3 LABORATORY DATA QUALITY OBJECTIVES

The laboratory will demonstrate analytical precision and accuracy by the analysis of laboratory duplicates and by adherence to accepted manufacture and procedural methodologies. The project laboratory will provide NYSDEC Analytical Services Protocol (ASP) Level B deliverables.

The performance of the laboratory will be evaluated by the Project Manager and Project QA Officer during data reduction. The evaluation will include a review of all deliverables for completeness and accuracy when applicable.

4.0 QUALITY CONTROL PROCEDURES

This section presents a general overview of the QA/QC procedures that will be implemented during the investigation. These quality control procedures are to be implemented as follows:

- at the factory for certain manufactured products;
- in the field; and
- in the project laboratory.

4.1 FIELD ACTIVITIES

Sampling and analysis will be conducted during or subsequent planned remedial activities and may include the collection of additional investigative samples, confirmation soil samples, ground water samples, process water samples, and soil vapor samples to assess the effectiveness of remedial activities. Field sampling procedures are described in Appendix A of this QAPP. All field and laboratory personnel will handle project samples in a manner that facilitates custody tracking and validity of the samples. Sample custody procedures are presented as Appendix B of this QAPP.

All field measurement and sampling equipment will be cleaned or decontaminated according to procedures presented in Appendix C.

All field activities will be documented in accordance with procedures presented in Appendix D.

5.0 CALIBRATION PROCEDURES

Laboratory calibration and frequency for specific analytical methods and pieces of equipment is specified in the United States Environmental Protection Agency (USEPA) SW-846 and the project laboratory's Standard Operating Procedures.

Team members will be familiar with the field calibration, operation, and maintenance of the equipment, and will perform the prescribed field operating procedures outlined in the operation and field manuals accompanying the respective instrument. Field personnel will keep records of all field instruments calibrations and field checks in the field logbooks. Calibration information recorded in field logbooks will include date, time, instrument make and model, a description of specific calibration or field check procedures, and any instrument deviations.

If on-site monitoring equipment should fail, the Field Team Leader will be contacted immediately. Replacement equipment will be provided or the malfunction will be repaired in a timely fashion.

6.0 *ANALYTICAL PROCEDURES AND DATA EVALUATION*

A general summary of the sampling program, analytical methods, preservatives, holding times, containers, and method detection limits is shown in Table 6-1. Soil and ground water samples will be collected for analysis of metals, and occasionally for selected waste characterization parameters (i.e., ignitibility, corrosivity, etc.). In general, laboratory analytical procedures will adhere to USEPA SW-846 methodology, although other methods may be utilized as appropriate. All samples will be analyzed by a New York State Department of Health (NYSDOH)-approved environmental laboratory.

Upon receipt of analytical reports from the laboratory, ERM will evaluate the data packages. A full data validation is not included in the scope of work; however, an evaluation of the data following the Data Usability Summary Report (DUSR) guidelines will be performed. The project laboratory will provide ASP Category B deliverables for all data packages.

The project QA/QC officer will review the data packages and prepare a DUSR in accordance with NYSDEC guidelines. At a minimum, the following information will be evaluated:

- completeness of the data package under NYSDEC ASP Category B;
- chain-of-custody forms;
- date sampled/date analyzed;
- sample temperature at check-in;
- raw data;
- initial and continuing instrument calibrations;
- matrix spikes;
- laboratory duplicate analyses; and
- surrogate recoveries (organics).

Upon completion of this review, the project QA/QC officer will prepare a DUSR. Data reduction will consist of presenting analytical results on summary tables. The DUSR will be prepared according to the guidelines established by NYSDEC's Division of Environmental Remediation Quality Assurance Group and will describe the samples and the analytical parameters, data deficiencies, analytical protocol deviations, and quality control problems and their effect-on the data. The DUSR shall also include recommendations on re-sampling and/or re-analysis, if necessary. All data qualifications will be documented following the NYSDEC ASP 1995 revised guidelines.

Data from laboratory analyses will be used to evaluate potential remedial adjustments and to evaluate the effectiveness of remedial activities.

7.0 KEY PROJECT PERSONNEL

ERM will staff this project with persons having expertise in the tasks to be performed and experience in working on NYSDEC sites. Key project personnel expected to be assigned to this project are presented below.

Mr. Ed Hinchey, P.G.. will be the Principal-in-Charge for this project. Mr. Hinchey has a B.S. in Natural Science, a M.S. degree in Environmental Science and an M.A. degree in Geology. He has more than 15 years of diverse experience providing environmental consulting services to private and public sector clients. He has been site manager and technical lead on numerous field investigations at hazardous waste sites throughout the eastern United States. Mr. Hinchey will be responsible for strategic planning and finalizing the Scope of Work, project implementation, and budget and schedule management.

Mr. David W Myers, C.G. will be the project manager and construction manager for this project. Mr. Myers is a certified geologist and has Bachelors degree in geology and over 25 years of professional geologic and construction related experience. He has performed and supervised many field investigation and remediation projects, including projects at USEPA-regulated sites and NYSDEC listed hazardous waste sites. Mr. Myers will be responsible for detailed technical management and overall project management aspects of the project including management of field activities.

Mr. Jim Vener, P.E. will be the engineer of record for this project. Mr. Vener has a Bachelors degree in architectural engineering and a Masters degree in environmental engineering and over 9 years of experience including extensive engineering and remediation experience involving contaminated properties. He will be responsible for detailed engineering aspects of the project, including assistance with project and budget management of engineering-related tasks.

Mr. Robert Sents will be the QA/QC officer for this project. Mr. Sents has a Bachelors degree in geology and three years of professional environmental sampling experience. Mr. Sents will perform periodic field and sampling audits, interface with the analytical laboratory to make requests and resolve problems, interface with the data evaluator, and assist with development of a project-specific Data Usability Summary Report.

8.0 SCHEDULE

The proposed remediation schedule for various phases of the Site remediation program is presented and described in Section 7 of the associated BIWP.

Tables

TABLE 6-1

SAMPLING PROGRAM

CELI DRIVE SITE

Analysis	Analytical Method	Number of Samples			Frequency of Duplicates	Sample Preservative		Sample Container		Holding Time	Method Detection Limit (ppm)*
		Soil	Water	Air		Solid	Aqueous	Solid	Aqueous		
Chromium	EPA 200.7	29	6	0	1:20	4°C	4°C, pH<2 (HNO_3)	200 grams glass	1 liter glass	6 months	0.001
Copper	EPA 200.7	29	6	0	1:20	4°C	4°C, pH<2 (HNO_3)	200 grams glass	1 liter glass	6 months	0.001
Nickel	EPA 200.7	29	6	0	1:20	4°C	4°C, pH<2 (HNO_3)	200 grams glass	1 liter glass	6 months	0.001
Zinc	EPA 200.7	29	6	0	1:20	4°C	4°C, pH<2 (HNO_3)	200 grams glass	1 liter glass	6 months	0.001
Hexavalent Chromium	SM3500CrD/ 7196A	29	6	0	1:20	4°C	4°C, pH<2 (HNO_3)	200 grams glass	1 liter glass	6 months	0.025
Total Cyanide	SW-846 9012A	29	6	0	1:20	4°C	4°C, pH<2 (HNO_3)	200 grams glass	1 liter glass	6 months	0.01

NOTES:

* - method detection limit is lowest achievable by method, actual detection limit will be dependent upon sample matrix.

Appendix A
General Sampling Procedures

GENERAL SAMPLING PROCEDURES FOR OVERSITE OF REMEDIAL ACTIVITIES

1.0 INTRODUCTION

During the course of the remedial activities, the applicable procedures listed below will be followed for sample collection.

- Wherever possible, samples will be collected first from the location expected to be least contaminated. Samples that are expected to be most contaminated will be collected last.

- Accurate and detailed field notes will be maintained including detailed descriptions of sample collection and handling procedure and sample characteristics.

- Sampling procedures will be performed with the overall intent of collecting representative samples and minimizing sample disturbance.

- Worst-case samples will be selected for analyses based on observations (e.g., staining, odor), organic vapor field screening results, or other methods acceptable to NYSDEC.

- Any borings drilled that will not be used for monitoring wells will be backfilled with drill cuttings in accordance with NYSDEC guidance (TAGM-HWR-89-4032).

- Sample bottles will be labeled with the sample location, identification number, and date and time of sampling prior to being filled with a sample.

- All sample collection, handling and shipping information will be recorded in the field notebook.

2.0 SOIL/SEDIMENT/BENCH TEST SAMPLE COLLECTION PROCEDURES

2.1 Materials

The following materials generally will be available during soil, sediment and bench test sampling activities:

- health and safety equipment (personal protective equipment or PPE; FID or PID, etc.);
- sample retrieval device (concrete cutting machine, split-spoon sampler, hand operated corer, hand auger, trowel);
- stainless steel spatulas, bowls, and/or scoops;
- plastic (polyethylene) sheeting;
- knife;
- sample containers and seals;
- chain-of-custody forms;
- transport container with a cold source (ice or blue ice);
- field book;
- decontamination supplies (detergent, water, hexane, methanol or nitric acid rinses, buckets, brushes, etc.); and
- aluminum foil and sealable plastic storage bags.

2.2 *Sample Collection*

The applicable procedures noted below will be followed during collection of soil, sediment, or bench test samples.

1. Bench Test samples will be obtained by using the concrete cutting machine to cut a 1-foot by 1-foot access thru the floor slab. Upon completion of the concrete cutting, an eight-pound sledgehammer will be used to break the concrete. Upon breakup of the concrete, the concrete fragments will be removed to expose the underlying soils.

2. All subsurface soil samples will be collected using a hand auger or trowel. The hand auger and trowel will be made of stainless steel. Other equipment used during sampling such as bowls and mixing spoons will be made of stainless steel.

3. All soil samples will be screened immediately upon sample retrieval with a calibrated FID or a PID with 11.2 eV or higher lamp. Samples for VOC analysis will be collected directly from the split-spoon or coring device, using a decontaminated stainless steel sampling tool to transfer the soil into appropriate sample containers. All remaining soil samples will then be homogenized using USEPA's coning and quartering method. This method includes removing any debris not considered as part of the sample, thoroughly mixing the sample in the center of a decontaminated stainless steel pan or bowl, then quartering and mixing the

individual sample corners. The entire sample will be rolled to the center of the pan followed by a final mix. Placement into sample containers will be conducted after homogenization. Soil samples will not require preservation except for cooling to 4° Celsius.

4. All samples containers are to be labeled with: 1) site name; 2) ERM project number; 3) boring number; 4) sampled interval; 5) date; 6) time of collection; and 7) initials of sampling personnel.

5. The sample collector will record descriptions of samples as to: 1) percent recovery; 2) structure and degree of sample disturbance; 3) soil type; 4) color; 5) odor; 6) moisture content; 7) texture; 8) grain size, shape, and angularity; 9) density or consistency; and 10) any other observations, particularly relating to waste materials or unnatural materials.

6. Sample containers will be capped immediately after filling and placed into a chilled-cooler containing sufficient ice to cool the media for transport to the project laboratory.

7. All equipment used to collect samples for analysis will be either cleaned before each use or dedicated to a particular sample location after initial cleaning.

3.0 GROUND WATER SAMPLE COLLECTION PROCEDURE

The following procedures will be used for collection of ground water samples.

Well purging and sampling methods will utilize the simplest sampling method that will yield representative ground water samples. ERM expects to use low-flow purging for well sampling at the Site. The well purging method will be consistent with the well development method. A peristaltic pump and low flow sampling techniques will be used to collect ground water samples.

Prior to sampling, all wells will be purged of at least three well casing volumes. Wells with low recovery rates will be evacuated slowly until stable prior to sampling.

3.1 MATERIALS

The following materials will generally be available for ground water sampling activities:

- water level indicator (accurate to 0.01 foot);
- new dedicated well tubing;
- peristaltic pump;
- sample bottles and labels;
- chain-of-custody forms;
- thermally-insulated cooler with cold source;
- sample preservative (may be added to bottle by analytical laboratory);
- field book;
- PPE as needed (gloves, etc.);
- decontamination supplies (detergent, water, hexane, methanol or nitric acid rinses, bucket, brushed, etc.).

3.2 GROUND WATER SAMPLING PROTOCOL

Ground water sampling protocols to be used at the Site are as follows.

- Sampling will progress from the least-affected well to the most-affected well based on visual and olfactory observations and/or on historical results of sampling and analysis. Samples will be properly preserved, stored on ice and transported under proper chain-of-custody procedures.

- The depth to water in each well will be measured to the nearest 0.01-foot and the volume of water in the well calculated. The volume of water in the well, in gallons, will be calculated by subtracting the measured depth to water from the total depth of the well and multiplying by the appropriate conversion factor for the inside diameter of the well (i.e., 0.163 gallons per linear foot is the conversion factor for a two-inch well).

- Each well will then be purged to remove stagnant water from the screened portion of the well. Purging will be accomplished using low-flow (minimal drawdown)/low-volume purging techniques. Low-flow purging will be conducted using stainless steel bladder pumps with the associated control box(es) equipped with Teflon bladders and dedicated Teflon lined polypropylene tubing.

- The low-volume purging technique will be used to purge three well volumes from the well. Wells with low recovery rates will be evacuated to near dryness once and allowed to recover sufficiently for samples to be collected. All purged water will be contained in 55-gallon steel drums or other appropriate container pending receipt of laboratory analytical results. Purge waters from wells known to be "clean" based on absence of separate-phase product, sheen, or odors and historical laboratory analytical results may be poured on the ground near the well. In no event shall purge water be disposed of in a way that could cause a discharge to storm sewers or surface water.

- All bottles (if required) will be filled to a minimum of 90 percent capacity and then properly preserved (**Note**: if specifically required by NYSDEC, all non-VOC acid-based aqueous sample preservation may be verified by pouring a small amount of the preserved sample over pH paper; submerging pH paper into a sample container will not be permitted).

- Sample containers will be capped immediately after filling and placed into a pre-chilled cooler for transport to the project laboratory under proper chain-of-custody procedures.

Appendix B
Sample Custody Procedures

SAMPLE CUSTODY PROCEDURES

The primary objective of sample custody procedures is to create an accurate written record which can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. For the purpose of this document, the USEPA Office of Enforcement and Compliance Monitoring, National Enforcement Investigation Center (NEIC) Policies and Procedures (May 1986) definition of custody applies. USEPA states that a sample is under custody if:

1. it is in one's possession, or
2. it is in one's view, after being in one's possession, or
3. it is locked up after being in one's possession, or
4. it is in a designated secure area.

Custody for samples collected during this investigation will be maintained by the Field Team Leader (FTL) or the field personnel collecting the samples. The FTL or field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory.

A self-adhesive label will be affixed to each sample container before sample collection. These labels will be covered with clear waterproof tape in order to protect the label from water or solvent attack. The sample label should contain the following information:

- laboratory name;
- sample identification/number;
- sample location;
- sample matrix;
- date and time of collection;
- designation as a grab or composite sample;
- analytical parameter(s);
- preservative; and
- name of sampler.

All sampling containers will be supplied by the project laboratory. The bottles are cleaned by the bottle supplier, in accordance with standard laboratory procedures. Analytical proof of cleanliness can be made available for review on-site if requested. Sample containers will be

enclosed in clear plastic bags and packed with cushioning material (e.g. vermiculite) inside the coolers.

Custody of the sample bottles will be maintained by the FTL. Sample bottles needed for a specific sampling task will then be relinquished by the FTL to the sampling team after the FTL has verified the integrity of the bottles and that the proper bottles have been assigned for the task. ERM will place a sufficient volume of sample in the appropriate laboratory-grade bottles for use as sample containers. All necessary chemical preservatives will then be added to the bottles after sample collection.

The samples collected for analyses will be stored in an insulated cooler for shipment to the laboratory. The samples will be hand-delivered or shipped to the laboratory within 24 hours of sample collection for arrival no later than 48 hours after sample collection. ERM field chain-of-custody records completed at the time of sample collection will be placed inside the cooler for shipment to the laboratory. These record forms will be sealed in a zip-lock type plastic bag to protect them against moisture. Each cooler will contain sufficient ice packs to insure that a 4°C (± 2°C) temperature is maintained, and will be packed in a manner to prevent damage to sample containers. Sample coolers will be sealed with nylon strapping tape and the FTL will sign and date a custody seal and place it on the cooler in such a way that any tampering during shipment will be detected. A cooler custody seal is not required for hand deliveries where custody of the sample cooler is maintained by the FTL or sampling technician.

All coolers will be hand-delivered or shipped by an overnight courier according to current United States Department Of Transportation (USDOT) regulations. Upon receiving the samples, the sample custodian at the laboratory will inspect the condition of the samples, compare the information on the sample labels against the field chain-of-custody record, assign a laboratory control number, and log the control number into the computer sample inventory system. The sample custodian will then store the sample in a secure sample storage cooler maintained at 4°C (± 2°C) and maintain custody until the sample is assigned to an analyst for analysis. Custody will be maintained until disposal of the analyzed samples.

The sample custodian will note any damaged sample vials, void space within the vials, or discrepancies between the sample label and

information on the field chain-of-custody record when logging the sample. This information will also be communicated to the FTL or field personnel so proper action can be taken. The chain-of-custody form will be signed by both the relinquishing and receiving parties and the reason for transfer indicated each time the sample custody changes.

An internal chain-of-custody form will be used by the laboratory to document sample possession from laboratory sample custodian to analysts and final disposition. All chain-of-custody information will be supplied with the data packages for inclusion in the document control file.

Appendix C
Decontamination Procedures

DECONTAMINATION PROCEDURES

1.0 INTRODUCTION

Decontamination or cleaning of all field investigation and sampling equipment will follow guidelines established in the USEPA Region II CERCLA Quality Assurance Manual, Final Copy, October 1989, and specific decontamination procedures detailed below.

Equipment cleaning areas will generally be established within or adjacent to the specific work area. The equipment cleaning procedures described below include pre-field, field and post-field cleaning of sampling equipment. The equipment consists soil and sediment sampling equipment. The non-disposable equipment will be cleaned after completing each sampling event. All rinse water will be contained and treated on site or sent to an approved disposal facility. Cleaning procedures will be monitored by the project QA/QC officer and QA/QC checks and samples as previously described.

Any solvents and water used in the decontamination process will be contained and collected for characterization and proper disposal if necessary. Solids (e.g., disposable gloves, disposable clothing, and other disposable equipment) resulting from personnel cleaning procedures will be contained for proper disposal. Decontamination procedures will be fully documented in the field notebook.

2.0 SAMPLING EQUIPMENT DECONTAMINATION

Typical sampling equipment cleaning materials may include:

- phosphate-free detergent solution soap;
- potable water (which will be obtained from a treated municipal water source);
- appropriate cleaning solvent (e.g., pesticide-grade hexanes or methanol);
- nitric acid;
- wash basins;
- brushes;
- plastic (typically polyethylene) sheeting;
- aluminum foil;
- large, heavy-duty garbage bags;
- spray bottles;

- zip-lock type bags;
- paper towels/Handiwipes®; and
- non-phthalate (i.e., latex or nitrile) disposable gloves (surgical gloves). Note: These gloves will also be worn by the sampling team and changed between sample points.

All sampling equipment will be stored in a clean environment and, where appropriate, the equipment will be covered in aluminum foil.

Field decontamination procedures, as described below, will include the establishment of cleaning stations. These stations will be located away from the immediate work area so as not to adversely impact the cleaning procedure, but close enough to the sampling teams to keep equipment handling to a minimum.

A designated area will be established to conduct large scale cleaning. All equipment such as drill rigs will receive an initial cleaning at this location prior to use on-Site. The frequency of subsequent on-Site cleaning will depend on actual equipment use in the collection of environmental samples. All fluids and residues produced from the decontamination procedures will be collected and stored on-Site until analyses can be conducted and a decision regarding final disposition of the materials is made pursuant to state and federal requirements.

All sampling equipment (e.g., hand-operated coring devices, knives, hand-augers, bowls, etc.) will be cleaned before each use. The field sampling equipment cleaning procedure when analyzing for organic constituents is as follows:

1. Phosphate-free detergent solution;
2. potable water rinse;
3. de-ionized water rinse;
4. repeat water rinse two more times (i.e., triple rinse) and allow to air dry if time allows; and
5. Wrap equipment completely with aluminum foil to prevent contact with other materials during storage and/or transport to the sampling location.

The field sampling equipment cleaning procedure when analyzing for inorganic constituents is as follows:

1. phosphate-free detergent solution;

2. potable water rinse;
3. rinse equipment with at least a 10 percent nitric acid solution, ultrapure (carbon steel samplers will be rinsed with a one percent nitric acid solution);
4. potable water rinse;
5. de-ionized water rinse;
6. air dry if time allows (sampling activities will not be held up to allow for air drying); and
7. wrap equipment with aluminum foil to prevent contact with other materials during storage and/or transport to the sampling location.

The initial step (detergent and water wash) removes all visible particulate matter and residual oils and grease (this may be preceded by a steam cleaning to facilitate residuals removal). When analyzing for organic constituents when tools appear heavily contaminated, this may be followed by a potable water rinse to remove the detergent and a rinse sequence of solvent (e.g., hexanes, methanol) and de-ionized water. When analyzing for inorganic constituents the detergent and water wash will be followed by a nitric acid rinse, a potable water rinse, and a de-ionized water rinse.

All heavy equipment (drill rigs, etc.) will be steamed cleaned before entering the study area. All down-hole equipment will be steam-cleaned between uses at each location. Equipment will be scrubbed manually as needed to remove heavy soils prior to steam-cleaning. Clean drilling equipment will be stored in an in-active work area on-site until use.

3.0 METER AND FILTER DECONTAMINATION

All meters and probes that are used in the field will be decontaminated between use as follows:

1. detergent/potable water wash; and
2. de-ionized water rinse (triple rinse).

Filtering apparatus will be cleaned prior to each use by washing with a phosphate-free detergent solution, rinsing with potable water, followed by a 10 percent nitric acid solution rinse, a potable water rinse, and a final rinse with deionized water. Following sample collection the used filter will be properly disposed.

Sampling equipment and probes will be decontaminated in an area covered by polyethylene sheeting near the sampling location.

Appendix D
Field Documentation

FIELD DOCUMENTATION

All field data, such as those generated during field measurements, observations, and field instrument calibrations, will be entered directly into a bound field notebook. Each project team member will be responsible for proofing all data transfers made, and the Field Team Leader may proof at least 10 percent of all data transfers.

One or more bound field notebooks will be maintained for the Site; each book will be consecutively numbered. The book(s) will remain with the Site project file.

All entries in the Logbook will be made in ink. Logbook entries will generally include but not be limited to the following:

First Page:

- facility name and number;
- date and time started; and
- personnel on-site.

Subsequent Pages:

- a detailed description of investigative activities including sampling, on-site meetings and any problems encountered along with the duration of these activities;
- documentation of all personnel monitoring results (e.g. PID readings);
- list of all samples obtained and sample appearance (referenced to field logs if necessary);
- list of PPE used and documentation procedure; and
- all other pertinent daily activities.

Each new day will contain:

- date and time started;
- weather;

- personnel on-site;
- activity information; and
- initials of notekeeper.

*Note: When a mistake is made in the log, it will be crossed out with a single ink line and will be initialed and dated.

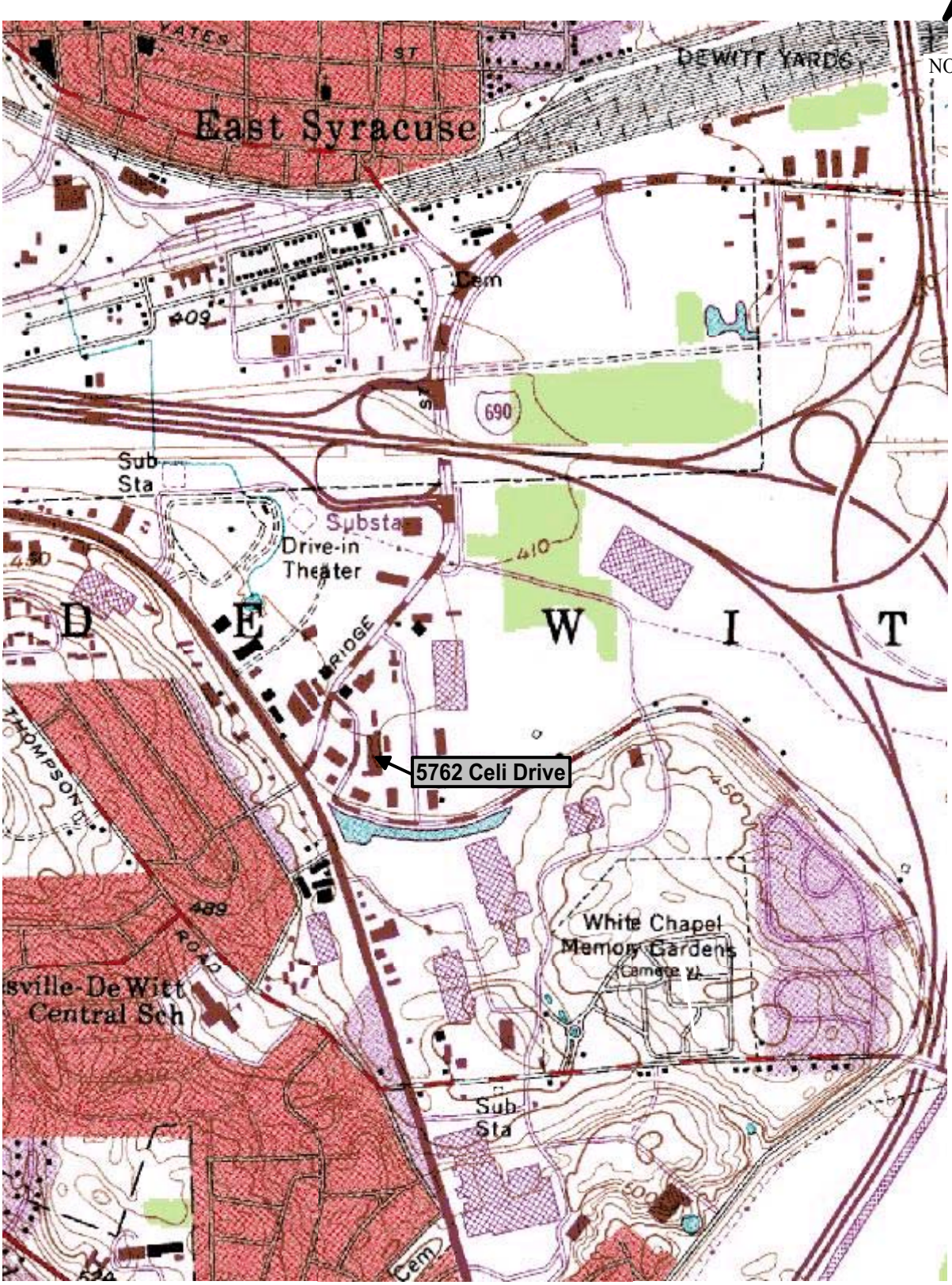
Special care will be taken in the description and documentation of sampling procedures. Sampling information to be documented in the field notebook and/or associated forms are as follows:

- sample number;
- date and time sample collected;
- source of sample (area, monitoring well number, etc.);
- location of sample - document with a Site sketch and/or written description of the sampling location so that accurate resampling can be conducted if necessary;
- sampling equipment (trowel, split spoon, sediment corer, etc.);
- analysis and QA/QC required;
- chemical preservative used (HCI, HNO_3, H_2SO_4, NaOH, etc.);
- field instrument calibration including date of calibration, standards used and their source, results of calibration and any corrective actions taken;
- field parameters data (pH, temperature, conductivity, etc.);
- field observations - all significant observations will be documented;
- sample condition (color, odor, etc.);
- relevant Site conditions (stressed vegetation, exposure of buried wastes, erosion problems, etc.);

- sample shipping procedure, date, time, destination and if container seals were attached to transport container(s); and

- general comments - any observation or event that occurred that would be relevant to the facility (e.g., weather changes and effect on sampling, conversations with the client, public official or private citizen; and instrument calibration, equipment problems, field changes, etc.).

Figure



Brownfield Program - Celi Drive Site
Site Location Map

PREPARED FOR: GSP

ERM

SCALE: 1" ~ 2000'

DATE: JANUARY 2006

FIGURE: 1

SOURCE: USGS 7/1/1978

ENVIRONMENTAL RESOURCES MANAGEMENT

Appendix C

Health and Safety Contingency Plan

General Super Plating Co., Inc.

Site Specific Health and Safety Plan

Celi Drive Site
Town of Dewitt
Onondaga County, New York
NYSDEC Spill Number 00550288

January 2005

ERM Project No. 0032572

Environmental Resources Management, Inc.
5788 Widewaters Parkway
Dewitt, New York 13214
(315) 445-2554

HEALTH AND SAFETY PLAN

APPROVED BY:

_____ _____

ERM, Inc. Date
Health and Safety Manager
Ernest Sweet, C.I.H.

_____ _____

ERM, Inc. Date
Principal-In-Charge
Edward Hinchey

_____ _____

ERM, Inc. Date
Project/Site Manager
David W. Myers

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)

TABLES

APPENDICES

1.0 INTRODUCTION

ERM will provide Project Oversight Services for General Super Plating Co., Inc. (Owner) for Remediation activities at the General Super Plating Co., Inc. facility at 5762 Celi Drive, East Syracuse, NY (the Site).

This Health and Safety Plan (HASP) summarizes the remedial activities to be performed at the Site and chemicals of concern expected to be present.

The HASP then describes the procedures to be followed in conducting the remedial activities, given the existing data concerning the Site.

SITE DESCRIPTION

The General Super Plating Co., Inc. (GSP) facility is located at 5762 Celi Drive, East Syracuse, Onondaga County, New York (see Figure 1). The Site consists of an industrial buildings with approximately 48,000 square feet situated on approximately 1.3 acres of contiguous land. Paved areas, along with several landscaped lawn areas along the building fronts surround the buildings. According to the Town of Dewitt Department of Planning, the subject property is zoned as a Business/Commercial Area.

Niagara Mohawk Power Company provides electrical and natural gas services to the subject property. The Onondaga County Water Authority provides potable water service to the facility.

PHYSICAL SETTING

Topographic map coverage of the site and vicinity is provided by the U.S. Department of Transportation 7.5-minute topographic map for Syracuse East quadrangle, New York, dated 1990. Based on the U.S. Department of Transportation information, the average ground surface elevation of the site is approximately 420 feet above mean sea level (MSL). The topography of the facility and surrounding area is generally flat. It appears that surface water at the site drains locally to several storm sewer drains and to the swale on the east side of the GSP Facility. In general, it appears that shallow groundwater migration would flow to the north-northeast.

The surface water drainage feature noted by the NYSDEC as affected by the "spill incident" is a swale located adjacent to the east side of the GSP Facility. The swale is above-ground directly behind the southern half of the main facility where the swale then is directed underground through concrete or corrugated piping for approximately 750 to the north towards

Bridge Street. At Bridge Street, the swale flows into a large vault and is then directed through a large corrugated culvert under Bridge Street to a small retention pond adjacent to Bridge Street. At the north end of this retention pond, the swale continues flowing north for approximately 1,000-feet where it enter a New York State Registered wetland area just north of the eastbound exit ramp of I-690 to Bridge Street.

The *Soil Survey of Onondaga County, New York*, produced by the USDA Natural Resources Conservation Service, dated October 1977, classified the soils in the immediate vicinity of the subject facility as Urban Land (Ub). Urban Land consists of large built-up areas that have been so altered or obscured by urban works and structures that identification for the soils is not feasible.

Typical soils in the area of the swale generally consist of typical wetland black organic peat which occasional pockets and piles of man-made fill and/or debris underlain by two to three feet of dense clay. In several areas, fine gray sandy silt is located under the clay. Groundwater typically is located along this clay-silt interface.

2.0 REMEDIAL ACTIVITIES AND CHEMICALS OF CONCERN

Descriptions of the remediation activities to be conducted are presented as follows:

- General preparation of the areas of concern on the site;
- Implementation of soil erosion and storm water controls;
- Construction of an earthen berm of stockpiled clay/soil material to control surface water drainage to swale;
- Removal and containment of water;
- Diversion of surface water;
- Removal of water from areas of the Site for transport, containment and treatment at the GSP wastewater treatment facility or other appropriate facility;
- Removal of existing vegetation;
- Soil excavation, disposal; and
- Excavation backfill;

Work requiring 40-hour certification will be performed by an approved contractor. Remedial activities are scheduled to begin in the 2006 and may last till fall of 2008.

Previous sampling of soil and surface water has identified metals as the primary chemicals of concern. The areas where the chemicals of concern have been identified are described ERM's October 2005 Comprehensive Report and are summarized as the following Areas of Concern (AOC):

1) AOC-1 – Affected soil beneath the manufacturing building;
2) AOC-2 – Affected soil in the GSP swale;
3) AOC Ground Water;
4) AOC-3 – Buried culvert; and
5) AOC-4 – Affected soil and sediment at the Bridget Street swale.

3.0 POTENTIAL CHEMICAL AND PHYSICAL HAZARDS

Chemicals identified in the soil, surface and ground water at the Site, which may be encountered at concentrations that may exceed OHSA Permissible Exposure Levels (PELS) and the New York State Department of Environmental Conservation (NYSDEC) Standards, and Guidance during remedial activities are as follows:

Table 3-1

Metals	ACGIH Threshold Limit Values (TLV)
• Hexavalent Chromium	0.01 mg/m^3
• Total Chromium	0.05 mg/m^3
• Nickel	0.01 mg/m^3
• Copper	0.05 mg/m^3
• Zinc chromate	0.01 mg/m^3
• Cyanide	5.0 mg/m^3

Metals have been identified as the major group of chemicals that may be present in potentially hazardous concentrations at the facilities. Metals may cause health effects due to inhalation but dermal contact may also be of concern. Since some of the remedial activities involve subsurface disturbance for short periods of time, ingestion and the inhalation must be considered as a pathway of concern. These same activities may generate the release of airborne particulate (Dust) containing metals with inhalation again being the pathway of concern.

The maximum concentration of metals encountered during previous site investigations are as follows:

Soil: GSP Swale Area

Total Chromium	3,830 mg/kg
Copper	1,300 mg/kg
Nickel	3,720 mg/kg
Zinc	2,340 mg/kg
Total Cyanide	903 mg/kg

Water: GSP Swale Area

Total Chromium	55 mg/l
Copper	110 mg/l

Nickel	120 mg/l
Zinc	0.68 mg/l
Total Cyanide	Not Detected

Soil: <u>BSS Swale Area</u>

Total Chromium	4,100 mg/kg
Copper	7,200 mg/kg
Nickel	2,330 mg/kg
Zinc	17 mg/kg
Total Cyanide	8 mg/kg

Water: <u>BSS Swale Area</u>

Total Chromium	6.4 mg/l
Copper	23 mg/l
Nickel	12 mg/l
Zinc	0.12 mg/l
Total Cyanide	0.012 mg/l

Table 3-2 lists potential physical hazards that may be encountered during the remedial activities. This list has been compiled based on planned activities and potential site conditions.

TABLE 3-2
PHYSICAL SAFETY CONCERNS

Hazard	Description	Location	Procedures Used to monitor/reduce hazard
Underground Utilities	Electric, gas, sanitary and storm ewer	Throughout	Verify number and location of utilities prior to site operations
Heat Stress	Hot weather activities	Throughout	Protection and monitoring as designated in this HASP
Cold Weather	Frost-bite, Hypothermia	Throughout	Wear appropriate clothing; have warm shelter area available, monitor worker physical conditions.
Heavy Equipment	Excavators, loaders and trucks	Specific areas of operation	Tailgate briefings
Insects	Bees, wasps, spiders ticks	Throughout	Identify if any worker is allergic to insects; bee sting kit
Animals	Ground hogs, rabid raccoons, dogs, cats, and rabbits	Throughout	Do not approach any animal
Plants	Poison ivy, poison sumac, poison oak	Specific areas of operation	Identify and do not touch
Weather	Lightning, heavy rain or snow	Throughout	With lightning; cease all activities with heavy equipment; beware of slippery conditions
Noise	Heavy equipment	Specific areas of operations	Utilize hearing protection
Overhead Electrical Equipment	Overhead powerlines, telephone lines	Specific areas with the operation of heavy equipment	Make sure of clearance before raising tower

4.0 HAZARDS EVALUATION

The scope of work associated with the remedial activities involves but is not limited to soil excavation and backfill, soil sampling, and surface and ground water sampling activities at the Site.

4.1 CHEMICAL HAZARDS

To minimize exposure to site personnel from potential chemicals of concern during remedial activities, standard safety procedures will be followed during work activities.

Potential chemical hazards may include:

- Personnel exposure by inhalation, ingestion, and/or skin absorption of toxic metals, or airborne particulate (dust) containing toxic metals;
- Personnel injury by contact with corrosive or irritating chemical contaminants; and
- Off-site migration of airborne chemicals or dusts.

Personnel in the work zones must observe each other for signs of chemical exposure.

Indications of adverse effects include, but are not limited to:

- changes in complexion and skin color;
- changes in coordination;
- changes in demeanor;
- excessive salivation and preliminary response; and
- changes in speech patterns.

Personnel should also inform their Field Team Leader of non-visible effects of overexposure to chemical materials.

The symptoms may include, but are not limited to:

- headaches;
- dizziness;
- nausea;
- blurred vision;
- cramps; and
- irritation of eyes, skin or respiratory track.

4.1.1 Site Monitoring for Chemical Hazards

The primary compounds of concern in the portion of the remedial work areas are metals. Air monitoring and good work practices will be used during intrusive (where site soils are excavated) remedial activities to ensure that appropriate personal protection is used and to minimize potential exposures. Ambient air monitoring equipment to be used during site activities will be selected based on their ability to detect the chemicals of concern.

Airborne particulate concentration levels will be monitored routinely in the breathing zone with an appropriate direct-reading instrument. Minimally, monitoring will be conducted at the initiation of a task. Outdoor ambient air airborne total dust monitoring, in conjunction with field observations, will be used as action level criteria for upgrading or downgrading personal protective equipment and implementing additional precautions or procedures.

The potential risks associated with working in hot weather will also be considered when upgrading levels of protective equipment.

Field monitoring of work activities will be conducted by or under the supervision of the Health and Safety Officer (HSO).

The HSO will properly maintain and calibrate air-monitoring instruments throughout the field activities to ensure their accuracy and reliability.

4.1.1.1 Total Dust Monitoring

Monitoring for total dust will be conducted in the breathing zone of site personnel at intervals recommended by the HSO.

Screening for specific metals will not be performed; rather, the action levels will be based on total dust concentration levels assuming the presence of Hexavalent Chromium has a Permissible Exposure Level (PEL) of 0.01 milligrams per cubic meter. The total dust action level assumes that the background level of metals is close to non-detectable:

SUSTAINED Mini Ram READING IN BREATHING ZONE and ABOVE BACKGROUND LEVEL	RECOMMENDED ACTION
< 100 micrograms per M^3	None
100 to 150 micrograms per M^3	Contact Site HSO
150 micrograms per M^3	Suspend Work/Contact Site HSO

In order to prevent unnecessary upgrading or downgrading, when the total dust concentration level in the breathing zone is close to an action level, the zone will be continuously monitored for several minutes to determine whether or not the exceedence is a temporary fluctuation.

4.1.1.2 Metals Monitoring

Monitoring for metals will be conducted in the breathing zone of site personnel at intervals recommended by the HSO.

Screening for airborne particulate in the breathing zone that have the potential for containing metals will be accomplished using a real-time particulate dust monitor.

4.1.2 Outdoor Ambient Air Monitoring Program

A site outdoor ambient air-monitoring program will be implemented as described below:

- Airborne particulates will also be monitored at various locations along the Site boundary with a portable particulate monitor that have an alarm set at 150 $\mu g/m^3$.

- If particulate levels, averaged over a period of 15 minutes, are greater than 150 $\mu g/m^3$ over the particulate levels at the upwind location, then intrusive activities must be stopped and corrective action taken.

- Site readings will be recorded and be available for NYSDEC and NYSDOH personnel to review.

4.1.3 Chemical Hazard Action Levels

Based upon the OSHA Permissible Exposure Limits (PELs) for the compounds listed in Table 3-1, action levels have been established for activity cessation and the upgrade or downgrade in the level of personal protective equipment (PPE).

These action levels are guidelines; the HSO will have the ability to adjust PPE requirements as appropriate based on field conditions.

Level D protection shall be used at a minimum for intrusive site activities. The PPE requirements for additional protective equipment will be determined by the HSO based on weather and wind conditions, the particular remedial activity, the length of time in one location, potential for exposure and the action levels. Descriptions of the various levels of personal protection equipment are presented in Section 7.0.

4.2 PHYSICAL HAZARDS

To minimize hazards, standard safety procedures will be followed at all times. The primary physical safety hazards for this project include, but are not limited to:

- common slip, trip, and fall hazards;
- excavation and trenching hazards;
- overhead and buried hazards;
- excavator and loader operation;
- electrical and power equipment;
- vehicular traffic;
- lifting excessive weights;
- sampling hazards;
- excessive noise levels;
- heat and cold stress; and
- other hazards.

4.2.1 Common Slip, Trip, Fall Hazards

Personnel should be aware of common slip, trip, or fall hazards, which are encountered frequently in outdoor project environments. Heightened

awareness and emphasis on good housekeeping are the most effective ways to prevent accidents.

4.2.2 Overhead and Buried Hazards

Utility lines, both above and below ground, may pose a safety hazard for site personnel during soil boring or other heavy equipment operations. If overhead utilities have been identified on site as a hazard, the equipment operator must maintain a safe clearance between the lines and the equipment at all times during work operations.

High voltage lines require greater clearance distances.

As a safe work practice, equipment operators will maintain a 20-foot clearance between equipment and power lines or other energized sources unless the source is greater than 350 KV, in which case 29CFR 1910.180(j)(ii) must be applied.

The location of buried utilities lines must be determined prior to the start of work activities. Overhead and buried utility and electrical lines may be a concern during site remedial activities. These concerns will be addressed as part of the daily safety meeting.

4.2.3 Equipment Operation

Operation of earthwork equipment such as excavators and loaders present multiple hazards while in operation. Excessive noise, boom raising, lowering and swing, cable and bucket damage and operator error may result in injuries. To minimize potential accidents, the following safety measures will be required for excavators and loaders and associated equipment operations:

- Operators of equipment used on site will be familiar with the requirement for inspection and operation of such equipment.
- The operator will be required to demonstrate proficiency in safe operation the equipment;
- Excavations shall be performed from a stable ground position.
- If unable to locate on level ground, the excavating equipment shall be appropriately checked, blocked, and braced prior to operation;

- Daily inspections of the remediation work areas shall be made by a person competent in equipment operation safety.

- The inspector shall note the safety of the remediation work area and confirm the location of utilities;

- Before any excavation work is performed, the existence and location of utility lines (electric and gas) will be determined by the appropriate contractor or subcontractor.

- This will be done, if possible, by contacting the appropriate utility company and/or client representative to mark the location of the lines.

- If the knowledge is not available, an appropriate device, such as a cable avoiding tool, will be used to locate the services line(s);

- No ignition sources are permitted if the ambient airborne concentration of flammable vapors exceeds 20 percent of the Lower Explosive Limit (LEL) during equipment excavation activities.

- A combustible gas indicator will be used as needed to make this determination in conjunction with constituent-specific LEL percentages;

- Operations must be suspended and the area evacuated if the airborne flammable concentration reaches 20 percent of the LEL in an area of an ignition source, such as an internal combustion engine or an exhaust pipe;

- Combustible gas readings of the general work area will be obtained as required based on the HSO's determination;

- If excavation equipment is located in the vicinity of overhead power lines, a distance of 20-feet must be maintained between the lines and any point on the excavator; and

- Daily inspection of the remedial equipment must be conducted and documented by the operator prior to each day's operation of the equipment.

4.2.4 Tools - Hand and Power

Hand and power tools may be utilized as part of this remedial activity.

Hand and power tools used during field activities will conform to the standards set both in OSHA 29CFR-1926.300 - 1926.305.

To minimize the potential for any safety related accidents the following measures will be required:

- Hand and power tools shall be maintained in a safe condition;
- Power operated tools shall be equipped with protective guard when in use;
- Hand-held power tools shall be equipped with a constant pressure switch that will shut off the power when the pressure is released;
- Hand tools shall be kept free of splinters or cracks;
- Electrical power tools shall have double-insulated type grounding;
- Electrical cords are not permitted for hoisting or lowering tools;
- Fuel powered tools shall be stopped while being refueled, serviced or maintained; and,
- When fuel powered tools are used in enclosed spaces the ambient air will be measured for oxygen and toxic gases;

4.2.5 Vehicular Traffic

Vehicular traffic in and around the Site may pose a hazard to project personnel. Precaution should be taken when remediation activities make it necessary to work near traveled areas.

4.2.6 Lifting Excessive Weights

Personnel should exercise caution when lifting any object that weighs greater than 60 pounds. For objects, which weigh less than 60 pounds, proper lifting technique is essential to minimize the potential for injury. No excessively bulky objects should be lifted without assistance.

4.2.7 Sampling Hazards

Oversight activities by ERM will consist of collecting soil, surface and ground water samples for analyses and evaluation and the collection of excavated soil samples for classification, transport and disposal purposes.

The hazards of these operations are primarily associated with the sample collection methods and procedures utilized. Potential hazards which may be encountered are described other sections of the HASP.

4.2.8 Excessive Noise Levels

Noise generated by heavy equipment such as excavators may present a hazard during site operations. Excessive noise can physically damage the ear, hinder communications, and startle or annoy the workers.

On-site personnel will wear hearing protection when working near heavy equipment and whenever noise levels have the potential to exceed 85dBA.

4.2.9 Heat Stress

Heat stress is the aggregate of environmental and physical work factors that make up the total heat load imposed on the body. The environmental factors of heat stress include air temperatures, humidity, radiant heat exchange, wind, and water vapor pressure (related to humidity).

Physical work contributes to the total heat stress by producing metabolic heat in the body, proportional to the intensity of work. Heavy physical labor can greatly increase the likelihood of heat fatigue, heat exhaustion, and heat stroke, the latter being a life threatening condition.

Visual observation of personnel for symptoms of heat stress shall commence when the ambient temperature is 80°F (70°F if chemical protective clothing is worn) or above. Frequency of visual observation shall increase as the ambient temperature rises.

Various control measures shall be employed if heat stress becomes a problem. These include:

- Provision of liquids to replace lost body fluids;
- Establishment of a work regimen that allows for rest periods to cool down; and,
- Training workers in the recognition and prevention of heat stress;

Specific steps to implement should ambient air temperatures pose a hazard include:

- Site workers will be encouraged to drink plenty of water throughout the day;
- They will be advised to slightly increase their salt intake by lightly salting their food;
- On-site drinking water will be kept cool (50°-60°F) to encourage personnel to drink frequently;
- A work regimen that will provide adequate rest periods for cooling down will be established as required;
- On-site personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps;
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary;
- A shaded rest area must be provided. Rest breaks should take place in the shaded rest area;
- Employees shall not be assigned to other tasks during breaks; and
- On-site employees shall be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

The signs of heat stress disorders are described below.

Heat Cramps

Heat cramps are caused by work and exercise resulting in periods of heavy sweating and inadequate replacement of electrolyte in body fluids.

Signs and symptoms include muscle spasms and pain in the hands, feet, and abdomen.

Heat Exhaustion

Heat exhaustion occurs from increased stress on various body organs, signs and symptoms include:

- Pale, cool, moist skin;
- Heavy sweating and;

- Dizziness, nausea, and fainting;

Heat Stroke

Heat stroke is the most serious form of heat stress, and should always be treated as a medical emergency. The body's temperature regulation system fails and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs.

Signs and symptoms of heat stroke include;

- Red, hot, unusually dry skin;
- Lack of, or reduced, perspiration;
- Nausea;
- Dizziness and confusion;
- Strong, rapid pulse and confusion; and,
- Coma;

4.2.10 Cold Stress

Cold and/or wet environmental conditions can place workers at risk of cold related illness. Hypothermia can occur whenever temperatures are below 45°F. It is most common during wet windy conditions, with temperatures between 40° to 30°F.

The principal cause of hypothermia in these conditions is loss of insulating properties of clothing due to moisture, coupled with heat loss due to wind and evaporation of moisture on the skin.

Frostbite, another hazard associated with exposure to the cold, is the freezing of body tissue, which ranges from superficial freezing of surface skin layers to deep freezing of underlying tissue. Frostbite will only occur when ambient temperatures are below 32°F. The risk of frostbite increases as the temperature drops and the wind speed increases.

Most cold-related worker fatalities have resulted from failure to escape from work areas with low environmental temperatures, or from

immersion in low temperature water. The single most important aspect of life-threatening hypothermia is a significant decrease in the temperature of the deep core of the body. Site workers should be protected from exposure to cold so that the temperature of the deep core of the body does not fall below 97°F.

Lower body temperatures will very likely result in reduced mental alertness, reduction in rational decision-making, or loss of consciousness with the threat of fatal consequences. To prevent such occurrence the following measures are recommended. Site workers shall wear warm clothing, such as mittens, heavy socks, etc when the outdoor ambient air temperature is below45°F.Protective clothing or coveralls may be used to shield employee from the wind; When the air temperature is below 35°F, clothing for warmth, in addition to chemical protective clothing, will be worn by employees.

This will include:

- Insulated suits, such as whole body thermal underwear;
- Wool socks or polypropylene socks to keep moisture off the feet;
- Insulated gloves and boots;
- Insulated head cover such as hard hat winter liner, or knit cap; and,
- Insulated jacket, with wind and water resistant outer layer.

At ambient air temperatures below 35°F the following work practices are recommended:

- If the clothing of an site worker might become wet on the job site, the outer layer of clothing should be water impermeable;
- If a site worker's underclothing becomes wet in any way, they should change into dry clothing immediately;
- If the clothing becomes wet from sweating (and the employee is not comfortable) the employee may finish the task at hand prior to changing into dry clothing;

- Site workers should be provided with a warm (65°F or above) break area;

- Hot liquids such as soups or warm, sweet drinks should be provided in the break area.

- The intake of coffee and tea should be limited, due to their circulatory and diuretic effects;

- The buddy system shall be practiced at all times on site.

- Any site worker observed with severe shivering shall leave the work area immediately; and

- Site workers should be dressed in layers, with thinner lighter clothing next to the body.

4.2.11 Confined Space

When workers are required to enter an excavation, pit or culvert that has been determined to be a permit-required confined space, the following Permit-Required Confined Space Entry program shall be implemented and utilized for employee entry into and work in these spaces (see Appendix A).

5.0 PERSONNEL RESPONSIBILITIES

A Health and Safety Management Team has been developed for the remedial site activities. The following responsibilities will be assigned to designated project personnel for all activities.

The Field Team Leader (FTL) will be ERM Project Manager Mr. David Myers, who will act in a supervisory capacity over the employees who participate in the remedial activities specified in this work plan. The FTL is responsible for ensuring that ERM Health and Safety responsibilities as identified in this document are carried out in conjunction with the work plan. As part of these responsibilities, the FTL will distribute the HASP to the field team personnel and discuss the HASP prior to the start of remedial activities.

Field personnel will sign the Health and Safety Plan Review Record shown on page 5-3 of this section, verifying that they have read and are familiar with the contents of this HASP.

The Health and Safety Officer (HSO) Mr. Michael Nigro, will be responsible for oversight, implementation and compliance of applicable health and safety regulations on-site. The HSO has the following authority and responsibilities:

- responsibility for the field implementation, evaluation, and any necessary field modifications of this HASP;
- responsibility for maintaining adequate supplies of personal protective equipment as well as calibration and maintenance of HASP monitoring instruments;
- authority to suspend field activities due to imminent danger situations;
- responsibility to initiate emergency response activities;
- presentation and documentation of field safety briefings;
- maintain daily log of on-site safety activities; and
- oversight of health and safety practices of GSP and ERM subcontractors.

While at the Site, ERM through the HSO will oversee the health and safety measures followed by site personnel.

Contractors and their sub-contractors will be provided a copy of this HASP and will be informed of health and safety concerns, as well as environmental monitoring data collected during remedial activities.

This information will be shared with the subcontractors to assist them in implementing the appropriate health and safety measures. However, ERM is not responsible for the health and safety of subcontractors or other site or facility personnel that are on site.

HEALTH AND SAFETY PLAN REVIEW RECORD

I have read the Health and Safety Plan for the GSP facility and have been briefed on the nature, level, and degree of exposure likely as a result of participation in this project.

I understand the requirements in the Health and Safety Plan for the Site and this project.

_____ _____

Employee Signature Date

_____

Printed Name

_____ _____

Field Team Leader Signature Date

_____

Printed Name

6.0 PERSONAL PROTECTIVE EQUIPMENT

6.1 PURPOSE/APPROACH

A critical aspect of investigation field crew safety is appropriate personal protective equipment (PPE). PPE refers to the types of footwear, headwear, eyewear, hearing protection, coveralls, gloves and respiratory protection each individual will wear while performing a specific task(s) and exposed to a particular chemical(s) at a given concentration(s).

The levels of PPE are commonly referred to as Level D, Level C and Level B; with Level D requiring the least amount of PPE and Level B the most.

The HSO will decide when it is necessary to upgrade, downgrade or modify the existing level of protection based on field monitoring and action levels described in Section 4.0. The HSO will make entries in the health and safety field book detailing each days PPE, task and if the level of PPE is modified, the reason for each change.

Remediation field activities will be performed as a minimum in Level D.

Each level of PPE requirements may be modified by the HSO as needed. The different levels of PPE and equipment required at each level are described in the following sections and are based on 29 CFR 1910.120.

6.2 LEVEL D PROTECTION

Level D PPE consists of the following:

- Coveralls or a work uniform affording protection for nuisance contamination;
- Chemical resistant gloves at a minimum;
- Steel-toe, steel-shank work boots;
- Safety glasses;
- Hard hat (May be exempt by HSO);

Optional Equipment or as Required by the HSO

- Disposal outer boot;

- Hearing protection;
- Disposable outer chemical coveralls;

6.3 LEVEL C PROTECTION

Level C PPE consists of the following:

- Full-face air purifying respirator (APR) equipped with appropriate HEPA filters cartridges (personnel requiring respiratory protection must be "fit-tested" with the respirator model to be used in the field); HEPA filters in combination with VOC cartridges will be available and utilized as warranted by site conditions;

- Powered air purifying respirators may be utilized if specified by the HSO;

- Only with the approval of the HSO can half-mask air purifying respirators be donned;

- Chemical-resistant clothing such as Tyvek®, poly-coated Tyvek® or Saranex®;

- Suits will be hooded and one piece with booties and elastic wrist bands;

- Outer chemical-resistant (recommend nitrile or neoprene) gloves and inner latex surgical gloves;

- Steel-toe, steel-shank work boots with rubber overboots;

- Hard hat (may be exempt by HSO);

Optional Equipment as Required by the HSO

- Escape SCBA;

- Hearing protection;

6.4 LEVEL B PROTECTION

Level B PPE consists of the following:

- Self-contained breathing apparatus (SCBA) in a pressure demand mode, or supplied air with escape SCBA in the pressure demand mode;

- Chemical-resistant clothing such as poly-coated Tyvek® or Saranex®. Suits will be hooded and one piece with booties and elastic wrist bands;

- Chemical-resistant (recommend nitrile or neoprene) outer gloves and inner latex surgical gloves (both chemical resistant);

- Steel-toe, steel-shank work boots with rubber overboots;

- Chemical-resistant tape over protective clothing (as necessary);

- Hard hat (may be exempt by HSO);

7.0 SITE OPERATION AREAS AND DECONTAMINATION

Site operation areas will be formally set up for field activities associated with the excavation of soils from the RDA, the GSP-Swale, the BSS-Swale and the interior of the facility. Note: If the HSO identifies any additional areas during remediation activities, which should be covered by this portion of the HASP, the HSO has the authority to implement the required protocols and procedures.

Personal decontamination procedures will be closely adhered to upon entering or leaving work performed in the AOC areas. Section 7.1 describes the three zones used to control site operation areas and Section 7.2 describes decontamination procedures.

7.1 SITE OPERATION AREAS

A three-zone control system will be used during work and excavation activities in the AOC areas. The purpose of the zones is to control the flow of personnel to or from potentially contaminated work areas.

Guidelines for establishing work areas and support zones are as follows:

Exclusion Zone (EZ): Primary exclusion zones will be established around each area being excavated and, at a minimum, this zone will radiate to a distance of 25 feet from the point of operations. Appropriate personal protective equipment must be worn in this zone.

This zone will be separated from the contaminant reduction zone by cones or barrier tape to prevent personnel from entering the exclusion zone boundary without appropriate protective equipment or leaving without proper decontamination.

Contaminant Reduction Zone (CRZ): The CRZ is the transition area between the EZ and the Support Zone (clean area). Personnel and equipment must be decontaminated in the CRZ upon exiting the EZ and before entering the Support Zone. The CRZ will be set up along the perimeter of the EZ at a point upwind of field activities.

Support Zone (SZ): The support zone is considered to be uncontaminated; as such, protective clothing and equipment are not required but should be available for use in emergencies. Equipment and materials are stored and maintained within this zone. Protective clothing is donned in the support zone before entering the contaminant reduction zone.

7.2 DECONTAMINATION GUIDELINES

In the situation where work areas are controlled using the three-zone concept, site personnel must exit the EZ through an established CRZ. At a minimum, site personnel leaving the point of operations should wash outer gloves and boots, if applicable. The outer boots shall be first washed and removed and then either stored in an appropriate area or disposed of properly. If worn, personnel shall then remove and dispose of their chemical resistant coveralls with care so that inner clothing does not come in contact with any contaminated surfaces.

After chemical resistant coverall removal, personnel shall remove and clean gloves, inspect the gloves, and discard if damaged. Personnel shall then remove the respirator, when applicable. Respirators shall be disinfected between usages by utilizing sanitization methods.

Potable water, at a minimum, will be present so that site personnel can thoroughly wash hands and face after leaving the point of operations.

Decontamination of equipment used in the AOC areas will be as follows:

1. *Heavy Equipment* - The excavator and/or front-end loader and associated tools will be steam cleaned upon arrival and at the complete of excavation activities in the SEAOC area.
2. If necessary, equipment will be scrubbed manually to remove heavy soils prior to steam cleaning.
3. Water and soil/sediment generated during decontamination activities will be collected, stored and profiled by ERM for proper disposal.

4. *Sampling Equipment (e.g., knives, hand-auger, bowls, and bailers)* - Non-disposable sampling equipment will be cleaned before each use by washing with solutions in the following order:

    - phosphate-free detergent wash;
    - potable water rinse;
    - distilled water rinse;
    - air dry;
    - wrap in aluminum foil until use.

The potable water will be obtained from a municipal water source. Heavily contaminated tools may also have to be steam cleaned. After the final rinse with distilled water, equipment will be wrapped in aluminum foil and stored in a clean area until use.

5. *Meters and Probes* - Meters and probes that are used in the field will be decontaminated between uses by triple-rinsing with distilled water.

7.3 MANAGEMENT OF GENERATED WASTES

Wash and rinse waters, discarded health and safety equipment, and discarded sampling equipment will be segregated by waste stream and managed according to appropriate NYSDEC guidance. Waste generated for disposal will be placed in appropriate drums and containers. These containers will be properly labeled, and stored in a secure area on site while arrangements are made for disposal.

8.0 SITE ACCESS AND SITE CONTROL

Access to site activities will be limited to authorized personnel, and should be coordinated with the Site owner. Such authorized personnel include GSP, ERM employees, subcontractors, and other personnel as deemed appropriate by the Site owner.

However, access into the established contaminant reduction and exclusion zones will be limited to those authorized personnel with required certifications and wearing appropriate personal protective equipment.

The exclusion zones will be monitored by the HSO to ensure personnel do not enter without proper personal protection equipment.

9.0 EMERGENCY RESPONSE

In the event of an emergency, the FTL will coordinate response activities, unless the HSO is on-site. Appropriate authorities will be notified immediately of the nature and extent of the emergency.

Table 9-1 provides emergency telephone numbers that will be posted within the support zone or any other visible location. Directions to the nearest hospital are also included on Table 9-1.

9.1 RESPONSIBILITIES

The FTL will be responsible for initiating response to emergencies, and will:

1. Notify appropriate individuals, authorities, and health care facilities of the activities and hazards of the field activities.

2. Ensure that the following safety equipment is available at the site: fire extinguisher, eyewash station and first aid supplies.

3. Have working knowledge of safety equipment available at the site.

4. Ensure that a map, which details the most direct route to the nearest hospital, is present with the emergency telephone numbers.

5. For a release incident, determine safe distances and places of refuge.

9.2 ACCIDENTS AND INJURIES

In the event of a safety or health emergency at the Site, appropriate emergency measures will immediately be taken to assist those who have been injured or exposed and to protect others from hazards.

The FTL and HSO will be immediately notified and will respond according to the seriousness of the injury.

9.3 SITE COMMUNICATIONS

Telephones (either temporary landlines or cellular) will be located prior to the start-up of field activities, and will be used as the primary off-site communication network. Radios will be used as needed to provide communication for on-site personnel.

TABLE 9-1

EMERGENCY CONTACTS

ERM Health and Safety Manager:
Ernest Sweet..... (315) 445-2554
ERM Project Director:
Ed Hinchey..... (315) 445-2554
ERM Project/Site Manager:
David W. Myers ..... (518) 461-8936
ERM Site HSO/Construction Oversight
Michael Nigro..... (315) 546-5341
General Super Plating Co., Inc.:
Tom Gearheart..... (315) 446-2264
General Super Plating Co., Inc.:
Woody Southwell..... (315) 446-2264 x 26
General Super Plating Co., Inc.:
Jean Jodoin ..... (315) 247-5298
NYSDEC Project Manager:
Kevin Kemp ..... (315) 426-7464
Ambulance (Rural Metro Medical Services) ..... (315) 471-4141
Hospital (St. Joseph's Hospital) ..... (315) 448-5111
Fire Dept. (Syracuse Fire Department) 911
Police (City of Syracuse) 911
NYSDEC Spill Hotline..... 1-800-457-7362

Directions to St. Joseph's Hospital:

Go west on Celi Drive to Bridge Street, turn right onto Bridge St and travel for 0.5 miles to entry ramp for I-690 west.
Turn left off of Bridge St onto ramp for I-690 west and travel 0.9 miles on entry ramp.
At exit 16S on I-690 entry ramp, take left ramp to I-690 west and travel 2.9 miles.
On I-690 west, at exit 13, turn right onto off ramp for Townsend St.

At light at Townsend St, turn right onto North Townsend St and travel 0.3 miles to intersection of Townsend St and Union St.
Turn left (west) onto Union Street from Townsend St and travel 120 yards to the intersection of Union St and Prospect Avenue.
St. Joseph's Hospital is directly ahead and located at 301 Prospect Avenue.

A route map will be supplied to applicable field personnel from Celi Drive to St. Joseph's Hospital

9.4 RESPONSE EVALUATION

The effectiveness of response actions and procedures will be evaluated by the HSO. Improvements will be identified and incorporated into this and future plans.

10.0 ADDITIONAL SAFETY PRACTICES

The following are important safety precautions, which will be enforced during the remedial activities:

1. Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases that probability of hand-to-mouth transfer and possible toxic ingestion of material is prohibited in any area designated as contaminated by the HSO.

2. Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activity.

3. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.

4. No facial hair that interferes with the effectiveness of a respirator will be allowed on personnel that must wear a respirator. The respirator must seal against the face so that the wearer receives air only through the air purifying cartridges attached to the respirator. Fit testing shall be performed prior to each usage of a respirator to ensure the wearer obtains a proper seal.

5. Even when wearing protective clothing, contact with potentially contaminated surfaces should be avoided whenever possible. One should not walk through puddles, mud, or other discolored surfaces; kneel on ground; lean, sit or place equipment on drums, containers, vehicles, or the ground.

6. Medicine and alcohol can enhance the effect from exposure to certain compounds. Personnel involved in the project will not consume alcoholic beverages during work hours. Personnel using prescription drugs during the project may be precluded from performing specific tasks (e.g. operating heavy equipment) without authorization from a physician.

7. Personnel and equipment in the work areas will be minimized.

8. Procedures for leaving the work area will be planned and implemented prior to going to the site. Work areas and decontamination procedures will be established on the basis of prevailing site conditions.

9. Respirators will be issued for the exclusive use of one worker and will be required to be cleaned and disinfected after each use.

10. Safety gloves and boots shall be taped to the disposable, chemical-protective suits as necessary.

11. Cartridges for air-purifying respirators in use will be changed daily at a minimum.

Appendix A

Excavation, Trenching, Shoring

EXCAVATION, TRENCHING, SHORING

The main concerns of trenching and excavation are ground control and fall prevention. Before an excavation is made, a thorough effort shall be made to determine whether underground utilities (such as sewer, telephone, gas, fuel, water or electrical conductors) or aboveground hazards may be encountered. Underground utility lines shall be properly supported during excavation. Where appropriate, the respective utility companies shall be informed of the proposed Site Work and consulted to receive any additional advice based on their experience. Natural hazards, such as boulders and trees, shall be removed or controlled before excavation begins if there is a potential hazard to workers.

Very specific guidelines exist to protect employees from uncontrolled ground movement during excavation. The guidelines are based on ground type and excavation depth. The walls and faces of all excavations to which employees are exposed shall be guarded by a shoring system or sloping of the ground. All slopes shall be excavated to the degree required in Table P-1, which is based on soil type and the ground's unique ability to slide (see Table P-1). Soil types are based on cohesiveness (exhibiting cohesion). A cohesive soil is one that is hard to break up when dry and exhibits significant cohesion when submerged. Soil types may be defined as:

Stable Rock - natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

Type A soil - Soil that has an unconfined compressive strength of 1.5 tons per square foot (tsf). This includes cohesive soils such as clay, silty clay, sandy clay and clay loam. No cohesive soil is Type A if:

- soil is fissured;
- subject to vibration;
- has been previously disturbed;
- part of a sloped, layered system which dips into the excavation on a slope of four horizontal to one vertical; and
- other factors require it to be classified otherwise;

3. Type B Soil - Soil that is a cohesive soil with an unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf. This includes all soils classified as silt, angular gravel, silt loam, sand loam and all type A soils previously disturbed. Dry rock that is not stable will be considered type B soil. Soil as well as material that is part of a layered system where the layers dip into the excavation on a slope less than four horizontal to one vertical, but only if material is classified as type B.

4. Type C Soil - Soil, which has an unconfined compressive strength of 0.5 tsf or less.

   Type C soil includes:

   - Granular soils including gravel, sand or loamy sand;
   - Submerged soil or soil from which water is freely seeping;
   - Submerged rock which is not stable;
   - Material in a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical or steeper;

Each soil and rock deposit shall be classified by a competent person as stable rock or one of the soil types described above.

The Contractor shall ensure that a competent person is assigned to the Site during all excavating activities, i.e., sloping, shoring or working within excavations.
A competent person is defined as one who is capable of identifying existing and predictable hazards, or working conditions, which are unsanitary, hazardous or dangerous to employees, and has authorization to take prompt corrective measures to eliminate them.
The Contractor shall identify the competent person and submit the competent person's qualifications to the FTL.
A competent person shall perform daily inspection of excavations and adjacent areas. Inspections shall be concerned with possible cave in, failure of protective systems, hazardous atmospheres or other hazardous conditions.
Where a competent person finds evidence of such hazards, Contractor employees shall be evacuated from the excavation until the unsafe condition is corrected.

Vibrations from nearby railroad, highway traffic or heavy equipment requires the side of the excavation to be braced to resist the additional force from such loads.
A warning system shall be in place when movable equipment is operated next to an edge of an excavation and the operator does not have clear or direct view of the edge.
Warning systems may be barricades, hand or mechanical signals or stop logs.

No entry into an excavation in which there is accumulated water will be allowed unless adequate precautions are taken.
Safety harness with attached line shall be worn at all times in excavations over four (4) feet.
Precautions include the removal of water by pumps and the diversion of any surface water by berms, dikes, ditches or plastic sheeting.

If excavations are to be performed near a wall or building and may compromise its stability, a registered professional engineer shall evaluate the wall or building and ensure its stability accordingly.
Stability may be achieved by designing a bracing system if necessary.
If bracing is not necessary, the registered professional engineer shall indicate in writing a bracing system is not required.

Excavated material shall be kept at least two feet from the edges of all excavations.

Excavations less than 20 feet in depth occurring in type C soil may be sloped at an angle no greater than 34 degrees measured from the horizontal plane.
Excavations less than 20 feet in depth occurring in type B soil may be sloped 45 degrees measured from the horizontal plane.
Sloping of excavations greater than 20 feet in depth must be approved by a registered professional engineer.

The Contractor may use tabulated data for slope design. The tabulated data must be in written form and shall include identification of the parameters, limits of use, and identify the New York State registered professional engineer (PE) who approved the data.
A copy of the tabulated data identifying the New York State registered PE will remain on-Site during construction activities.
A sloping system designed and approved by a New York State registered PE may be utilized.
The written design must illustrate the magnitude of the slope considered safe based on the project.

A copy of the approved written design must remain on the job Site until final completion.

Shoring systems, support systems, shield systems and other proactive systems may be used providing such systems are approved by the manufacturer, or by a New York State registered PE using the manufacturer's tabulated data.
Deviations from those specifications outlined by the manufacturer or New York State registered PE shall only be made following specific written approval.

If initiated, shoring systems shall be utilized for type B soils at a depth of 5 feet or greater and immediately for type C soils.
Shoring systems shall be designed by a manufacturer, a New York State registered PE or be consistent with Attachment 1 of this Appendix (OSHA Minimum Timber Shoring Requirements).
All shoring systems used at a depth of 20 feet or greater require approval from a New York State registered PE.

In excavations greater than 4 feet in depth, ladders must be located every 25 feet and extend three feet over the surface.

Any excavation activities below the ground water table shall be examined and approved in writing by a New York State registered PE.

TABLE P-1
Maximum Allowable Sloping Requirements*

Type	Maximum Allowable Slope
Stable Rock	Vertical (90˚)
Type A	3/4:1 (53˚)
Type B	1:1 (45˚)
Type C	1-1/2:1 (34˚)

* Sloping for excavations greater than twenty feet in depth shall be designed by a New York State registered professional engineer.

Appendix B

Permit-Required Confined Space Entry

CONFINED SPACE PERMIT REQUIRED ENTRY

1.0 Application

This policy sets forth the accepted practice for entry into a confined space and establishes the requirements for administering its procedure. This procedure applies to ERM, Inc. (ERM) employees who may be working in a confined space area. ERM personnel are prohibited from entering any confined space as described below without authorization from a qualified member of the ERM Health and Safety group.

2.0 Purpose

The intent of this procedure is to provide information and guidance to ensure that a consistent, safe approach is instituted each time a confined space is entered. Confined spaces are those areas that are large enough to enter and perform work, have limited means for entry or exit, and are not designed for continuous occupancy. It is very important that personnel understand their role during confined space entry operations due to the significant and numerous hazards posed by such activities.

3.0 Authority

This policy is based on The Occupational Safety and Health Administration's (OSHA) standard (Title 29, Section 1910.146), regulating entry into confined spaces.

The confined space entry permit will be kept in the project file for a period of one year

4.0 Confined Space Entry

There are certain characteristics of confined spaces that must be recognized and/or evaluated in order to enter such spaces properly.

General confined space characteristics include:

- Areas that are large enough for an employee to enter and perform an assigned job;
- Has limited or restricted means to enter or exit; and
- Is not designed for continuous occupancy;

The OSHA standard focuses on those confined spaces that require an entry permit due to the hazards posed by the operation. A Permit-Required Confined Space has any of the following, additional characteristics:

- Contains or may contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an entrant;
- Is configured in a way that could trap or asphyxiate an entrant; and
- Contains any other recognized serious safety or health hazard;

Some examples of a permit-required confined space may include storm and sanitary sewers, sumps, tanks, or any number of similar spaces.

The determination of general and permit required confined spaces will be made by a qualified member of the ERM Health and Safety group.

If the only hazard posed by a permit-required confined space is an actual or potential hazardous atmosphere, and this hazard can be eliminated by continuous forced air ventilation alone, then this space can be considered to be a low-hazard confined space.
If there are no hazards posed by the confined space, then this space can be considered to be a non-permit confined space.

The standard requires an evaluation of the workplace and identification of permit-required confined spaces. The existence and location of these spaces, and the dangers they pose, must be known to exposed employees.

A qualified ERM Health & Safety Group member must be contacted to determine the appropriate confined space designation and appropriate confined space entry procedures.

5.0 Entry Permit Program

The OSHA standard also requires a written program for entry into permit-required confined spaces. This ERM Confined Space Entry Program, in conjunction with the site-specific Health & Safety Plan, satisfies this requirement. The program includes the following elements:

- Preventing unauthorized entry — such as the use of covers, guardrails, fences, locks, or whatever means are necessary;
- Identifying and evaluating hazards before entry — such as hazardous atmospheres, engulfment hazards, hazardous energy sources, introduction of hazardous chemicals, or hot work;

- Implementing safe entry procedures; and,
- Specifying acceptable entry conditions (for example, carbon monoxide level <35 PPM);

Action levels will be included within the health and safety plan. If there are any questions about these levels or the use of them, the field team leader shall contact a qualified member of the ERM Health & Safety Group.

- Isolating the space (for example, lockout/tagout, line breaking, etc.) ERM personnel shall not be responsible for isolating the space. This is the responsibility of the client;
- It is, however, the responsibility of the ERM field team leader to ensure that the isolation has taken place and that a review of the isolation procedure has been conducted with the client;
- Purging the space to control atmospheric hazards the safest method of space purging is natural ventilation. If this method is not possible, an electrical or gasoline-powered ventilation fan can be used;
- Potentially explosive atmospheres must not be pulled through the ventilation fan unless the fan is designated as explosion-proof;
- Ideally, positive ventilation should be used. This involves fresh air pumped into the space and the contaminated air exhausted out;
- Providing barriers to protect entrants from external hazards the field team leader will ensure that consideration has been given with regard to the entire confined space, not just the entrance;
- The field team leader and/or site safety officer will fully investigate potential hazardous conditions;
- At the entrance, caution tape and/or traffic cones will be placed to prevent unauthorized entry near the entrance;.

- If an entrance cover is removed, the opening will be guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening;
- Heavy equipment, such as front-end loaders and trucks will be prohibited from the confined space vicinity;
- In addition to verifying acceptable entry conditions throughout entry (periodic inspections and atmospheric testing), a qualified member of the ERM Health & Safety Group must ensure that the proper equipment is on-site and that the on-site user of the equipment has had the proper training in the use of the equipment;

- The field team leader must ensure that the equipment is in operational condition, that the equipment has been calibrated, and that the equipment is being used correctly;
- Providing necessary equipment for testing and monitoring on-site personnel will have, at a minimum, the following monitoring instrument;
- Oxygen meter;
- Combustible gas indicator;
- Toxic gas monitors for anticipated contaminants in addition to having the piece of equipment on-site, the field team leader will also ensure that appropriate calibration span gas and equipment, and equipment instructions are included; and
- Ventilating - where necessary, ventilation equipment will be used to flush contaminated air out of the space;
- The ventilation equipment will not be used to pull air through the fan unless it has been certified explosion- proof;
- If ventilation equipment is not available and the atmosphere is suspected to be hazardous, supplied air respiratory protection will be used;
- Under no circumstances will entry into a confined space where combustible gases exceed 10% of the lower explosive limit be allowed;

Communicating

The entrant and the attendant must have at least one method of communicating while confined space operations are in progress. Methods of communication include the following:

- Speaking;
- Two-way Radio;
- Hand signals;
- Horn or other audible signals;
- Light signals;
- Life line tugs;
- Written message;

During confined space operations brevity of message is one of the best ways to improve communications. In spoken communication, this is

accomplished by avoiding unnecessary words and by using a standardized set of words and phrases.

The use of two-way radios can cause a frustrating, ineffective communication between the entrant and the attendant.

Some methods that may be helpful include:

- The person called is always followed by the person doing the calling; For example: "Attendant, this is entrant."
- The word "over" can be used at the end of a transmission to denote the end of that transmission. This lets the receiver know when the sender has stopped speaking and is waiting for a reply. This also prevents dual transmission, in which communication breaks down;
- The word "out" can be used to indicate the end of the conversation. This prevents either party from needlessly waiting for additional transmissions;
- Speak slowly, loudly, and clearly. It may seem uncomfortable to speak in such a manner, but the message has a much better probability of being understood;
- Try to reduce the number of words, thereby reducing the probability of the message being misunderstood; For example, the message, "The water level is down as far as we can get it; go ahead and shut down the pump - over," becomes, "Stop pump - over."

Personal Protection

A health and safety plan must be completed for remedial fieldwork.

If the confined space operation is not already a part of the health and safety plan, it must be included as an attachment to the plan, addressing the confined space entry operation.

Within the plan, there will be a list of PPE required. The entrant must be equipped with applicable PPE.

Lighting

Lighting will be either external to the confined space, or configured in such a way as to prevent accidental breakage.

If the atmosphere has the potential to be explosive, the lighting equipment must be explosion-proof.

Ingress/egress

The confined space entrant may enter the space only when given permission by the field team leader.

The field team leader must ensure that the HSO has been contacted for guidance.

If a confined space entry permit is required, the field team leader will ensure that no entry is made until all appropriate checks have been accomplished in accordance with the confined space entry permit.

During egress, the attendant will assist the entrant by preventing airline hoses, wire life lines, electrical chords, and other encumbrances from cluttering the egress route or snagging as the entrant leaves the confined space.

Rescue and Emergencies

Only trained and authorized employees may attempt a rescue which necessitates confined space entry.

The attendant **may not** enter the space to attempt a rescue unless the attendant has been trained and certified in confined space entry rescue, is wearing appropriate personal protective equipment, **and has been properly relieved as attendant.**

ERM has available rescue equipment consisting of a full body harnesses, a tripod, and a winch assembly.
This retrieval equipment, when properly used, is designed to effect a rescue in a vertical confined space.
Because of the serious personal injury that may result with the inappropriate use of this equipment, only trained personnel are authorized to use the rescue equipment.

5.1 Training and Duties of the Entry Supervisor

Personnel who authorize entry into permit-required confined spaces, known as "Entry Supervisors," must ensure proper procedures are followed prior to and during confined space operations.

Additionally, these individuals must remain aware of ongoing conditions during operations so that appropriate decisions can be made.

Supervisors must receive training and instruction in their duties and responsibilities regarding confined space entry. The following are assigned duties:

- Ensure entry permit is completed and accurate;
- Ensure proper procedures and equipment are used;
- Monitor conditions during the confined space operations for changes that would affect entrants;
- A change in condition may require the Entry Supervisor to halt operations and remove entrants from the confined space until hazards are controlled;
- Evaluating conditions when entry operations are conducted;
- Testing to determine if acceptable entry conditions exist before entry is authorized;
- Testing to determine if acceptable entry conditions exist throughout the entry;
- Closeout the permit and return the confined space to its intended use;
- Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin;
- The entry supervisor will be designated in the site-specific health and safety plan;

5.2 Training and Duties of Authorized Entrants

Entrants must have training and instruction in their duties and responsibilities regarding confined space entry.

The following are assigned duties:

- Identify and evaluate hazards which may be present prior to and during a confined space operation;
- Review the job at hand with each member of the confined space entry team prior to entry;
- Maintain contact and communications with the attendant;
- Use the personal protective equipment provided;

- Maintain awareness of all external barriers required to protect from external hazards, e.g., blanking, blocking, lockout, etc., and the use of those barriers;
- Review entry operations when there is reason to believe existing measures may not protect entrants;
- Obey evacuation orders given by either the attendant, automatic alarm activation, or when self-perceived;
- Entrants will be designated in the site-specific health and safety plan;

5.3 Training and Duties of Attendants

Attendants are the critical link between those entering the confined space and those outside the confined space who would provide necessary assistance in the event of an emergency.
Attendants must have training and instruction in their duties and responsibilities regarding confined space entry.

The following are assigned duties:

- Continuously monitor the progress of the confined space operation to ensure the safety of the entrants;
- In the event of an emergency, the attendant must resist the urge to rescue entrant personnel until additional assistance arrives on the scene;
- **Attendants DO NOT enter a confined space and attempt rescue unless additional personnel are on hand and the attendant is trained to do so!;**
- Recognize hazards and take corrective action;
- Order evacuation of the confined space if an uncontrolled hazard develops, either within or outside the space, or upon observing a behavioral effect of hazard exposure among entrants;
- Keep unauthorized personnel away from the permitted confined space work area. Entrants are to be informed of any unauthorized personnel entering the confined space;
- Entrants will be designated in the site-specific health and safety plan;

5.4 Atmospheric Testing

Prior to entering any confined space and/or prior to removing any covering (e.g., manhole covers), the confined space atmosphere must be

monitored for combustible gases, oxygen levels, and toxic vapors or gases.

The following is the sequence and acceptable air quality criteria that testing must follow:

- Oxygen content (19.5-23%) for all confined space entry;
- Combustible gas levels below 10%;
- Contaminate concentrations at or below PEL/TLV where compound is known (SCBA are required where compounds are unknown) or where contaminant concentrations exceed the capacity of air purifying respirators;

Those identified confined space areas having the potential for oxygen deficient, combustible, or toxic atmospheres will require that levels be measured and recorded on the Confined Space Entry Permit.

ERM personnel calibrate field-monitoring equipment in accordance with manufacturers' instructions.

The field team leader will ensure that the organic vapor meters has been calibrated within the past 3 weeks and that the combustible gas indicators have been calibrated within the past month.

The Photovac Microtip is cleaned and charged prior to issue.

The field team leader shall ensure that the instrument is calibrated in the field using the appropriate span gas.

Calibration information will be noted, at a minimum, in the field team leader's field book.

6.0 Personal Protective Equipment and Emergency Equipment

The supervisor authorizing entry into a confined space (entry supervisor) is responsible to ensure that appropriate personal protective equipment (PPE) is available at the site and that it is used when necessary.

PPE includes:

- respiratory protection;
- protective clothing;
- head protection;
- eye and face protection;

- hearing protection;
- body harnesses and associated retrieval equipment and retrieval lines;

Two major types of respiratory protection equipment are available from ERM; air purifying and air supplying.

Air-purifying respirators include disposable and non-disposable cartridge or filter-type respirators. These units filter out contaminants and allow the user to breathe filtered air.

Air-purifying respirators can be worn in a confined space to filter out contaminants, but only after the atmosphere has been tested and is found to be within the limits of the respirator (i.e., half-face is allowed up to ten times PEL).

Remember the limitations of the air-purifying respirators does not permit them to be worn in an oxygen-deficient atmosphere, to be used if excessive concentrations of toxic gases or vapors are present, to be worn in conditions that are immediately dangerous to life or health or IDLH, and they should not be worn during most rescue operations.

If oxygen deficiency, high concentrations of toxic gases and vapors, or excessive dusts exist in a confined space, supplied-air respirators must be used.

Supplied-air respirators provide the user with a constant supply of breathing air.

Supplied-air respirators available include self-contained Breathing Apparatus (SCBA) and airline respirators equipped with escape bottles.

Supplied-air respirators provide the highest level of respiratory protection for entry

7.0 CONCLUSION

Confined space fatalities and injuries are, for the most part, preventable.

The most important step in fatality and injury prevention is hazard recognition.

Remedial field personnel must be able to recognize a confined space entry situation and contact the Site HSO for further instruction.

Since every situation is unique, this confined space policy has not attempted to address every conceivable possibility.

It is imperative, then, that the field team's senior member work closely with the Site HSO to ensure that proper entry procedures are followed.

Project schedules, budget limitations, and worker convenience will never take higher priorities than worker safety.

Failure to comply with the provisions of this confined space entry policy are grounds for immediate dismissal from ERM.

Appendix C
Subsurface Clearance

1.0 SUBSURFACE CLEARANCE

1.1 Introduction

The purpose of subsurface clearance is to prevent injury to workers and damage to subsurface structures during ground disturbance activities. Examples of subsurface structures and types of ground disturbance are provided below.

Subsurface Structures - Examples	Ground Disturbance Activities
Tanks	Drilling
Pipelines	Augering
Water lines	Direct-push drilling
Natural gas lines	Excavation
Electrical lines	Trenching
Fiber optic telecommunication lines	Driven posts, stakes, or poles
Sewers	Grading

This procedure provides guidelines for subsurface clearance activities associated with ground disturbance activities managed by ERM at project sites. Special care should be taken in urban and old industrial areas. All steps taken to ensure safe subsurface activities should be carefully documented. Information about subsurface obstacles provided by third parties should be put in writing. The third party should sign such documentation, which should specify that ERM has the right to rely on it. Do not rely on oral communication.

1.2 Contractual Considerations

The level of ERM's contractual responsibility for subsurface clearance depends on the terms of the relevant contract documents. With the assistance of ERM's Legal Department, clearly define contractual and legal responsibilities associated with ground disturbance before site work begins. If ERM is not working under its standard terms and conditions, ERM should include language such as the following in its contract with the client*: "Prior to any boring, drilling and/or excavation work being commenced by ERM or its subcontractor, Client shall provide the specific location(s) of such work and identification of any underground obstructions or utilities. If Client is unable to provide ERM with specific locations of concealed or underground utilities, installations or other obstacles, Client shall be responsible for, and shall indemnify and defend ERM against, any harm or injury resulting from contact with same."*

When hiring any subcontractor to perform subsurface activities, use ERM's standard form subcontract for drilling services, or, if the subcontractor will be performing other services, the standard form subcontract for professional services and field work. Although ERM has a responsibility to its client to prevent incidents at the worksite,

ERM should never accept contractual liability for the health and safety of any subcontractor.

1.3 ERM Designated Person/ Quality Assurance Role

Regardless of the contractual provisions, ground disturbance activity must be performed safely. ERM's PM will assign a "Designated Person" role. This person will be aware of the subsurface work being performed on the site by any subcontractor hired by ERM.

Where ERM has directly engaged the subcontractor performing subsurface work, the Designated Person should monitor the subcontractor's work and should require that the subcontractor immediately stop work if the subcontractor is engaging in unsafe subsurface clearance conditions or is not conducting the subsurface clearance activities in accordance with the scope of work and health and safety plan.

ERM's Project Manager assumes or may delegate the role of Designated Person to an experienced person for subsurface clearance activity done by ERM or its subcontractor. The PM will be responsible for following this subsurface clearance guideline and overseeing successful completion of ground disturbance activities associated with the project. The PM or the PM's Designated Person is responsible to coordinate the following tasks:

Designated Person's Responsibilities
• Document, review and approve the results of the preliminary activities that are required prior to ground disturbance activities (see Section 10.1.4) • Notify any subcontractors if any preliminary activities are not performed or if there are any unsafe conditions or circumstances • Ensure the selection and use of trained and experienced ERM pre-qualified subcontractors. • Direct notification, emergency response, and abatement activities in the event that a subsurface structure is encountered or damaged during ground disturbance activities.

1.4 Health and Safety Plan

A Health and Safety Plan (HASP) must be developed prior to initiating all field activities. The HASP should include the following information associated with ground disturbance activities:

Health and Safety Plan – Ground Disturbance Requirements
• Define potential issues associated with ground disturbance and underground utilities.

- Identify emergency shut-off for underground utilities.
- List preventative measures to be used to preserve employee and subcontractor health and safety.
- List emergency response resources with telephone numbers.
- List client, regulatory, ERM and subcontractor notification information.

An evaluation of potential electrical or fire/explosion risks should be part of the overall subsurface clearance task hazard analysis to evaluate whether the use of non-conductive materials and/or non-sparking materials is warranted.

Subsurface work must be stopped if any portion of a tank, line, utility, or other subsurface structure is encountered. The ERM PM must be notified, and the potential damage to the subsurface structure evaluated, prior to continuing subsurface work. If warranted, ERM will notify the client and any necessary emergency response resources as well as taking initial abatement measures such as shutting down the affected underground equipment or utility and/or evacuation of the site.

1.5 Preparation Tasks

The following tasks are to be completed and documented prior to initiating ground disturbance activities.

Ground Disturbance – Preparation Tasks
1. Scope the ground disturbance activity and preliminary ground disturbance locations
2. Historical site information review.
3. Site walkover.
4. Public utility markout.
5. Private utility markout.
6. Select final ground disturbance locations, if necessary.

1.5.1 Historical Site Information Review

Obtain the most recent as-built drawings and/or site plans (including underground storage tank (UST), product and vent lines) as available. As-built drawings may not accurately depict the locations and depths of improvements and subsurface structures and should not be solely relied upon. Also seek to obtain any other site information such as easements, right-of-ways, historical plot plans, fire insurance plans, tank (dip) charts, previous site investigations, soil surveys, boring logs and aerial photographs, etc. as relevant to the planned ground disturbance activities. Any site-specific excavation and safe work permit requirements must be known and implemented. Where applicable, facility personnel who may have historical site knowledge should be interviewed and participate in the site walkover.

1.5.2 Site Walkover

Conduct visual survey of work area and surrounding areas to look for signs of potential underground utilities. This task by itself may not be sufficient to locate all underground structures, but it does provide information to direct subsequent underground utility searches. Features indicative of subsurface structures and utilities include the following.

Surface Indicators of Underground Structures and Utilities - Examples	
• Utility poles with conduit leading into the ground	• Remote buildings with no aboveground utilities
• Area lights and signs	• Fire hydrants
• Sewer drains and cleanouts	• Sprinkler systems
• Cable markers	• Water meters
• Utility boxes and enclosures	• Natural gas meters
• Utility manholes	• Sewer manholes and drop inlets
• Pavement scars	• UST fillports and vent pipes
• Pipeline markers	• Steam lines

1.5.3 Public Utility Markout

All underground utilities must be marked out on the ground disturbance work site. In some cases, such as disturbing ground on an active site, the client's Engineering Department will take responsibility for delineating and marking utilities and infrastructure.

Where available, the public utility locator must be called to mark utilities. A site map with planned work areas should be made available to the public utility locator if possible. Mark the work areas on the ground in advance of contacting the public utility locator if possible. The area should be outlined in white to avoid confusion with the colors used by utility locator. Commonly used utility markout colors are listed below.

Utility Markout Colors	
Red	Electric
Blue	Water
Yellow	Natural gas

The ERM Designated Person should attempt to meet the utility locator on-site, if possible.

WARNING – *Public utility locator markouts are not always reliable and do not typically enter private property. Every effort should be made to confirm the location of utilities identified by the public utility locator and utilities that are not included in the public utility survey.*

1.5.4 Private Utility Markout

In some cases, project sites are located in regions that do not have public utility locator services. In addition, the public utility locator normally will not locate and mark utilities outside of the public right-of-way. In these cases, ERM must hire a private utility locator, if reasonably available, to locate and mark utilities on the project site. Only the project PIC or an ERM Partner may approve **NOT** conducting a utility marking.

1.5.5 Selection of Ground Disturbance Locations

After utilities have been located and, if necessary uncovered, the information collected to this point will be used in combination with regulatory requirements and project objectives to select final ground disturbance locations. Ground disturbance locations should also consider the location of overhead obstructions (e.g. power lines, etc.). The selection of ground disturbance locations within a critical zone should be avoided if possible. All ground disturbance locations must be approved by the ERM Designated Person and the client.

Critical Zone Definition
• 10 feet (3 meters) distance from all suspected underground lines. • 10 feet (3 meters) distance from the edge of any tank, pump island, pump gallery, manifold, electrical transformer, compressor, production well, loading rack, or other process equipment with associated underground lines.

Final critical zone determination must be reviewed with the ERM Designated Person. The ERM Designated Person can waive the critical zone designation of a planned ground disturbance area if the lines of concern can be de-energized via a formal lock-out/tag-out program, and/or if impacted do not present a safety, environmental, or operational concern (either on-site or off-site). Even if the critical zone definition is waived, **ground disturbance should not occur less than 3 feet (one meter) from the utility**.

1.6 Ground Disturbance - Drilling

On-site ground disturbance can proceed after the subsurface clearance preparation tasks have been completed. The ground disturbance includes the following tasks:

Ground Disturbance Tasks
1. Explanation of subsurface clearance procedures to on-site

Ground Disturbance Tasks
personnel. 2. Expose subsurface utilities *(if required)*. 3. Subsurface clearance for ground disturbance.

1.6.1 Explanation of Subsurface Clearance Procedures to On-Site Personnel

All ERM personnel and subcontractors involved in ground disturbance activities must review the subsurface clearance procedures that will be used prior to initiating work on-site.

1.6.2 Expose Subsurface Utilities

In some cases it will be necessary to uncover one or more utility lines to verify location, line size, and alignment. Examples of situations where underground utilities will need to be uncovered are listed below.

When to Expose Underground Utilities - Examples
• The lines could not be located by a pipeline locator. • The client requires that utility lines are uncovered. • Contractors are required by their insurance companies and/or company policies to physically locate and expose underground utilities before conducting intrusive work; especially for fiber optic lines, high voltage electric lines, and natural gas mains. • There are particularly hazardous utilities involved (high voltage, flammable/corrosive liquids, LPG, utilities that are particularly critical to existing facility operations). • Ground disturbance is being done in a limited space where precision of line avoidance is required.

Procedure For Exposing Underground Utilities
• Cautiously probe at least 2 feet. If probing can not be performed, identify the location utilizing other methods, such as hydrovac, compressed air excavation, or hand digging. • After probing at least 2 feet, remove 1 foot of soil mechanically and probe for the exact location. Repeat the process until the utility or infrastructure has been located. • Dig down beside the utility until it can be exposed by hand to determine its orientation. Do not dig within 2 feet of the utility by mechanical means.

1.6.3 Subsurface Clearance for Ground Disturbance

All ground disturbance points must be physically cleared for obstructions as part of the ground disturbance activity to ensure that there are no underground utilities or

infrastructure at each ground disturbance location. There are situations when clearance of the specific ground disturbance point may be waived by the ERM Designated Person. Examples include work on undeveloped land and disturbance of backfill materials in a previously excavated ground disturbance location (e.g. a former UST basin).

Ground disturbance activities should be planned such that ground disturbance activities farthest from any suspected underground features are completed first. This is done to determine the natural subsurface conditions and to allow on-site personnel to recognize fill material indicative of underground infrastructure if encountered.

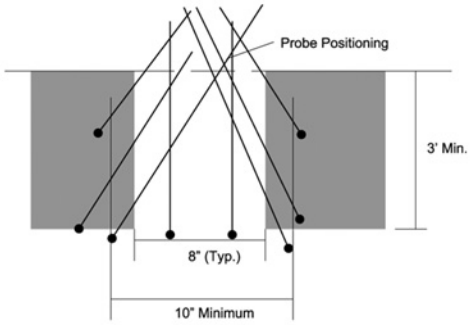
Minimum Depth of Subsurface Clearance Required	
Non-critical zone area	4 feet (1.3 m) or below frost line
Critical zone	7 feet (2.3 meters)

Subsurface Clearance Procedures Based on Planned Subsurface Ground Disturbance Activities:

The ground disturbance location to be delineated must exceed the diameter of the largest tool (e.g. drilling auger, direct-push sampler, and ream) to be advanced and sufficiently large to allow any obstructions encountered to be inspected visually. The diagram below, for example, demonstrates the need to clear 10" diameter for using an 8" diameter tool.

Subsurface Clearance Procedure
1. Remove pavement – recommended pavement cuts:
• Monitor Wells: 2ft x 2 ft (60 cm x 60 cm).
• Direct-push or hand auger samplers: 8 in. x 8 in. (20 cm x 20 cm).
2a. Probing and hand excavation to 4 feet below grade for **non-critical** zone areas.
2b. Probing and hand excavation to 7 feet below grade for **critical zone** areas.

Probing involves the use of a blunt non-conductive rod to probe ahead of and around the subsurface clearance excavation for obstructions as shown below. Probing may not be practical in hard soil (e.g. dry clay) and becomes less effective with depth.



Subsurface Clearance Methods

Approved subsurface clearance methods include:

Subsurface Clearance Methods	
Hand digging	Performed using a shovel. A post-hole digger should not be used to loosen soil in the excavation.
Hand augering	The auger is to be turned slowly and not forced through the soil. Non-conductive or insulated augers are recommended if electrical utilities are an issue.
Compressed air excavation	Soil should be broken up with an air lance and simultaneously vacuumed to remove loose soils.
Pressurized water excavation	Alternatively a low volume/high pressure water lance may be used to break-up cohesive/dense soils while vacuuming. Current test/experience indicates that water lances operating at pressures below 5,000 psi and at rates below 12 gpm are unlikely to damage typical fiberglass/metal lines/tanks and utilities.
Other methods	Must be approved by the ERM Designated Person

The following warning signs may indicate the presence of a subsurface structure:

Subsurface Clearance Warning Signs
• Warning Tape (typically indicative of underground services) • Pea Gravel/Sand/Non-indigenous Material (typically indicative of tanks or lines) • Red Concrete (typically indicative of electrical duct banks) • The abrupt absence of soil recovery in the hand auger. This could indicate pea gravel or sand that has spilled out of the auger. Except in areas where native soil conditions typically result in poor hand auger recoveries • Any unexpected departure from the native soil or backfill conditions as established in other on-site digging • If any of the above warning signs or a suspicious condition is encountered, work in this area should immediately stop and the PM should be contacted.

1.7 Ground Disturbance - Trenching

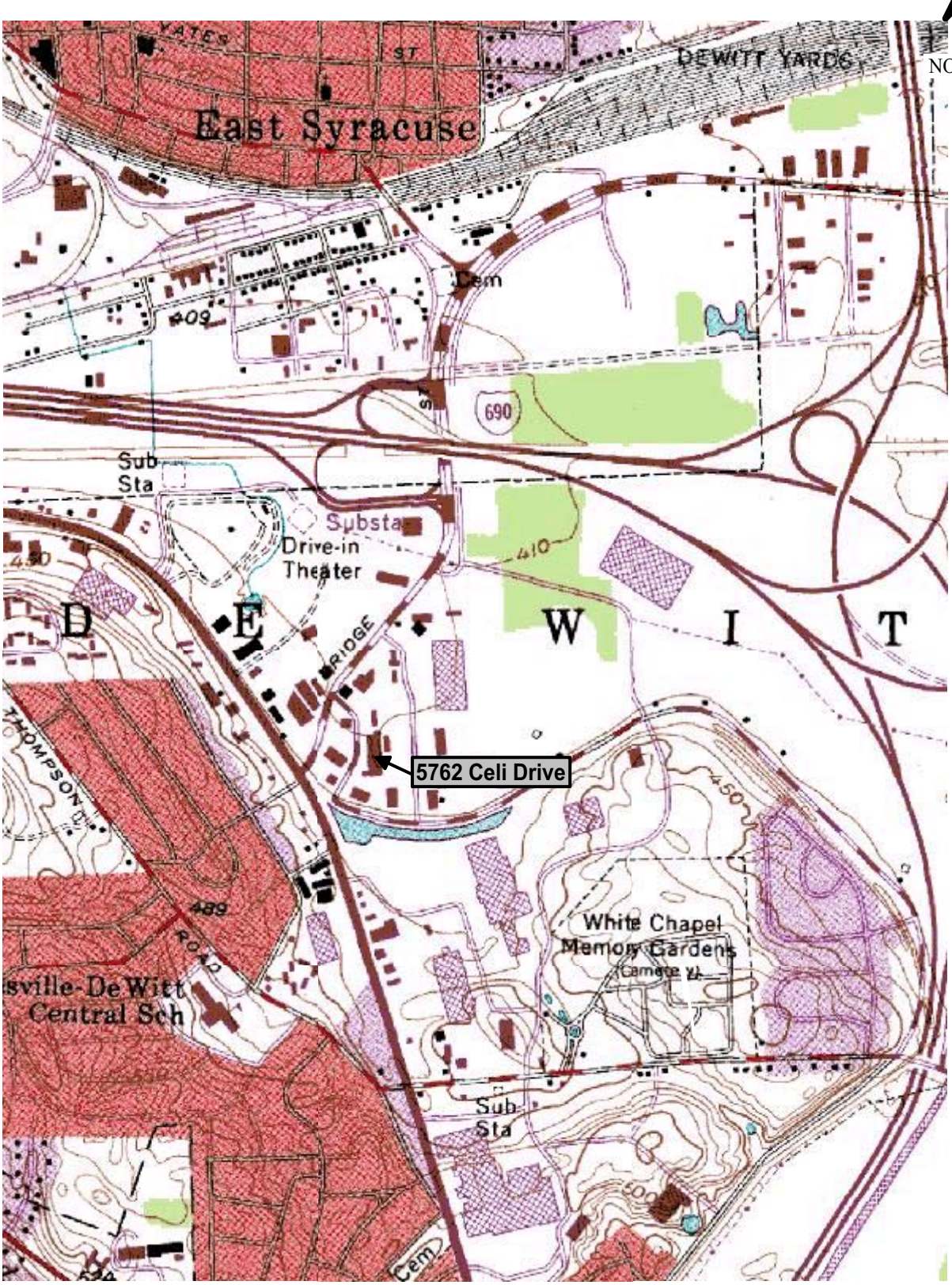
Outside of critical zones, site-specific conditions will determine the appropriate course of action. Subsurface clearance requirements must be reviewed with the ERM Designated Person prior to start of ground disturbance activities.

Appropriate subsurface clearance methods should be conducted along the length and width of the excavation at a frequency sufficient to ensure adequate precautions have been applied to the entire work area. The frequency and density of investigation should be based on site knowledge, potential hazards, and risks of the site/work area and surrounding locations (e.g. proximity to residential areas, areas of public assembly, etc.).

Whenever subsurface structures are exposed, work in the area must cease until precautions (e.g. flags, cross-bracing, stakes, etc.) are taken to ensure that the integrity of those structures is maintained during the trenching/excavation and subsequent backfilling activities.
A minimum 2-foot buffer zone must be maintained around exposed lines. No mechanical equipment may be used to excavate the buffer zone.

A Subsurface Clearance Procedure Checklist, when applicable, will be supplied to field personnel.

Figures



Brownfield Program - Celi Drive Site
Site Location Map

PREPARED FOR: GSP

ERM

SCALE: 1" ~ 2000'

DATE: JANUARY 2006

FIGURE: 1

SOURCE: USGS 7/1/1978

ENVIRONMENTAL RESOURCES MANAGEMENT

New York State Department of Environmental Conservation

FACT SHEET

Brownfield Cleanup Program

Celi Drive Site
C734108
Dewitt, NY

January 2006

Draft Brownfield Remedial Investigation Work Plan Available for Public Comment

The New York State Department of Environmental Conservation (NYSDEC) requests public comments as it reviews a draft work plan to investigate the Celi Drive Site located at 5762 Celi Drive in Dewitt, Onondaga County. See map for the location of the site. The draft "Remedial Investigation Work Plan" was submitted by General Super Plating, Co. Inc., (GSP) under New York's Brownfield Cleanup Program (BCP).

NYSDEC previously accepted an application submitted by GSP to participate in the BCP. The application proposes that the site will be used for industrial purposes.

Public Comments About the Draft Brownfield Remedial Investigation Work Plan
NYSDEC is accepting written public comments about the draft Remedial Investigation (RI) Work Plan for 30 days, from **{insert date}** through **{insert date}**. The draft RI Work Plan is available for public review at the document repository identified in this fact sheet.

Written comments should be submitted to:
Project Manager, Mr. Kevin Kemp
New York State Department of Environmental Conservation, Region 7
615 Erie Boulevard West
Syracuse, NY 13204

Highlights of the Proposed Brownfield Remedial Investigation

The remedial investigation has several goals:

1) define the nature and extent of contamination in soil, surface water, groundwater and any other impacted media;
2) identify the source(s) of the contamination;
3) assess the impact of the contamination on public health and/or the environment; and
4) provide information to support the development of a Remedial Work Plan to address the contamination. The investigation will be performed by GSP with oversight by NYSDEC and the New York State Department of Health (NYSDOH).

Brownfield Cleanup Program: New York's Brownfield Cleanup Program (BCP) encourages the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and redeveloped. These uses include recreation, housing and business.

A **brownfield** is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination.

For more information about the BCP, visit:
www.dec.state.ny.us/website/der/bcp

Based on the data collected during previous Site investigations, chromium (Cr) has been identified as the primary constituent of concern at the Site. Copper (Cu), nickel (Ni), zinc (Zn), and cyanide (Cn-) have also been identified. Media affected include soil located beneath and in the vicinity of the GSP manufacturing building located on the Site, Site groundwater, water and sediment in a buried culvert originating from the Site and surface water, sediment and soil in a swale in the vicinity of Bridge Street. The proposed remedial investigation shall consist of three phases. Phase I will include the sampling of soil beneath and immediately adjacent and east of the GSP facility located on the Celi Drive Site and the installation and sampling of groundwater wells. Phase II shall consist of sampling a buried culvert pipe (to include off-site sampling) that originates from the Site. Phase III shall consist of soil and sediment sampling in the swale adjacent to Bridge Street (off-site). Interim remedial measures as part of the investigation are likely to include soil removal.

Next Steps

NYSDEC will consider public comments when it completes its review, has any necessary revisions made, and approves the Brownfield Investigation Work Plan. NYSDOH must concur in the approval of the Brownfield Investigation Work Plan. The approved Brownfield Investigation Work Plan will be placed in the document repository (see below). After the Work Plan is approved, GSP may proceed with the remedial investigation of the Site. It is estimated that the remedial investigation will take about one year.

The applicant will develop a Brownfield Remedial Investigation Report that summarizes the results of the Brownfield remedial investigation.

NYSDEC will keep the public informed during the investigation and remediation of the Celi Drive Site.

Background

The Celi Drive Site consists of approximately 1.3 acres of land. The Site is located in a small cluster of industrial and commercial properties. The Site has been historically used as an industrial metal finishing facility. Soil and surface water samples taken in May 2005 confirmed that a metals release had occurred from the facility. A source investigation was conducted as well as abatement, including interim remedial measure activities to control the further release of contamination at and from the Site. Soil and groundwater samples were taken in 2005 and a summary report submitted to NYSDEC. A Brownfield Application was submitted to NYSDEC in November, 2005.

FOR MORE INFORMATION

Document Repository

A local document repository has been established at the following location to help the public to review important project documents. These documents include the draft RI Work Plan and the application to participate in the BCP accepted by NYSDEC:

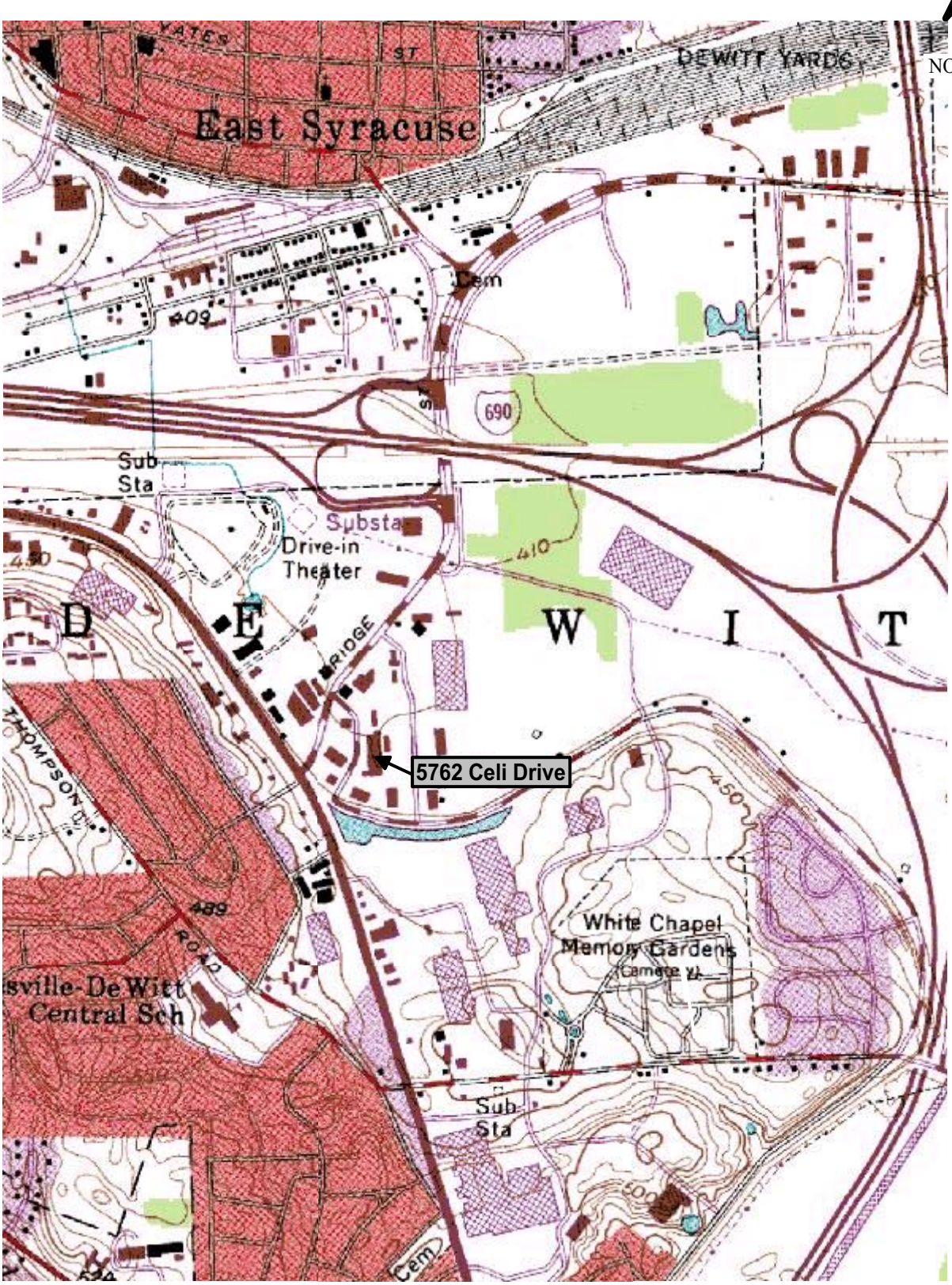
Dewitt Community Library
3649 Erie Boulevard East
Dewitt, NY 13214
315-446-3578

Whom to Contact
Comments and questions are always welcome and should be directed as follows:

Project Related Questions
Project Manager, Mr. Kevin Kemp
New York State Department of Environmental Conservation, Region 7
615 Erie Boulevard West
Syracuse, NY 13204
Telephone: (315)426-7464
E-Mail: *kckemp@gw.dec.state.ny.us*

Health Related Questions
Mr. Geoff Laccetti
Environmental Exposure Investigation
New York State Department of Health
Flanigan Square
547 River Street, Room 300
Troy, NY 12180
Telephone: (800) 458-115x ext. 2-7880

If you know someone who would like to be added to the project mailing list, have them contact the NYSDEC project manager above. We encourage you to share this fact sheet with neighbors and tenants, and/or post this fact sheet in a prominent area of your building for others to see.



Brownfield Program - Celi Drive Site
Site Location Map

PREPARED FOR: GSP

ERM

SCALE: 1" ~ 2000'

DATE: JANUARY 2006

FIGURE: 1

SOURCE: USGS 7/1/1978

ENVIRONMENTAL RESOURCES MANAGEMENT