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New York State Department of Conservation
Region 8 Division of Environmental Remediation
6274 East Avon-Lima Road
Avon, New York 14414

Attention: **Bartholomew H. Putzig, P.E.**

Subject: **Remedial Investigation Work Plan**
BCP Site# C851031
Tioga Avenue
Corning, New York

Ladies and Gentlemen:

On behalf of Corning Property Management Corporation and Corning Incorporated (collectively referred to as Corning), Haley & Aldrich of New York (Haley & Aldrich) is submitting herewith the revised Work Plan to conduct the Remedial Investigation (RI) at the above referenced site. This document is submitted in accordance with the Brownfield Cleanup Agreement Site #C851031 between the New York State Department of Environmental Conservation (NYSDEC) and Corning.

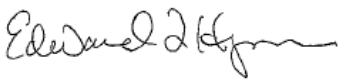
This Work Plan is a revised version of the original Work Plan dated 7 October 2008 reflecting revisions made in response to the Department's comments dated 12 February 2009 as reviewed in the 25 March 2009 meeting with representatives of your staff and the Department of Health. These comments and associated responses and Work Plan revisions are described in the attached summary document.

The RI Work Plan presents available information on the current and former land-use and geographic setting, environmental history, and geology and hydrogeology of the Site. This work plan presents the results of previous recent non-intrusive and intrusive site assessment activities on the Site and identifies additional investigation activities that will be implemented to further determine the environmental conditions at the Site.

The RI Work Plan has been developed in accordance with the NYSDEC (6NYCRR) Part 375 Brownfield Cleanup Regulations, the draft "Technical Guidance for Site Investigation and Remediation" (DER-10) and other relevant NYSDEC technical and administrative guidance.

If you have any questions or comments concerning the content of this document, please do not hesitate to contact us at 585.321.4236.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK



Edward L. Hynes
Vice President

Enclosures

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TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

Corning Property Management Corporation and Corning Incorporated (collectively referred to in this document as "Corning") have entered into a Brownfield Site Cleanup Agreement, Index #B8-0767-08-01/Site #C851031, with the New York State Department of Environmental Conservation (NYSDEC) for the real property located at 213, 219, and 239 East Tioga Avenue in the City of Corning, New York as shown on Figure 1. This property is owned and was used by Corning to support the former Fall Brook glass manufacturing and related facilities. Historically this property was owned and used by other entities unaffiliated with Corning for various railroad operations and maintenance facilities. This property is referred to as the Tioga Avenue Site or the "Site".

Corning completed the process of closure of the Fall Brook facility and demolition of all of the buildings and structures on the Site in 2007. The building demolition project involved complete removal of structures to grade and securing the Site pending future redevelopment. Photographs showing past and current property conditions are provided in Appendix A. Concurrent with the demolition program, Corning gained approval in late 2007 to enter the Site into the Brownfield Cleanup Program and will redevelop the property for commercial and/or industrial use. Corning will undertake environmental investigations and, as necessary, environmental remediation in accordance with the requirements of the Brownfield Site Cleanup Agreement to make the Site suitable for the intended future land use. This document presents the work plan that details the scope of the Brownfield Cleanup Program Remedial Investigation (BCP RI) to be conducted on the Site.

This BCP RI Work Plan (Work Plan) describes environmental conditions as currently known on the Site based on existing environmental reports and the institutional knowledge of Corning personnel familiar with the former manufacturing operations on the Site as well as various historical records on the prior railroad operations. This information is used as a basis for delineation of potential areas of concern and contaminants of concern that warrant further investigation as detailed herein. The overall objective of the BCP RI is to obtain sufficient information to enable development of a Site conceptual model that will:

- **Delineate the nature and extent of contamination in near surface soil, subsurface soil, and groundwater at the Site, focusing on the areas of concern that are documented based on existing site information and investigations as described herein; and**

- **Assess the significance of the conditions within the areas of concern based on the BCP RI results, the relevant BCP regulatory criteria, and the land use assumptions under a future commercial and/or industrial land use scenario.**

The following sections of this document provide the basis and scope of the BCP RI program. Section 2 of the Work Plan presents historical uses and environmental setting and conditions based on recent non-intrusive environmental site assessment activities conducted prior to facility decommissioning.

Section 3 of the Work Plan presents the scope and findings of previous non-intrusive site assessments and Section 4 presents results of the Phase II ESA undertaken by Corning during the facility decommissioning.

Section 5 provides the methods and procedures for additional investigation activities to be conducted at the property to further delineate the potential impacts identified during the Phase

II activities as required under the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Agreement (BCA) between NYSDEC and Corning.

Sections 6 through 9 provide supporting documentation for conduct of the work including Quality Assurance/Quality Control protocols, a site specific Health & Safety Plan conforming with the requirement of the OSHA 29 CFR 1910.120 Regulations, scope of the RI report deliverables and schedule, and discussion of the Citizen Participation planning activities to be implemented over the course of the BCP process.

The RI Work Plan is appended with supporting documentation and information related to past investigations on the Site and details on investigation methods and procedures.

2. SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Site comprises 14.18 acres of property located within the City of Corning, Steuben County, New York being generally situated along the north side of East Tioga Avenue between Steuben Street to the west and Chemung Street to the east. The northern Site boundary is formed by railroad and flood control levee easements that isolate the Site from the Chemung River. The Tioga Avenue Site contained the former Corning Fall Brook glass manufacturing plant and related adjacent former support facilities the demolition of which was completed in 2007 with oversight provided by the NYSDEC. A Site Plan showing the property boundary and former manufacturing facility layout is provided on Figure 2.

Prior to facility closure and decommissioning, the Site contained approximately 400,000 square feet of space in seven main buildings. These buildings included the former main glass manufacturing facility and associated warehouse and Batch Material Storage, various trades shops (the Mason, Platinum and Fabrication Shops and Central Trades), and the General Machine Shop (GMS). Glass manufacturing activities were discontinued in the fall of 2002 but operation of the Central Trades (including the Platinum Shop), the Mason Shop, and Batch Material Storage (Mix House), continued until facility decommissioning that started in late 2006. All of these pre-existing buildings and support structures have been demolished to ground surface except for certain small storage buildings. Floor slabs, foundations and other subsurface utilities and features will be removed in the future.

The Tioga Avenue Site is contiguous with property owned by World Kitchen LLC and unaffiliated with Corning. The World Kitchen LLC facility is an active manufacturing operation producing consumer glassware products. A portion of the World Kitchen property houses the Wastewater Treatment Plant (WWTP) formerly used for treatment of process waste water from the Fall Brook facilities as well as stormwater from the Site and from a portion of the World Kitchen LLC property. The WWTP is not part of the Site or BCP RI Work Plan based on the Brownfield Cleanup Application determination letter from NYSDEC dated November 2007 wherein the Department has determined that the WWTP parcel does not meet the definition of a "brownfield site" as there is "no reasonable basis to believe that contamination is likely to be present on this parcel or that contamination or the potential presence of contamination is complicating the redevelopment or reuse of this parcel".

Currently the Site is generally level and largely covered by impervious surfaces including concrete floor slabs and asphalt paving. The Site currently contains certain facilities that remain in operation generally situated in the northeast corner of the property consisting of the newly constructed Batch Unloading building and related facilities as shown on Figure 3. The Batch Unloading facility is served by the existing rail spur running through the Site used for the delivery of bulk raw materials for World Kitchen operations. Other vehicular access routes to World Kitchen are also maintained on the Site. These facilities and access points will remain in use by World Kitchen LLC.

2.2 Land Use, Zoning and Development Plans

The Site is located in an urban area of mixed industrial, commercial, residential and recreational land use at the edge of the City of Corning's central business district. A narrow strip of Corning property separates the northern Site boundary from the Chemung River, and a railroad easement, electrical utility easement, and flood control embankment are present on that property creating a physical separation between the Site and the Chemung River.

The World Kitchen LLC property described above is located adjacent to the northeast corner of the Site. A combination of parking lots (for the World Kitchen facility and the former Fall Brook plant), vacant land, and one residential property are located on the east side of Steuben Street east of the Site, beyond which are located private residential properties. Commercial and residential properties are located to the southeast of the Site, and a city park (Denison Park) is located two blocks to the southeast of the southeast corner of the Site.

Residential apartment properties and the Corning Civic Center buildings are located south of Tioga Avenue south of the Site, and the Corning Hospital and a mixed residential and commercial area are located in the next blocks south. The Steuben County Convention and Conference Center is located in the block west of the southwest corner of the Tioga Avenue Site, beyond which is the east end of the Market Street commercial district.

2.3 Geologic Setting, Groundwater and Surface Water Resources

Geologic Setting

The Site is essentially flat, with an average ground surface elevation of approximately 924 feet above sea level. The topography in the area of the Site is also shown on Figure 1.

The site is located in a river valley formed within the Allegheny Plateau. The valley was a pre-glacial stream course that was broadened and deepened during advance and retreat of glaciers. The glacial influence resulted in a thick but variable sequence of glacial till and post-glacial alluvium and lacustrine deposits overlying bedrock. Cultural activities have resulted in a deposit of fill soils overlying the natural soil deposits.

A recent Phase II Environmental Site Assessment by Haley & Aldrich included the drilling of 45 soil test borings across the site to depths ranging up to approximately 28 feet below ground surface (bgs). The test boring locations are shown on Figure 3 and generally encountered two primary soil deposits: fill and alluvium. The fill material generally consisted of a mixture of granular soil with varying amounts of ash, cinders, brick and other debris. The alluvium consisted primarily of poorly- graded or well-graded sand with varying amounts of gravel and relatively low percentage of silt. The alluvium was not fully penetrated by any of the explorations during this investigation.

A report by Ground Water Associates (1984) for the City of Corning indicates the soil deposits underlying the Site extend to at least 70 feet bgs. A report by the USGS (1982) indicates bedrock may be as much as 100 feet bgs in the vicinity of the site. Figure 4 presents a cross-section of the subsurface materials encountered in the recent soil test borings and monitoring well installations conducted on the property by Haley & Aldrich; Appendix B contains test boring logs and well installation reports for these explorations.

Based on the recent explorations and information from other sources, the Site appears to be underlain by, in order of increasing depth, the units listed below.

Deposit	Approximate thickness (feet)
Fill	0.5 to 14
Alluvial sand and gravel	13 to 20 (or greater)
Lacustrine clay	10
Interbedded sand and gravel	45

Actual conditions at the Site may vary somewhat and will be further assessed during the investigations proposed in this RI Work Plan. The significance, if any, of a confining clay deposit requires further assessment as the lateral extent of the clay unit beneath the Site is not known, and it appears this layer is discontinuous in the Corning area.

Hydrogeology and Groundwater Resources

Water level measurements obtained on 10 October 2007 in the installed monitoring wells indicate groundwater to be approximately 19 to 25 feet below ground surface (bgs).

The alluvial sand and gravel deposits that underlie the Site and surrounding Corning area form a regional groundwater aquifer that is used a source of potable water. Corning city municipal water supply wells are located within one-half mile of the Site. Five water supply wells in the alluvial aquifer are present at the Site and the adjacent World Kitchen property. These wells were formerly used to provide process water for Corning's operations at the Site and historically also provided a potable supply for the Site. The wells are 8 to 12 in. in diameter and are screened from approximately 60 to 70 feet below grade. Currently one of the wells on the Tioga Avenue Site continues to operate to supply make-up water to the WWTP; and one well on the World Kitchen site is reportedly operational and used exclusively in its manufacturing processes and not for potable supply.

The water level data for this investigation indicate groundwater flow beneath the Site is generally toward the east at a relatively low gradient and the flow direction appears to be influenced by groundwater extraction from the supply wells located on the World Kitchen property as well as on the Site property (See Figure 5). Some variation in groundwater level can be expected to occur as a result of fluctuation in the level of the Chemung River, which is known to vary by several feet.

Surface Water Resources

No surface water bodies exist on the site, as the ground surface is nearly entirely covered with pavement or concrete. Runoff from precipitation generally directed into the Site storm water system, treated and discharged at the Waste Water Treatment Plant under a NYSDEC-issued SPDES Permit.

2.4 Site History

A detailed assessment of the history and use of the Site has been prepared and is documented in the Environmental Site Assessment Report (Haley & Aldrich, July 2007) previously submitted to the NYSDEC as an appendix to the Corning BCP Application. The following discussion provides a summary of the Site history information presented in the ESA Report. The ESA report can be referenced for more detailed Site history and related environmental information including copies of the referenced information sources. Assessment of potential areas of environmental concern developed from the ESA is described in Section 3.3 below and shown on Figure 2a.

2.4.1 General

The available history records reviewed indicate that development on the Site dates to at least the 1850s. Title records indicate that the property was acquired by the Blossburg and Corning Railroad in 1854. It is documented in *"History of the Corning Painted Post Area"* (Dimitroff and Janes, as revised 1991) that the Blossburg and Corning rail system had established its operations center in Corning in 1859 and that its machine shops had been established in 1862. An 1873 Steuben County Atlas indicates that a Blossburg and Corning Rail Road repair shops and roundhouse occupied the Tioga Avenue Site at that time and mostly situated in the eastern portion of the Site. Sanborn maps indicate that railroad operations and roundhouse, engine house, and machine shop structures were present on Site at least through 1921. Remnants of former railroad maintenance structures were evident during recent manufacturing facilities decommissioning being generally situated in the eastern part of the site in the area of the Batch Material and Mix House facilities.

The local history information referenced above indicates that the railroad car shops at the Site produced passenger and freight cars for the railroad. The history indicates that the Blossburg system was reorganized under the Fall Brook Coal Company in the late 1860s, was renamed the Fall Brook Railroad Company in 1892, and became part of the New York Central Railroad in 1899. Title records indicate that Corning Glass Works purchased the property from the New York Central Railroad Company in 1929.

The Sanborn map for 1930 indicates that a Corning Glass Works manufacturing plant was present at that time. Some of the buildings that had been part of the railroad company facility were used for the Corning Glass Works manufacturing plant. These included the buildings that became the Cullet storage, Batch Material Storage, and Fall Brook Mix buildings that were grouped together at the east end of the Site. The original, eastern portion of the glass manufacturing plant building, located just to the west of the Cullet storage, Batch Material Storage, and Fall Brook Mix buildings, was also present on Site by 1930.

Various additions to the plant were constructed after 1930. The General Machine Shop, which was located on the west side of the Site, was constructed in approximately 1951. The off-site wastewater treatment plant (WWTP) was constructed in the late1960s (WWTP Plant #1). A second WWTP plant building (#2) was built adjacent to the first in the 1980s.

2.5 Former Site Operations

The Corning manufacturing operations at the Site produced glass tubing, glass wool, and other glass products including glass tubes used in the following products: television sets, lighting accessories, diodes, automobiles and other products. Although Corning's glass-making operations at the Site were not chemical-intensive, certain operations and types of raw

materials included the use and potential for release of heavy metals, petroleum, or hazardous substances. The operations conducted during the earlier period of railroad car and engine maintenance, and railcar manufacturing on the Site is the likely source of ash and cinders that have been observed in the historic fill on the Site. These conditions are further described in prior investigation summaries below. Available information indicates that the railroad operations may represent potential sources of contamination by oil or other petroleum products, paint materials, coal combustion residues, and metals.

The General Machine Shop (GMS), Central Trades, and Mason Shop buildings located in the western end of the Site housed large shops for general machining and milling of manufacturing tools, manufacturing-tool fabrication, and related activities and trades such as masonry and carpentry that supported Corning's local manufacturing operations. Some of the support operations continued at the Site until 2006.

In addition to the silica and other inert raw materials primarily used in glass production, certain hazardous substances were also used as manufacturing ingredients including lead monoxide (litharge), arsenic oxide, antimony, and beryllium. Raw materials were stored in the Mix House and in silos in the area of the glass making tanks. Molten glass was produced in the glass making tanks using natural gas. Cullet produced from off-spec glass was reused in the glass making operation, and cullet stored in covered bins at locations near the mix house and glass making tanks.

Five above ground storage tanks (ASTs) are known to have been in past use at the Site including a 500,000-gallon stormwater and wastewater equalization tank, a 300-gallon diesel fuel storage tank that was associated with the equalization tank pump house, a 1,000-gallon process wastewater holding tank in the Mason Shop, a 100-gallon oil tank in the Mix House, and a 100-gallon hydrofluoric acid storage tank in the Platinum Shop in the Central Trades building. Except for the stormwater equalization tanks, these ASTs were cleaned and removed during the Site demolition project.

Historical information indicates that several underground storage tanks (USTs) were also in use in the past for storage of various petroleum products. These USTs are reported to have been removed but records detailing the closure process are not available given timeframe of closure (which pre-dates UST regulatory requirements). More detailed discussion of USTs is presented in Section 4 below.

Site operations necessitated the use and storage of petroleum products and hazardous substances at several locations on the property, as well as generation and storage of hazardous and non-hazardous waste. Waste historically generated at the Site primarily included:

- **waste leaded glass;**
- **lead-contaminated sludge from the WWTP;**
- **paint-shop waste;**
- **particulates from air emission control devices; and**
- **tank debris and refractory brick from decommissioning activities.**

Between approximately 1980 and 1992, the facility operated under the US EPA and NYSDEC Resource Conservation and Recovery Act (RCRA) environmental programs as an Interim Status facility for hazardous waste storage. After a closure plan was approved by NYSDEC and implemented by Corning, closure of its interim status was obtained in 1992. After 1992, hazardous waste was stored on a "less-than-90 day" basis. Hazardous substances contained

in Site-generated waste included: ignitable waste paint and mineral spirits, corrosive wastes (including hydrochloric acid and chromic acid), arsenic compounds, barium, cadmium, chromium, lead, selenium, benzene, chlorinated solvents, methanol, and waste oil.

3. PREVIOUS SITE ASSESSMENTS

3.1 RCRA Inspection

As part of the RCRA closure process described above, a "Corrective Action Prior To Loss of Interim Status" (CAPT LOIS) inspection was performed at the Site in 1990. The inspection was performed for the US EPA by CDM Federal Programs Corporation. The inspection report identified three (3) Solid Waste Management Units (SWMUs), each designated as a Container Storage Area (CSA):

1. **The WWTP Sludge Storage Area (CSA-1) – a concrete pad adjacent to WWTP 1 for staging hoppers for filter sludge from WWTP operations. (This area is not located on the Tioga Avenue Site and is not owned by Corning.)**
2. **A Hazardous Waste Storage Pad (CSA-2) – a 20-by 30-foot diked concrete pad for pallets of bag-house dust and the filled hoppers for filter sludge from WWTP operations.**
3. **A Drum Storage Area (CSA-3) – a 30- by 40-foot bermed and fenced concrete pad for storage of drums of liquid waste and new product.**

The CAPT LOIS report concluded that these SMWUs were all in generally good condition and that no evidence or record of releases was found during the inspection.

3.2 Preliminary RCRA Facility Assessment (RFA)

In 1993, a Preliminary RCRA Facility Assessment (RFA) was performed by TRC Environmental Corporation under contract to the USEPA. The assessment identified eight (8) areas of concern (AOCs) at the Site described as follows:

RFA/CAPTLOIS Reference		Phase II ESA Reference
AOC 1	Hazardous Materials Pen	AOC 3
AOC 2	Former Drum Storage Area	AOC 4
AOC 3	Former Fuel Oil UST Area	AOC 6
AOC 4	WWTP Sludge Storage Area	
AOC 5	Hazardous Waste Accumulation Pad	AOC 2
AOC 6	Electrostatic Precipitators	
AOC 7	Bag House Dust Collectors	
AOC 8	Paint Shop Accumulation Area	

AOC #1, #4 and #5 correspond to the CSA #3, #1 and #2, respectively, identified in the CAPT LOIS report described above. The Preliminary RFA report indicated that a potential for past release existed at AOC #1, 2 and 3, and no evidence of release at AOC #4 (CSA-1). At #5 (CSA-2), a low potential for release was indicated, but the wastes were indicated to be well contained and no evidence of a release was identified.

Environmental issues identified for AOC #6 and #7 were related to a potential for fugitive air emissions of dust, and did not involve the potential for surface or subsurface release at these AOCs. The report indicated that no evidence of release was found at AOC #8, a paint storage area located inside the facility in a fully-enclosed basement area with a sound concrete floor.

Based on the above findings, certain of the AOCs identified during the RFA process were included in the scope of the Phase II ESA. The previously investigated AOCs included in the Phase II ESA are enumerated above.

3.3 Environmental Site Assessment (ESA)

In 2006, Haley & Aldrich performed an assessment of site environmental conditions and developed a report entitled "Environmental Site Assessment (ESA) Report", Tioga Avenue Site, Corning, New York," dated 25 July 2007, to support the Tioga Avenue Decommissioning and Demolition project and BCP Application. The complete ESA report has been previously provided to NYSDEC as an attachment to the Corning BCP Application. A review of available site historical information and records as summarized above identified specific areas of concern (AOCs) where environmental contaminants were known or suspected to have been handled, stored, and potentially released. The AOCs identified in the ESA Report were further evaluated and expanded upon during the planning and implementation of the building demolition project beginning in late 2006 and extending through 2007. Additional AOCs were later identified and added to the ESA AOC list based on additional site information and/or observations of site conditions during the building decommissioning and demolition process. Accordingly, the following areas, historic uses or conditions were identified as potential AOCs on the Tioga Avenue Site:

- **Former Railroad Company Railcar and Engine Maintenance and Manufacturing Operations (site wide)**
- **Potential for Heavy Metals in Shallow Soils (site wide)**
- **Site Groundwater Quality/TCE in Plant Water Supply Wells (site wide)**
- **Hazardous Waste Storage Pad – AOC 2**
- **Former Hazardous Materials Drum Storage Pad – AOC 3**
- **Former Drum Storage Area – AOC 4**
- **Current Hazardous Materials Storage Building – AOC 5**
- **Former Fuel Oil Underground Storage Tanks (UST) – AOC 6**
- **Former Gasoline UST – AOC 7**
- **Former Fuel Oil AST at Fire System Water Tank – AOC 8**
- **Former Fuel Oil AST at GMS Annex – AOC 9**
- **1950s-era Oil Drum Storage House Located North of GMS Annex – AOC 10**
- **Areas of Oil Staining on the GMS Slab – AOC 11**
- **Area of Oil Staining on the Fall Brook Slab in the Gun Mounts Area – AOC 12**
- **Former Septic System & Storm Sewers – AOC 13**
- **Hydraulic System Pit for the GMS Dock Levelers – AOC 14**
- **Hydraulic Elevator Pits – AOC 15**
- **Boiler House Blow Down Pits – AOC 16**
- **Unidentified Pipe and Sump Outside the Mason Shop PP1 Building – AOC 17**
- **1950s-era Acetone Drum Storage Near Multiform Office – AOC 18**
- **1930s-era Acid Ampoule Burial Area – AOC 18**
- **1950s-era Paint Shed Northeast of Gate 3 – AOC 19**
- **1950s-era Arsenic Acid Bulk Storage Area – AOC 20**
- **1950s-era Cyanide Storage Bldg Located at NW Corner of Central Trades – AOC 21**

Identification of AOCs in the ESA report was based exclusively on records review, site observations and institutional knowledge of various Corning employees. While some limited existing environmental sampling information was available, the ESA did not include any intrusive site investigation activities with sampling and analysis of environmental media.

4. PREVIOUS SITE INVESTIGATIONS

Coincident with the submittal of the BCP application for the Tioga Avenue Site, Haley & Aldrich conducted a subsurface investigation (referred to herein as the Phase II ESA) involving soil and groundwater sampling focusing in the areas of the property where AOCs were identified and documented in the ESAs as are summarized above. The intent of the Phase II ESA was to provide a preliminary assessment to confirm the presence or absence of contamination in near surface soil, subsurface soil, and groundwater on the Tioga Avenue Site within each of the AOCs identified in the ESA Report.

4.1 Phase II Environmental Site Assessment (Phase II ESA)

The Phase II ESA was undertaken in accordance with environmental investigation procedures recommended in NYSDEC Draft DER 10, "Technical Guidance for Site Investigation and Remediation", dated December 2002. Each AOC and associated soil boring and monitoring well locations are shown on Figure 3. A summary of the laboratory analytical data is summarized in Tables 1 and 2. A copy of the soil boring logs and monitoring well installation reports is provided in Appendix B.

The Phase II ESA was performed in September and October 2007 involving 45 soil borings and 6 permanent monitoring well locations. Drilling services were provided by Nothnagle Drilling, Incorporated of Scottsville, New York and observed by a Haley & Aldrich geologist who classified soils and performed environmental sample screening. All of the soil borings were continuously sampled with a Macrocore Sampler equipped with disposable acetate sleeves. Downhole tools and equipment were cleaned before (by steam pressure wash) and between (Alconox and distilled water) sampling runs and successive boring locations.

4.1.1 Soil Investigation Procedures

The Phase II ESA involved continuous soil sampling by installing test borings using direct push drilling equipment. Each boring was advanced through fill material until native soil was encountered. Field screening for the presence of volatile organic compounds was performed using a photoionization detector (PID) and visual examination of soil samples was performed in the field. Results of the field screening program are summarized on Table 3. The borings were advanced to varying depths up to approximately 28 feet below ground surface (bgs) extending through the historic fill materials into the underlying native soils and terminating within the saturated zone. Soil boring locations targeted to the areas of concern where fuel storage tanks had been located, were advanced to below the water table (into the top two feet of the saturated zone).

Discrete sample intervals from each boring were be selected for laboratory analysis based on field observations and nature of the area of concern, and field screening results. In general, samples from test borings were retained for analysis based on the following selection criteria:

- **For surface soil comprised on historic fill, samples were collected from the top two (2) feet of soil including beneath any sub-base gravel layer beneath pavements or slabs.**

- **For other soil/historic fill, samples were collected of the interval exhibiting the greatest apparent degree of potential contamination evident from field screening, PID measurements or visual observations. The results of PID screening performed during the boring program are summarized on Table 3. In general, however, PID measurements were not a primary sample collection criterion because elevated PID readings were not observed during the boring program except at certain locations where USTs were formerly present.**

- **For native/undisturbed soil beneath historic fill, samples were collected from the upper 2 foot layer to enable assessment of potential impact from historic fill.**

4.1.2 Groundwater Investigation Procedures

Six groundwater monitoring wells were installed during the Phase II ESA in selected borings as shown on Figure 3. These overburden monitoring wells were installed to permit sampling of shallow groundwater in the following areas of the Site:

- **At locations where groundwater impact was suspected based on field observations;**

- **At assumed up gradient locations widely-spaced along the Site boundary that runs along East Tioga Avenue and Steuben Street; and**

- **At assumed down gradient locations widely-spaced along the Site boundary that runs along the World Kitchen property and the Chemung River levee.**

The groundwater monitoring wells were installed to characterize groundwater flow and overall quality conditions on the Site and for evaluation of groundwater conditions from the borings completed where there were indications of contamination observed during drilling such as staining, odors, elevated readings on field instruments. The monitoring wells were constructed using 2-inch diameter PVC riser pipe and 10-foot length of PVC 0.010 inch slot well screen installed across the water table. Details on completion of each of the wells are provided on the Observation Well Reports in Appendix B. After installation, the wells were developed and groundwater quality sampling was performed on 1 and 2 October, 2007, approximately 2 weeks after development to enable re-equilibration of the static water table.

Groundwater sampling was performed using low flow purging methods, with screening and monitoring of field parameters. Groundwater samples from each well were submitted for laboratory analysis of the same parameters listed above for soil samples.

Following groundwater sampling, a hydraulic-conductivity test (rising head test) was performed at each well and this data is being retained for future evaluation as necessary. Groundwater level monitoring was performed at each well during the well development, sampling, and slug-testing activities. A one-day groundwater-level monitoring event was performed including the measurement of water levels in all accessible on-site water supply wells. These ground water level monitoring data are interpreted on the contour plan presented in Figure 5 and discussed in greater detail below in Section 4.3.24.

4.1.3 Laboratory Analytical Program

Consistent with DER 10, the investigative program included analysis of soil and groundwater for the presence of organic and inorganic constituents considered to be potential Site contaminants based on recent and historical operations at the Site as well as for a broader suite of non-target contaminants as verification of their non-presence. The following general protocol was used during the Phase II ESA for selection of analytical parameters:

- **Site specific metals including lead, arsenic, cadmium, barium and antimony are associated with raw materials used in manufacturing on the Site and referred to herein as the "site metals" of the "site related contaminants". Analysis of the "site metals" was performed on the bulk of the samples obtained during the Phase II ESA.**

- **The recommended sample analytical protocols for petroleum constituents as identified in the NYSDEC STARS Memo #1 (August 1992) were used at the AOC locations where petroleum storage occurred or where potential petroleum substances were otherwise observed during the investigation program.**

- **Many samples of historic fill were submitted for laboratory analysis of potential site related contaminants including metals and polynuclear aromatic hydrocarbons (PAHs) as generally associated with coal combustion materials and historic fill.**

- **Any sample where PID measurements were observed were submitted for analysis of volatile organic compounds (VOCs) as well as other parameters as appropriate based on sample location.**

In addition to the above targeted sample collection program, approximately 20 percent of the Phase II samples were also submitted for analysis of a broader suite of parameters consistent with DER 10 recommendations and which includes the following parameter list whether or not these substances were known or suspected to be present on the Site: USEPA Target Compound List (TCL) volatile organic compounds (VOCs); TCL semi-volatile organic compounds (SVOCs); polychlorinated biphenyls (PCBs); organo-chlorine pesticides; EPA Target Analyte List (TAL) metals, total cyanide; and pH. These parameters are collectively referred to as the "expanded parameters" or "expanded parameter list". Many substances on the expanded parameter list are not known or suspected to be associated or present at the Site, but were included in the sampling program as confirmation of the assumption of non-presence.

The project samples were submitted for chemical analysis to the Test America Laboratories in North Canton, Ohio an independent NYSDOH ELAP laboratory. Sample analyses were performed using the US EPA SW-846 methods. Laboratory analysis results for approximately 10 percent of the Phase II ESA soil and groundwater samples were reported using the New York State Department of Health's Analytical Services Protocol (ASP) extended Category B data deliverables; the data for the remaining project samples were reported using the ASP category A data deliverables. In either case, laboratory deliverables were sufficient to enable independent validation and preparation of a project Data Useability Summary Report (DUSR). Copies of the standard laboratory analytical report deliverables (Form 1s) are provided in Appendix C. Copies of the expanded laboratory deliverables including the Category B packages are maintained by Haley & Aldrich.

4.1.4 Data Validation

The Phase II ESA sampling and analysis plan included the following Quality Assurance/Quality Control procedures:

- **Collection and analysis of quality control samples including duplicate, blank and matrix spike/matrix spike duplicates (ms/msds).**
- **Use of an NYSDOH ELAP-certified laboratory and standard US EPA SW-846 analytical methods.**
- **Expanded laboratory deliverables including NYSDEC ASP Category B packages for a representative subset of the sampling program and ASP Category A for the balance of the samples analyzed.**
- **Preparation of Data Usability Summary Reports (DUSRs) for each sample delivery group (SDG) by a NYSDEC-approved data validator in accordance with the procedures set forth in the NYSDEC "Guidance for the Development of Quality Assurance Plans and Data Usability Summary Reports (DUSR)", September 1997.**

Copies of the DUSRs prepared by Haley & Aldrich are provided in Appendix D which indicate that all of data obtained during the Phase II ESA are valid and usable.

4.1.5 Comparison Criteria

Results of the Phase II ESA are summarized on Tables 1 and 2, for the soil and groundwater data respectively. The significance of the soil data is evaluated based on comparison with the Soil Cleanup Objectives (SCOs) set forth in the NYSDEC 6 NYCRR Subpart 375-6 Regulations. Consistent with the BCP Application, results of soil sampling are compared to the restricted "commercial" and "industrial" SCOs based on the planned future use of the Site. Table 1 lists the applicable SCOs and highlights any results exceeding these screening criteria.

The groundwater data are evaluated relative to New York State Groundwater Standards for potable use as presented in the NYSDEC TOGS 1.1.1, June 1998 Edition with addenda through 2004. These screening criteria are listed on Table 2 and sample results exceeding the screening values are highlighted.

4.2 Phase II ESA Findings Summary

The Phase II investigation program included completion of 45 borings throughout the Site with soil sampling and analysis for a broad suite of parameters focused on the identified AOCs. These investigations included characterization of historic fill present on the Site and preliminary assessment of groundwater quality conditions. The objective of the Phase II ESA program was to confirm presence or absence of contamination as may be associated with the recent and historical industrial site use. The Phase II ESA results were used in development of the BCP RI Work Plan as described herein for more comprehensive site investigations where AOCs are identified.

The results of the soil boring program indicate that although some constituents were detected in soil samples, the levels were mostly below relevant regulatory cleanup objectives and in many samples none of the analytes were reported above laboratory detection and/or practical quantitation limits (MDLs or PQLs). The investigations have identified the presence of historic urban fill across the site composed of a heterogeneous mixture of ash, coal, and lesser

amounts of other debris such as brick intermixed with soil to depths up to 13 ft bgs on the Site. Sampling of this material for the site related as well as the expanded suite of organic and inorganic parameters identified limited detections of certain heavy metals, mostly arsenic, at levels above the relevant BCP soil cleanup criteria for commercial or industrial land use including:

- **arsenic with SCO exceedances in 10 of 47 samples analyzed;**
- **lead with SCO exceedances in 1 of 47 samples analyzed;**
- **copper with SCO exceedances in 1 of 47 samples analyzed;; and**
- **mercury with SCO exceedances in 2 of 47 samples analyzed.**

The Phase II data does not indicate the presence of any specific heavy metal concentration or source area given the heterogeneous nature of the fill and sporadic nature of metal detections contained therein. The Phase II data also show no evidence of any metal impact either in the underlying native soil strata or in groundwater on the Site. This preliminary conceptual model and the nature and extent of the historic fill material on the Site will be evaluated in greater detail as part of the BCP RI. The BCP RI program will build upon the Phase II investigations and include further characterization of the quality and extent of the historic fill on the Site property.

Observations during the soil boring program also indicate the presence of apparent weathered petroleum impact in the subsurface in areas of the Site where historic USTs were in former use. Analysis of impacted soil indicates limited detections of certain petroleum constituents above the BCP SCOs that do not appear significant in nature and extent based on sampling to date. However, these areas also warrant further investigation to verify the Phase II findings, fill data gaps and to specifically ascertain if a source of release or ongoing impact to groundwater may exist in these areas.

The Phase II ESA included a preliminary assessment of groundwater flow and quality conditions on the Site involving the installation and sampling from six monitoring wells. Groundwater samples were collected and analyzed for a broad suite of parameters the results of which do not indicate that groundwater contamination is present at the locations sampled. Certain naturally occurring inorganic constituents, mostly manganese and sodium, were detected at levels higher than NYSDEC TOGS 1.1.1 comparison criteria, but none of the inorganic constituents appear to be related to Site operations. The six wells were installed on a fairly wide spacing and are generally situated along the south and north Site property line assuming groundwater flows south to north in the direction of the Chemung River as shown on Figure 3. It appears however based on water levels measured during the Phase II that groundwater flow is being influenced to some extent by groundwater extraction from high capacity pumping wells on-site and off-site on the adjacent World Kitchen LLC property. Water level measurements during the Phase II indicate a general west to east groundwater flow direction on the Site. To complete a hydrogeologic model for the Site as well as to further assess potential impact at certain AOCs, the BCP RI includes expansion of the groundwater monitoring network to further evaluate groundwater flow and quality conditions based on the Phase II findings.

4.3 Phase II ESA Results by AOC

Descriptions of each AOC, the investigation activities performed within the respective AOC, a summary of the results obtained relative to these screening criteria, and recommendations relative to need and scope for further assessment are presented below. Locations of the AOCs

and the borings and wells are shown on Figure 3. More detailed discussion of the AOCs including supporting site documentation is provided in the Site Assessment Report (Haley & Aldrich, July 2007).

4.3.1 Hazardous Waste Storage Pad (AOC-2)

AOC-2 is a 20-by 30-foot concrete-lined dike formerly used for storage of pallets of bag-house dust and other waste located northeast of the boiler house. This feature was identified as a SWMU/AOC by the CAPT LOIS and RFA reports (see Section 3.1 above), as an area "with no evidence of and/or a low potential for releases". This AOC was nevertheless included in the scope of the Phase II ESA to confirm the prior anecdotal information.

Two soil borings (B-131 and B-132) were performed to investigate shallow soils in this area. Soil fill samples were obtained from each boring at depths of 1-3 and 5-7 feet bgs, respectively. There were no indications of contamination based on visual observations and PID screening during the explorations. The analytical parameter list for these samples included TCL VOCs, TCL SVOCs, site metals, and PCBs. As indicated on Table 1, there were no organic parameters detected higher than the laboratory practical quantitation limits (PQLs) except acetone with a reported value of 84 ug/kg and of no significance relative to the SCO for this compound. Trace levels of certain PAH compounds characteristic of historic urban fill were also reported below the PQL and of no significance relative to the SCOs. There were low levels of certain inorganic parameters reported that were all substantially lower than SCOs except for arsenic reported in a fill sample from boring B-132, at 215 mg/kg.

The historic fill material observed in the samples from this AOC was all similar in nature and generally comprised of a heterogeneous mixture of soil with cinder, ash and other intermixed debris. The higher level of arsenic appears to be present sporadically in the historic fill on the property. Further evaluation of the presence of arsenic site-wide as well as other metals in the historic fill on the property appears to be warranted and is included within the scope of the BCP RI program as generally described in Section 4.3.22 and detailed in Section 5 below.

4.3.2 Former Hazardous Material Drum Storage Pad (AOC-3)

A 30- by 40-foot bermed and fenced concrete pad for storage of drums of liquid waste and new products was located northwest of the hazardous materials storage building. This pad was identified as a SWMU/AOC by the CAPT LOIS and RFA reports, with a potential for releases.

Soil boring (B-125) was performed to investigate shallow soils in this area. Soil samples from the 6-8 foot and 21-23 feet bgs depth intervals, above and below the saturated zone, were submitted for analysis of VOCs, site metals, and PCBs. As indicated on Table 1, there were no organic parameters detected higher than the PQLs in any of the samples analyzed. There were low levels of certain inorganic parameters reported at levels below SCOs and of no significance. Based on these results, no additional investigation activities are proposed for this AOC as part of the BCP RI.

4.3.3 Former Drum Storage Area (AOC-4)

This storage area consisted of an asphalt pad that was used for storage of drums from approximately 1980 until it was formally closed in 1992. This pad was identified as a SWMU/AOC by the CAPT LOIS and RFA reports. The pad was noted to have cracks and

holes during the 1993 RFA. Soil samples were obtained from beneath the pad as part of 1992 RCRA closure activities. The results indicated the presence of 1,1,1-TCA (16 to 1,200 parts per billion, or ppb) and lead (130 to 1,800 parts per million, or ppm) in shallow soil beneath cracks in the asphalt. Soil in an apparent source area approximately 8 feet by 8 feet and 1 foot deep was excavated and disposed of off-site. Closure was subsequently granted for the Former Drum Storage Area.

Soil boring B-127 was performed through the center of the soil-removal excavation area and soil samples retained from depths of 1-3 and 21-23 feet bgs, above and within the saturated zone, and submitted for analysis of VOCs, SVOCs, site metals, and PCBs. As indicated on Table 1, there were no organic parameters detected higher than the PQLs except for a 1,1,1-TCA in the shallow soil sample with a reported value of 86 ug/kg and of no significance relative to the SCO for this compound. Trace levels of certain PAH compounds characteristic of historic urban fill were also reported in the shallow soil sample below the PQLs and of no significance relative to the SCOs. There were low levels of certain inorganic parameters reported that were all substantially lower than SCOs except for arsenic reported in the shallow sample at 30.2 mg/kg.

The sporadic presence of higher levels of arsenic is most likely related to the historic fill containing cinder and ash that overlies natural soils across the Site as there appears to be no specific source of the presence of this element. Further evaluation of the presence of arsenic site-wide as well as other metals in the historic fill on the property appears to be warranted and is included within the scope of the BCP RI program as generally described in Section 4.3.22 and detailed in Section 5 below.

4.3.4 Current Hazardous Materials Storage Building (AOC-5)

The hazardous materials storage building has been used more recently for storage of hazardous materials. No releases are known to have occurred in this AOC, however, this area was included in the Phase II ESA for further confirmation.

One soil boring (B-123) was performed to investigate shallow soils at this AOC and a soil sample from 0-2 feet bgs analyzed for VOCs and site metals. As indicated on Table 1, there were no organic parameters detected higher than the PQLs. There were low levels of certain inorganic parameters reported that were all substantially lower than SCOs except for arsenic reported in the shallow sample at 25.6 mg/kg.

Consistent with sampling in other AOCs, further evaluation of the presence of arsenic site-wide as well as other metals in the historic fill on the property appears to be warranted and is included within the scope of the BCP RI program as generally described in Section 4.3.22 and detailed in Section 5 below.

4.3.5 Former Fuel Oil USTs (AOC-6)

Three former fuel oil underground storage tanks (USTs) were located near the engineering storage building as shown on Figure 3. This area also contained a concrete pad that was formerly used for storage of non-hazardous waste. The USTs included two steel 26,000 gallon tanks and one steel 12,000 gallon tank. The tanks were installed around 1951 and removed in December 1985. Closure of these USTs was performed in response to indications of petroleum odor in subsurface soil samples collected in several of the nine soil borings performed around the tanks in connection with a geotechnical study for construction of the wastewater equalization tank. The petroleum odors were noted in samples from depths

ranging from 15 to 25 feet below grade. Parts of the tanks were abandoned in place because complete removal would have undermined an adjacent underground electric main line. It does not appear that soil or groundwater was sampled for the presence of petroleum products in conjunction with the tank removal activities, since no analytical results were found in available records.

Soil borings B-136, B-137, B-138, and B-139 were installed within the area of the UST excavation and 5 soil samples from varying depths between 1 and 24 feet bgs were submitted for analysis of VOCs, PAHs, site metals, and PCBs. The samples submitted for analysis were biased to locations and depths were contamination was visually observed or recorded on the PID during drilling as indicated on Table 3 and on the boring logs in Appendix B. As indicated on Table 1, there were no organic parameters detected higher than the PQLs except for a 1,1,1-TCA in the shallow soil sample with a reported value of 20 ug/kg and methylnaphthalene in two samples up to 9,600 ug/kg. There were low levels of certain inorganic parameters reported that were all lower in concentration than SCOs.

The sample analytical results from this AOC are all lower than SCOs for either industrial or commercial land use. Nevertheless based on observed petroleum odors and PID readings in this area it is apparent that petroleum and non-petroleum impacts remain and that additional evaluation is proposed as part of the BCP RI process. While levels of the detected substances and depth of impact do not exceed direct exposure criteria, the potential for impact to groundwater appears to require further assessment and included in the BCP RI scope of work.

4.3.6 Former Gas UST (AOC-7)

A historic (1950s) 1,000-gallon gasoline UST was located on the west side of the Boiler House the closure of which is not documented. Soil borings (B-115 and B-116) were performed at the location of the former UST and soil samples were collected from depths of 12-16 and 6-10 feet bgs respectively and submitted for the analysis of the NYSDEC STARS petroleum VOC and SVOC parameters, PCBs and site metals. The samples submitted for analysis were biased to locations and depths were contamination was visually observed or recorded on the PID during drilling as indicated on Table 3 and on the boring logs in Appendix B. As indicated on Table 1, there were detectable levels of several volatile petroleum constituents reported including one compound, 1,2,4 Trimethylbenzene, with a concentration of 210,000 ug/kg higher than the SCO value for this compound. There were no other substances detected above or near SCO values.

The compound 1,2,4-Trimethylbenzene was identified in B-116 at a concentration greater than the BCP Soil Cleanup objectives. Based on field observations and analytical testing results, additional soil investigation in the area of AOC 7 appears warranted and is included in the scope of the BCP RI program as described in Section 5 below.

4.3.7 Former Fuel Oil AST at Fire-System Water Tank (AOC-8)

The 1953 fire insurance map indicates that a 500,000-gallon above-ground fuel oil storage tank was located in the area of the fire-system water tank at the northernmost part of the Site. Three soil borings (B-128, B-129, B-130) were performed for this area from which 5 soil samples from various depths between 3 and 27 feet bgs were submitted for the analysis of the NYSDEC STARS petroleum VOC and SVOC parameters, and site metals. The samples submitted for analysis were biased to locations and depths were contamination was visually observed or recorded on the PID during drilling as indicated on Table 3 and on the boring logs in Appendix B. As indicated on Table 1, there were detectable levels of certain PAH

compounds characteristic of coal combustion/ash in the shallow soil/fill sample and other low levels of petroleum SVOC compounds (PAHs) in deeper samples where petroleum odors were observed. All of these reported values are significantly lower than the corresponding SCOs. Certain metals were also reported including an arsenic concentration in one sample at a concentration of 121 mg/kg in the 0-2 foot sample interval in excess of the SCO.

The sample analytical results from this AOC are all lower than SCOs for either industrial or commercial land use except for the single arsenic detection. Nevertheless based on observed petroleum odors and PID readings in this area it is apparent that petroleum impacts remain and that additional evaluation is proposed as part of the BCP RI process. While levels of the detected substances and depth of impact do not exceed direct exposure criteria, the potential for impact to groundwater appears to require further assessment and included in the BCP RI scope of work. Also, consistent with sampling in other AOCs, further evaluation of the presence of arsenic in fill site-wide on the property appears to be warranted and is included within the scope of the BCP RI program as described in Section 4.3.22 and detailed in Section 5 below.

4.3.8 Former Fuel Oil AST at GMS Annex (AOC-9)

Historic aerial photography of the Site (pre-1950) shows the presence of several large bulk fueling tanks situated above grade in cradles in the general area of what was later occupied by the GMS annex buildings, as shown on Figure 2. No specific details were available from our review of records on the use or removal of these tanks. It appears that the subsequent construction of buildings in this area likely necessitated removal of any surface soil contamination that may have been present, nevertheless confirmatory sampling was performed in the area of this AOC.

Two soil borings (B-104 and B-105) were installed in this AOC and soil samples from 0-4 and 4.5 to 5.5 feet bgs were collected for analysis of the NYSDEC STARS petroleum VOC and SVOC parameters, and site metals. There were no odors, staining, PID readings or other indications of contamination observed in these borings. The samples were collected within historic fill. As indicated on Table 1, there were detectable levels of certain PAH compounds characteristic of coal combustion/ash and one compound, Benzo(a)anthracene, reported at a level only slightly higher than the applicable SCO and of low significance. Certain metals were also detected at levels that are all below the relevant SCOs. Based on these results, no additional investigation activities are proposed for this AOC as part of the BCP RI.

4.3.9 Oil Drum Storage House, ca. 1953 (AOC-10)

The 1953 fire insurance map indicates the presence of 240-square foot oil storage house northeast of the former GMS annex building location. One boring (B-121) was installed to investigate shallow soils in this area from which 2 soil samples were collected at 1-3 and 21-25 feet bgs and analyzed for SVOCs, and site metals. Analytical results, summarized in Table 1 show no target analyte concentrations at or near relevant SCO values. No further investigation is planned in this area as part of the BCP RI.

4.3.10 Oily Concrete at Machining System Pads on GMS Slab (AOC-11)

Areas of oil staining were noted on the GMS building floor slab during facility decommissioning activities. The stained areas are associated with former machining equipment locations. The condition of the concrete appears to be good in these areas, and therefore the potential for release of oil to the subsurface appears to be low. Nevertheless, as confirmation, soil borings (B-100 and B-102) in the locations with staining were performed and 2 soil samples from depths of 0-4 feet bgs submitted for the analysis of site metals, VOCs and SVOCs.

Analytical results, indicate that none of the organic parameters were reported at or near the SCO criteria. Arsenic was detected in both boring samples at a concentration greater than the SCO. The presence of arsenic is most likely related to the historic fill soils containing cinder and ash that are known to overlie natural soils across much of the Site. The nature and extent of arsenic in the on-site fill material will be evaluated further during the shallow soil boring program to be implemented as part of the BCP RI as described in Section 4.3.22 below.

4.3.11 Oily Saturation of Concrete in "Gun Mounts" Area (AOC-12)

An area of oil-soaked concrete was observed on the former floor slab of the former Gun Mounts section of the Fall Brook plant building during building demolition. The condition of the concrete appears to be good in this area, and therefore the potential for release of oil to the subsurface appears to be low. Nevertheless, as confirmation, soil boring (B-112) was performed in this area and samples submitted from 0-6 and 20-22 feet bgs for the analysis of site metals, and SVOCs.

Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria. No further investigation of this AOC is planned during the BCP RI.

4.3.12 Former Septic System and Site Storm Sewer System (AOC-13)

Based on historic drawings from the 1930's, sanitary wastes at the Site were discharged to an on-site septic tank located in the area of the Mason Shop. Soil borings B-108 and B-109 were performed in the area of the Site, and samples collected at depths of 0-4 feet below ground surface and submitted for the analysis of pesticides, PCBs, SVOCs, VOCs, and TAL metals plus cyanide. Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria except for arsenic with a reported concentration of 23.9 mg/kg and higher than the SCO. As with conditions observed in several other AOCs, the presence of arsenic is most likely related to the historic fill soils containing cinder and ash that are known to overlie natural soils across most of the Site. The nature and extent of arsenic in the on-site historic fill material will be evaluated further during the shallow soil boring program to be implemented as part of the BCP RI.

The storm sewer system on the Site property consists of a network of buried pipes of various size interconnected via manholes and catch basins, all of which discharge off-Site through the WWTP. The storm sewer system on the Site was thoroughly cleaned using a high pressure revolving jetting head cleaning tool, flushed, and inspected by a specialty industrial cleaning contractor as part of the 2007 building demolition project. As part of this process, all active and formerly closed sewer pipe runs were identified using a video camera, cleaned and visually inspected again after cleaning using the in-pipe video equipment. Observations

during the cleaning process did not indicate any significant accumulations or blockages of piping on the property and post cleaning inspections indicated that the piping all appeared to be in reasonably good condition with no observations of any significant cracking, breaching or structural failure. Based on these activities and observations no direct investigation of the on-site sewers is planned during the BCP RI, however, investigation of the other AOCs as well as Site-wide ground water conditions will provide comprehensive coverage across the site including the areas where sewers exist.

4.3.13 Hydraulic Pit at GMS Dock Levelers (AOC-14)

A shipping dock on the south side of the former GMS building had a hydraulic system for the dock leveler. The hydraulic system for the leveler was contained in a pit. During decommissioning, oil and oil-staining were noted in the pit, and a pipe through the pit wall represents a potential route for minor releases of hydraulic oil to the surrounding soil. One soil boring (B-101) was performed and a sample obtained from 8-10 feet bgs that was submitted for the analysis of PCBs, VOCs, and PAHs. The sample submitted for analysis was biased to the depth were possible petroleum odors (but no PID readings) was visually observed during drilling as indicated on Table 3 and on the boring logs in Appendix B. Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria. No further investigation of this AOC is planned during the BCP RI.

4.3.14 Elevator Pits (AOC-15)

Hydraulic piston-driven elevators were present in the General Machine Shop, the Central Trades building and in the Fall Brook main building at the locations shown on Figure 2. The elevators and related subsurface elements were completely removed by crane during building decommissioning activities and the elevator casings all observed to be in very good condition based on inspections after removal with no visual indications of any rust, breaching or holes of any kind. The pits in which the elevators were located are constructed of concrete. Residual oil was present in the pits; the oil was removed and the pits cleaned prior to backfilling. The pits for these elevators appeared to be in good condition and to represent very low potential for release. Based on observations made during removal of the elevator and associated underground elements, it does not appear these systems have leaked in the past. Nevertheless soil borings (B-103, B-107 and B-113) were performed (one in each elevator pit) in this area and two confirmatory samples were collected for the analysis of site metals, and SVOCs.

Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria except for arsenic in one sample with a reported concentration of 17.4 mg/kg and slightly higher than the SCO. As with conditions observed in several other AOCs, the presence of arsenic is most likely related to the historic fill soils containing cinder and ash that are known to overlie natural soils across most of the Site. The nature and extent of arsenic in the on-site historic fill material will be evaluated further during the shallow soil boring program to be implemented as part of the BCP RI as described in Section 4.3.22 below.

4.3.15 Boiler Blow Down Pits (AOC-16)

A series of concrete-lined pits were present in the floor slab of the former Boiler House that were used to collect blow down from heating system equipment. Four soil borings (B-117, through B-120) were performed at each pit location and four confirmatory samples collected for laboratory analysis at different depth intervals from 1 to 23 feet bgs at soil borings B-117 and B-119. One sample was obtained from boring B-117 at a depth interval of 3 to 4 feet bgs

and three samples obtained from boring B-119 at depth intervals of 1 to 3, 16 to 20, and 21 to 23 feet bgs. All of these samples were submitted for the analysis of site metals, and two of the samples were analyzed for SVOCs. There were on observed odors, staining, PID reading or other indications of contamination in any of the 4 borings in this AOC.

Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria except for arsenic with a reported concentration of 39.6 mg/kg in one of the four samples analyzed, a level higher than the SCO. As with conditions observed in several other AOCs, the sporadic presence of arsenic is most likely related to the historic fill soils containing cinder and ash that are known to overlie natural soils across most of the Site. The nature and extent of arsenic in the on-site historic fill material will be evaluated further during the shallow soil boring program to be implemented as part of the BCP RI as described in Section 4.3.22 below.

4.3.16 Pipe and Sump Near Mason Shop-PP1 Bldg (AOC-17)

A sump and an associated 8-inch pipe were noted during decommissioning at a location outside the north end of the former Mason Shop building. The nature and past use of these features is not known. One soil boring (B-124) was performed at this AOC and samples collected from the 0-4 and 21-23 feet bgs depth intervals and submitted for analysis of site metals and VOCs.

Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria except for arsenic with a reported concentration of 16.9 mg/kg in the shallower sample analyzed, a level slightly higher than the SCO. As with conditions observed in several other AOCs, the sporadic presence of arsenic is most likely related to the historic fill soils containing cinder and ash that are known to overlie natural soils across most of the Site. The nature and extent of arsenic in the on-site historic fill material will be evaluated further during the shallow soil boring program to be implemented as part of the BCP RI as described in Section 4.3.22 below.

4.3.17 Acetone Drum Storage/Acid Ampule Burial Area (AOC-18)

The 1953 fire insurance map for the Site indicates a narrow 30-foot long area with the label "Stage Acetone in Storage Drums" was located near the former Multiform Office building. No other details on the area were found. A 1935 plan of the Site indicates that an "Acid Ampoule Burial" area was present at essentially the same location as the acetone drum staging area. No further details on the nature or volume of the buried materials have been identified. To evaluate the presence/absence of impacts in this area, two soil borings (B-110, B-111) were installed in this area with soil samples collected at depths of 0-3 and 1.5-5 feet bgs for the analysis of site metals and VOCs.

Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria. No further investigation of this AOC is planned during the BCP RI.

4.3.18 Former Paint Shed Northeast of Gate 3 (AOC-19)

The 1953 fire insurance map indicates the presence of a small paint shed. No other information on conditions in this area was available. One shallow soil boring (B-135) was performed and a sample collected from 1-3 feet bgs was submitted for the analysis of site metals, PCBs and VOCs. Analytical results indicate that none of the parameters analyzed

were reported at or near the SCO criteria except for lead with a reported concentration of 1280 mg/kg in the shallower sample analyzed, a level slightly higher than the SCO.

The elevated detection of lead at this AOC appears to be of low significance lacking any other evidence of past spills or releases at this AOC or of elevated lead being detected in any other sample during the Phase II ESA. Nevertheless additional investigation of the overall levels of metals, including lead, in historic fill across the Site will be conducted as described below in Section 4.3.22.

4.3.19 Former Arsenic Acid Storage Area (AOC-20)

Facility records indicate that in the 1950s an arsenic-acid bulk storage area was present near the northwest corner of the Fall Brook main plant building. No other information on conditions in this area was available. One shallow soil boring (B-134) was installed and a sample from 0-3 feet bgs was collected for analysis of site metals. Analytical results indicate that none of the parameters analyzed were reported at or near the SCO criteria. No further investigation of this AOC is planned during the BCP RI.

4.3.20 Cyanide Storage Building, ca. 1953 (AOC-21)

The 1953 fire insurance map indicated the presence of a small addition to the west side of the north end of the former Central Trades building was used for cyanide storage. No other information on conditions in this area was available. One shallow soil boring (B-106) was installed and a soil sample from 0-4 feet bgs was submitted for analysis of total cyanide (EPA Method 9012) and results reported as not detected above the laboratory PQL. No further investigation of this AOC is planned as part of the BCP RI.

4.3.21 Former Railroad Operations

The historical maps reviewed as part of the Phase I ESA, indicate that except for a narrow strip of the southern part of the Site which was occupied by residential lots located along the north side of Tioga Avenue between Pearl Street and Steuben Street, the remainder of the Site was occupied from at least the 1850s to 1929 by a rail yard with ten or more rail spurs, one or more car sheds and several small buildings. Sanborn Fire Insurance maps of the Site area from the mid-1800s and early 1900s indicate that the former Cullet Storage and Batch Material storage buildings, and the Mix House, located near the east end of the Site, were former railroad buildings dating from 1888 or earlier that were used by Corning after 1930. A round house present prior to 1930 in the area northwest of the Mix House appears to have been located for the most part off-site on the adjacent World Kitchen property, but its former footprint may extend to the area near the Engineering Storage building.

In addition to the sampling performed at the specific AOCs across the site as described above, additional test borings (B-140 and B-141) were performed for more complete coverage in the northeast corner of the Site (current location of the new Batch Materials building) where the former railroad roundhouse was located. Soil samples from 0-4 and 4-8 feet bgs were collected for the analysis of all or portions of a broad suite of parameters including TAL metals, PCBs, Pesticides, VOCs and SVOCs. The analytical results summarized in Table 1 indicate that all target analyte concentrations are below the relevant SCOs except for copper and mercury detections that are higher than the commercial SCOs. Duplicate samples were collected and analyzed from the B-141 boring with markedly different results for these same elements. Lack of reproducibility in sample splits appears to indicate the sporadic nature of metals in the historic fill as opposed to a pervasive or specific source area impact.

Nevertheless, additional shallow soil samples will be collected in this area as well as throughout the Site as part of the BCP RI as described in Section 4.3.22 below.

4.3.22 Heavy Metals in Site-Wide Shallow Soils

As indicated in the history information above, past manufacturing operations on the Site involved the use of various raw materials including products containing the "site metals" described in this work plan. The Phase II ESA focused on assessing the quality of surficial soil fill on the Site for the presence of elevated levels of the site metals as well as other suspected constituents such as PAH compounds that are typically associated with the historic fill or could otherwise result form the former railroad operations on the Site. The quality of the historic fill was assessed for these substances throughout the Site with greater sampling being conducted in areas proximate to railroad spurs and the areas where the raw sand materials were stored. As noted in the findings for several of the AOCs summarized above, the historic fill on the site is a heterogeneous mix of soil and non-soil materials containing ash, coal pieces, some brick and other materials. Of the many samples of historic fill material analyzed there were no reported detections of PAH compounds higher than the commercial/industrial SCOs but there were sporadic detections of certain site metals higher than the commercial and/or industrial land use SCOs including:

- **arsenic with SCO exceedances in 10 of 47 samples analyzed;**
- **lead with SCO exceedances in 1 of 47 samples analyzed;**
- **copper with SCO exceedances in 1 of 47 samples analyzed;; and**
- **mercury with SCO exceedances in 2 of 47 samples analyzed.**

In addition, the Phase II field screening and sampling for a much broader suite of compounds in selected historic fill samples has not identified elevated levels of such other substances to be associated with the historic fill.

Based on the Phase II analytical data for shallow soil samples collected across the Site it appears that the historic fill is ubiquitous on the property and quality of this material is heterogeneous with only sporadic detections of certain metals higher than SCOs. Investigations to date do not indicate that the site metals are concentrated in any specific area or fill strata on the Site and there is no evidence that these metals are mobile lacking any detections of elevated site metals in native soil which underlies the historic fill or in the groundwater sampling conducted on the Site to date. This preliminary conceptual model and the nature and extent of the historic fill material on the Site will be evaluated in greater detail as part of the BCP RI.

4.3.23 TCE in Plant Water Supply Wells

In 1990, Trichloroethene (TCE) was detected at a concentration of 22 parts per billion in an offsite water supply well identified as No. 1. This well is located on World Kitchen LLC property as shown on Figure 5 and was in use for extraction of groundwater used in manufacturing operations. The origin of TCE was not identified based on available records. To investigate the potential presence of TCE in groundwater beneath the Site, a groundwater monitoring well identified as B-143-MW was installed and sampled during the Phase II ESA. This monitoring well is situated in the northeast corner of the Site boundary, proximate to the production well No. 1. A groundwater sample from well B-143-MW was collected and analyzed for a broad suite of parameters including TAL metals, PCBs, Pesticides, VOCs and SVOCs. The analytical results summarized in Table 2 do not indicate the presence of any substances above the laboratory PQL except for iron, sodium, both naturally occurring

elements, and a Freon compound (Trichlorofluoromethane/CFC-11) reported at 1.8 ug/l and below the drinking water standard. The pesticide compounds dieldrin and alpha-hexachlorocyclohexane were reported in this sample at concentrations below the PQLs but higher than the drinking water standards. These results are qualified by the laboratory as possibly being "false positives" or "mis-identified" at the reported quantitation limits. TCE was not detected in this sample.

4.3.24 Site-Wide Groundwater Quality Assessment

In addition to the investigation of potential TCE in groundwater in the northeast section of the Tioga Avenue property, site-wide groundwater conditions were investigated through the installation and sampling of five additional monitoring wells (B-129-MW, B-144-MW, B-145-MW, B-146-MW, B-147-MW) installed primarily along the property boundaries; groundwater samples were collected and analyzed for the parameters summarized in Table 2. Prior to sampling, water levels measurements were obtained from each well to assess groundwater flow direction as described in Section 2.3 above. Based on groundwater elevations obtained, groundwater flow appears to be generally from west to east and is potentially influenced by groundwater extraction on the adjacent World Kitchen property and from the on-site pumping well. (World Kitchen continuously operates a production well in the general proximity of the Mix House. The pumping rate of this production well is reported to be in excess of 1,000 gallons per minute. The on-site pumping well is operated intermittently to sustain the operation of the WWTP). Groundwater samples were obtained and analyzed from each of these wells for TAL metals, SVOCs (base-neutral fraction) and VOCs and a subset of the wells also analyzed for a full SVOC scan (base-neutral and acid-extractable fractions), pesticides and PCBs and the results summarized on Table 2.

The analysis of groundwater indicates that inorganic constituents are present in select wells at levels exceeding NYSDEC drinking water quality criteria. These detections do not appear to be related to site operations and therefore may represent natural conditions. There were no detections of organic constituents above the laboratory PQLs in any of the samples. To further evaluate the groundwater conditions at the site, additional groundwater wells will be installed within the interior of the site in order to further assess and confirm groundwater flow direction as well as to confirm the groundwater quality conditions indicated by the Phase II ESA results focusing in down gradient areas of the Site and selected AOCs.

4.3.25 Off-Site Sampling

As described in Section 2.1 above, the BCP application for the site included the WWTP located on World Kitchen LLC property northeast of the Tioga Avenue Site, however, the Department excluded this WWTP property from the BCP lacking reasonable basis that contamination is present on the WWTP property. The Phase II ESA was performed before the Department's determination of the Site boundary, thus the Phase II program included the installation and sampling from boring B-133 at the WWTP and which is outside BCP Site boundary as shown on Figure 3. This boring was performed to investigate shallow soils in the area of the sludge hopper pad and a sample obtained and analyzed for a broad suite of parameters including VOCs, SVOC, TAL metals, and pesticides and PCBs. There were no detections of any of the parameters analyzed except for certain metals reported at levels they are suspected to naturally occur and all well below relevant SCOs. These data support the NYSDEC exclusion of the WWTP from the Site as well as prior conclusions of EPA (as discussed in Section 3.2 above) on lack of evidence on a release or other concerns in this area.

5. BCP REMEDIAL INVESTIGATION SCOPE AND RATIONALE

The BCP RI program will include the completion of approximately 60 to 70 test borings, installation of six additional monitoring wells, groundwater elevation and flow determination, and sampling and laboratory analysis of soil and groundwater samples. Proposed soil boring and monitoring well locations are shown on Figure 6.

These investigations will build upon and complete data gaps from the Phase II ESA. The additional investigations are intended to enable further evaluation of the AOCs where actual or suspected impacts have been identified and to specifically assess:

- **the quality of historic urban fill that is present throughout the site;**
- **the potential for impact in the area of AOC 6 from possible historic releases of fuel oil from former USTs;**
- **the potential for impact in the area of AOC 7 from possible historic releases of gasoline from a former UST;**
- **the potential for impact in the area of AOC 8 from possible historic releases of fuel oil from former USTs; and**
- **to confirm the conceptual site hydrogeologic model.**

The data produced from the BCP RI Program will provide a more comprehensive basis on the nature and extent of potential impacts to soil or groundwater on the Site and significance of such impacts relative to BCP criteria under a future industrial and/or commercial land use scenario. Assessment of other media, such as soil vapor, will be considered if warranted based on the findings of the investigations proposed herein if the investigation results indicate the potential for concern.

Project samples will be submitted to an independent laboratory certified by the New York State Department of Health (NYSDOH) under its ELAP Program. Sample analysis will be performed using US EPA SW-846 methods with samples from approximately 10 percent of the BCP RI soil borings and groundwater monitoring wells reported using the NYSDEC Analytical Services Protocol (ASP) extended Category B data deliverables and the balance of the data set reported using ASP Category A or equivalent data deliverables. All project data deliverables will be validated by a NYSDEC-approved Data Validator. Both ASP categories of laboratory deliverables will be sufficient to enable independent validation and preparation of a project Data Usability Summary Report (DUSR).

Based on historical site use and the Phase II ESA, soil and groundwater investigations will focus on analysis of the organic and inorganic constituents known or suspected to be associated with the Site referred to herein as the "site-related" contaminants which are related to a class of compounds or individual constituents including: petroleum hydrocarbons, PAHs as related to fill containing coal combustion residuals, and antimony, arsenic, barium, cadmium, and lead as potentially related to former operations of the Fall Brook facility. In approximately 10 percent of the BCP RI sample locations, laboratory analysis will also include non-target parameters, TCL VOC by EPA 8260B, TCL SVOC by EPA 8270C and TAL metals and collectively referred to as the "expanded parameter list". If the analyses for

these expanded parameters indicates concerns with other non site-related compounds additional sampling and analysis may be warranted.

Table 4 provides a summary of field and analytical parameters for soil and groundwater, and quality control sampling program including analytical method, sample handling, preservation, and holding time requirements. The field screening program will include use of instrumentation for detection and relative quantification of VOCs.

Tables 5 and 6 summarize the target analytes and reporting limits for soil and groundwater, respectively. A summary of the planned borings, wells, and sample analyses planned for each of the areas of concern identified at the Site is presented on the attached Table 7.

5.1 Soil Investigation Summary

Soil sampling will be performed by installing test borings with continuous sampling. The soil boring program will be targeted to specific locations on the Site where AOCs are identified (such as USTs areas), as well as randomly to further assess the historic fill material that is broadly distributed on the Site. The borings planned for investigation of the site specific AOCs will be determined in the field. The random sampling program to further investigate historic fill will be accomplished on grid pattern of approximately 50 boring locations covering the Site with a spacing of approximately 100 feet by 100 feet as shown on Figure 6.

Test borings will be advanced using standard auger, roto-sonic or direct push hydraulic drilling equipment. The depth of each boring will depend on the location and the soil conditions observed. At a minimum, each soil boring will be advanced through historic fill material until native soil is encountered. Soil samples will be collected if indications of contamination are encountered and/or otherwise at predetermined target intervals. Soil borings will generally be advanced to the top of un-impacted native soil or to the water table based on the AOC being investigated and field screening results. If evidence of contamination is observed in any boring, such boring will be extended to a depth sufficient for full penetration through the impacted zone or at a minimum to the water table depth.

Field screening for the presence of volatile organic compounds (VOCs) and visual examination and classification of soil type will be performed in the field. VOC screening will be performed using a Mini-Rae Model 2000 or equivalent hand-held photo-ionization detector (PID). Relative VOC impacts to soil will be determined by head space analysis of a representative sample of the sampling interval.

Soil borings designated as groundwater monitoring well locations will be advanced to the water table which is anticipated to occur in the depth range between 19 to 25 bgs based on the Phase II ESA. Drilling spoils will be returned to the open boreholes at each boring except where monitoring wells are installed, in which case, the soil or waste material will be drummed for appropriate handling.

Discrete sample intervals from each soil boring will be selected for laboratory analysis based on field observations and the particular AOC being investigated as summarized on Table 7. Sample selection will be made on the basis of field screening results and/or, in the case of historic fill, at targeted depth intervals. In general, one to three soil samples from each test boring will be retained for off-site laboratory analysis based on the protocol described below.

- **For assessment of historic fill, multiple samples will be collected from each test boring within the sample grid for analysis of the site-related metals as are known or**

are suspected to be associated with the historic fill. Given the extent and heterogeneous nature of the historic fill on the property the sampling program will entail the following process.

- **One grab sample from 0 – 1 feet immediately beneath any sub-base gravel layer beneath pavements or former facility concrete slabs will be submitted for analysis of the site-related metals. These data will enable assessment of the "exposed soil" criteria as described in the BCP Regulations.**
- **Beneath the 0 – 1 depth sample additional grab samples will be obtained from each two foot interval throughout the historic fill layer. These samples will be homogenized into a composite sample for analysis of the site-related metals to assess of the overall quality of historic fill on the Site.**
- **One grab sample from native soil beneath the historic fill will be obtained and submitted for analysis of the site-related metals. This sample will be used to assess the potential for the known or suspected site-related metals to impact underlying soil.**
- **Additional grab samples of historic fill materials will be obtained, as necessary, based on field observations for any sample locations exhibiting potential contamination from visual observations or field screening.**
- **The expanded parameter list inclusive of other non-target substances will analyzed in 20 percent of the sample population for confirmation of non-presence on the Site. These samples will be obtained at predetermined boring locations within the sample grid and from the upper 0-1 foot bgs zone at locations where the historic fill is present.**

¾ **For assessment of other AOCs representing specific potential sources of impact, it is anticipated that several borings will be performed within each AOC as indicated on Table 7. Based on the Phase II ESA findings, the initial borings will be advanced within the identified areas of impact and additional borings extended outward to define the limits (area and depth) of impact within each AOC. One or more soil samples will be retained at most boring locations biased to the highest level of impact observed by field screening and selected samples obtained in native soil below the zone of impact to assess contaminant mobility. The AOCs to be investigated using these methods are associated with former bulk petroleum storage facilities, therefore the samples retained from these areas will be analyzed for TCL VOCs as well as the semi-volatile petroleum constituents in accordance with the NYSDEC STARS Memo #1, "Petroleum-Contaminated Soil Guidance Policy", dated 1992 for assessment relative to the BCP Soil Cleanup Objectives (SCOs).**

5.2 Groundwater Investigation Summary

Six additional groundwater wells will be installed during the BCP RI to expand the existing 6 well monitoring network established during the Phase II ESA. The new groundwater monitoring wells will be installed to enable further evaluation of groundwater quality and flow, and overall hydrogeologic conditions across the Site. The locations of the existing wells and proposed approximate new monitoring well locations are shown on Figure 6 and will be sampled as summarized on Table 7. The new overburden monitoring wells will be installed to permit the assessment and sampling of groundwater in the following areas of the Site:

¾ **at locations equidistant between existing monitoring wells to provide more complete coverage across and in the center of the Site;**

- **at locations near to and down gradient from AOCs #6, 7 and 8 where contamination was identified during the Phase II ESA to assess potential impacts to groundwater; and**

- **at locations along the west/up-gradient and east/down gradient Site boundary to further assess the quality of groundwater entering and leaving the Site.**

Monitoring wells will be constructed using 2-inch diameter PVC riser pipe and 10-foot length of PVC well screen. In general, the wells will be installed to screen across the water table surface. After installation, the wells will be developed to remove residuals from drilling and to facilitate connection with the overburden groundwater. Groundwater level monitoring will be performed at each well during the well development, prior to sampling, and at least one one-day Site-wide groundwater-level measurement event will be performed.

Groundwater sampling will be performed at least three (3) days following development to allow for equilibrium with static groundwater conditions. Groundwater sampling will be performed using low flow purging methods, with in-line monitoring of field parameters, pH, dissolved oxygen (DO), oxidation reduction potential (ORP), specific conductivity and turbidity. Groundwater samples for each of the 6 existing and 6 new monitoring wells will be submitted for analysis of TCL VOCs and TAL metals.

Groundwater removed during well installation, development, purging and sampling and slug test activities will be contained for appropriate handling.

5.3 Location and Elevation Survey

The location and ground-surface elevation of each completed test boring and monitoring well will be surveyed by a licensed land surveyor as referenced to the previously established Site datum. The survey data will be used to establish the static groundwater elevation across the Site.

6. QUALITY ASSURANCE/QUALITY CONTROL PROTOCOLS

6.1 Quality Assurance

The quality assurance program for the BCP RI is described in the Quality Assurance Project Plan (QAPP) presented in Appendix E. The QA program has been designed to acquire the necessary data to meet the Data Quality Objectives (DQO) to achieve the goals of the RI. The QAPP has been prepared in accordance with quality assurance requirements of NYSDEC DRAFT "Technical Guidance for Site Investigation and Remediation" (DER-10).

6.2 Field Investigation Procedures

The primary objective of sampling activities is to permit an evaluation of potential impact of the current site conditions on human health and the environment, and to conduct such work in a safe and workmanlike manner following recommended practices and relevant regulatory guidelines. The sampling will be conducted so that samples collected will retain in-situ physical characteristics and chemical composition.

Standard operating procedures (SOPs) to be used during sampling and other BCP RI field activities are provided in Appendix F. These SOPs will be used as applicable based on the investigations performed and may be changed as necessary, dependent on Site conditions, equipment limitations, or limitations imposed by the procedure. If the procedures employed differ from the SOP, the deviations will be documented. The SOPs include the following topics:

- **Initial Site Reconnaissance Surveys**
  - **Utility Clearance**
  - **Field Data Recording – Field Books, Log Forms, and Electronic Data**
- **Subsurface Investigations**
  - **Drilling Techniques/Background Information**
  - **Soil Borings**
  - **Borehole Abandonment/Sealing**
  - **Soil Classification**
- **Monitoring Wells**
  - **Well Construction Materials**
  - **Procedures for Overburden Monitoring Well Installation**
  - **Well Decommissioning Procedures**
  - **Well Development Procedures**
- **Aquifer Characterization**
  - **Manual Water Level Measurement Procedure**
  - **In-Situ Hydraulic Conductivity (Slug Testing) Procedure**
- **Sample Collection for Laboratory Analysis**
  - **Soil Sample Collection for Laboratory Analysis**
  - **Groundwater Sample Collection for Laboratory Analysis**
  - **Non-Aqueous Phase Liquid (NAPL) Monitoring/ Sample Collection**
  - **Sample Handling and Shipping**
- **Field Instruments – Use and Calibration**
- **Equipment Decontamination**

7. HEALTH AND SAFETY PROTOCOLS

The Site-specific Health and Safety Plan for the BCP RI is attached in Appendix G. All project personnel will conduct project activities in accordance with the Site-specific Health and Safety Plan.

All project personnel (including subcontractor personnel) will also be required to complete site specific health & safety training and conduct their work in accordance with the Corning Incorporated health and safety procedures.

8. REPORTING AND SCHEDULE

8.1 Reporting

Preparation of tables and figures summarizing results of the sampling, analysis and survey activities will be performed as soon as the field and laboratory activities are completed. The preliminary data will be presented in required Progress Reports to the Department as required by the Brownfield Cleanup Agreement and until such time as the RI Report is submitted to the Department.

The RI Report as required by the BCA will be prepared in general accordance with the recommended report content and format as presented in DER 10 and will include the integration of the cumulative findings from the pre-BCA assessments and investigation programs. The investigation results will be evaluated in accordance with the relevant standards, criteria and guidelines including performance of a site-specific Qualitative Exposure Assessment following the New York State Department of Health (NYSDOH) guidelines contained in DER 10.

In overview, the RI Report will provide: characterization on site use and history as related to potential for environmental contamination; environmental setting and hydrogeologic site characterization; identification and characterization of sources of contamination; assessment of significance and fate and transport of any identified contamination relative to the NYSDEC Brownfield Cleanup Program Regulations, applicable SCOs and the intended future use of the Site; description of any Interim Remedial Measures completed during the RI program; conclusions regarding presence of absence of unacceptable exposure pathways; and recommendations on need, if any, for additional investigation or remedial action. The RI Report will be supported with data summary tables and figures as recommended in DER 10 and appended with relevant supporting documentation including but not limited to soil boring logs and well completion records, laboratory analytical reports, data usability reports, and other records as applicable. The RI Report will be submitted to the designated NYSDEC and NYSDOH recipients in accordance with the distribution list in the BCA.

8.2 Schedule

Upon the approval of this Work Plan it is anticipated that implementation of the RI Program will be undertaken based on the following approximate timeframes:

Activity	Time frame	Task
Pre-sampling activities	30 Days from Work Plan Approval	Utility clearance
		Engage drilling and laboratory subcontractors,
		Finalize Test Boring Locations
Field Work	90 Days from Work Plan Approval	Soil and groundwater sampling and
		Water-level and slug testing
		Survey of locations and elevations
Laboratory Analysis	140 days from Work Plan Approval	Analysis of soil and groundwater samples and preparation of deliverables
		Prepare DUSR, evaluate and summarize data
Data Evaluation	200 Days from Work Plan Approval	Prepare DRAFT Remedial Investigation report

9. CITIZEN PARTICIPATION ACTIVITIES

The Citizen Participation Plan (CPP) for the Tioga Avenue Site has been prepared and submitted to the Department under a separate cover in accordance with the requirements of the BCA.

REFERENCES

Corning Property Management Corporation and Corning Incorporated, (July 2007), Brownfield Cleanup Program Application, Tioga Avenue Site, Corning, New York, July 2007.

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APPENDIX A

Site Photographs

APPENDIX B

Phase II ESA Boring Logs
And
Well Completion Reports

APPENDIX C

Phase II ESA Laboratory Reports
And
Chain-Of-Custody Documentation

APPENDIX D

Phase II ESA DUSR Reports

APPENDIX E

Quality Assurance Project Plan

APPENDIX F

SOPS For Field Investigations

APPENDIX G

Health & Safety Plan

REMEDIAL INVESTIGATION WORK PLAN
TIOGA AVENUE SITE
CORNING, NEW YORK

BCP Site # C851031

by

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