REMEDIAL ALTERNATIVES REPORT

for the

BROWNFIELD CLEANUP PROGRAM

at the

FORMER ONEIDA KNIFE PLANT LOT 1

Kenwood Avenue
City of Sherrill, Oneida County, New York
NYSDEC Site No. C633077

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I. INTRODUCTION

The former Oneida Knife Plant, Lot 1 (Site) is located on Kenwood Avenue in the City of Sherrill, Oneida County, New York. The property was a former silverware manufacturing facility owned by Oneida Silversmiths, Inc. (Oneida). The Site is a 2.9-acre parcel of land that includes the northerly and oldest portion of the former Oneida Knife Plant. The factory facilities on the Site are vacant. The remainder of the former Oneida Knife Plant to the south (Lot 2) includes the newer portion of the factory on 17.6 acres that was purchased by Omega Wire, Inc. in 2006 and is currently an active copper wire drawing mill. Refer to Figure 1 for the Site location.

A Brownfield Cleanup Program (BCP) application for the Site[1] was submitted to and approved by the New York State Department of Environmental Conservation (DEC). Subsequently, Oneida and the DEC entered into a Brownfield Cleanup Agreement in December 2009. The purpose of this BCP project is to investigate environmental impacts on the Site and undertake cleanup that may be required to allow reuse or redevelopment for industrial use. A Remedial Investigation Work Plan (RIWP)[2] for completing a Remedial Investigation (RI) of the Site was submitted to and approved by the DEC. The RIWP proposed a number of investigation activities directed at sufficiently completing a characterization of the nature and extent of environmental impacts at the Site, aimed at providing the basis for determining the need for cleanup and, if appropriate, selecting remediation methods. The RI was summarized in a report[3] which was submitted to and reviewed by the DEC and New York State Department of Health (DOH). Agency comments on the RI were received,[4] which approved proceeding with the Remedial

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[1] *Brownfield Cleanup Program (BCP) Application*, prepared by Plumley Engineering, P.C., dated June 30, 2009.

[2] *Remedial Investigation Work Plan for the Brownfield Cleanup Program at the Former Oneida Knife Plant, Lot 1, Kenwood Avenue, City of Sherrill, Oneida County, New York, NYSDEC Site No. C633077*, prepared by Plumley Engineering, P.C., dated January 2010 and *Addendum to Work Plan*, prepared by Plumley Engineering, P.C., dated April 1, 2010.

[3] *Remedial Investigation Report for the Brownfield Cleanup Program at the Former Oneida Knife Plant, Lot 1, Kenwood Avenue, City of Sherrill, Oneida County, New York, NYSDEC Site No. C633077,* prepared by Plumley Engineering, P.C., dated November 2010.

[4] Letter from Peter Ouderkirk, Region 6 DEC, Dated March 29, 2011.

Alternatives (RA) analysis, but which also requested some additional sampling in the adjacent Oneida Creek. These comments were addressed in a response letter[5] from our office, which included some follow-up Site sampling of the Oneida Creek. The results of the additional creek sampling work were forwarded to the DEC[6] and comments on the additional analytical results received in November 2011,[7] completing the RI phase of the project.

This report presents the results of the RA analysis completed for the Site. The purpose of the analysis is to identify, evaluate and select an appropriate remedy or remedies addressing the impacts indentified by the RI report.

The RA analysis was performed in substantial conformance with the DEC's *Technical Guidance for Site Investigation and Remediation* (DER-10), dated November 2009, and New York Codes, Rules and Regulations, Title 6 (6NYCRR), Part 375 *Environmental Remediation Programs*, dated December 14, 2006.

II. SITE DESCRIPTION AND HISTORY

The Site is bounded to the north by Oneida Creek, which flows northeasterly by the Site, eventually draining into Oneida Lake approximately 10 miles downstream to the north-northwest. The Site currently contains a vacant factory consisting of several attached industrial buildings of different ages. The active, newer factory building of the former Oneida Knife Plant property abuts immediately to the south of the Site. A large area of undeveloped woods surrounds the former Oneida Knife Plant property to the south and east. Refer to Figure 1 for topographic and geographic features in the area of the Site. The current conditions of the Site are provided on Figure 2.

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[5]Letter from Dale Vollmer, Plumley Engineering, dated April 28, 2011.

[6]Letter Report prepared by Plumley Engineering, dated August 31, 2011.

[7]Letter from Peter Ouderkirk, DEC Division of Environmental Remediation, dated November 9, 2011.

The land uses around the Site are mixed:

- The newer factory building of the former Oneida Knife Plant, along with related property and parking lots, are now owned and used by Omega Wire for copper wire manufacturing.

- Across Kenwood Avenue to the west are vacant (wooded) land, a pond (Sunset Lake) and the paved parking lot for the factory, now part of Omega Wire property holdings.

- The nearest residential areas are located north of the Site, approximately 300 to 600 feet north of the Oneida Creek. The Oneida Community Mansion property abuts Oneida Creek on the north.

- East of the Site is vacant land and a steep, wooded hillside.

- The Site is currently zoned M-1 Manufacturing District by the City of Sherrill.

Oneida Creek is classified as a Class C stream. Flood Insurance Rate Maps (FIRMs) indicate the lowest areas of the Site along the eastern bank are not within a floodplain. No critical habitats of endangered or threatened species are known to exist in the project area. No wetlands are located on the Site. The nearest New York State wetlands are located approximately 1,100 feet southwest of the Site (Figure 1). The nearest mapped Federal wetland areas are located approximately 200 feet upstream and downstream of the Site along Oneida Creek.

The Site and vicinity are served by City of Sherrill public water and sewer utilities. Natural gas is also available to the Site. The natural gas and water mains run along Kenwood Avenue. City of Sherrill sanitary sewer services the Site via an easement that enters the Site from the north, crossing Oneida Creek. The City of Sherrill provides electric power to the Site. The nearest known water wells are located approximately 1,600 to 1,800 feet south of the Site on properties along Kenwood Avenue.

Existing buildings on the Site are in need of maintenance or demolition. These structures are constructed of masonry and steel building components with concrete floors, built primarily in the mid-1800's through the mid-1900's.

The Site operated as a manufacturing facility beginning in the mid-1800's. Silverware (mainly knives) manufacturing began in the early 1900's. Knife manufacturing typically included stamping and rolling of stainless steel flatware. All manufacturing operations at the Site were terminated by 2006. The main components of the manufacturing facility included forging units, furnace and boiler rooms, hot rolling, stock and trim presses, die setting, basket wash, compressor room, milling, machine shop, offices and stock rooms.

Petroleum products used in the knife manufacturing process included lubricating oils and synthetic coolants. Fuel oil was used to heat the plant until the 1980's, when natural gas began being used to fire the boilers. Former aboveground and underground storage tanks were located outdoors at the north end of the plant. Trichloroethylene (TCE) was used to clean oily parts until the mid-1990's. The TCE parts washer was located in Building 2K prior to the mid-1980's, which was demolished in 1987. Acid dip operations were reportedly used as part of the steel preparation during manufacturing, requiring the use of various acids and alkalis. PCB-containing electrical transformers were decommissioned or retro-filled in the 1980's and 1990's. A State Pollutant Discharge Elimination System (SPDES) permit was in effect for the former Oneida Knife Plant for non-contact cooling water and stormwater, with an outfall to Oneida Creek. A sediment retention pond and outfall to the creek has been in use from at least 1938 (Figure 2). Early Sanborn maps indicate a sluiced raceway was in use through the early development of the property, evident in 1899 up to at least 1923 (Figure 3). The 1945 Sanborn indicates an expansion of the Oneida Knife plant over the raceway, which presumably was then filled and abandoned.

III. SUMMARY OF REMEDIAL INVESTIGATION

A. Hydrogeology

The Remedial Investigation Report (RIR) described the Site hydrogeology in detail. Figure 3 is a Site Plan showing all the drilling and sampling locations completed fro the RI. Subsurface cross sections for the Site are illustrated on Sheet 1.

The bedrock at the Site is the Vernon Shale Formation. Exposures in the higher elevations to the south are present, indicating a red mudstone. A reddish-brown till overlies the Vernon in this area. The top of bedrock drops significantly in elevation northward toward Oneida Creek, with an on-lapping, relatively thick sequence of overburden deposits entering the section that thickens toward the creek beneath the Site.

The overburden sequence can generally be described as consisting of fine-grained clay and silt deposits with interbedded units of sand and gravelly sands, including graded, gravelly and sandy clay-silt units.

This overburden sequence was shown to be greater than 35 to 40 feet thick at SB-26, located near Kenwood Avenue and about 100 feet south of Oneida Creek. The data regarding the subsurface geology and extent of impact collected for the RI indicated the impacted stratigraphic interval was within the upper portion of the sequence.

A sand unit (often gravelly at the base) with a thickness of 2 to 10 feet occurs as a prominent "near surface" unit at depths (to top of the unit) of 2 to 12 feet. The unit is generally at a shallower depth closer to Oneida Creek. At all locations, the unit was found to be underlain by a clay unit, sometimes with a thin silt unit intervening between the two. Silt was commonly encountered overlying the gravelly sand, particularly closer to the buildings. Fill has been placed over the unit in places, particularly north of the building. The gravelly sand unit is thickest north of the building and thins or pinches out to the south and east. The clay unit underlying the near-surface gravelly sand extends as a continuous sheet laterally through the investigation area of the

Site, as it was consistently encountered in all borings. The unit also is interbedded with silt both vertically and laterally.

The near-surface gravelly sand unit occurs at elevations in the range of 85 to 95+ and was found present near the Oneida Creek bank north of the building. The Oneida Creek channel occurs at elevations of approximately 86 to 88. Therefore, the creek channel is probably incised into the gravelly sand unit.

Groundwater at the Site occurs at depths of approximately 6 to 13 feet below ground surface (bgs). Greater depths to groundwater were encountered at the higher elevations to the east and south. The shallowest depth to groundwater was encountered north of the building, at the lower grade and closest to the creek. The water table occurs at an average depth of about 6 to 7 feet in the key area north of Buildings 9K and 4K, positioned within the aforementioned gravelly sand unit. Monitoring well and groundwater elevation data is provided in Table 1.

Groundwater flow directions at the Site, based on June 15, 2010 water level elevations, indicate flow directions toward the north and northwest (Figure 4). This flow direction is consistent with what would generally be expected, based on the topographic slope and surface water features in the vicinity of the Site (Figure 1). The flow direction and gradient are not uniform. The average gradient is approximately 2.5%, with a range of about 1.5 to 5%. The gradients are lower west of the building complex. This may be attributed to a change in subsurface aquifer properties or by the presence of the subsurface building structures influencing (diverting) groundwater flow. Well TW-2, located close to the creek, has an “anomalously” high water level elevation (Figure 4). Groundwater gradients west of the building complex are lower and with the presence of clay confining bed units at the Site, groundwater could be “perched”.

The gravelly sand and clay-silt units will have very marked differences in permeability and hydraulic conductivity. The hydraulic conductivity of the clay-silt and till units will have very low values (“confining beds”) compared to variable and higher values for the sand units. The distribution of these two contrasting unit types in the subsurface and below the water table is a dominant Site characteristic influencing groundwater flow direction, contaminant migration and formation groundwater yield.

Based on the subsurface geology of the near-surface gravelly sand-clay units described above and the available water level elevation data, it is concluded that the water table at the Site discharges into Oneida Creek, suggesting the creek is a “gaining” stream or groundwater discharge feature. As the existence of the sand and gravel unit is prevalent near the creek with some occurrence at elevations below the creek bed (Sheet 1), there is the potential that during periods of high runoff (high river stage), the creek may temporarily turn to a loosing stream condition, with surface water recharging the water table in directions back toward the south.

B. Standards, Criteria and Guidance (SCGs)

The following guidance or regulatory criteria are applicable for evaluation of the analytical results obtained from the remedial investigation.

Groundwater ....New York Codes, Rules and Regulations, Title 6 (6NYCRR) Part 703 Groundwater Quality Standards and DEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values*, dated June 1998, and including 2008 revised standards as applicable.

Soil ....6NYCRR Part 375-6, *Remedial Program Soil Cleanup Objectives (SCOs)*, specifically the SCOs for *Industrial Restricted Use* and for *Protection of Groundwater*.

Sediment……………………………*Technical Guidance for Screening Contaminated Sediment*, DEC, January 1999.

Soil Vapor .... *Guidance for Evaluating Soil Vapor Intrusion*, DOH, October 2006.

Site Investigation and Remediation ... DEC Draft *Technical Guidance for Site Investigation and Remediation* (DER-10), dated December 2002 and Title 6 (6NYCRR) Part 375-1, *General Remedial Program Requirements* and Part 375-2, *Inactive Hazardous Waste Disposal Site Remedial Program*.

C. Extent of Contamination

The extent of contamination is discussed in this Section. Figure 3 subdivides the site into six data evaluation areas that were used to assess the spatial distribution of the analytical data results at the site (Table 6). This analysis was done during the RIR work prior to the delineation of the Areas of Concern (AOCs). Thus, the data evaluation areas do not correspond numerically nor spatially with the AOCs.

Surface Soil

Surface soil samples were collected at four locations from yard areas (SS-3 through SS-6) and two locations from the retention pond (SB-23 and SB-24), and analyzed for volatile orgranic compounds (VOCs), semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) metals and PCBs (Table 2; Figure 3). The only exceedances of SCOs were for two SVOCs (chrysene and benzo(a)anthrasene) in only one sample (SS-5), located north of Building 3K/5K, slightly exceeding the 1,000 micrograms per kilogram (µg/kg) SCOs for the protection of groundwater with concentrations of 1,170 and 1,700 µg/kg.

Creek Sediment

Haley & Aldrich (H&A) sampled the Oneida Creek sediment at four locations in March 2006 for analysis of VOCs using EPA Method 8260 (Figure 3). Two additional samples of creek sediment were obtained for the RI (SD-1 and SD-2) from locations nearby and downstream of locations HA-SED-2 and HA-SED-3. These samples were analyzed for VOCs, SVOCs, RCRA metals, PCBs and TOC. No VOCs or SVOCs were detected. No PCBs were detected. Nine of the 13 RCRA metals were detected present in both samples, with five exceedances of sediment guidance values. To verify the criteria exceedances for the Site contaminants were few and of low concentrations in the creek, the DEC requested some additional creek sediment samples be obtained. Samples were collected from three additional locations on June 30, 2011 (Figure 3) and analyzed for VOCs, RCRA metals and TOC, with a fourth location collected for metal background analysis upstream. The results are summarized as follows:

All seven of the sediment samples analyzed for metals (Table 3) contained several metals with reportable concentrations. The majority of these detections were below the DEC criteria. Exceedances were reported for chromium, arsenic, copper, nickel and cadmium variably in four of the five samples. All of these exceedances were for the lower effect level (LEL) criteria and by small degrees, significantly less than an order of magnitude except for chromium, reported at a concentration of 498 milligrams per kilogram (mg/kg) in SD-1, exceeding the LEL of 26 mg/kg. Manganese exceedances were reported in three of the samples, all at concentrations that only slightly exceeded the LEL of 460 mg/kg. The reported detections of metals in the upstream background sample location SD-7 were similar (including two low-level exceedances for cadmium and copper), suggestive of a naturally occurring metal content in the sediments.

The sediment sample results for VOCs are summarized in Table 4A (the results of the 2010 RI samples and the recently completed 2011 samples) and 4B (the H&A sampling work completed in 2006). A total of ten samples have now been analyzed for VOCs. The only VOCs detected were chlorinated hydrocarbons (CHCs), specifically tetrachloroethylene (PCE), trichloro-ethlylene (TCE) and cis-1,2, dichloroethlylene (DCE). PCE was detected in three of the ten samples, TCE in two of the ten samples and DCE in one of the ten samples. H&A did not analyze for TOC, therefore sediment criteria could not be specifically calculated for these two samples (Table 4B). Exceedances for CHCs were reported in two of the six recent samples (Table 4A) for the lowest criteria (human health) and by relatively small factors (approximately an order of magnitude or less). TCE was reported at 1.5 µg/kg for SD-5, equal to the human health criterion. All analytical results for VOCs with benthic criteria were non-detect. Individual CHC concentrations reported ranged from 1.5 to 187 µg/kg in the ten samples (Tables 4A and 4B).

Based on these results, the Creek sediment was ruled out as an AOC for the RAR.

Surface Water – Oneida Creek

A total of six surface water samples were collected from the creek on two different dates and analyzed for VOCs (Table 5). No detections were reported in any of the samples.

Subsurface Soil

The concentrations of the detected VOCs and SVOCs in subsurface soil were low, with relatively few exceedances of SCOs (Tables 6 and 7). Total VOC concentrations in 97% of the 38 samples were either non-detect or less than 10 mg/kg (82% less than 1 mg/kg) and total SVOC concentrations in 83% of the 23 samples were either non-detect or less than 10 mg/kg. Only nine out of 38 samples (24%) had VOCs exceeding any of the SCOs, and only two out of 23 samples (9%) of the SVOC sample analyses (Table 7). VOC exceedances were most numerous and of highest concentration involving CHCs in the former Building 2K area (Tables 5 and 6; Figure 5). The degree of exceedances for VOCs and SVOCs were by relatively small factors (usually less than order of magnitude).

Exceedances for metals have a similar level of occurrence (Tables 6 and 7). Exceedances were reported for six of the 13 metal species analyzed, with exceedances reported in 5% to 29% of the samples. Metal exceedances occurred most frequently in outdoors areas north of the building. Lead was the metal with the most exceedances (29% of the samples) and the largest degree of exceedances. Concentrations ranged from 648 to 30,200 mg/kg, with the SCO for the protection of groundwater and industrial use being 450 and 3,900 mg/kg, respectively.

None of the subsurface samples had PCB concentrations exceeding SCOs for the protection of groundwater or industrial Site use (Table 7). Traces of PCBs were detected in six of the 18 samples analyzed, all of which were at outdoor locations north of the building.

A subsurface zone of oily stained soil with no free product was found in two clustered outdoor areas (Figure 5): near Building 3K/5K (and 14K) and north of Buildings 9K and 4K, straddling the driveway. Oily soil was also present at the two locations drilled inside Building 4K and at TW-11A. Two samples of oily material analyzed during the SI activities from SB-11 and SB-13, located north of Buildings 3K and 4K, contained non-chlorinated VOC compounds, including naphthalene, isoproylbenzene and n-butylbenzene, which are also relatively prevalent compounds in these outdoor areas (Table 6). One of the more frequently reported SVOCs was 2-methylnaphthalene, a constituent of fuel oil, at four locations. Oil identification (GC/FID) analyses on these samples suggested degraded fuel oil and lubricating oil. Petroleum fuel and lubricating oils were both used in plant operations. Fuel oil storage tanks were also located in the outdoor areas (Figure 5).

Figure 6 and Table 8 summarize the field observations and photoionization detection (PID) screening work done on subsurface soil completed during the drilling activities. Overall, the areas of impact at the Site have a relatively low PID signature (maximum PID readings obtained in the range of 50 to <300 parts per million [ppm]) and a low odor characteristic. Highest PID readings were obtained from the outdoor areas of impact north of the building and at TW-12, the northernmost location drilled in the basement of Building 4K. None of the oily impacted soil horizons sampled show any evidence of saturated, free product.

Groundwater

CHCs were the only organic contaminants detected above groundwater standards in the groundwater samples collected from all of the Site wells for the RI, with the exception of toluene in TW-3, located outdoors in the former Building 2K area (Tables 9A and 9B). Wells TW-1 and TW-9 had reported detections of toluene in the first round of VOC sample analysis, but not the second. CHC concentrations exceeded groundwater standards in six of the 13 wells (46% of the samples). Exceedances were slight to moderate, by factors of approximately two orders of magnitude or less. Total historical VOC concentrations ranged from 1 to 1,240 micrograms per liter (µg/L). CHC concentrations were the highest outdoors in the Building 2K area and north of Building 9K (Figure 4). Concentrations of metals in groundwater were non-detect or slightly above standards (Table 9A). SVOCs and PCBs have been ruled out as Site COCs in groundwater (Table 9A).

The source of the CHCs in groundwater at the Site has been concluded as being mainly or entirely from degreasing operations within the former Building 2K. Considering the groundwater flow direction (Figure 4), the occurrence of VOCs in TW-10 and TW-7 is also likely from this area. Groundwater samples collected from wells TW-12 and MW-2 installed elsewhere in delineated areas of subsurface soil impact do not have concentrations of dissolved-phase CHCs (Figure 4; Table 9A). This interpretation implies that the groundwater migration from the 2K area is not entirely straight toward the creek, with some component eastward directed by subsurface geology (e.g., confining bed-fluvial channel boundary) and/or buried utilities that trend in that direction through the area.

Interior Sub-Slab Soil Vapor

Soil vapor samples were collected from five locations beneath the concrete floors inside the building (SV-series; Figure 3) and analyzed for VOCs. The results are summarized in Tables 10A and 10B. VOCs, including some CHCs, were reported in all samples. The concentrations are relatively low, however, with only one exceedance of the DOH 50 micrograms per cubic meter (µg/M^3) guidance value (triggering monitoring) for TCE. The number of compounds detected present were more numerous in the Building 4K/9K area.

Hydrogeologic Factors Influencing Extent of Contamination

The hydrogeology conditions established for the Site that have a bearing on the extent of contamination are summarized as follows:

- Except for the impacts in the upper elevation area of the Site containing Building 3K/5K, field indicators and detections of subsurface impacts elsewhere at the Site are found at depths most commonly at 6 to 10 feet, often found as a relatively thin zone (typically less than 2 feet) associated with the water table at an average depth of about 6 to 7 feet (Sheet 1).

- The subsurface indicators of impact most commonly occur in a more permeable, near-surface unit of gravelly sand. This sand unit has underlying clay and silt units forming an "aquifer-confining bed" two-unit sequence. This near-surface sequence is a key stratigraphic interval at the Site along the northern and lower elevation area of the Site, where the majority of the subsurface indicators of contamination have been found (Figure 6, Sheet 1).

- Groundwater flow within the near-surface gravelly sand unit will be principally in horizontal directions, as opposed to vertical, given that the "aquifer" is relatively thin and bounded beneath by confining units. Groundwater gradients and flow direction involving the water table are non-uniform, but are generally suited for inducing an overall flow direction toward the northwest and north.

- The interlayered nature of the overburden sequence containing appreciable units of fine-grained lake clay and silt deposits will afford a considerable impedance to vertical contaminant migration and potential impacts to deeper aquifer type soils or bedrock. Glacial till is likely present overlying the bedrock at the Site. The areas of highest impact delineated at the Site are contained in soils above the first, near-surface clay-silt confining unit. No dense non-aqueous phase liquid (DNAPL) has been found nor suggested to be present at the Site.

- The current Oneida Creek channel is at the same elevation interval as the near-surface gravelly sand/clay unit sequence. Groundwater flow direction (Figure 4) and the groundwater and surface water elevation data (Table 1) indicate the creek along the northern section of the Site is a likely groundwater discharge feature. With the exception of TW-2, soil borings and groundwater wells installed furthest downgradient north of the driveway indicate no impact.

D. Delineation of Areas of Concern (AOCs)

The investigation work supports the delineation of the following AOCs (Figure 7):

AOC #1 – Dissolved-Phase Groundwater Plume-Former Building 2K Degreaser

This AOC pertains to an area of elevated groundwater contamination within and downgradient of the former Building 2K. This AOC is generally coincident with data evaluation area 6 (Figure 3). Main characteristics include:

- The former Building 2K contained solvent degreasing facilities. CHCs are the characteristic COC in this area.

- CHCs are present as lightly impacted soils near and below the water table at approximately 8 feet and as dissolved-phase contaminants in groundwater. Subsurface soil exhibited a low PID signature without staining (Figure 6), an indication of a dissolved-phase contaminant occurrence, typically 2 to 3 feet thick, with thin staining noted at only one location (B-102). Some low-order exceedances of soil SCOs for CHCs occur.

- Groundwater CHC concentrations exceed groundwater standards in and downgradient of the former building area (Figure 4). Dissolved-phase CHCs associated with this area are the highest on the Site. Detections of CHCs in groundwater in the Building 9K area likely migrated from the Building 2K source area via anomalies in the groundwater flow direction. Total VOC concentrations in impacted wells are relatively low, with the highest concentration being approximately 1,000 µg/L.

AOC #2 –Outdoor Subsurface Oil Impact –Building 9K/4K

This AOC pertains to outdoor subsurface soil impacts adjacent to and north of Buildings 9K and 4K (Figure 7). This AOC is spatially associated with data evaluation areas 1 and primarily 2 (Figure 3). Characteristics include:

- Former aboveground and buried fuel oil storage facilities to fire plant boilers are the most likely sources. Outdoor storage yards were also located in the area. Lubricating oils were also used at the Site.

- Subsurface soils at various depths of 6 to 11 feet contain a soil-absorbed oil material, possible contaminant staining (it is possible that some of the dark staining is attributed to a soil organic content) and moderately elevated PID readings (Figure 6). The thickness of the impacted zones with visual indicators and elevated PID readings was typically 1 to 3 feet. These zones were found at and below the water table with limited vertical extent. The impact is contained within the near-surface unit of gravelly sand above underlying clay and silt units.

- Subsurface soil contains both CHCs and non-chlorinated hydrocarbons (NCHCs) at low concentrations with few, low-order exceedances of SCOs.

- With the exception of TW-7, which had a total VOC concentration of 257 µg/L and concluded to have likely migrated as dissolved-phase contamination from the Building 2K area, groundwater quality in, near and downgradient of the oil impact area either meets or nearly meets groundwater standards (Figure 4; Table 9).

AOC #3 – Outdoor Subsurface Oil Impact- Building 3K/5K

This AOC is located outdoors, adjacent to Buildings 3K/5K and 14K (Figure 7). This AOC is spatially associated with data evaluation area 4 (Figure 3). Main characteristics include:

- The area occurs at the higher Site grade with a deeper depth to the water table. A fuel oil underground storage tank (UST) was located within the area of impact. Outdoor storage and incidental surface spills are also a possible source, as suggested by the shallow occurrence of the impact.

- Subsurface soils impacted with an absorbed oil material, some staining and low-level PID readings occur adjacent to the building (Figure 6) at shallow depths (1 to 6 feet) above the water table. The thickness of the impacted subsurface soil zones with visual indicators and elevated PID readings was typically a few inches to 2 to 4 feet. The impact is contained in soils distinctly above the water table, associated with the finer-grained, cohesive clay-silt unit soils and surface fill materials.

- Subsurface soil contains NCHCs and some SVOCs at low concentrations, with no exceedances of SCOs. No CHCs were detected.

- Groundwater in TW-1, located downgradient of this AOC, has a low total VOC concentration of 79 µg/L.

AOC #4 – Indoor Subsurface Oil Impact-Building Basement 4K

This is an area of impacted subsurface soil located under Building 4K (Figure 7), which is partially constructed into the hillside to the south, forming a basement under the two-story building. The basement floor level meets the outdoor ground surface grade to the north. This AOC is spatially associated with data evaluation area 3 (Figure 3). Main characteristics of the area are as follows:

- Two locations drilled in the building (TW-12 and SB-31) both contained black subsurface soil, primarily with low to moderate PID readings and some soil-absorbed oil material. The impact is present in groundwater-saturated soil composed of gravelly sand underlain by the clay confining bed correlated in the area (Sheet 1). Field indicators were distinctly more pronounced in the northern location (TW-12) than at the southern location (SB-31) (Figure 6; Table 8).

- The number of detected COCs and their concentrations are lower than the outdoor area of impact to the north of Buildings 9K and 4K. A few NCHCs and SVOCs were detected in the subsurface soil samples from the zone of impact, but no exceedances of any SCOs were detected. Only one metal (lead) was detected at a concentration exceeding SCOs.

- Groundwater from TW-12 was non-detect for all Site COCs.

- TW-11A, located outside the building but tightly against the 9K/4K building wall, had similar oily impact and with groundwater sampling and analysis results also non-detected (Table 9A).

- The source of this oily material has not been documented. Petroleum oil was used to fire boilers located inside Building 9K and lubricating oils were used in plant processes. Some of the black material in the soil could be degraded organic plant material. Releases inside the basement and/or in the adjacent outdoor area involving the buried sluiceway feature (Figure 7) are the likely source scenarios.

- Sub-slab soil vapor results indicate the presence of a few CHCs and NCHCs at relatively low concentrations (Table 10A).

AOC #5 – Indoor Vapors- Building 3K-5K

This AOC refers to relatively minor subsurface soil and groundwater impact inside Building 3K/5K. The slab-on-grade building was constructed at the higher plant elevation and contained forges. This AOC is spatially associated with data evaluation area 5 (Figure 3). Main characteristics are:

- Field indicators of contamination included low to moderately elevated PID readings with no visual indicators (Figure 6). No staining or oily material was observed present.

- COCs in soils included only NCHCs, similar to the outdoor area adjacent to the wall and Building 14K. Field indicators were the highest at depths of 4 to 8 feet. None of the soil samples analyzed exceeded any of the SCOs. Groundwater from TW-13 had a total VOC concentration of 10 µg/L and slightly exceeded groundwater standards for vinyl chloride.

- Sub-slab soil vapor results indicate the presence of both CHCs and NCHC at relatively low concentrations.

- No incident or source for these conditions has been documented. The most likely source of contamination is the leaching of contaminants from data evaluation area 4 / AOC #3.

AOC #6 – Retention Pond and Surface Soils

The retention pond and the Site surface soils were given an AOC designation based on the detected presence of PCBs, SVOCs and some metals in the surface soils about the Site and in the retention pond at low concentrations (primarily less than SCGs), but which could potentially be a source of additional off-Site contaminant release of COCs into Oneida Creek via stormwater and soil erosion mechanisms. Characteristics include:

- The stormwater retention pond contains an overflow outfall to Oneida Creek. Approximately 60% of the Site is unpaved grass or gravel yard areas sampled for the surface soil analytical program, with the remainder containing the building, pavement or concrete ground covers. The area north of the driveway adjacent to and uphill of the creek has a well-established cover of vegetation, primarily grass and shrubs.

- No visual indicators were observed in the retention pond and PID readings were ~1 ppm or less, recorded only in the first few inches of soil. No visual indicators of surface soil impacts were noted anywhere on the Site.

- A few SVOCs and RCRA metals were exceeded at limited locations in the surface soils and retention pond (Table 2). No VOCs were detected in any of the surface soils.

- PCBs were detected present in all surface soil sampled in the yard areas and retention pond, but at levels below SCOs (Table 2).

E. Exposure Assessment

Introduction

The purpose of qualitative exposure assessment (EA) is to assess the potential pathways involving human health or sensitive environmental features to the Site COCs for use in guiding decisions regarding the need and objectives of Site remediation. This evaluation considers current Site conditions, as well as reasonably expected future Site conditions. For each potentially exposed receptor, Site conceptual pathways have been evaluated to determine the exposure route, medium and exposure point. If any exposure pathways are found to be potentially complete, investigation measures to further assess impacts or measures to close the pathway, such as engineering controls, institutional controls or remediation, can be considered. The EA is summarized in Table 11.

Current and Future Uses

The Site is a manufacturing facility in an area zoned for manufacturing. The building complex is currently not being used, and has been closed for several years. No manufacturing or commercial uses are anticipated in the immediate future, as the facility is old and in need of significant improvements prior to any occupancy and use. The anticipated future use of the property is for industrial purposes. Oneida currently maintains the property. A locked fence is in place restricting traffic.

Human Health

As the current and expected future use of the property is industrial, identification of potential human health receptors has focused on the maintenance and operational activities related to industrial uses. The same receptors have been evaluated for both, as follows:

- On-Site workers for industrial uses of the Site (future).

- On-Site maintenance personnel (current and future).

- On-Site construction workers (current and future).

An analysis of the potentially completed human health exposure pathways is detailed in the attached Table 11. The most likely scenarios with potentially completed exposure pathways are related to exposure to potentially impacted subsurface soils and groundwater by workers taking part in current or future intrusive construction activities at the Site. On-Site day-to-day exposures to personnel do not exist under the current (unused) conditions.

The exposure risk to the current maintenance personnel overseeing the buildings and grounds is considered insignificant. If the building remains into the future, there is a minimal to low risk of soil vapor exposure scenarios for future indoor Site workers.

Fish and Wildlife Resources

Fish and Wildlife Resources (FWRs) in proximity of the Site are described below:

- FWR habitat associated with Sunset Pond and the identified nearest freshwater wetlands located several hundred to 1,200 feet west of the Site (Figure 1).

- Oneida Creek is a Class C stream. The creek is regularly stocked with trout. The Oneida Creek corridor upstream (toward the wetlands) and downstream of the Site into more wooded ground covers support wildlife species typical of woodlands. The commercial and industrial development on both sides of the creek has largely eliminated bordering wooded habitat along the segment of the creek immediately adjacent to the Site.

- Sediment dwelling fauna and bottom feeding fish in the creek are to be expected. The condition of the creek bed adjacent to the Site is characterized by a moderately flowing current and generally a gravelly-silt sand, free of aqueous weed beds.

- There are no known or threatened endangered species or rare ecological communities recorded in the vicinity within a ½-mile radius of the Site.[8]

The investigation provided the basis for identifying the following potential contaminant pathways:

- Seepage of groundwater containing dissolved-phase COCs (CHCs in particular) into the surface water or sediment of the creek adjacent to the Site, particularly in the TW-2 area downgradient (north) of AOC #1 (former Building 2K).

- Potential discharge of soil-absorbed contaminants from stormwater runoff and erosion and control problems involving surface soils and Site drainage features to the creek potentially contributing additional, low concentrations of Site COCs, particularly PCBs, SVOCs and Metals.

Based on the identified potential pathways, the most likely completed pathway for FWR is concluded to involve the sediment-dwelling fauna and fish in Oneida Creek. However, the exposure scenario has been ruled out as a significantly completed exposure pathway, based on:

- The investigation work indicates the main areas of subsurface impact associated with the delineated AOCs do not extend to the creek. Oily material absorbed in subsurface soil associated with the AOCs is not mobile.

- Dissolved-phase groundwater contaminant concentrations are relatively low and given the various natural attenuation mechanisms, do not constitute a high strength source

[8] DEC Environmental Resource Mapper, October 2010.

pathway to creek water or sediments. Surface water analytical results obtained were non-detect for VOCs. Sampling and analysis data of creek sediments have not indicated significant impacts (Tables 3 and 4). None of the benthic criteria for VOCs in any of the samples were exceeded and concentrations of metals were low, exceeding the lowest effect level only for a few of the metals.

- The Site surface soils and stormwater retention pond can be ruled out as a significant contributing source, considering the low concentrations of contaminants present. Given and maintaining the current ground cover conditions, the Site does not pose a significant risk of sediment loading to the creek via erosion problems.

IV. DEVELOPMENT AND ANALYSIS OF ALTERNATIVES

A. Introduction

The development and analysis of alternatives consisted of completing the following scope of work:

- Remedial Action Objectives (RAOs) were developed for the Site that considered Site hydrogeology conditions, the nature and extent of contamination (media-specific) and potential exposure pathways. This analysis is summarized in Table 12.

- A screening of the remedial technologies applicable for the RAOs was then completed. Choices were initially screened for viability based on their potential to meet project SCGs, protectiveness of human health and the environment, their implementability and expected cost-effectiveness. Consideration was also given to their "green" attributes.[9] This analysis was applied to each AOC and resulted in identifying a number of remedial methods potentially usable at the Site. The work is summarized in Table 13.

[9]DER-31/Green Remediation; issued August 11, 2010.

- Two alternatives were evaluated involving undertaking no remedial actions (Alternative #1-No Action) and completing Site remediation to the extent that would allow unrestricted use of the Site (Alternative #2-Unrestricted Use). These were completed as required by the RAR guidance documents to establish a baseline frame of reference for the Site. Subsequently, a proposed remedial alternative (Alternative #3-Proposed) was designed as a cost effective alternative that would accomplish the RAOs, reasonably meet the project SCGs and render the Site suitable for the intended industrial use. The work is summarized in Table 14. Conceptual cost estimating was used in evaluating the alternatives (Cost Estimate Tables).

B. Remedial Goals and Action Objectives

The remedial goals of the project are:

- Remove or treat the source of contamination.

- Remove soil contamination to protect groundwater and ecological resources.

- Limit surface soil contamination to meet the lower of the industrial SCOs or ecological resource SCOs.

- Reduce the level of groundwater contamination to meet DEC groundwater standards (6NYCRR Part 703) to the extent reasonably feasible, considering Site conditions, currently available technology, implementability and cost-effectiveness.

- Eliminate risk of future human health exposures to potential soil vapor intrusion.

The following RAOs for the Site have been identified:

- Prevent human exposures via direct contacts with impacted subsurface soil and groundwater contaminants.

- Prevent inhalation of contaminants volatizing from impacted soil and groundwater into future buildings (renovated existing or new).

- Remove any source of groundwater contamination to the extent practical.

- Restore groundwater to pre-release conditions to the extent practical.

- Maintain Site best management practices and soil and erosion controls to minimize potential releases of eroded soil to the creek.

C. Technology Alternatives

General Response Actions

Potentially applicable general response actions considered for subsurface soil above or below the water table included (Table 13):

- No action with the implementation of institutional-engineering controls and a Site Management Plan (SMP).

- Removal of the soil by excavation methods.

- In-situ treatment methods using remediation wells and/or trenches.

Potentially applicable general response actions for dissolved-phase groundwater contaminants included:

- No action with the implementation of institutional-engineering controls and an SMP.

- Removal of the subsurface contaminated source soil by excavation methods.

- In-situ treatment methods using remediation wells or trenches

Potentially applicable general response actions for soil vapor intrusion (SVI) scenarios:

- Completing soil and groundwater remediation at the Site that would reduce or eliminate the source of soil vapor.

- Implementing institutional, engineering and Site management SVI protocols for future occupancy of the Site, as documented in an SMP.

No analysis of alternatives was undertaken regarding the potential release of Site contaminants from the Site into Oneida Creek via stormwater discharges or erosion of surface soils identified as "AOC #6". A Best Management Plan (BMP) for stormwater discharges from the Site, and for preventing soil erosion and potential mobilization of eroded soils to the creek, will be a component of the Site remediation plan.

D. Screening of Technologies

The technologies selected for evaluation to subsurface soil include:

- Excavation of subsurface soil with off-Site landfill disposal and replacement with clean imported fill.

- Excavation of subsurface soil with on-Site treatment using either constructed soil cells and employing soil mixing with chemical oxidation and/or bioremediation treatment methods or on-Site thermal desorption. The treated soil would be reused as backfill in the remedial excavation.

- In-situ treatment methods using remediation wells or trenches applying soil vapor extraction and bio-venting, chemical oxidation and/or enhanced bioremediation treatment methods.

In-situ approaches were ruled out on the basis of subsurface soil heterogeneities complicating the design of a suitable delivery system and the uncertain effectiveness and remedial timeframes. On-Site treatment of excavated soil was ruled out on the basis of uncertain effectiveness to treat all COCs identified at the Site and uncertain timeframes in completing the treatment. Excavation with off-Site disposal was selected as an appropriate technology, based on it relative simplicity, ability to meet SCOs and its short-term implementability. In-situ and on-Site treatment methods could have "green" advantages, however, they were ruled out on technical grounds.

The technologies selected for evaluation to remediate groundwater in conjunction with the installation of remediation wells and/or trenches included:

- Groundwater extraction and on-Site treatment and discharge (pump and treat).
- Air sparging.
- Chemical oxidation and bioremediation using portable injection equipment.
- Removal of subsurface source soils, if any.

Air sparging was ruled out on the grounds that the groundwater-saturated subsurface soil with dissolved-phase contaminants was too thin for sparging and overlain in places by a confining bed. Extraction and treatment using an installed and automated treatment and discharge system was ruled out on the basis of it being less cost-effective than other alternatives. Chemical oxidation-bioremediation using portable equipment and remediation wells and/or trenches was identified as being the most technically viable and "green". It is unlikely that any in-situ method will practically achieve groundwater standards, given the complex subsurface geology at the site. Removal of impacted soils that may be contributing to the dissolved-phase plume using excavation methods was identified as a technology alternative.

The technologies selected for evaluation to mitigate soil vapor intrusion included:

- Excavation and disposal of source soils.

- Active remediation of the AOC #1 dissolved-phase groundwater plume.

- Implementation of soil vapor intrusion evaluations to determine if SVI is a Site condition.

- Sub-slab depressurization or vapor barrier systems for any future building occupancy at the Site.

Refer to Tables 12 and 13 for additional details.

E. Alternatives Analysis

Three remedial alternatives have been evaluated for the Site (Table 14). These included undertaking no remedial actions (Alternative #1-No Action), completing Site remediation to the extent practical allowing unrestricted use of the Site (Alternative #2-Unrestricted Use) and the proposed alternative (Alternative #3-Proposed). These alternatives are described and evaluated in this section of the report. The two remedial action alternatives (#2 and #3) are composed of general response actions and technologies screened in Table 13 and include soil excavation with off-Site landfill disposal, groundwater remediation of AOC #1 and institutional controls and SMP elements. Cost estimates and quantity take-offs are provided in Table 12 and the Cost Estimate Tables.

As requested by the DEC, a separate analysis of remedial alternatives for groundwater contamination has also been completed and is summarized in Table 15.

Remedial Alternative #1 – No Action

This alternative assumes no remedial actions are undertaken. The alternative has merit, in that:

- There are only a relatively few, low-order exceedances of the Part 375 SCGs for surface and subsurface soils. The impacted subsurface soil in AOCs #1 and #2 is at depths of 6 to 8 feet and that in AOC #4 is beneath an industrial concrete floor slab at depths of 2 to 6 feet. Therefore, the majority of the impacted soil at the Site is beneath a significant protective buffer zone.

- Protection of human health for contact exposures to impacted soil and groundwater and potential soil vapors can be provided by the implementation of industrial land use restrictions and an SMP.

- Dissolved-phase groundwater concentrations are relatively low and no free product has been identified at the site.

- The alternative is easily implemented and of the lowest cost.

The disadvantages of the No Action alternative are:

- The SMP will potentially be of the most onerous nature to future owners of the Site, in that none of the impacted soils would be remediated.

- It is possible that dissolved-phase Site contaminants (of low concentrations) associated with AOC #1 could continue to discharge into the creek.

Remedial Alternative #2 – Unrestricted Use

This alternative would remediate the Site to where there would be no restrictions for future use, eliminating the need for institutional controls and an SMP. All surface and subsurface soils would meet unrestricted SCOs. The following elements are involved:

- Excavate impacted subsurface soil from all outdoor AOCs (#1, #2 and #3; Figure 7) and dispose of off-Site in the Oneida-Herkimer Solid Waste Authority, Town of Ava Landfill (project landfill). Oil-impacted soil in AOCs #2 and #3 would be removed. The source area in AOC#1 would be further investigated by completing an excavation in the B-102 area and removal of any source soil, if found. Analytical data from the Site has been sent to the landfill for initial screening purposes and a tentative approval given for accepting the soil pending completion of landfill TCLP analytical testing requirements. It is anticipated the DEC will issue a "contained-in" status for the soil,[10] allowing it to be disposed of as solid waste (rather than hazardous waste), making the approach considerably more cost-effective. The approach assumes non-impacted soil overlying the deeper impacted zones in AOCs #1 and #2 is selectively removed for replacement as backfill (pending analytical testing confirming the soil meets the project SCOs) after completing the excavation of impacted soil. As the excavation is required to depths below the water table in AOCs #1 and #2, where relatively permeable sand layers or lenses are present, dewatering is expected to assist with draining the soils for excavating and loading out the soil. An on-Site groundwater treatment system would be provided to treat the water. Sheet piling is included to minimize groundwater flow and maintain stability of the excavations in AOCs #1 and #2, if needed. Shallow impacted soil in AOC #3 is removed for disposal by straight excavating without the need for sheet piling or dewatering. Clean imported backfill is trucked to the Site to complete the backfilling of the excavations. It is estimated that a total of approximately 2,500 tons of impacted soil is involved in these AOCs.

- The dissolved-phase plume groundwater downgradient of the former Building 2K (AOC #1) is addressed by active remediation involving the installation of a network of reusable injection wells and trenches (in source area excavation and one additional trench downgradient) and application of chemical oxidation products using portable equipment and water based injections. Injection wells are spaced evenly throughout the AOC and connected to a piping network to facilitate the injections. A groundwater monitoring program would be implemented and several injections (5) are anticipated. As described above, a remedial excavation in the former Building 2K source area would be undertaken as part of the overall groundwater cleanup plan to be sure there are no grossly impacted

[10] Letter to Oneida, Ltd., dated September 16, 2001, from Peter Ouderkirk, DEC, Region 6; a request for "contained-in" status to be submitted as part of remedial plan documenting the soil does not contain hazardous waste materials, does not exhibit any of the hazardous waste characteristics and will be managed in a manner protective of the environment and human health during final disposal.

soils in the area. Groundwater treatment and monitoring activities are expected to take place over a 2-year timeframe. The same approach using injection wells would be undertaken in the eastern region of the Site, where concentrations of dissolved contaminants are lower, involving AOCs #2, #3 and #5, to address groundwater contamination exceeding State standards Site-wide (Figures 4 and 7).

- Surface and subsurface soils at the Site must meet the unrestricted SCOs. A comparison of the surface soil analytical results (Table 2) with the unrestricted SCOs indicates all of the samples do not meet the criteria. For example, nine out of ten surface soil samples exceeded the unrestricted SCO for PCBs of 0.1 mg/kg (all ten of the samples meet the industrial use SCO for PCBs of 3.2 mg/kg). Some of the metals and SVOCs also exceeded the unrestricted SCOs. Therefore, a remedial excavation of Site surface soils would also be necessary (as institutional controls or SMP practices are not allowed with an unrestricted Site condition). This involves an estimated area of 35,000 square feet with the removal of at least 2 feet of soil, equating to approximately 4,700 tons of soil, which is a significant cost factor for the alternative.

- The existing building structures must be demolished and removed from the Site if unrestricted use of the Site is to be considered. This is considered necessary in order to allow the remediation of impacted soil and soil vapor necessary to allow unrestricted Site uses without institutional or SMP controls. Therefore, building demolition would be completed as an initial task in the construction sequence. After completing the demolition, the excavation of impacted soil beneath the building in AOC #4 would be completed as part of the remedial excavation work proposed for the other AOCs. Soils with vapors beneath Building 3K/5K could also be investigated and removed, as needed, to mitigate the need for contending with potential future SVI issues. An estimated 2,400 tons of soil are involved with this task.

- Site restoration would include backfilling excavations with clean imported fill and any clean hard fills generated from the building demolition, providing a clean cap system across the entire Site consisting of an allowable combination of clean imported fills in the remedial excavations, and topsoil cover systems.

At the completion of the work for this alternative, all identified areas of soil impact would be removed and groundwater would be restored to meet groundwater standards. SVI issues would be eliminated and clean soils would be established across the Site. It would be expected that the Site would be suitable for unrestricted uses. The total estimated cost of this alternative has been estimated at $2,688,000, involving disposal of an estimated 9,600 tons of soil, one to two construction seasons for the completion of the building demolition and remedial work, concurrently with 2 years of groundwater treatment. Refer to Table 14 and the Cost Estimate Tables for additional details.

Remedial Alternative 3 – Proposed Alternative

The proposed alternative would remediate the Site to conditions suitable for industrial uses. Central to the alternative is the concept of removing source material, leaving the deeper subsurface impacted soils in place and maintaining institutional and Site management controls for the Site. The following elements are involved:

- Excavate impacted subsurface soil from outdoor AOCs #1, #2 and #3 (Figure 7) with off-Site landfill disposal. Test trenches (for making observations of soil conditions) and excavation in the source area in AOC #1 would be completed and any significantly impacted soils removed. A remedial excavation program is proposed for AOC #2 outside subsurface soil impact. It is assumed that sheet piling and some groundwater dewatering and treatment will be needed for the AOC #2 and possibly AOC #1 soil excavations. The approach assumes non-impacted soil overlying the deeper impacted soil in AOCs #1 and #2 is selectively removed for replacement as backfill after completing the excavation of impacted soil. Soil impact in AOC #3 occurs at shallow depths well above the water table, unlike the other AOCs. Clean imported backfill would be trucked to the Site to complete the backfilling of the excavated AOCs.

- A groundwater monitoring program would be conducted following the remedial excavation program. Results obtained would be utilized to evaluate the need for further groundwater sampling or a monitored natural attenuation program.

- Impacted soil in AOC #4 exhibits very few exceedances of Site contaminants and the soil is not an ongoing source of groundwater contamination. The soil impact inside the basement level of Building 4K and AOC #5 is beneath concrete floors at depths of 2 to 4 feet or greater, in affect serving as a significant protective cap. Future building and handling of any excavated soils on the Site, if any, can be readily managed by institutional and SMP controls. It is therefore concluded that these impacted soils can be left in place without risk of receptor impacts.

- The demolition of the existing building inherent in Remedial Alternative #2 is not a necessity, or more flexibility can be given in the demolition scope of work.

- In response to detections of PCBs, metals and SVOCs in the shallow soils in the retention pond, a minimum of 12 inches of surface soil will be excavated for landfill disposal and replaced with clean, imported fill. Sloping ground areas adjacent to the creek in Areas #1, #2, #4 and #6 (Figure 3) will also either be excavated (minimum 12 inches) and replaced with clean imported fill or covered with a minimum of 12 inches of stabilized soil cover. Excavated soil, if it meets the protection of groundwater SCOs, can be used as backfill in the deeper areas of the remedial excavations.

- Site restoration would include backfilling excavations with clean imported fill, assuring all disturbed areas are appropriately stabilized with clean cover system to prevent soil erosion. All outdoor Areas will be covered with a cap system comprised of either 12 inches of clean, imported soil or gravel, concrete or asphalt cover components.

- A groundwater monitoring program would be implemented in the AOC #1 area (data evaluation areas 1, 2 and 6) of dissolved-phase contamination. Monitoring would involve the use of existing monitoring wells and an additional well installed in the remedial excavation of AOC #1.

- Institutional controls and an SMP would be implemented and would specify the need to complete an SVI evaluation and installation of soil vapor remedial measures (e.g., vapor barriers, depressurization system) in future, occupied buildings as needed. The SMP would also detail the excavation and handling of Site soils during constructing activities and the maintenance of protective caps.

At the completion of the work for the proposed alternative, all shallow impacted soils would be removed and source soils in AOC #1 and #2 would be removed. Surface and subsurface soils would meet or nearly meet all of the SCOs for restricted industrial uses and the protection of groundwater. Significant protective buffer conditions (concrete floor and non-impacted soil) occur over the remaining subsurface AOCs. The Site would be suitable for industrial uses consistent with the BCP, with institutional controls and an SMP required. The estimated cost for the proposed alternative is $1,105,000. The alternative involves the removal of approximately 2,550 tons of soil with 4 years of groundwater monitoring in AOC #1. If sheet piling and dewatering is not required for the AOC #1 excavation (considered likely), costs would be approximately $652,000. Refer to Table 14 and the Cost Estimate Tables for additional details.

Comparison of Remedial Alternatives

The comparative analysis incorporates the following criteria, as required by Part 375 and DER-10, into evaluating and selecting a final remedial alternative:

- Overall protectiveness of the public health and the environment.
- Compliance with SCOs.
- Long-term effectiveness and permanence.
- Reduction in toxicity, mobility or volume.
- Short-term impacts and effectiveness.
- Implementability.

- Cost-effectiveness.

- Land use.

- Community acceptance.

These factors are incorporated into the comparison of the three remedial alternatives for the Site in Table 14 and are summarized below.

- *Overall Protectiveness of the Public Health and the Environment:* All alternatives are protective of public health and the environment. Remedial Alternative #1 is considered viable, given a suitable SMP and considering no significant risk of environmental impact exists at the site. Remedial Alternatives #2 and #3 both provide additional protective actions for the environment. Both alternatives address the impacts of groundwater in AOC #1 through source area excavation and removal of any significant impacted soils. Remedial Alternative #3 provides additional protection of public health by a combination of the removal or capping of shallow impacted soil, and implementation of institutional controls and an SMP.

- *Compliance with SCGs:* Remedial Alternative #2 can be expected to meet the project SCOs for soil. It is uncertain that aggressive treatment of groundwater in AOC #1 with Remedial Alternative #2 will meet groundwater standards. Remedial Alternative #3 proposes to leave the deeper impacted soils in place in AOCs #2 and #4, as supported by the RI, which indicated these soils exhibited no or few, low-order SCG exceedances and are not an ongoing source of dissolved-phase groundwater contamination. Both alternatives are expected to induce reductions of groundwater plume contaminants in AOC #1.

- *Long-Term Effectiveness and Permanence*: The long-term effectiveness of remedial excavations will be good, as the impacted soils are physically removed from the Site and replaced with clean materials. Remedial Alternatives #2 and #3 make use of the method.

Groundwater remediation of AOC #1 is expected to be permanent for Remedial Alternatives #2 and #3, in that a remedial excavation will be completed in the source area, with direct remediation in the downgradient plume area of the Site proposed in Remedial Alternative #2. The institutional controls and SMP elements of Remedial Alternative #3 must remain in place indefinitely. Future construction activities related to development of the Site will need to comply with the SMP requirements and would incur any related costs regarding soil vapor intrusion issues and special handling requirements of any soils excavated below designated depths in AOCs. (Their conditions would be described in detail in the SMP.)

- *Reduction in Toxicity, Mobility or Volume:* Remedial Alternative #2 significantly reduces the volume of impacted soil at the Site, considerably more so than Remedial Alternative #3. The toxicity or chemical character of the impacted soil is not reduced by landfilling the soil, the disposal method used in both alternatives. The impacted subsurface soils at the Site do not constitute a mobile plume condition, so either alternative is adequate in this regard. The remedial excavation in the source area of AOC #1, proposed in both alternatives, can be expected to help reduce toxicity. The volume of contamination in AOC #1 is very small, but the remediation will further reduce the volume, more so with Remedial Alternative #2.

- *Short-Term Impacts and Effectiveness*: Remedial excavations provide good short-term effectiveness. Remedial excavations and driving and removing sheet pile through the subsurface soil units, anticipated in Remedial Alternative #2, could result in some uncontrolled subsurface migration of impacted groundwater. However, considering the low degree of toxicity and volume of the contaminants, coupled with the large amount of removal completed, this factor is not considered particularly problematic. Excavations and landfill disposal projects create short-term increase in traffic and construction related nuisances. Groundwater remediation of AOC #1 will not be accomplished in a short time frame for either alternative. For Remedial Alternative #2, a 2-year treatment and monitoring program is proposed that would increase effectiveness. As is common with in-situ remediation, the subsurface geologic complexities will likely limit the effectiveness of the groundwater cleanup.

- *Implementability*: All methods proposed for both Remedial Alternatives #2 and #3 are well understood and straight forward to implement. A confirmatory landfill sampling and analysis event and a "contained-in" determination from the DEC will be required for either alternative.

- *Cost-Effectiveness*: Remedial Alternative #2 involves a very high cost related to the requirement of meeting unrestricted use criteria without the use of institutional and engineering controls or SMP elements. As the Site is zoned industrial and has had a long history of industrial use, the high cost of rendering the Site suitable for unrestricted uses is not considered practical. Given the low risk that there are any significant ongoing impacts to the creek, the high cost of inducing remedial reduction of dissolved-phase COCs in AOC #1 via Remedial Alternative #2 in-situ remediation is considered impractical. Remedial Alternative #3 is cost-effective.

- *Land Use:* Remedial Alternative #2 would restore the Site to a condition suitable for more types of uses, however a final evaluation would be needed at the completion of the remediation project to verify suitability of unrestricted uses. Remedial Alternative #3 achieves the intended industrial land use by a combination of remediation and institutional and SMP-related controls.

- *Community Acceptance*: The project endpoint of either alternative is to meet overall goals of the BCP project, that is, complete investigation and remediation as necessary to allow future industrial development of the Site to occur. It is expected that either alternative will be acceptable to the community. Remedial Alternative #2 involves considerably more obtrusive Site activities and construction traffic than Remedial Alternative #3.

V. RECOMMENDED ALTERNATIVE

Based on our evaluation of the applicable Site conditions (Table 12), applicable technologies (Table 13) and comparison of assembled alternatives (Table 14), we recommend Remedial Alternative #3 as the remedial alternative for the Site. This is based on the following:

- Cost-effectiveness for the owner.

- The alternative is sufficiently protective of the public health and environment.

The main components of the proposed remedy are summarized as follows:

- Complete landfill sampling and analysis and acceptance profile with Oneida-Herkimer Solid Waste Authority for the Ava Landfill. Obtain the “contained-in” criteria designation with the DEC.

- Mobilize an environmental contractor to complete remedial excavations of the subsurface soils in AOCs #1, #2 and #3 (Figure 7). Soil removal would involve approximately 16,000 square feet from depths of 0 to 4 feet below grade in AOC #3 and 8 to 10 feet below grade in AOC #2. Excavations would be backfilled with clean, imported fill. The excavation work will be started without the use of sheet piling and a determination thus made as to whether or not sheet piling and dewatering will be necessary (this may be completed as a remedial design task).

- Excavation in the Building 2K source area would be centered around B-102 (Figure 7) to verify lack of or remove any impacted soil deemed to be potential source soil for groundwater contamination. Several east-west trenches or test pits would be dug in the area initially to evaluate the conditions. Protocols will be developed in the remedial design to determine the presence or absence of impacted soil requiring removal and disposal. An area of at least 1,000 square feet will be excavated and extended, as needed, if impacted soil warranting removal is encountered. A monitoring well would be installed in the excavation after completing the removal.

- Implement groundwater monitoring in AOC #1. Monitoring would involve the use of existing wells TW-2, TW-3, TW-7, TW-9 and TW-10, plus one proposed well in the remedial excavation area. Wells would be sampled quarterly for one full year. The number of wells and sampling frequency would then be evaluated. The goal of the monitoring is to verify VOC concentrations are declining over time. Data from several years may be necessary.

- Twelve inches of soil will be removed from the retention pond for landfill disposal or on-Site reuse if appropriate SCOs are met (protection of groundwater). Fill in the retention pond to adjacent ground grades.

- Provide a protective surface cover resistant to erosion over all remaining surface soils in all of the outdoor areas. A minimum of 12 inches of clean, imported soil will be used in all areas restored to grass. Appropriate concrete, gravel or asphalt surfaces could be provided if more suitable for future use. Surface soils can be excavated (12 inches) and used as backfill in the remedial excavation (providing appropriate SCOs are met) if needed to accommodate Site grading requirements.

- Draft and implement the appropriate institutional controls and SMP covering:

  - Allowable uses of the Site (industrial) and Site restrictions.

  - A detailed soil handling and disposal plan covering future excavations associated with any building demolition and new construction activities at the Site.

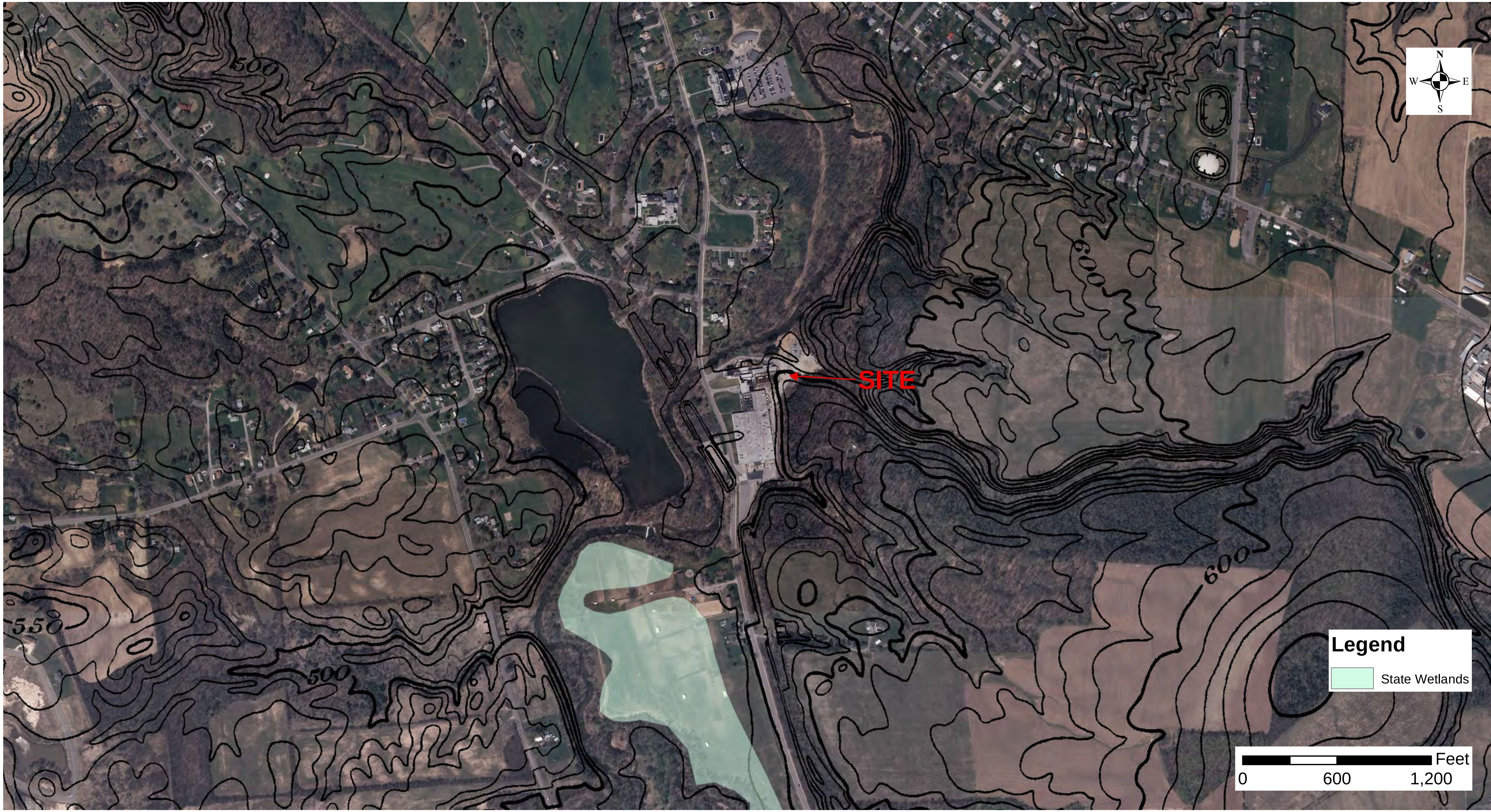
  - Delineation of AOC soil areas and detailed cover maintenance requirements.

  - Procedures involving investigating and mitigating potential soil vapor intrusion associated with occupying future buildings at the Site.

- Surface cover requirements for maintaining protective covers and adequate erosion protection measures at the Site. Stipulate that all areas of the Site are to remain surfaced with erosion resistant cover systems (established grass, pavement, concrete) and provide a stormwater BMP.

- Periodic SMP review and certification requirements.

FIGURES



DOT Topo - Vernon (NY) Quad., 1955 Contours, 1978. NYS GIS Clearinghouse - City of Sherrill, Oneida County, New York, 1-Foot and 2-Foot Resolution Natural Color Orthoimagery, April 2008.

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PROJECT: **FORMER ONEIDA KNIFE PLANT - LOT 1 REMEDIAL ALTERNATIVES REPORT**

CLIENT: ONEIDA SILVERSMITHS, INC.

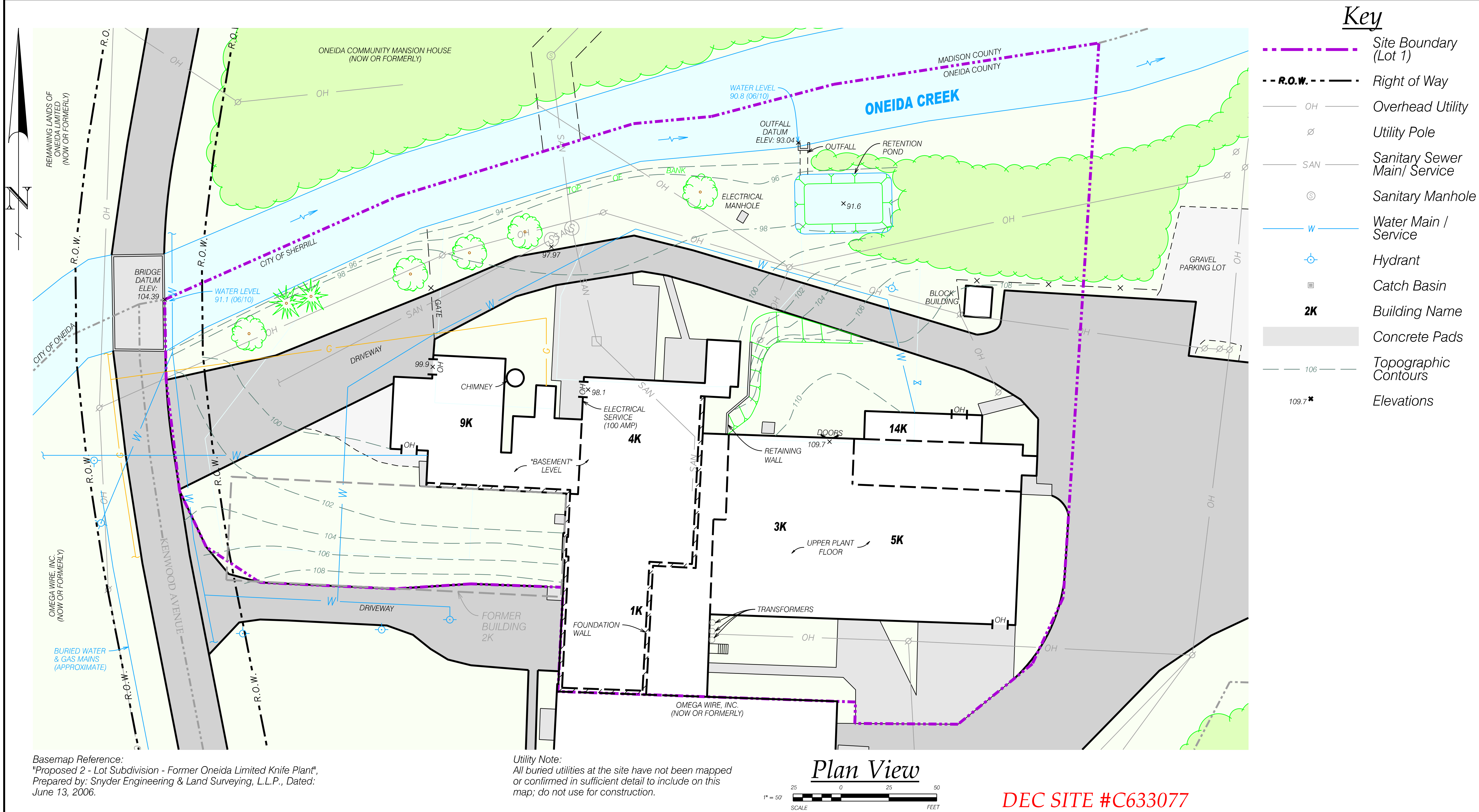
LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

TITLE: **AERIAL VICINITY MAP**

PROJECT No.: 2006065

DATE: December 2011

FIGURE 1



Basemap Reference:
"Proposed 2 - Lot Subdivision - Former Oneida Limited Knife Plant", Prepared by: Snyder Engineering & Land Surveying, L.L.P., Dated: June 13, 2006.

Utility Note:
All buried utilities at the site have not been mapped or confirmed in sufficient detail to include on this map; do not use for construction.

DEC SITE #C633077

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REVISIONS:	DATE:	BY:

PROJECT: FORMER ONEIDA KNIFE PLANT - LOT 1 REMEDIAL ALTERNATIVES REPORT

DWG. TITLE:
EXISTING CONDITIONS SITE PLAN

CLIENT: ONEIDA SILVERSMITHS, INC.

LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2006065
FILE NAME.:	EV01P
SCALE:	AS NOTED
DATE:	NOV. 2011
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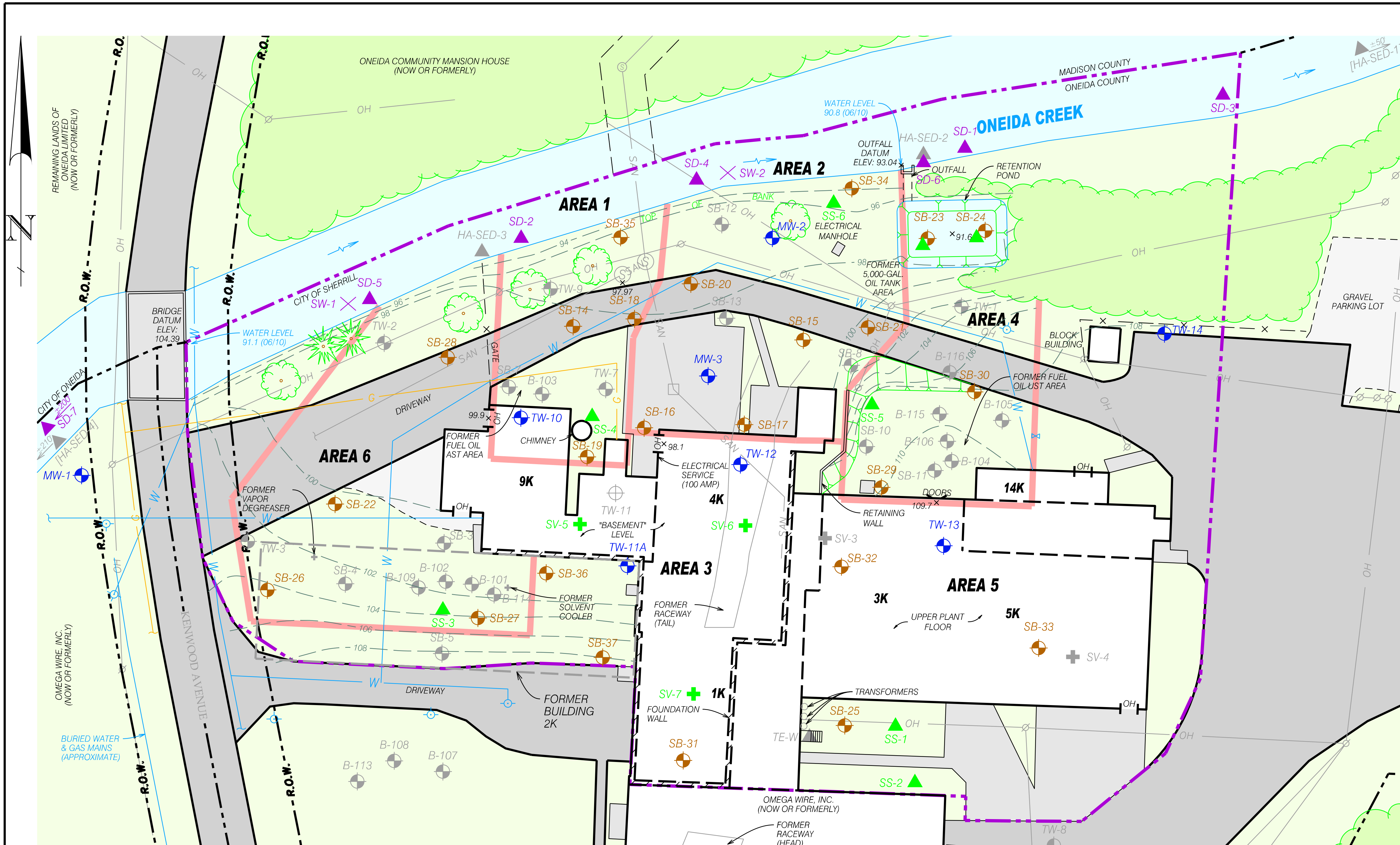
SHEET NO.:
FIGURE 2



Key

Site Boundary	
R.O.W.	Right of Way
OH	Overhead Utility
	Utility Pole
SAN	Sanitary Sewer Main/ Service
	Sanitary Manhole
W	Water Main/ Service
	Hydrant
	Catch Basin
2K	Building Name
	Concrete Pad
110	Topographic Contour

Locations From Prior Site Investigation

TE-E	Soil Boring
TW-1	Test Well Location
SV-4	Soil Vapor Sample
HA-SED 2	Sediment Sample
TE-E	Surface Sample

Locations Completed May 2010 for Remedial Investigation

- Soil Boring
- Monitoring Well
- Soil Vapor Sample
- Sediment Sample
- Surface Sample

AREA 1 — Data Evaluation Area Discussed in Report (See Table 6)

Utility Note:
All buried utilities at the site have not been mapped or confirmed in sufficient detail to include on this map; do not use for construction.

Plan View

1" = 50' SCALE 25 0 25 50 FEET

DEC SITE #C633077

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REVISIONS:	DATE:	BY:

PROJECT: FORMER ONEIDA KNIFE PLANT - LOT 1 REMEDIAL ALTERNATIVES REPORT

DWG. TITLE: **BORING AND SAMPLING LOCATION PLAN**

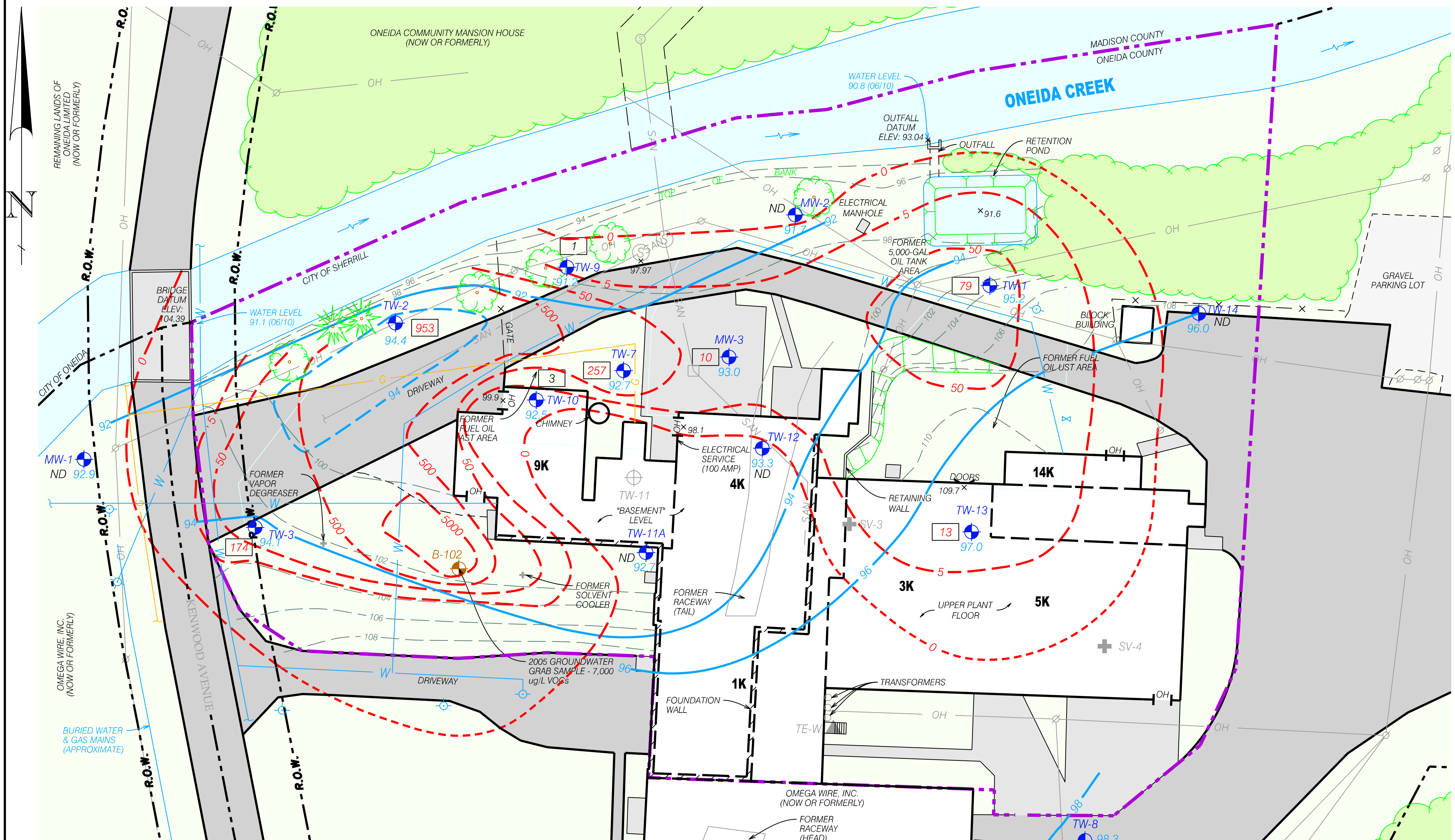
CLIENT: ONEIDA SILVERSMITHS, INC.

LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2006065
FILE NAME.:	Figure3
SCALE:	AS NOTED
DATE:	NOV. 2011
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	DRV

SHEET NO.: FIGURE 3



Key

- Site Boundary
- R.O.W. — Right of Way
- OH — Overhead Utility
- Utility Pole
- SAN — Sanitary Sewer Main/ Service
- Sanitary Manhole
- W — Water Main/ Service
- Hydrant
- Catch Basin
- 2K — Building Name
- Concrete Pad
- 110 — Topographic Contour
- Groundwater Well
- 93.0 — Groundwater Elevation (Based on 06/11/10 data)
- 94 — Groundwater Contour (Based on 06/11/10 Data)

VOC Data (EPA 8260); 5/3/10 & 6/15/10 Data

- 174 — Total VOCs (ug/L)
- ND — No Detected VOCs
- 50 — Total VOC Concentration Isopleths (ug/L)

Numbers in red indicate VOCs present exceeding groundwater standards.

Utility Note:
All buried utilities at the site have not been mapped or confirmed in sufficient detail to include on this map; do not use for construction.

Plan View

1" = 50' SCALE 25 0 25 50 FEET

DEC SITE #C633077

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ADDED 0 CONTOUR.	04/17/12	FAK

PROJECT: FORMER ONEIDA KNIFE PLANT - LOT 1 REMEDIAL ALTERNATIVES REPORT

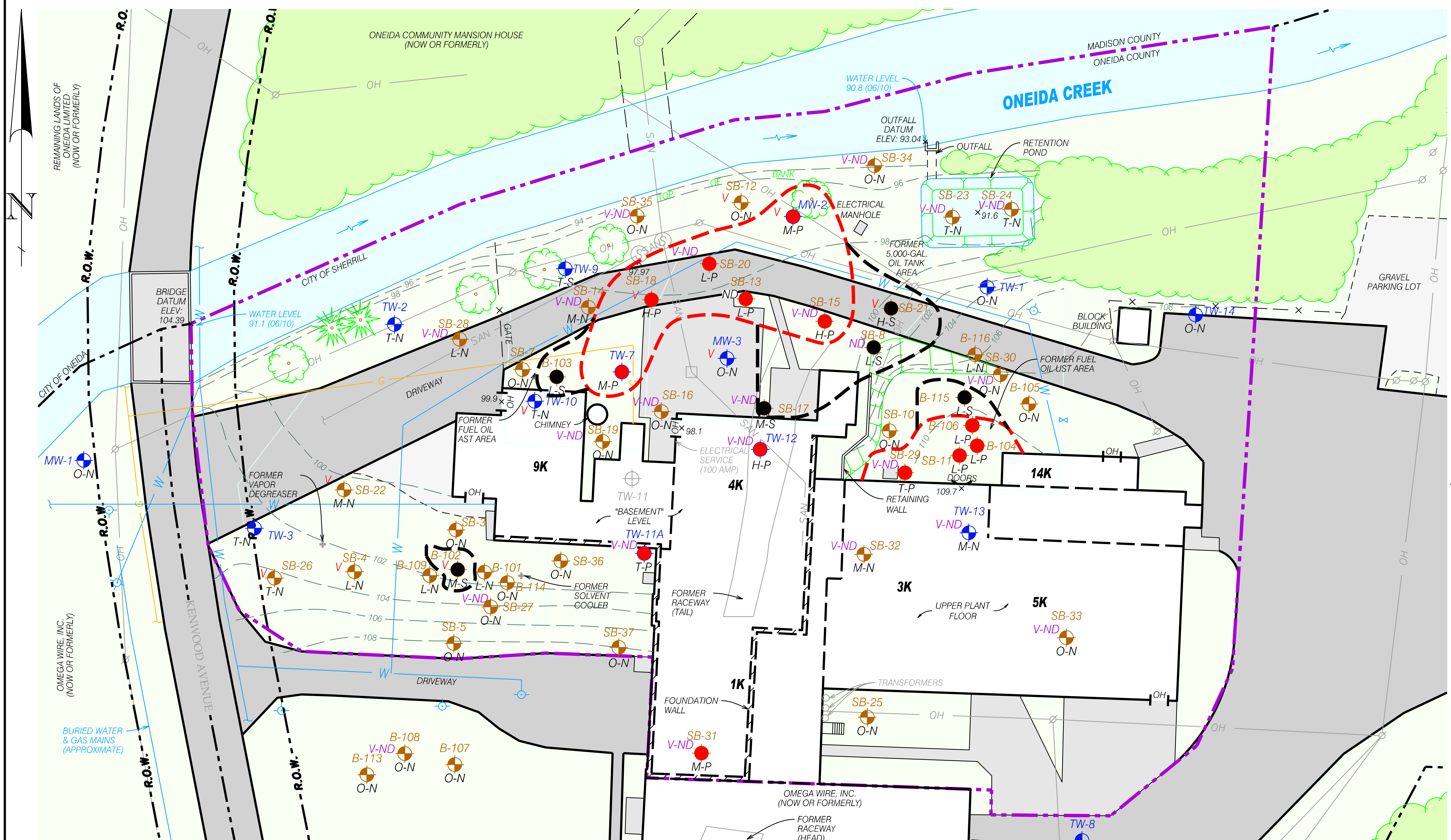
DWG. TITLE: GROUNDWATER DATA

CLIENT: ONEIDA SILVERSMITHS, INC.

LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

PROJECT No.:	2006065
FILE NAME.:	Figure4
SCALE:	AS NOTED
DATE:	NOV. 2011
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	DRV

SHEET NO.: FIGURE 4



Utility Note:
All buried utilities at the site have not been mapped or confirmed in sufficient detail to include on this map; do not use for construction.

Plan View

1" = 50' SCALE FEET

DEC SITE #C633077

Key

- Site Boundary
- Right of Way
- Overhead Utility
- Utility Pole
- Sanitary Sewer Main/ Service
- Sanitary Manhole
- Water Main/ Service
- Hydrant
- Catch Basin
- 2K Building Name
- 110 Topographic Contour
- Soil Boring
- Well Location

Locations w/ Subsurface Visual and PID Indicators

- Oily Material, Staining and Elevated PIDs
- Staining and Elevated PIDs
- Oily Material
- Staining

Summary of Subsurface Soil Field Indicators

PID Soil Sample Screening (PPM)	Visual Indicators Observed
O - No Detections	N - None
T - Trace; <5	S - Staining
L - Low; >5, <25	P - Oily Material Present
M - Medium; >25, <100,	
H - High; >100	

Analytical Summary Results

V-ND - No VOC Detections Above SCGs
V - VOC Detections Above SCGs

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REVISIONS: DATE: BY:

PROJECT: FORMER ONEIDA KNIFE PLANT - LOT 1 REMEDIAL ALTERNATIVES REPORT

DWG. TITLE: **AREAS OF SUBSURFACE SOIL IMPACT**

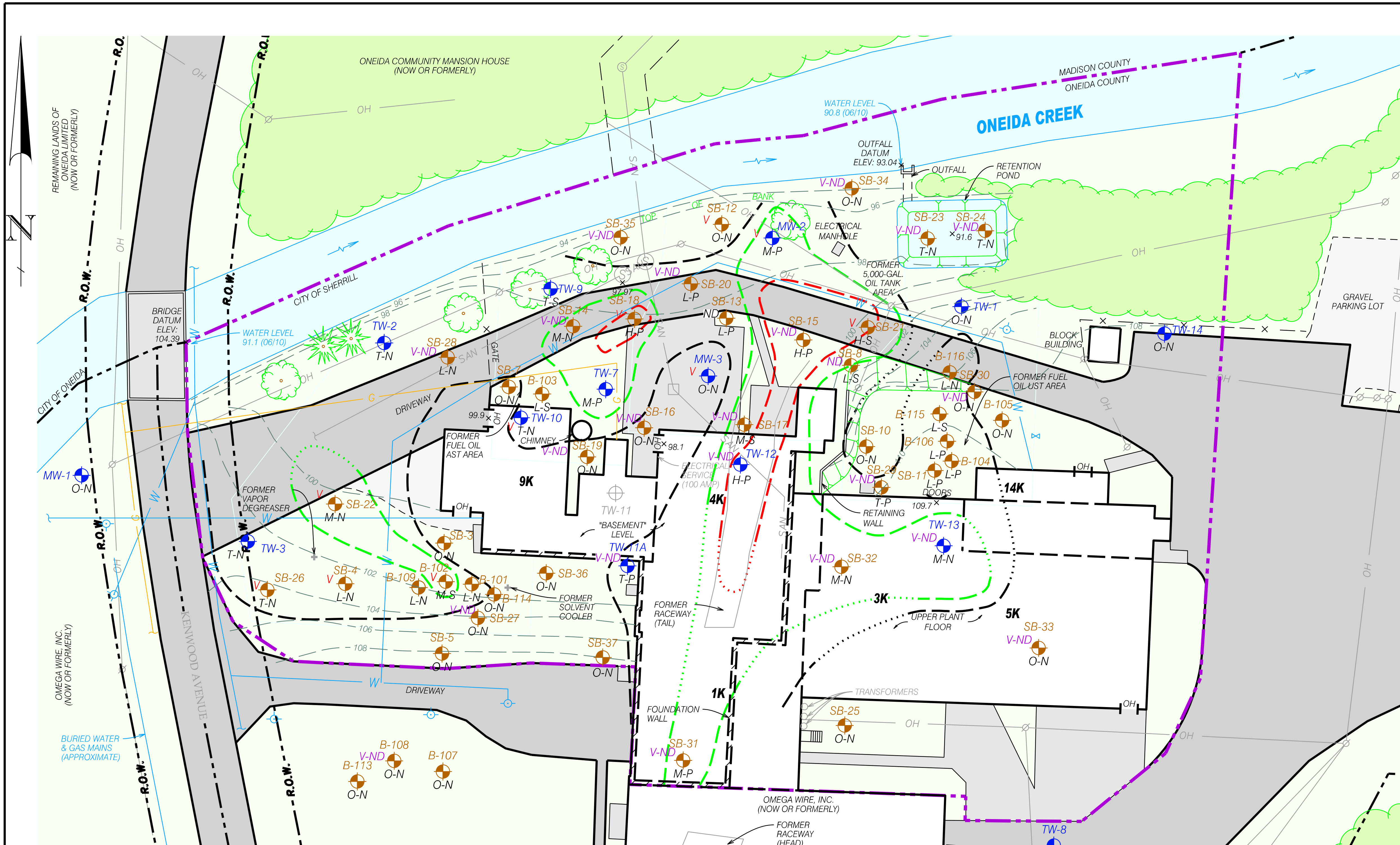
CLIENT: ONEIDA SILVERSMITHS, INC.

LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2006065
FILE NAME.:	Figure5
SCALE:	AS NOTED
DATE:	NOV. 2011
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	DRV

SHEET NO.: FIGURE 5



Utility Note:
All buried utilities at the site have not been mapped or confirmed in sufficient detail to include on this map; do not use for construction.

Plan View

1" = 50' SCALE 25 0 25 50 FEET

DEC SITE #C633077

Key

	Site Boundary
R.O.W.	Right of Way
OH	Overhead Utility
	Utility Pole
SAN	Sanitary Sewer Main/ Service
	Sanitary Manhole
W	Water Main/ Service
	Hydrant
	Catch Basin
2K	Building Name
110	Topographic Contour
	Soil Boring
	Well Location

Summary of Subsurface Soil Field Indicators

PID Soil Sample Screening (PPM)	Visual Indicators Observed
O - No Detections	N - None
T - Trace; <5	S - Staining
L - Low; >5, <25	P - Oily Material Present
M - Medium; >25, <100,	
H - High; >100	

Analytical Summary Results

V-ND - No VOC Detections Above SCGs
V - VOC Detections Above SCGs

PID Contours

Trace-No Detection
Medium
Moderate

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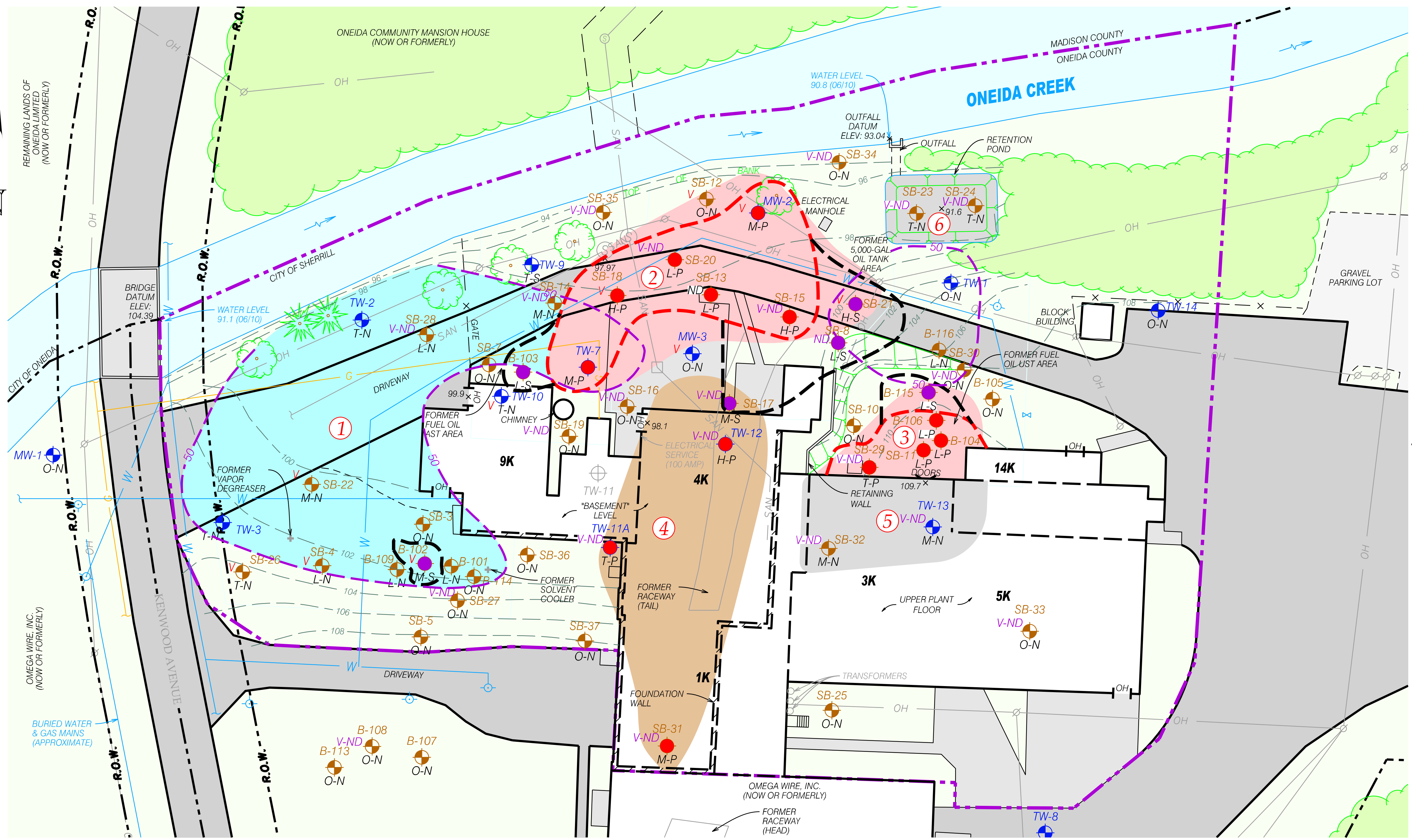
REVISIONS: DATE: BY:

PROJECT: FORMER ONEIDA KNIFE PLANT - LOT 1 REMEDIAL ALTERNATIVES REPORT
DWG. TITLE: SUBSURFACE SOIL DATA - PID FIELD SCREENING
CLIENT: ONEIDA SILVERSMITHS, INC.
LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2006065
FILE NAME.:	Figure6
SCALE:	AS NOTED
DATE:	NOV. 2011
ENG'D BY:	FAK
DRAWN BY:	JMD
CHECKED BY:	DRV

SHEET NO.: FIGURE 6



Key

1. AOC #1 (Dissolved Phase Groundwater Plume)
2. AOC #2 (Subsurface Oil Impact)
3. AOC #3 (Subsurface Oil Impact)
4. AOC #4 (Subsurface Oil Impact)
5. AOC #5 (Building 3K/ 5K interior)
6. AOC #6 (Retention Pond)

Locations w/ Subsurface Visual and PID Indicators

- Oily Material Staining and Elevated PIDs
- Staining and Elevated PIDs
- Oily Material
- Staining
- 50 — Total Groundwater VOCs Concentration Isopleths (ug/L) (See Figure 4)

See Figure 5 for additional Legend details.

Utility Note:
All buried utilities at the site have not been mapped or confirmed in sufficient detail to include on this map; do not use for construction.

Plan View

1" = 50' — SCALE 25 0 25 50 FEET

DEC SITE #C633077

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REVISIONS:	DATE:	BY:

PROJECT: FORMER ONEIDA KNIFE PLANT - LOT 1 REMEDIAL ALTERNATIVES REPORT

DWG. TITLE: REMEDIAL INVESTIGATION AREAS OF CONCERN (AOCS)

CLIENT: ONEIDA SILVERSMITHS, INC.

LOCATION: CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

Note: No alteration permitted hereon except as provided under Section 7209 Subdivision 2 of the New York State Education Law.

PROJECT No.:	2006065
FILE NAME.:	Figure7
SCALE:	AS NOTED
DATE:	NOV. 2011
ENG'D BY:	FAK
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SHEET NO.: FIGURE 7

TABLES

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 1 - MONITORING WELL AND GROUNDWATER ELEVATION DATA

MONITORING WELL CONSTRUCTION DATA	MONITORING WELL													CREEK		OFF-SITE MONITORING WELLS			
	TW-1	**TW-2**	**TW-3**	**TW-7**	**TW-9**	**TW-10**	**TW-11A**	**TW-12**	**TW-13**	**TW-14**	**MW-1**	**MW-2**	**MW-3**	**Bridge[2]**	**Outfall[3]**	**TW-4**	**TW-5**	**TW-6**	**TW-8**
Top-of-Casing Elevation	103.70	98.40	102.60	98.80	97.40	100.15	99.16	98.23	109.91	110.13	105.44	96.52	98.00	104.39	93.04	107.30	106.90	106.90	108.50
Ground Elevation	104.0	98.7	103.3	99.3	97.8	99.9	99.5	98.1	109.7	108.0	102.9	97.0	98.4	-	-	107.5	107.1	107.2	108.6
Total Well Depth	19.1	5.0	15.5	11.6	10.2	16.1	15.5	13.1	20.2	19.1	25.3	14.5	11.2	-	-	9.3	15.6	15.6	18.0
Bottom of Well Elevation	84.9	93.7	87.8	87.7	87.6	83.8	84.0	85.0	89.5	88.9	77.6	82.5	87.2	-	-	98.2	91.5	91.6	90.6
Diameter (inches)	1	1	1	2	1	1	1	1	1	1	2	2	2	-	-	1	1	1	1
MEASUREMENT DATE	**GROUNDWATER ELEVATIONS[1]**																		
04/11/2006	95.40	96.30	94.20	93.10	91.80	NI	NI	NI	NI	NI	NI	NI	NI	NM	NM	104.60	101.80	98.50	98.90
04/13/2006	95.40	95.80	94.30	93.00	91.60	NI	NI	NI	NI	NI	NI	NI	NI	NM	NM	104.60	101.60	98.00	98.80
05/03/2010	95.11	94.88	96.32	92.52	91.20	NI	NI	NI	NI	NI	NI	NI	NI	NM	NM	103.74	101.57	98.04	98.38
06/11/2010	95.18	94.35	94.10	92.67	91.21	92.50	92.70	93.28	96.99	95.95	92.87	91.67	92.95	91.09	90.84	103.62	101.72	97.89	98.32

Notes:

[1]Relative elevations are based on an arbitrary datum of 100.0 feet.
[2]Surveyed benchmark on bridge guard rail for measuring depth to river level; field marked.
[3]Surveyed benchmark on top of concrete wall of retention pond outfall for measuring depth to river level; field marked.
NI Not Installed
NM Not Measured

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 2 - SUMMARY OF SURFACE SOIL ANALYTICAL RESULTS

DETECTED VOCs [EPA Method 8260]

Date Sampled: May 20-26, 2010

Compound	Recommended Soil Cleanup Objective[1] (µg/kg)			AOC #1 (Area[2] 6 - Outdoor 2K)	AOC #2 (Area 1 - Outdoor 9K)	AOC #2 (Area 2 - Outdoor 4K)	AOCs #3 and #6 (Area 4 - Outdoor 3K/5K and Retention Pond)		
				Compound Concentration (µg/kg)					
				SS-3	SS-4	SS-6	SS-5	SB-23-1	SB-24-1
	Industrial Restricted Use	Protection of Groundwater	Protection of Ecological Resources	Depth Below Grade					
				0-2"	0-2"	0-2"	0-2"	0-2"	0-2"
Tetrachloroethene	300,000	1,300	2	ND<4.32	***15.4***	ND<4.62	ND<4.37	ND<8.07	ND<8.74
m&p-Xylene	1,000,000	1,600	0.26	***4.35***	ND<4.64	***12.5***	ND<4.37	ND<8.07	ND<8.74
1,3,5-Trimethylbenzene	380,000	8,400		ND<4.32	ND<4.64	4.9	ND<4.37	ND<8.07	ND<8.74
1,2,4-Trimethylbenzene	380,000	3,600		4.87	ND<4.64	12.6	ND<4.37	ND<8.07	ND<8.74
Total VOC Concentrations	---	---		9.22	15.4	30	0	0	0

DETECTED SVOCs [EPA Method 8270]

Date Sampled: May 20-26, 2010

Compound	Recommended Soil Cleanup Objective[1] (µg/kg)			AOC #1 (Area 6 - Outdoor 2K)	AOC #2 (Area 1 - Outdoor 9K)	AOC #2 (Area 2 - Outdoor 4K)	AOC #3 (Area 4 - Outdoor 3K/5K)		
				Compound Concentration (µg/kg)					
				SS-3	SS-4	SS-6	SS-5	SB-23-1	SB-24-1
	Industrial Restricted Use	Protection of Groundwater	Protection of Ecological Resources	Depth Below Grade					
				0-2"	0-2"	0-2"	0-2"	0-2"	0-2"
Phenanthrene	1,000,000	1,000,000		507	ND<691	ND<425	1,470	ND<576	1,810
Anthracene	1,000,000	1,000,000		ND<365	ND<691	ND<425	455	ND<576	ND<663
Carbazole				ND<365	ND<691	ND<425	389	ND<576	ND<663
Fluoranthene	1,000,000	1,000,000		999	771	ND<425	2,810	ND<576	2,550
Pyrene	1,000,000	1,000,000		608	ND<691	449	1,660	ND<576	1,360
Benzo(a)anthracene	11,000	1,000		451	ND<691	ND<425	***1,700***	ND<576	882
Chrysene	110,000	1,000		453	ND<691	ND<425	***1,170***	ND<576	822
Benzo(b)fluoranthene	11,000	1,700		454	ND<691	ND<425	920	ND<576	ND<663
Benzo(k)fluoranthene	110,000	1,700		ND<365	ND<691	ND<425	871	ND<576	ND<663
Benzo(a)pyrene	1,100	22,000	2.6	***472***	ND<691	ND<425	***1,020***	ND<576	***703***
Indeno(1,2,3-cd)pyrene	11,000	8,200		ND<365	ND<691	ND<425	526	ND<576	ND<663
Benzo(g,h,i)perylene	1,000,000	1,000,000		ND<365	ND<691	ND<425	523	ND<576	ND<663
Total SVOC Concentrations	---	---		3,944	771	449	13,514	ND<576	8,127

DETECTED RCRA METALS

Date Sampled: May 20-26, 2010

Compound	Recommended Soil Cleanup Objective[1] (mg/kg)			AOC #1 (Area 6 - Outdoor 2K)	AOC #2 (Area 1 - Outdoor 9K)	AOC #2 (Area 2 - Outdoor 4K)	AOC #3 (Area 4 - Outdoor 3K/5K)		
				Compound Concentration (mg/kg)					
				SS-3	SS-4	SS-5	SS-6	SB-23-1	SB-24-1
	Industrial Restricted Use	Protection of Groundwater	Protection of Ecological Resources	Depth Below Grade					
				0-2"	0-2"	0-2"	0-2"	0-2"	0-2"
Arsenic	16	16	13	4.38	ND<3.2	5.11	6	***13.3***	***29***
Barium	10,000	820	820	25.9	16.8	40.4	45	79.8	114
Beryllium	2,700	47	47	0.303	0.219	0.201	0.235	0.337	0.245
Cadmium	60	7.5	7.5	ND<0.208	ND<0.194	ND<0.218	ND<0.245	1.06	2.95
Chromium, Trivalent	6,800	NS	41	***63.2***	***163***	***501***	***498***	***1,530***	***4,460***
Copper	10,000	1,720	50	29.7	10.6	37.5	19	***84.1***	***204***
Lead	3,900	450	63	11.8	ND<3.91	62.3	16	26.5	63
Manganese	10,000	2,000	1,600	463	328	202	392	365	518
Nickel	10,000	130	30	12.5	11	19.3	23	***83.4***	***257***
Silver	6,800	8.3	2.0	ND<1.15	ND<1.08	ND<1.12	ND<1.36	***2.28***	***7.15***
Zinc	10,000	2,480	109	31.5	13.5	25	49	***308***	***745***
Mercury	5.7	1	0.18	ND<0.022	***0.458***	0.0458	0.0466	ND<0.415	0.131
Cyanide	10,000	40		ND<0.256	ND<0.748	0.308	ND<0.299	0.135	ND<0.473

DETECTED PCBs [EPA Method 8082]

Date Sampled: May 20-26, 2010

Compound	Recommended Soil Cleanup Objective[1] (mg/kg)			AOC #1 (Area 6 - Outdoor 2K)	AOC #2 (Area 1 - Outdoor 9K)	AOC #2 (Area 2 - Outdoor 4K)	AOCs #3 and #6 (Area 4 - Outdoor 3K/5K and Retention Pond)			Transformer Area			
				Compound Concentration (mg/kg)									
				SS-3	SS-4	SS-5	SS-6	SB-23-1	SB-24-1	*TE-W*	SS-1	SS-2	SB-25-SS
	Industrial Restricted Use	Protection of Groundwater	Protection of Ecological Resources	Depth Below Grade									
				0-2"	0-2"	0-2"	0-2"	0-2"	0-2"	0-6"	0-2"	0-2"	0-2"
Aroclor 1254	---	---	1	0.183	0.609	0.162	0.567	0.0893	0.177	1.03	0.239	0.177	1.01
Aroclor 1260			1	ND<0.0531	ND<0.0516	0.0646	ND<0.0626	ND<0.0862	ND<0.0993	2.13	ND<0.0533	ND<0.0527	0.631
TOTAL	25	3.2	1.0	0.18	0.61	0.23	0.57	0.09	0.18	***3.16***	0.24	0.18	***1.64***

Notes:

[1]New York Codes, Rules and Regulations, Title 6 (6NYCRR) Part 375-6, *Remedial Program Soil Cleanup Objectives*.
[2]"Area" refers to data evaluation areas used in the Remedial Investigation Report (refer to Figure 3).

µg/kg micrograms per kilogram, equivalent to parts per billion (ppb).
mg/kg milligrams per kilogram, equivalent to parts per million (ppm).

ND Not detected above the laboratory method detection limit.
Concentrations exceeding soil cleanup objectives denoted in ***BOLD***.

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 3 - SEDIMENT ANALYTICAL RESULTS - METALS

Date Sampled: June 30, 2011, unless noted otherwise **Analysis:** Various Methods

PRIORITY POLLUTANT METALS								
Compound	Sediment Guidance Value[1] (mg/kg)	Compound Concentration (mg/kg)						
		Downstream Location	Mid-stream section		Upstream Location	Near Outfall		Upstream Location
	Lowest / Highest Effect Level	SD-3	SD-2*	SD-4	SD-5	SD-1*	SD-6	SD-7
Arsenic	6 / 33	**11.1**	6.2	3.4	4.2	6.16	4.6	4.6
Barium	---	21.8	39.7	64.3	88.7	45.1	33.3	60.6
Beryllium	---	ND	0.257	ND	ND	0.235	ND	ND
Cadmium	0.6 / 9	ND<0.52	ND	ND<0.56	ND<0.51	ND	ND<0.58	***0.64***
Chromium	26 / 110	6.9	5.67	6.8	8.6	***498***	8.1	8.5
Copper	16 / 110	14.3	6.87	6.8	13.8	18.7	9.2	***16.7***
Cyanide	---	ND		ND	ND		ND	ND
Hexavelent Chromium	---	0.45		ND	ND		ND	ND
Lead	31 / 110	4.8	ND	5.7	4.3	15.5	8.1	7.3
Manganese	460 / 1,100	318	**463**	***484***	***525***	392	286	292
Nickel	16 / 50	12.7	14.4	8.9	12.8	23.3	11.6	11
Selenium	---	ND	ND	ND	ND	ND	ND	ND
Silver	1 / 2.2	ND<0.52	ND	ND<0.56	ND<0.51	ND	ND<0.58	ND<0.86
Zinc	120 / 270	23.1	19.3	21.8	26.7	48.9	34.5	43.6
Mercury	0.15 / 1.3	ND<0.19	ND	ND<0.26	ND<0.23	0.0466	ND<0.21	ND<0.35

Notes:

* Sampled May 2010 for Remedial Investigation Report.
[1]DEC *Sediment Criteria for Metals* per *Technical Guidance for Screening Contaminated Sediment*, dated January 1999.
mg/kg milligrams per kilogram, equivalent to parts per million (ppm)
ND Not detected above the laboratory method detection limit
Compounds that exceeded Sediment Guidance Values are denoted in ***BOLD***.
--- No DEC recommended sediment guidance value.
Blank cells indicate not analyzed

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 4A - SEDIMENT ANALYTICAL RESULTS - VOCs - DETECTED COMPOUNDS

Date Sampled: May 20-26, 2010 **Analysis:** EPA Method 8260

Compound	Compound Concentration (µg/kg)									
	SD-1	Sediment Guidance Value[1] (µg/kg)				SD-2	Sediment Guidance Value (µg/kg)			
		Human Health	Benthic-Acute	Benthic-Chronic	Wildlife		Human Health	Benthic-Acute	Benthic-Chronic	Wildlife
Benzene	ND<5.01	1.86				ND<4.93	4.56			
Carbon tetrachloride	ND<5.01	1.86				ND<4.93	4.56			
Chlorobenzene	ND<5.01		107	11		ND<4.93		263	27	
Dichlorobenzenes	ND<5.01		372	37		ND<4.93		912	91	
1,2 Dichloroethane	ND<5.01	2.17				ND<4.93	5.32			
1,1 Dichloroethylene	ND<5.01	0.062				ND<4.93	0.15			
Hexachlorobutadiene	ND<5.01	0.93	171	17	12	ND<4.93	2.28	418	42	30
1,1,2,2-Tetrachloroethane	ND<5.01	0.93				ND<4.93	2.28			
Tetrachloroethylene	ND<5.01	2.48				ND<4.93	6.08			
Trichlorobenzene	ND<5.01		2,821	282		ND<4.93		6,916	692	
Trichloroethylene	ND<5.01	6.2				ND<4.93	15.20			
Vinyl Chloride	ND<5.01	0.217				ND<4.93	0.53			
Ethylbenzene	ND<5.01		657	74		ND<4.93		1,611	182	
Isopropylbenzene	ND<5.01		326	37		ND<4.93		798	91	
Naphthalene	ND<5.01		800	93		ND<4.93		1,961	228	
Toluene	ND<5.01		729	152		ND<4.93		1,786	372	
1,2,4-trimethylbenzene	ND<5.01		5,056	577		ND<4.93		12,396	1,414	
Xylene	ND<5.01		2,582	285		ND<4.93		6,331	699	
Total Organic Carbon (mg/kg)	3,100					7,600				
(%)	0.3%					0.8%				

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 4A - SEDIMENT ANALYTICAL RESULTS - VOCs - DETECTED COMPOUNDS

Date Sampled: June 30, 2011 **Analysis:** EPA Method 8260

Compound	Compound Concentration (µg/kg)									
	SD-3	Sediment Guidance Value[1] (µg/kg)				SD-4	Sediment Guidance Value (µg/kg)			
		Human Health	Benthic-Acute	Benthic-Chronic	Wildlife		Human Health	Benthic-Acute	Benthic-Chronic	Wildlife
Benzene	ND<2.2	0.93				ND<2.5	0.51			
Carbon tetrachloride	ND<2.2	0.93				ND<2.5	0.51			
Chlorobenzene	ND<2.2		54	5		ND<2.5		29	3	
Dichlorobenzenes	ND<6.6		186	19		ND<7.5		102	10	
1,2 Dichloroethane	ND<2.2	1.085				ND<2.5	0.60			
1,1 Dichloroethylene	ND<2.2	0.031				ND<2.5	0.02			
Hexachlorobutadiene	ND<5.5	0.465	85	9	6	ND<6.3	0.26	47	5	3
1,1,2,2-Tetrachloroethane	ND<2.2	0.465				ND<2.5	0.26			
Tetrachloroethylene	***2.7***	1.24				ND<2.5	0.68			
Trichlorobenzene	ND<5.5		1,411	141		ND<6.3		774	77	
Trichloroethylene	ND<2.2	3.1				ND<2.5	1.70			
Vinyl Chloride	ND<2.2	0.1085				ND<2.5	0.06			
Ethylbenzene	ND<2.2		329	37		ND<2.5		180	20	
Isopropylbenzene	ND<2.2		163	19		ND<2.5		89	10	
Naphthalene	ND<2.2		400	47		ND<2.5		220	26	
Toluene	ND<2.2		364	76		ND<2.5		200	42	
1,2,4-trimethylbenzene	ND<5.5		2,528	288		ND<6.3		1,388	158	
Xylene	ND<6.7		1,291	143		ND<7.6		709	78	
Total Organic Carbon (mg/kg)	1,550					851				
(%)	0.2%					0.1%				

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 4A - SEDIMENT ANALYTICAL RESULTS - VOCs - DETECTED COMPOUNDS

Date Sampled: June 30, 2011 **Analysis:** EPA Method 8260

Compound	Compound Concentration (µg/kg)									
	SD-5	Sediment Guidance Value[1] (µg/kg)				SD-6	Sediment Guidance Value (µg/kg)			
		Human Health	Benthic-Acute	Benthic-Chronic	Wildlife		Human Health	Benthic-Acute	Benthic-Chronic	Wildlife
Benzene	ND<2.1	0.45				ND<2.3	1.278			
Carbon tetrachloride	ND<2.1	0.45				ND<2.3	1.278			
Chlorobenzene	ND<2.1		26	3		ND<2.3		73.698	7.455	
Dichlorobenzenes	ND<6.3		90	9		ND<6.9		255.6	25.56	
1,2 Dichloroethane	ND<2.1	0.525				ND<2.3	1.491			
1,1 Dichloroethylene	ND<2.1	0.015				ND<2.3	0.0426			
Hexachlorobutadiene	ND<5.2	0.225	41	4	3	ND<2.3	0.639	117.15	11.715	8.52
1,1,2,2-Tetrachloroethane	ND<2.1	0.225				ND<2.3	0.639			
Tetrachloroethylene	ND<2.1	0.6				***17***	1.704			
Trichlorobenzene	ND<5.2		683	68		ND<5.8		1938.3	193.83	
Trichloroethylene	***1.5***	1.5				***8***	4.26			
Vinyl Chloride	ND<2.1	0.0525				ND<2.3	0.1491			
Ethylbenzene	ND<2.1		159	18		ND<2.3		451.56	51.12	
Isopropylbenzene	ND<2.1		79	9		ND<2.3		223.65	25.56	
Naphthalene	ND<2.1		194	23		ND<2.3		549.54	63.9	
Toluene	ND<2.1		176	37		ND<2.3		500.55	104.37	
1,2,4-trimethylbenzene	ND<5.2		1,223	140		ND<5.8		3474.03	396.18	
Xylene	ND<6.3		625	69		ND<7.0		1774.29	195.96	
Total Organic Carbon (mg/kg)	750					2,130				
(%)	0.1%					0.2%				

TABLE 4A - SEDIMENT ANALYTICAL RESULTS - VOCs - DETECTED COMPOUNDS

Notes:

[1]DEC *Sediment Criteria for Non-polar Organic Contaminants* per *Technical Guidance for Screening Contaminated Sediment, Table 1,* dated January 1999.

µg/kg   micrograms per kilogram, equivalent to parts per billion (ppb)
mg/kg   milligrams per kilogram, equivalent to parts per million (ppm)
ND<   Not detected less than
Compounds that exceeded Sediment Guidance Values are denoted in ***BOLD***.
Table does not include COCs with no sediment guidance criteria.
Blank cells indicate no DEC sediment criteria.

Sediment Guidance Value Equation	
Kow	Octanol/Water partition coefficient (unitless)
SCoc	Organic carbon normalized sediment criterion
	[SCoc (µg/gOC) = WQC (µg/l) x Kow x 1 kg/1,000 gOC]
foc	Organic carbon content of sample (gOC/kg)
SGV	Sediment guidance value [SGV = SCoc x foc]

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
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TABLE 4B - 2006 SEDIMENT ANALYTICAL RESULTS - VOCs - DETECTED COMPOUNDS

Sample Date: March 2006 **Analysis:** EPA Method 8260

Compound	Compound Concentration (µg/kg)			
	HA-SED-1	HA-SED-2	HA-SED-3	HA-SED-4
Trichloroethene	ND<15.5	ND<12.9	41.9	ND<13.8
Tetrachloroethene	ND<15.5	ND<12.9	187	ND<13.8
cis-1,2-Dichloroethene	ND<15.5	ND<12.9	42.6	ND<13.8

Notes:

Results from Haley & Aldrich
Total organic carbon was not analyzed

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 5 - SUMMARY OF SURFACE WATER ANALYTICAL RESULTS - VOCs - DETECTED COMPOUNDS

Volatile Organic Compounds (EPA Method 8260) in µg/L		
Location	**Date**	**Reportable Detection Limits**
		2 to 10 µg/L
HA-SED-1	03/2006	**None Detected**
HA-SED-2	03/2006	**None Detected**
HA-SED-3	03/2006	**None Detected**
HA-SED-4	03/2006	**None Detected**
SW-1	06/30/2011	**None Detected**
SW-2	06/30/2011	**None Detected**

Notes:

µg/L micrograms per liter, equivalent to parts per billion

FORMER ONEIDA KNIFE PLANT
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TABLE 6 - SUMMARY OF CONTAMINANT STATISTICS

Media	Class	Contaminant of Concern	Units	Concentration Range	Protection of Groundwater SCG[1] (µg/kg)	Data Evaluation Area (Figure 3) of Highest Concentration	Number of Samples	Number of Samples with detections		Criteria Comparison: Number of Samples Exceeding SCGs	
								Number	Percent	Number	Percent
Surface Soils	Volatile Organic Compounds	Tetrachloroethene	µg/kg	ND - 15.4	1,300	1	6	1	17%	0	0%
		m&p-Xylene		ND - 12.5	1,600	2		2	33%	0	0%
		1,3,5-Trimethylbenzene		ND - 4.9	8,400	2		1	17%	0	0%
		1,2,4-Trimethylbenzene		ND - 12.6	3,600	2		2	33%	0	0%
	Semi-Volatile Organic Compounds	Phenanthrene	µg/kg	ND - 1810	1,000,000	4	6	3	50.00%	0	0%
		Anthracene		ND - 455	1,000,000	2		1	16.67%	0	0%
		Carbazole		ND - 389		2		1	16.67%	0	0%
		Fluoranthene		ND - 2810	1,000,000	2		4	66.67%	0	0%
		Pyrene		ND - 1660	1,000,000	2		4	66.67%	0	0%
		Benzo(a)anthracene		ND - 1700	1,000	2		3	50.00%	0	0%
		Chrysene		ND - 1170	1,000	2		3	50.00%	0	0%
		Benzo(b)fluoranthene		ND - 920	1,700	2		2	33.33%	1	17%
		Benzo(k)fluoranthene		ND - 871	1,700	2		1	16.67%	1	17%
		Benzo(a)pyrene		ND - 1020	22,000	2		3	50.00%	0	0%
		Indeno(1,2,3-cd)pyrene		ND - 526	8,200	2		1	16.67%	0	0%
		Benzo(g,h,i)perylene		ND - 532	1,000,000	2		1	16.67%	0	0%
	Metals	Arsenic	mg/kg	ND - 29	16	4	6	5	83.33%	1	17%
		Barium		16.8 - 114	820	4		6	100.00%	0	0%
		Beryllium		0.201 - 0.337	47	4		6	100.00%	0	0%
		Cadmium		ND - 2.9	7.5	4		2	33.33%	0	0%
		Chromium, Trivalent		63.2 - 4460	NS	4		6	100.00%	0	0%
		Copper		10.6 - 204	1,720	4		6	100.00%	0	0%
		Lead		ND - 63	450	4		5	83.33%	0	0%
		Manganese		202 - 518	2,000	4		6	100.00%	0	0%
		Nickel		11 - 257	130	4		6	100.00%	1	17%
		Silver		ND - 7.15	8.3	4		2	33.33%	0	0%
		Zinc		13.5 - 745	2,480	4		6	100.00%	0	0%
		Mercury		ND - 0.131	1	4		4	66.67%	0	0%
		Cyanide		ND - 0.308	40	2		2	33.33%	0	0%
	Total PCBs	PCBs	mg/kg	ND - 3.16	3.2	5	10	10	100.00%	0	0%
Sub-Surface Soils	Volatile Organic Compounds	Vinyl Chloride	µg/kg	ND - 42.3	20	6	38	3	7.89%	2	5%
		trans-1,2-Dichloroethene		ND - 18.9	190	6		1	2.63%	0	0%
		cis-1,2-Dichloroethene		ND - 4,050	250	6		7	18.42%	1	3%
		Trichloroethene		ND - 3,710	470	6		1	2.63%	1	3%
		Tetrachloroethene		ND - 934	1,300	6		2	5.26%	0	0%
		Benzene		ND - 101	60	4		1	2.63%	1	3%
		Toluene		ND - 114	700	4		1	2.63%	0	0%
		m&p-Xylene		ND - 127	1,600	4		4	10.53%	0	0%
		o-Xylene		ND - 120	1,600	4		3	7.89%	0	0%
		Isopropylbenzene		ND - 2,070		2		4	10.53%	0	0%
		n-Propylbenzene		ND - 4,530	3,900	2		4	10.53%	1	3%
		n-Butylbenzene		ND - 63	12,000	4		2	5.26%	0	0%
		1,3,5-Trimethylbenzene		ND - 108	8,400	4		4	10.53%	0	0%
		1,2,4-Trimethylbenzene		ND - 1,010	3,600	2		8	21.05%	0	0%
		sec-Butylbenzene		ND - 7,380	11,000	2		8	21.05%	0	0%
		4-Isopropyltoluene		ND - 2,200		2		7	18.42%	0	0%
		Naphthalene		ND - 10,700	12,000	2		9	23.68%	0	0%
		Acetone		ND - 263	50	6		10	26.32%	5	13%
		Carbon Disulfide		ND - 14.3		6		9	23.68%	0	0%
		2-Butanone		ND - 39.8	120	6		9	23.68%	0	0%
	Semi-Volatile Organic Compounds	Naphthalene	µg/kg	ND - 4130	12,000	4	23	4	17.39%	0	0%
		2-Methylnaphthalene		ND - 69700		2		5	21.74%	0	0%
		Phenanthrene		ND - 5170	1,000,000	4		6	26.09%	0	0%
		Fluoranthene		ND - 3540	1,000,000	4		5	21.74%	0	0%
		Flourene		ND - 1200	386,000	4		1	4.35%	0	0%
		Pyrene		ND - 2280	1,000,000	4		5	21.74%	0	0%
		bis(2-Ethylhexyl)phthalate		ND - 897		2		2	8.70%	0	0%
		Acenaphthene		ND - 760	98,000	4		2	8.70%	0	0%
		Anthracene		ND - 1200	1,000,000	4		2	8.70%	0	0%
		Benzo(a)anthracene		ND - 1610	1,000	4		3	13.04%	2	9%
		Chrysene		ND - 1240	1,000	4		3	13.04%	2	9%
		Dibenzofuran		ND - 460		4		1	4.35%	0	0%
		Benzo(b)fluoranthene		ND - 1030	1,700	4		3	13.04%	0	0%
		Benzo(k)fluoranthene		ND - 907	1,700	4		3	13.04%	0	0%
		Benzo(a)pyrene		ND - 1340	22,000	4		4	17.39%	1	4%
		Indeno(1,2,3-cd)pyrene		ND - 528	8,200	4		1	4.35%	0	0%
		Benzo(g,h,i)perylene		ND - 632	1,000,000	4		1	4.35%	0	0%

FORMER ONEIDA KNIFE PLANT
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TABLE 6 - SUMMARY OF CONTAMINANT STATISTICS

Media	Class	Contaminant of Concern	Units	Concentration Range	Protection of Groundwater SCG[1] (µg/kg)	Data Evaluation Area (Figure 3) of Highest Concentration	Number of Samples	Number of Samples with detections		Criteria Comparison: Number of Samples Exceeding SCGs	
								Number	Percent	Number	Percent
Sub-Surface Soils	Metals	Arsenic	mg/kg	ND - 143	16	1	21	14	66.67%	5	24%
		Barium		32.3 - 292	820	4		17	80.95%	0	0%
		Beryllium		ND - 0.507	47	4		15	71.43%	0	0%
		Cadmium		ND - 13.5	7.5	4		8	38.10%	0	0%
		Chromium, Trivalent		5.9 - 35300	NS	2		21	100.00%	1	5%
		Copper		18.9 - 288	1,720	2		21	100.00%	0	0%
		Lead		ND - 30200	450	4		19	90.48%	6	29%
		Manganese		206 - 1490	2,000	2		17	80.95%	0	0%
		Nickel		6.4 - 562	130	2		21	100.00%	3	14%
		Silver		ND - 32	8.3	4		2	9.52%	1	5%
		Zinc		15.4 - 2020	2,480	4		21	100.00%	0	0%
		Mercury		ND - 2.01	1	2		10	47.62%	1	5%
		Cyanide		ND - 1.86	40	2		6	28.57%	0	0%
	PCB	PCBs	mg/kg	ND - 1.965	3.2	4	19	6	31.58%	0	0%
Groundwater	Volatile Organic Compounds	1,1-Dichloroethane	µg/kg	ND - 1	5	6	13	1	7.69%	0	0%
		cis-1,2-Dichloroethene		ND - 784	5	2		6	46.15%	5	38%
		Tetrachloroethene		ND - 3	5	1,6		3	23.08%	0	0%
		Toluene		ND - 71	5	6		1	7.69%	1	8%
		trans-1,2-Dichloroethene		ND - 13	5	6		1	7.69%	1	8%
		Trichloroethene		ND - 129	5	1,2		5	38.46%	3	23%
		Vinyl Chloride		ND - 43	2	5		8	61.54%	4	31%
		Total VOCs		ND - 13	10	5		8	61.54%	6	46%
	Semi-Volatile Organic Compounds	Total SVOCs	µg/kg	ND	NA	NA	11	1	9.09%	0	0%
	Metals	Arsenic	mg/kg	ND - 0.0477	0.025	5	12	4	33.33%	1	8.33%
		Barium		0.077 - 0.687	2.000	5		9	75.00%	0	0.00%
		Berylliyum		ND - 0.0033	0.003	5		1	8.33%	1	8.33%
		Chromium		ND - 0.0911	0.05	5		4	33.33%	1	8.33%
		Copper		ND - 0.187	0.2	5		4	33.33%	0	0.00%
		Lead		ND - 0.0428	0.025	5		3	25.00%	3	25.00%
		Manganese		0.125 - 4.04	0.600	5		9	75.00%	5	41.67%
		Nickel		ND - 0.0915	0.1	5		3	25.00%	0	0.00%
		Zinc		ND - 0.197	2	5		8	66.67%	0	0.00%

Notes:

[1]New York Codes, Rules and Regulations, Title 6 (6NYCRR) Part 375-6, *Remedial Program Soil Cleanup Objectives* .
mg/kg milligrams per kilogram, equivalent to parts per million (ppm)
µg/kg micrograms per kilogram, equivalent to parts per billion (ppb)

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TABLE 7 - SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS

DETECTED VOCs - EPA METHOD 8260

Date Sampled: May 20-26, 2010			**AOC #2 (Area[3] 1 - Outdoor 9K)**						**AOC #2 (Area 2 - Outdoor 4K)**											**AOC #4 (Area 3 - Indoor 4K)**		
Compound	**Recommended Soil Cleanup Objective[1] (µg/kg)**		**Compound Concentration (µg/kg)**																			
			SB-14	**SB-18-1**	**SB-18-2**	**SB-19**	**SB-35**	**TW-10**	**SB-8**	**SB-12**	**SB-13**	**SB-15**	**SB-16**	**SB-20-1**	**SB-20-2**	**SB-21**	**SB-34**	**MW-2**	**MW-3**	**TW-11A**	**TW-12-1**	**SB-31**
	Industrial Restricted Use	**Protection of Groundwater**	**Depth Below Grade (feet)**																	**Depth Below Grade (feet)**		
			7.5-8.0	**7-8**	**15-16**	**9-11**	**7-9**	**8.5-10**	**11-12**	**7.5-8**	**8-9**	**7-9**	**8-10**	**7-8**	**15-16**	**9-11**	**5-7**	**7.5-8**	**8-10**	**13-15**	**7-8**	**3-5**
Vinyl Chloride	27,000	20	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	8.34	ND<4.31	ND<108	ND<104	ND<7.31
Acetone	1,000,000	50	48.8	***55***	ND<24.3	ND<27.1	ND<27.2	***85.7***	ND<10	ND<10	ND<5	ND<479	ND<37.7	29.4	ND<19	ND<521	ND<23.1	***61.4***	***74.30***	ND<540	ND<520	ND<35.7
Carbon Disulfide			6.78	ND<5.68	ND<4.85	7.57	ND<5.44	10.1	ND<10	ND<10	ND<5	ND<95.9	8.99	7.78	ND<3.81	ND<104	ND<4.63	7.58	7.77	ND<108	ND<104	ND<7.31
trans-1,2-Dichloroethene	1,000,000	190	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
2-Butanone	1,000,000	120	ND<5.18	15.6	ND<4.85	ND<5.41	ND<5.44	16.3	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	20.2	ND<3.81	ND<104	ND<4.63	12.2	16.10	ND<108	ND<104	ND<7.31
cis-1,2-Dichloroethene	1,000,000	250	ND<5.18	ND<5.68	11	ND<5.41	ND<5.44	ND<6.01	ND<10	57	ND<5	ND<95.9	ND<7.54	15.2	ND<3.81	ND<104	33.4	30.9	ND<4.31	ND<108	ND<104	ND<7.31
Benzene	89,000	60	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
Trichloroethene	400,000	470	ND<5.18	ND<5.68	5.37	ND<5.41	ND<5.44	92.3	ND<10	13	ND<5	ND<95.9	ND<7.54	33.1	ND<3.81	ND<104	10.4	9.12	ND<4.31	ND<108	ND<104	ND<7.31
Toluene	1,000,000	700	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
Tetrachloroethene	300,000	1,300	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	8.17	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
m&p-Xylene	1,000,000	1,600	ND<5.18	9.28	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
o-Xylene	1,000,000	1,600	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
Isopropylbenzene			ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	32	ND<95.9	ND<7.54	ND<5.32	ND<3.81	2,070	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
n-Butylbenzene	1,000,000	12,000	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	32	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
n-Propylbenzene	1,000,000	3,900	ND<5.18	11.9	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	***4,530***	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
1,3,5-Trimethylbenzene	380,000	8,400	ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	ND<95.9	ND<7.54	ND<5.32	ND<3.81	ND<104	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	ND<7.31
1,2,4-Trimethylbenzene	380,000	3,600	ND<5.18	9.54	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	300	ND<7.54	ND<5.32	ND<3.81	1,010	ND<4.63	ND<4.68	ND<4.31	ND<108	305	ND<7.31
sec-Butylbenzene	1,000,000	11,000	ND<5.18	17.1	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	81	296	ND<7.54	13.4	ND<3.81	7,380	ND<4.63	ND<4.68	ND<4.31	ND<108	567	ND<7.31
4-Isopropyltoluene			ND<5.18	ND<5.68	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	ND<5	509	ND<7.54	ND<5.32	ND<3.81	2,200	ND<4.63	ND<4.68	ND<4.31	463	396	ND<7.31
Naphthalene	1,000,000	12,000	11.6	34.9	ND<4.85	ND<5.41	ND<5.44	ND<6.01	ND<10	ND<10	43	ND<95.9	9.66	17.8	ND<3.81	10,700	ND<4.63	ND<4.68	ND<4.31	ND<108	ND<104	30.9
Total VOC Concentrations	---	---	67	153	16	8	ND	213	ND<10	70	188	1,105	19	137	ND	27,890	44	130	98	463	0	31
Total VOC TICs[2]	---	---	24,550	20,930	505	2,489	443	1,798	NA	NA	NA	152,900	4,726	22,110	301	64,480	648	14,438	1,240	28,320	107,290	19,070

			AOC #3 (Area 4 - Outdoor 3K/5K)			**AOC #5 (Area 5 - Indoor 3K/5K)**					**AOC #1 (Area 6 - Outdoor 2K)**								**AOC #6 (Area 4 - Retention Pond)**	
Compound	**Recommended Soil Cleanup Objective[1] (µg/kg)**		**Compound Concentration (µg/kg)**																	
			SB-11	**SB-29**	**SB-30**	**SB-32**	**SB-33**	**TW-13**	**TW-13-2**	**TW-13-3**	**SB-3**	**SB-4**	**SB-17**	**SB-22**	**SB-26**	**SB-27**	**SB-28**	**SB-37**	**SB-23-2**	**SB-24-2**
	Industrial Restricted Use	**Protection of Groundwater**	**Depth Below Grade (feet)**																	
			6-6.5	**2-4**	**12-16**	**4-5**	**14-14.5**	**4-6**	**16-16.5**	**19.5-20**	**9-10**	**7-8**	**5-6**	**13-14**	**10-12**	**10-12**	**9-10**	**23-23.5**	**1-2**	**1-2**
Vinyl Chloride	27,000	20	ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	***2,800***	ND<117	***42.3***	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
Acetone	1,000,000	50	ND<50	ND<485	ND<40.4	ND<39.2	ND<23.3	ND<26.9	47.9	41	ND<10	ND<130	ND<585	37.2	***263***	ND<49.5	ND<30.4	ND<34.7	ND<58.7	ND<58.6
Carbon Disulfide			ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	14.3	ND<6.45	ND<9.9	7.98	ND<6.94	ND<11.7	ND<11.7
trans-1,2-Dichloroethene	1,000,000	190	ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	18.9	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
2-Butanone	1,000,000	120	ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	6.42	39.8	ND<9.9	ND<6.07	ND<6.94	17	26
cis-1,2-Dichloroethene	1,000,000	250	ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	***4,050***	ND<6.45	ND<9.9	7.48	ND<6.94	ND<11.7	ND<11.7
Benzene	89,000	60	ND<50	***101***	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
Trichloroethene	400,000	470	ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	***3,710***	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
Toluene	1,000,000	700	ND<50	114	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
Tetrachloroethene	300,000	1,300	ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	934	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
m&p-Xylene	1,000,000	1,600	ND<50	127	ND<8.08	14.2	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	17	ND<6.07	ND<6.94	ND<11.7	ND<11.7
o-Xylene	1,000,000	1,600	ND<50	120	ND<8.08	9.74	ND<4.66	ND<5.38	8.28	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
Isopropylbenzene			ND<50	ND<97	ND<8.08	8.65	ND<4.66	ND<5.38	14.3	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
n-Butylbenzene	1,000,000	12,000	63	ND<97	ND<8.08	ND<7.83	ND<4.66	ND<5.38	ND<6.47	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
n-Propylbenzene	1,000,000	3,900	69	ND<97	ND<8.08	13.4	ND<4.66	ND<5.38	20.1	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
1,3,5-Trimethylbenzene	380,000	8,400	ND<50	108	ND<8.08	70.3	ND<4.66	5.82	27.2	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
1,2,4-Trimethylbenzene	380,000	3,600	62	294	ND<8.08	216	ND<4.66	ND<5.38	136	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
sec-Butylbenzene	1,000,000	11,000	ND<50	ND<97	ND<8.08	ND<7.83	ND<4.66	7.11	52.2	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
4-Isopropyltoluene			ND<50	124	ND<8.08	122	ND<4.66	29	143	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
Naphthalene	1,000,000	12,000	110	2,490	ND<8.08	2,380	ND<4.66	14.8	193	ND<7.97	ND<10	ND<130	ND<117	ND<5.68	ND<6.45	ND<9.9	ND<6.07	ND<6.94	ND<11.7	ND<11.7
Total VOC Concentrations	---	---	304	3,478	ND	2,834	ND	57	642	41	ND	2,800	ND	8,813	303	17	15	ND	17	26
Total VOC TICs[2]	---	---	NA	36,080	1,115	22,360	441	2,416	16,020	2,558	NA	NA	60,630	538	10,449	1,629	1,003	600	10,021	16,041

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 7 - SUMMARY OF SUBSURFACE SOIL ANALYTICAL RESULTS

DETECTED SVOCs - EPA METHOD 8270

Date Sampled: May 20-26, 2010			**AOC #2 (Area[3] 1 - Outdoor 9K)**			**AOC #2 (Area 2 - Outdoor 4K)**								**AOC #4 (Area 3 -Indoor 4K)**			**AOC #3 (Area 4 - Outdoor 3K/5K)**			**AOC #5 (Area 5 - Indoor 3K/5K)**		**AOC #1 (Area 6 - Outdoor 2K)**		**AOC #6 (Area 4 - Retention Pond)**	
Compound	**Recommended Soil Cleanup Objective[1] (ug/kg)**		**Compound Concentration (µg/kg)**																						
			SB-18-1	**SB-19**	**TW-10**	***SB-8***	***SB-12***	***SB-13***	**SB-15**	**SB-16**	**SB-17**	**SB-21**	**MW-3**	**TW-11A**	**TW-12-1**	**SB-31**	***SB-11***	**SB-29**	**SB-30**	**SB-32**	**TW-13**	***SB-3***	***SB-4***	**SB-23-2**	**SB-24-2**
	Industrial Restricted Use	**Protection of Groundwater**	**Depth Below Grade (feet)**																						
			7-8	**9-11**	**8.5-10**	**11-12**	**7.5-8**	**8-9**	**7-9**	**8-10**	**5-6**	**9-11**	**8-10**	**13-15**	**7-8**	**3-5**	**6-6.5**	**2-4**	**12-16**	**4-5**	**4-6**	**9-10**	**7-8**	**1-2**	**1-2**
Naphthalene	1,000,000	12,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	7,610	ND<388	ND<2310	9,850	ND<394	680	4,130	ND<391	ND<381	ND<382	ND<165	ND<165	ND<523	ND<556
2-Methylnaphthalene			ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	69,700	ND<388	ND<2310	51,100	ND<394	330	ND<2130	ND<391	2,630	777	ND<165	ND<165	ND<523	ND<556
Phenanthrene	1,000,000	1,000,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	2,600	ND<388	ND<2310	ND<4410	ND<394	3,800	5,170	ND<391	501	ND<382	280	ND<165	1,560	ND<556
Fluoranthene	1,000,000	1,000,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	2,800	ND<2130	ND<391	ND<381	ND<382	600	240	3,540	808
Flourene	1,000,000	386,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	1,200	ND<2130	ND<391			ND<165	ND<165		
Pyrene	1,000,000	1,000,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	2,200	ND<2130	ND<391	ND<381	ND<382	500	210	2,280	676
bis(2-Ethylhexyl)phthalate			ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	897	ND<2310	ND<4410	ND<394	ND<330	ND<2130	ND<391	ND<381	ND<382	720	ND<165	ND<523	ND<556
Acenaphthene	1,000,000	98,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	760	ND<2130	ND<391			ND<165	ND<165		
Anthracene	1,000,000	1,000,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	1,200	ND<2130	ND<391			ND<165	ND<165		
Benzo(a)anthracene	11,000	1,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	***1,400***	ND<2130	ND<391	ND<381	ND<382	300	ND<165	***1,610***	ND<556
Chrysene	110,000	1,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	***1,600***	ND<2130	ND<391	ND<381	ND<382	310	ND<165	***1,240***	ND<556
Dibenzofuran			ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	460	ND<2130	ND<391			ND<165	ND<165		
Benzo(b)fluoranthene	11,000	1,700	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	950	ND<2130	ND<391	ND<381	ND<382	290	ND<165	1,030	ND<556
Benzo(k)fluoranthene	110,000	1,700	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	100	ND<2130	ND<391	ND<381	ND<382	270	ND<165	907	ND<556
Benzo(a)pyrene	1,100	22,000	ND<406	ND<398	551	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	790	ND<2130	ND<391	ND<381	ND<382	290	ND<165	***1,340***	ND<556
Indeno(1,2,3-cd)pyrene	11,000	8,200	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	ND<330	ND<2130	ND<391	ND<381	ND<382	ND<165	ND<165	528	ND<556
Benzo(g,h,i)perylene	1,000,000	1,000,000	ND<406	ND<398	ND<450	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	ND<2100	ND<388	ND<2310	ND<4410	ND<394	ND<330	ND<2130	ND<391	ND<381	ND<382	ND<165	ND<165	632	ND<556
Total SVOC Concentrations	---	---	ND<406	ND<398	551	ND<165	ND<165	ND<830	ND<812	ND<514	ND<480	79,910	897	ND<2310	60,950	ND<394	18,270	9,300	ND<391	3,131	777	3,560	450	14,667	1,484
Total SVOC TICs[2]	---	---	171,000	8,885	16,080	NA	NA	NA	57,980	4,303	39,400	254,600	3,301	159,870	886,900	20,548	NA	389,200	0	33,062	15,418	NA	NA	36,270	35,340

DETECTED RCRA METALS

Date Sampled: May 20-26, 2010			**AOC #2 (Area 1 - Outdoor 9K)**			**AOC #2 (Area 2 - Outdoor 4K)**						**AOC #4 (Area 3 -Indoor 4K)**			**AOC #3 (Area 4 - Outdoor 3K/5K)**			**AOC #5 (Area 5 - Indoor 3K/5K)**		**AOC #1 (Area 6 - Outdoor 2K)**		**AOC #6 (Area 4 - Retention Pond)**	
Compound	**Recommended Soil Cleanup Objective[1] (mg/kg)**		**Compound Concentration (mg/kg)**																				
			SB-18-1	**SB-19**	**TW-10**	***SB-13***	**SB-15**	**SB-16**	**SB-17**	**SB-21**	**MW-3**	**TW-11A**	**TW-12-1**	**SB-31**	***SB-11***	**SB-29**	**SB-30**	**SB-32**	**TW-13**	**SB-3**	**SB-4**	**SB-23-2**	**SB-24-2**
	Industrial Restricted Use	**Protection of Groundwater**	**Depth Below Grade (feet)**																				
			7-8	**9-11**	**8.5-10**	**8-9**	**7-9**	**8-10**	**5-6**	**9-11**	**8-10**	**13-15**	**7-8**	**3-5**	**6-6.5**	**2-4**	**12-16**	**4-5**	**4-6**	**9-10**	**7-8**	**1-2**	**1-2**
Arsenic	16	16	5.69	ND<3.92	6.23	**46**	***143***	ND<5.05	***21.9***	ND<79.7	ND<3.75	7.24	ND<43.4	6.24	5	ND<40	ND<3.79	6.64	4.19	7	5	***20***	***27.3***
Barium	10,000	820	57.2	22.8	43.8	NA	32.3	36.9	63.8	142	44	52.9	79.3	65.3	NA	292	89	64.9	80.9	NA	NA	59.1	94.3
Beryllium	2,700	47	0.762	0.169	0.286	1	ND<1.57	0.336	0.848	ND<1.61	0.186	0.286	ND<0.875	0.452	0.2	ND<0.807	0.507	0.394	0.439	ND<0.1	0.2	0.209	ND<0.107
Cadmium	60	7.5	ND<0.243	ND<0.237	ND<0.266	3	ND<4.17	ND<0.306	4.19	ND<4.82	ND<0.227	ND<0.274	ND<2.63	0.238	4	ND<2.42	ND<0.23	ND<0.225	ND<0.222	0.5	0.3	1.62	***13.5***
Chromium, Trivalent	6,800	NS	7.39	5.9	11.8	53	***35,300***	14.3	1180	2,290	5.53	28.6	6,190	12.9	1760	931	13.2	10.6	12.7	26	14	2030	4290
Copper	10,000	1,720	23.6	24.1	20.1	236	288	24.4	93.6	89	6.90	20	109	22.1	70	81	21.3	18.9	23.5	29	26	118	314
Lead	3,900	450	10.8	ND<4.79	7.41	37	***13,700***	6.23	***648***	***3,870***	ND<4.58	30.5	***2,850***	30.8	***870***	***30,200***	5.13	10.1	193	42	48	44.1	75.5
Manganese	10,000	2,000	497	375	457	NA	1,490	302	251	596	206	261	608	669	NA	590	465	517	491	NA	NA	391	379
Nickel	10,000	130	71.9	6.4	8.95	48	***562***	9.55	49.3	92	24.2	9.98	125	16.5	***182***	162	18.2	15	16.4	19	16	67.2	***155***
Silver	6,800	8.3	ND<1.35	ND<1.32	ND<1.48	ND<0.3	ND<26.2	ND<1.7	ND<1.53	ND<26.8	ND<1.26	ND<1.52	ND<14.6	ND<1.29	***32***	ND<13.4	ND<1.28	ND<1.25	ND<1.23	ND<0.3	ND<0.3	ND<1.72	5.52
Zinc	10,000	2,480	224	15.4	24.2	557	74.3	29.6	910	138	148	29.8	315	61.9	86	57.6	33.7	27.6	36.6	63	50	311	2020
Mercury	5.7	1	ND<2.94	ND<0.021	0.0455	ND<0.1	0.224	ND<0.0279	***2.01***	0.0459	0.0446	0.0526	0.678	0.0403	ND<0.1	ND<0.292	ND<0.284	0.0763	ND<0.0221	ND<0.1	ND<0.1	ND<1.18	0.325
Cyanide	10,000	40	ND<0.0213	ND<0.292	ND<0.292	NA	ND<0.89	0.449	ND<0.99	1.86	0.275	0.383	ND<0.884	ND<0.291	NA	0.045	ND<0.0209	ND<0.258	ND<0.269	NA	NA	1.32	ND<1.11

DETECTED PCBs - EPA METHOD 8082

Date Sampled: May 20-26, 2010			**AOC #2 (Area 1 - Outdoor 9K)**			**AOC #2 (Area 2 - Outdoor 4K)**						**AOC #4 (Area 3 -Indoor 4K)**			**AOC #3 (Area 4 - Outdoor 3K/5K)**			**AOC #5 (Area 5 - Indoor 3K/5K)**			**AOC #6 (Area 4 - Retention Pond)**	
Compound	**Recommended Soil Cleanup Objective[1] (mg/kg)**		**Compound Concentration (mg/kg)**																			
			SB-18-1	**SB-19**	**TW-10**	**SB-13**	**SB-15**	**SB-16**	**SB-17**	**SB-21**	**MW-3**	**TW-11A**	**TW-12**	**SB-31**	**SB-11**	**SB-29**	**SB-30**	**SB-25**	**SB-32**	**TW-13**	**SB-23-2**	**SB-24-2**
	Industrial Restricted Use	**Protection of Groundwater**	**Depth Below Grade (feet)**																			
			7-8	**9-11**	**8.5-10**	**8-9**	**7-9**	**8-10**	**5-6**	**9-11**	**8-10**	**8.5-10**	**8.5-11**	**3-5**	**6-6.5**	**2-4**	**12-16**	**2-3**	**2-4**	**2-5**	**1-2**	**1-2**
Aroclor 1254	---	---	ND<0.0623	0.673	ND<0.0653	ND<0.017	ND<0.0602	ND<0.0777	ND<0.0724	ND<0.0631	ND<0.0543	ND<0.0689	ND<0.0666	ND<0.0581	ND<0.017	ND<0.0643	ND<0.059	ND<0.0589	ND<0.0562	ND<0.0568	1.51	0.376
Aroclor 1260	---	---	0.0189	ND<0.0601	ND<0.0653	0.27	0.0797	ND<0.0777	0.447	ND<0.0631	ND<0.0543	ND<0.0689	ND<0.0666	ND<0.0581	0.15	ND<0.0643	ND<0.059	ND<0.0589	ND<0.0562	ND<0.0568	0.455	0.206
TOTAL	25	3.2	0.019	0.673	ND<0.0653	0.270	0.080	ND<0.0777	0.447	ND<0.0631	ND<0.0543	ND<0.0689	ND<0.0666	ND<0.0581	0.150	ND<0.0643	ND<0.059	ND<0.0589	ND<0.0562	ND<0.0568	1.965	0.582

Notes:

[1]New York Codes, Rules and Regulations, Title 6 (6NYCRR) Part 375-6, Remedial Program Soil Cleanup Objectives.
[2]Tenatively Identified Compounds.
[3]"Area" refers to data evaluation areas used in the Remedial Investigation Report (refer to Figure 3).

mg/kg milligrams per kilogram, equivalent to parts per million (ppm).
µg/kg micrograms per kilogram, equivalent to parts per billion (ppb).

NA Not analyzed
ND Not detected above the laboratory method detection limit.

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 8 - SUMMARY OF FIELD INDICATOR DATA

SOIL SAMPLE/ BORING LOCATION	DEPTH (feet)	PID READING (ppm)	DEPTH TO TOP OF FIRST/SECOND SILT OR CLAY UNIT (feet)	VISUAL CONTAMINATION INDICATORS*
AOC #2 (Area[1] 1 - Outdoor 9K)				
SB-14	0 to 4	0	12	None noted
	4 to 8	12@6' / **72@7.5-8'**		
	8 to 12	1@11' / 0.6@12'		
	12 to 16	0		
SB-18	0 to 4	0	12	Oily shine at 7-9'
	4 to 8	2@5' / **105@7-8'**		
	8 to 12	14@10'		
	12 to 16	0 @12' / **0@15-16'**		
SB-19	0 to 4	0	5.5 / 11.5	None noted
	4 to 8	0		
	8 to 12	**0 @9-11'**		
	12 to 16	0		
SB-35	0 to 4	0	9	None noted
	4 to 8	0		
	8 to 12	0		
TW-10	0 to 4	1.5@2'	6 / 9	None noted
	4 to 8	0		
	8 to 12	**1.9@9'**		
	12 to 16	0		
AOC #2 (Area 2 - Outdoor 4K)				
SB-15	0 to 4	0	2 / 9.5	Gray soil with oily shine at 7-9'
	4 to 8	**174@7-9'**		
	8 to 12	25@9' / 0@11'		
	12 to 16	0		
SB-16	0 to 4	0	1 / 10	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		
SB-20	0 to 4	0	8	Slight oily shine 7-8'
	4 to 8	1.5@7' / **15@7-8'**		
	8 to 12	0		
	12 to 16	**0 @ 15-16'**		
SB-21	0 to 4	0	3 / 11.5	Gray soil at 9-11'
	4 to 8	0		
	8 to 12	110@9-11'		
	12 to 16	0		
SB-34	0 to 4	0	1.5 / 9	None noted
	4 to 8	0		
	8 to 12	0		
MW-2	0 to 4	0	7 / 13.5	Slight oily shine in cuttings
	4 to 8	**25@6-8'**		
	8 to 12	0		
	12 to 16	24@14-15'		
	16 to 20	0		
MW-3	0 to 4	0	2.5 / 9	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		
AOC #4 (Area 3 - Indoor 4K)				
SB-31	0 to 2	2.5	6	Black soil, oily 2-6'
	2 to 4	27		
	4 to 6	33		
	6 to 8	8.7		
	8 to 10	0.1		
	10 to12	0		
TW-11A	0 to 4	0	4 / 15.5	Yellowish product film13-15'
	4 to 8	0		
	8 to 12	0.5@8-11'		
	12 to 16	**2.8@14'** / 0 @15-16'		
TW-12	0 to 4	0.8@2'	13	Black, oily soil ~6-11
	4 to 8	2.4@6' / 1**76 @7-8'**		
	8 to 12	263@10-11'		
	12 to 16	0		
AOC #3 (Area 4 - Outdoor 3K/5K)				
SB-29	0 to 4	0@0-2' / **4@2-4'**	5	Oily cinder zone at 1.5-2' Oily shine in thin sandy seams 2-5'
	4 to 8	1@5'		
	8 to 12	0		
	12 to 16	0		
SB-30	0 to 4	0	1 / 12	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 8 - SUMMARY OF FIELD INDICATOR DATA

SOIL SAMPLE/ BORING LOCATION	DEPTH (feet)	PID READING (ppm)	DEPTH TO TOP OF FIRST/SECOND SILT OR CLAY UNIT (feet)	VISUAL CONTAMINATION INDICATORS*
AOC #5 (Area 5 - Indoor 3K/5K)				
SB-32	0 to 4	1.8@3' / **25@4'**	4.5	None noted
	4 to 8	2.8@7'		
	8 to 12	0		
	12 to 16	0		
	16 to 20	0		
SB-33	0 to 4	0	4	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		
TW-13	0 to 4	30@3-4'	12.5	None noted
	4 to 8	**91@4-5'** / 1.3@7-8		
	8 to 12	2.6@8-10'		
	12 to 16	35@ 12-13' / 0.2@14-15'		
	16 to 20	**0.3@16-17'** / **0.1@19-20'**		
AOC #1 (Area 6 - Outdoor Former 2K)				
SB-17	0 to 4	6.5@1' / 0 @3'	1.5 / 15	Gray soil with odor at 1'; black soil with odor at 5'
	4 to 8	**95@6-8'**		
	8 to 12	21@11'		
	12 to 16	0		
SB-22	0 to 4	0	7 / 15	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	**80@13-14'** / 0@15-16'		
SB-26	0 to 4	0	9 / 15.5	None noted
	4 to 8	0		
	8 to 12	**1.1@10'** 0.4@12'		
	12 to 16	0		
	16 to 20	0		
	20 to 24	0		
	24 to 28	0		
	28 to 32	0		
	32 to 36	0		
	36 to 40	0		
SB-27	0 to 4	0	14	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		
SB-28	0 to 4	0	12.5	None noted
	4 to 8	0.8@7' / 0@8'		
	8 to 12	**14@10'** / 0.1@12'		
	12 to 16	0		
AOC #6 (Area 4 - Retention Pond)				
SB-23	0 to 4	**1.2@1-2'** / 0.2@4'	8	None noted
	4 to 8	0		
	8 to 12	0		
SB-24	0 to 2	0@0-1' / **0.3@1-2'**		None noted
	2 to 4	0		
Transformer				
SB-25	0 to 4	0		None noted
SB-36 Area 3 - Indoor 4K Area 6 - Outdoor Former 2K	0 to 4	0	5	None noted
	4 to 8	0		
	8 to 12	0		
SB-37 Area 3 - Indoor 4K Area 6 - Outdoor Former 2K	0 to 4	0	9 / 16.5	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		
	16 to 20	0		
	20 to 24	0		
TW-14	0 to 4	0	17	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		
	16 to 20	0		
MW-1	0 to 4	0	12	None noted
	4 to 8	0		
	8 to 12	0		
	12 to 16	0		
	16 to 20	0		
	20 to 24	0		

Notes:

[1]"Area" refers to data evaluation areas used in the Remedial Investigation Report (refer to Figure 3).

PID Photoionization detection meter reading

* Staining, sheens, free-product.

Approximate sample intervals submitted for laboratory analysis are shaded. Numbers in bold indicate sample depths selected.

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 9A - SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
DETECTED COMPOUNDS - REMEDIAL INVESTIGATION WELLS

Date Sampled: June 15, 2010

		AOC #1 (Area[2] 6 - Outdoor 2K)	AOC #2 (Area 2 - Outdoor 4K)			AOC #2 (Area 1 - Indoor 9K)	AOC #4 (Area 3 - Indoor 4K)			AOC #5 (Area 5 - Indoor 3K/5K)		AOC #3 (Area 4 - Outdoor 3K/5K)
Compound	**State Groundwater Standards[1]**	**Compound Concentration**										
		MW-1	**MW-2**	**MW-3**	**MW-3 Dissolved**	**TW-10**	**TW-11A**	**TW-11A Dissolved**	**TW-12**	**TW-13**	**TW-13 Dissolved**	**TW-14**
Volatile Organic Compounds (EPA Method 8260) in µg/L												
1,2-Dichloroethene	5			***6***	NA			NA		3	NA	
Trichloroethene	5			2	NA	2		NA			NA	
Vinyl Chloride	2			2	NA	1		NA		***10***	NA	
Total VOCs		ND<1	ND<1	10	NA	3	ND<1	NA	ND<1	13	NA	ND<1
Semi Volatile Compounds (EPA Method 8270 B/N) in µg/L												
Total SVOCs	500	NA	ND<9.26	ND<9.26	NA	ND<9.26	ND<9.26	NA	ND<9.26	ND<9.26	NA	NA
Polychlorinated Biphenyls (EPA Method 8020) in µg/L												
Total PCBs	0.09	NA	ND<0.05	ND<0.05	NA	ND<0.05	ND<0.05	NA	ND<0.05	ND<0.05	NA	NA
Metals (EPA Method 7000 Series) in mg/L												
Arsenic	0.025	NA								***0.0477***		NA
Barium	2.000	NA	0.571	0.073	0.077	0.130	0.566	0.448	0.124	0.687	0.327	NA
Beryllium	0.003	NA								***0.00331***		NA
Chromium	0.05	NA								***0.0911***		NA
Copper	0.2	NA								0.187		NA
Lead	0.025	NA								***0.0428***		NA
Manganese	0.600	NA	0.134	***1.070***	***1.080***	0.339	***1.600***	***1.570***	0.159	***4.04***	0.125	NA
Nickel	0.1	NA								0.0915		NA
Zinc	2	NA		0.01	0.01		0.010	0.009		0.197		NA

Notes:

[1]DEC Division of Water's Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, dated June 1998, with Addenda dated April 2000 and June 2004.

[2]"Area" refers to data evaluation areas used in the Remedial Investigation Report (refer to Figure 3).

µg/L micrograms per liter, equivalent to parts per billion (ppb)

mg/L milligrams per liter, equivalent to parts per million (ppm)

NA Not analyzed

Blank cell indicates the compound was not detected.

Compounds that exceeded State Groundwater Standards are denoted in ***BOLD***.

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Site No. C633077

TABLE 9B - SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
DETECTED COMPOUNDS - PREVIOUS WELLS

		AOC #5 (Area[2] 5 - Outdoor 3K/5K)		**AOC #1 (Area 6 - Outdoor 2K)**				**AOC #2 (Area 1 - Outdoor 9K)**			
Compound	**State Groundwater Standards[1]**	**Compound Concentration**									
		TW-1		**TW-2**		**TW-3**		**TW-7**		**TW-9**	
Volatile Organic Compounds (EPA Method 8260) in µg/L		**Apr-06**	**May-10**	**Apr-06**	**May-10**	**Apr-06**	**May-10**	**Apr-06**	**May-10**	**Apr-06**	**May-10**
1,1-Dichloroethane	5				1						
cis-1,2-Dichloroethene	5	***6***	***8***	***640***	***784***	***100***	***76***	***430***	***87***	***21***	
Tetrachloroethene	5				***3***		***2***		***3***		
Toluene	5	***42***				***71***	***71***			***25***	
Trans-1,2-Dichloroethene	5				***13***						
Trichloroethene	5			***590***	***129***	***140***	***22***	***460***	***124***	***10***	
Vinyl Chloride	2	***6***	***71***	***10***	***23***	***15***	***3***	***95***	***43***	***48***	1
Total VOCs	10	***54***	***79***	***1,240***	***953***	***326***	***174***	***985***	***257***	***104***	1

Notes:

[1]DEC Division of Water's Technical and Operational Guidance Series (TOGS) 1.1.1, *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations* , dated June 1998, with Addenda dated April 2000 and June 2004.
[2]"Area" refers to data evaluation areas used in the Remedial Investigation Report (refer to Figure 3).
µg/L micrograms per liter, equivalent to parts per billion (ppb)
Blank cell indicates the compound was not detected.
Compounds that exceeded State Groundwater Standards are denoted in ***BOLD*** .

FORMER ONEIDA KNIFE PLANT
City of Sherrill, Oneida County, New York
DEC Spill No. C633077

TABLE 10A - SUMMARY OF SUB-SLAB SOIL VAPOR ANALYTICAL RESULTS
DETECTED COMPOUNDS

Date Sampled: June 15, 2010

Compound	Soil Vapor Concentration (μg/m^3)					Indoor Air Concentration (μg/m^3)				
	SV-5	SV-6	SV-7	Maximum Soil Vapor Concentration	Draft NYSDOH Sub-Slab Vapor Guideline[4]	Estimated Indoor Air Concentration		Background Indoor Air Concentration[3]	Draft NYSDOH Indoor Air Guideline[4]	OSHA Permissible Exposure Limit[5]
						EPA Screening[1]	Site Specific[2]			
1,2,4-Trimethylbenzene (1,2,4-TMB)	7.5	8.9	9.7	10	---	1.0	0.00001	1.7 - 5.1	---	---
1,3,5-Trimethylbenzene (1,3,5-TMB)	2.2	1.8	2.4	2	---	0.2	0.000002	<1.5	---	---
1,4-Dichlorobenzene	4.5	6.3	8.0	8	---	0.8	0.000008	<0.8 - 1.4	---	450,000
2,2,4-trimethylpentane	2.6	2.5	2.7	3	---	0.3	0.000003	---	---	---
4-Ethyltoluene	3.1	1.7	1.9	3	---	0.3	0.000003	---	---	---
Acetone (2-propanone)	18.0	16.0	27.0	27	---	2.7	0.000027	32 - 60	---	2,400,000
Benzene	0.9	0.9	0.9	1	---	0.1	0.000001	2.1 - 5.1	---	31,948
Ethylbenzene	6.6	3.8	3.9	7	---	0.7	0.000007	<1.6 - 3.4	---	435,000
Carbon Disulfide	0.4	0.7	0.4	1	---	0.1	0.000001	<0.8 - 2.1	---	311,000
Chloroform	5.5	4.7	0.8	6	---	0.6	0.000006	<0.4 - <1.2	---	240,000
cis-1,2-Dichloroethene	4.8	0.8	ND	5	---	0.5	0.000005	<0.8 - <1.2	---	---
Freon 11 (Trichlorofluoromethane)	7.3	4.6	30.0	30	---	3.0	0.000030	<3.7 - <6.7	---	5,600,000
Freon 12 (Dichlorodifloromethane)	2.5	2.5	2.4	3	---	0.3	0.000003	4.8 - 10.5	---	4,950,000
m/p-Xylenes	20.0	9.2	9.2	20	---	2.0	0.000020	4.1 - 12	---	435,000
MEK	3.0	3.1	4.0	4	---	0.4	0.000004	3.3 - 7.5	---	590,000
n-Heptane	ND	ND	1.0	1	---	0.1	0.000001	---	---	2,000,000
o-Xylene	6.8	4.3	4.1	7	---	0.7	0.000007	<2.4 - 4.4	---	435,000
Tetrachloroethene (PCE)	28.0	59.0	21.0	59	*Monitor if >100	5.9	0.000059	<1.9 - 5.9	100	678,241
Tetrahydrofuran	2.3	2.2	ND	2	---	0.2	0.000002	---	---	590,000
Toluene	17.0	7.3	7.3	17	---	1.7	0.000017	10.7 - 26	---	754,000
Trichloroethene	37	40	15	40	*Monitor if > 50	4	0.000040	<1.2 - 1.2	5	537,000

Notes:

[1]Values assume attenuation factor of 10^{-1} from shallow soil vapor to indoor air per EPA Draft Guidance for Evaluating Vapor Intrusion, Nov. 2002.
[2]Values assume attenuation factor of 10^{-6} from shallow soil vapor to indoor air, representative of structures with slabs in good condition, without preferential vapor pathways and without negative indoor air pressure.
[3]Values obtained from unpublished Background Indoor Air (office), Building Assessment and Survey Evaluation (BASE '94-'98) by Indoor Environments Division, EPA
[4]Values obtained from NYSDOH Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Feb 2005), Soil Vapor/Indoor, Air Matrix 1 and 2-Indoor Air Concentration of Compound values derived by NYSDOH.
[5]Occupational Safety and Health Standards, 29CFR1910, Tables Z-1 and Z-2, Time-weighted average - 8-hours.
μg/m^3 micrograms per cubic meter
* Monitoring involves testing indoor air quality together with sub-slab vapors and ambient (outside) air.
--- No guideline or standard.

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York

TABLE 10B - SUMMARY OF SUB-SLAB SOIL VAPOR ANALYTICAL RESULTS
DETECTED COMPOUNDS

Date Sampled: April 13, 2006 **Matrix:** Sub-Slab Soil Vapor

Compound	Soil Vapor Concentration (µg/m³)				Indoor Air Concentration (µg/m³)				
	SV-3	SV-4	Maximum Soil Vapor Concentration	Draft NYSDOH Sub-Slab Vapor Guideline[4]	Estimated Indoor Air Concentration		Background Indoor Air Concentration[3]	Draft NYSDOH Indoor Air Guideline[4]	OSHA Permissible Exposure Limit[5]
					EPA Screening[1]	Site Specific[2]			
1,2,4-Trimethylbenzene (1,2,4-TMB)			11	---	1.1	0.00001	1.7 - 5.1	---	---
1,3,5-Trimethylbenzene (1,3,5-TMB)			3	---	0.3	0.000003	<1.5	---	---
4-Ethyltoluene			20	---	2.0	0.000020	---	---	---
Acetone (2-propanone)	750	580	750	---	75	0.001	32 - 60	---	2,400,000
Benzene			7	---	0.7	0.000007	2.1 - 5.1	---	31,948
Ethylbenzene			10	---	1.0	0.000010	<1.6 - 3.4	---	435,000
Freon 11 (Trichlorofluoromethane)			3	---	0.3	0.00000	---	---	---
Isopropyl alcohol	450		450	---	45	0.0005	---	---	980,000
m/p-Xylenes			15	---	2	0.00002	4.1 - 12	---	435,000
n-Heptane			3	---	0.3	0.000003	---	---	2,000,000
n-Hexane			2	---	0.2	0.00000	1.6 - 6.4	---	1,800,000
o-Xylene			10	---	1	0.00001	<2.4 - 4.4	---	435,000
Tetrachloroethene (PCE)	131		131	*Monitor if >100	13	0.00013	<1.9 - 5.9	3	678,241
Tetrahydrofuran			6	---	1	0.00001	---	---	---
Toluene	25	58	58	---	6	0.0001	10.7 - 26	---	2,400,000

Notes:

[1]Values assume attenuation factor of 10^{-1} from shallow soil vapor to indoor air per EPA Draft Guidance for Evaluating Vapor Intrusion, Nov. 2002.
[2]Values assume attenuation factor of 10^{-6} from shallow soil vapor to indoor air, representative of structures with slabs in good condition, without preferential vapor pathways and without negative indoor air pressure.
[3]Values obtained from unpublished Background Indoor Air (office), Building Assessment and Survey Evaluation (BASE '94-'98) by Indoor Environments Division, EPA
[4]Values obtained from NYSDOH Draft Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Feb 2005), Soil Vapor/Indoor, Air Matrix 2 - Indoor Air Concentration of Compound values derived by NYSDOH.
[5]Occupational Safety and Health Standards, 29CFR1910, Tables Z-1 and Z-2, Time-weighted average - 8-hours.

µg/m³ micrograms per cubic meter
* Monitoring involves testing indoor air quality together with sub-slab vapors and ambient (outside) air.
--- No guideline or standard.

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TABLE 11 - HUMAN HEALTH SITE CONCEPTUAL EXPOSURE SCENARIOS

Potentially Exposed Population	Exposure Route, Medium and Exposure Point	Pathway Complete?		Reason for Selection or Non-Selection	Exposure Risk
		Current	Future		
On-Site Industrial Worker	Inhalation of volatiles from subsurface soils and/or shallow groundwater	No	Maybe	Site is vacant. Complete an SVI evaluation if existing building is reused; existing building has concrete floors.	Minimal-Low
	Dermal contact / ingestion of groundwater	No	No	Site is vacant. Municipal water supply. Contacts with groundwater unlikely.	NA
	Dermal contact with surficial soils	No	Unlikely	Site is vacant. Possible exposure to low level PCBs and SVOCs.	Minimal
	Dermal contact with subsurface soils	No	No	Site is vacant. Contacts with impacted subsurface soil unlikely beneath building and parking lots. Future site development can be governed by soil management plan (SMP).	NA
On-Site Maintenance Worker	Inhalation of volatiles from subsurface soils and/or shallow groundwater	No	No	Limited current activities at site. Existing building has concrete floors. Exposures unlikely during outdoor activities.	NA
	Dermal contact / ingestion of shallow groundwater	No	No	Limited current activities at site. Municipal water supply. Contacts with groundwater unlikely.	NA
	Dermal contact with surficial soils	No	Unlikely	Possible exposure to low level PCBs and SVOCs.	Minimal
	Dermal contact with subsurface soils	No	No	Contacts with impacted subsurface soil unlikely beneath building and parking lots. Future site development can be governed by soil management plan.	NA
On-Site Construction Worker	Inhalation of volatiles from subsurface soils and/or shallow groundwater	Maybe	Maybe	Potential short term exposures during intrusive construction activities.	Low
	Dermal contact / ingestion of shallow groundwater	Maybe	Maybe	Municipal water supply. Potential short term exposures during intrusive construction activities. Future site development can be governed by soil management plan	Low
	Dermal contact with surficial soils	No	Unlikely	Possible exposure to low level PCBs and SVOCs.	Minimal
	Dermal contact with subsurface soils	Maybe	Maybe	Potential exposures during intrusive construction activities. Future site development can be governed by soil management plan.	Low

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TABLE 12 - AOC CONDITIONS AND PROPOSED REMEDIAL ACTION OBJECTIVES

AOC # General Location[1]	Geology and Main Conditions	Contaminated Subsurface Soil	Groundwater Contamination	Surface Soils or Sediments	Surface Water	Soil Vapor	Potential Exposure Pathways (from RIR)	Remedial Action Objectives
1 Former Building 2K	-CHCs[2] are prevalent -Former building 2K degreasing source; current grass area -Water table at 7-8 feet -Impact in soils at and little below water table -Confining bed soils at 7-8 feet with overlying sands; impact in base of sand, but also within confining bed soils	-Few (3) CHCs exceed SCGs[3] by less than 1 and 2 orders of magnitude -Visual staining a few inches thick limited to one boring (B-102) -Low to medium PID readings[4] Key Take-Offs: -Estimated area of soil impact >SCGs 5,000 sf ; volume of 185 cy -No grossly impacted source soils indentified -Estimated area of assumed staining in source area 1,000 sf; volume 75 cy	-CHCs present exceeding groundwater standards; total VOC plume concentration ~100 to 1,000 µg/L -Plume extension downgradient from former Building 2K area Key Take-Offs: -Area of plume 20,000 sf -Volume of impacted groundwater 170,000 gal	-No associated surface soil impact -Impacted groundwater likely discharging to creek, potentially impacting sediments; low source strength in groundwater plume; analyses of sediments for VOCs indicate localized, low-level detections slightly exceeding human health sediment criteria	-Impacted groundwater may be discharging to creek; low source strength in groundwater plume -Surface water sampling non-detect for VOCs; pathway ruled out as significant	-No PID readings detected in uppermost 6- 12 feet of soil at borings where indicators were noted -Low to moderate concentrations of CHCs in groundwater plume	Human Health: -Exposures related to direct contacts with subsurface impacted soil and groundwater by construction workers digging relatively deep -Minimal or low risk of soil vapor intrusion into future buildings and exposures to industrial workers Fish and Wildlife: -Minimal risk of biota exposures to impacted sediment	-Prevent human exposures via direct contacts with subsurface soil and groundwater contaminants -Prevent inhalation of contaminants volatizing from impacted soil and groundwater into future buildings -Remove any remaining source of groundwater contamination to the extent practical -Restore groundwater to pre-release conditions to extent practical
2 Outdoor Area North of Building 9K and 4K	-Outdoor area of impact across grass, driveway and storage lot areas -Oily staining in subsurface soils encountered at depths of 7- 12 feet -Water table at 6-8 feet -Confining bed soils at 6-12 feet with overlying sands; additional, shallower confining bed soil unit enters section from the south; oily staining present primarily in deeper portion of sand unit, locally present in confining bed soil	-Oily staining in zones 2' thick or less; no free product -Few VOC and metal compounds exceed SCGs, most by small degrees; no SVOC or PCB exceedances -Low to moderate PID readings Key takeoffs: -Area of oily staining 12,000 sf; volume of ~900 cy	-Absorbed oil and staining in soils at and below the water table -Groundwater from wells installed in AOC either meets or slightly exceeded groundwater standard for one CHC; source of CHC concluded as being from AOC #1	-No associated surface soil or sediment impact	-No associated surface water impact	-No PID readings detected in uppermost 5- 12 feet of soil at borings where indicators were noted; PID readings low to moderate -Very low to non-detected concentrations of VOCs in groundwater	Human Health: -Exposures related to direct contacts with subsurface impacted soil by construction workers digging relatively deep -Minimal risk of soil vapor intrusion into future buildings and exposures to industrial workers Fish and Wildlife: -None	-Prevent human exposures via direct contacts with subsurface soil impact -Restore groundwater to pre-release conditions to extent practical
3 Outdoor Area Adjacent to Building 3K/5K	-Outdoor area of impact in grass area adjacent to building. -Oily staining in shallow subsurface soils encountered at depths of 1.0-8 feet; likely from surface spills -Water table at 15 feet -Granular fill over fine-grained silt and clay soil; impact within both units above water table	-Oily staining 1-5 feet thick -Few VOC, SVOC and metal compounds exceed SCGs, most by small degrees; no PCB exceedances -Low PID readings Key Take-Offs: -Area of oily staining 3000 sf with volume of 450 cy	-Soil impact is above water table; downgradient well slightly impacted (54-79 ug/l total VOCs).	-No oil impact in surface soils present, though shallow subsurface impact in places; no associated sediment impacts	-No associated surface water impact	-Low PID readings in impacted soil -Water table relatively deep (~15 feet)	Human Health: -Exposures related to direct contacts with subsurface impacted soil by construction workers digging at shallow depths -Minimal or low risk of soil vapor intrusion into future buildings and exposures to industrial workers Fish and Wildlife: -None	-Prevent human exposures via direct contacts with subsurface soil contamination -Prevent inhalation of contaminants volatizing from impacted soil and groundwater into future buildings

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TABLE 12 - AOC CONDITIONS AND PROPOSED REMEDIAL ACTION OBJECTIVES

AOC # General Location[1]	Geology and Main Conditions	Contaminated Subsurface Soil	Groundwater Contamination	Surface Soils or Sediments	Surface Water	Soil Vapor	Potential Exposure Pathways (from RIR)	Remedial Action Objectives
4 Indoor Subsurface Impact under Basement of Building 4K	- Impact beneath concrete floor, possibly localized in former sluiceway -Oily staining in subsurface soils encountered at depths of 2 to 6 feet -Water table at 5 feet -Sand and gravel with fines over clay soil; impact within sand and gravel unit	-Staining 2 to 6 feet thick -No exceedances of VOCs SVOCs or PCBS; one metal compound exceedance -Medium to moderate PID readings <u>Key Take-Offs</u>: 8,000 sf area of oily staining with volume of ~1,200 cy	-Groundwater from well installed in downgradient end of AOC meets groundwater standards	-No associated surface soil or sediment impact	-No associated surface water impact	-Low to moderate PID levels in soil -Water table relatively shallow -Soil vapor subslab sample results detected CHCs at low concentrations warranting further investigation/ monitoring	<u>Human Health</u>: -Exposures related to direct contacts with subsurface stained soil by construction workers digging below floor level -Minimal to low risk of soil vapor intrusion into existing or future buildings and exposures to industrial workers <u>Fish and Wildlife</u>: -None	-Prevent human exposures via direct contacts with subsurface soil contamination -Prevent inhalation of contaminants volatizing from impacted soil into occupied buildings -Restore groundwater to pre-release conditions to extent practical
5 Indoor Area under Building 3K/5K	-Indoor area of minor impact; likely vapor phase from outdoor AOC #3 impact -Building slab built out over clay-silt confining bed soils -Water table at ~15 feet	-No staining observed -Low to moderate PID readings -No exceedances of VOCs, SVOCs or PCBs; one metal compound exceedance	-Groundwater from well installed in AOC slightly exceeded groundwater standards for vinyl chloride (10 ug/L)	-No associated surface soil or sediment impact	-No associated surface water impact	-Low to moderate PID readings in soil -Water table relatively deep (~15 feet) -Soil vapor subslab sample results detected CHCs at concentrations warranting further investigation/monitoring	<u>Human Health</u>: -Minimal to low risk of soil vapor intrusion into existing or future building and exposures to industrial workers <u>Fish and Wildlife</u>: -None	-Prevent inhalation of contaminants migrating from subsurface soil into occupied buildings
6 Retention Pond/ Site Runoff to Creek	-Retention pond with discharge to creek main receiver of plant storm water runoff -Gravely silt-sand soil over clay soil -Shallow (±1 foot) depth to water table -Plant yard and lawn areas border creek	-No staining observed -No to trace PID readings -No exceedances of VOCs or PCBs; one metal compound and 3 SVOC compounds slightly exceeded SCGs	-No associated groundwater impacts	-No significant associated surface soil or sediment impact in retention pond; some COCs in site surface soils largely meeting site SCGs for industrial use	-No associated surface water impact	-No associated soil vapor impact	<u>Human Health</u>: -None <u>Fish and Wildlife</u>: -Past plant run-off to creek may have been a source of contaminant transport to creek sediment	-Maintain site best management practices for stormwater runoff and soil and erosion controls to minimize potential transport of eroded soils to creek

<u>Notes</u>:

[1]Refer to Figure 7.
[2]CHCs: Chlorinated Hydrocarbons
[3]SCGs: Regulatory Standards, Criteria and Guidance Values
[4]PID Scale (ppm): trace <5; low >5 - <25; medium >25-<100; Moderate >100 - <300

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TABLE 13 - SCREENING OF GENERAL RESPONSE ACTIONS AND TECHNOLOGIES

MEDIA-AOC (refer to Figure 7; Table 12)	RAO	Presumptive or Innovative Technologies	Comments Regarding Applicability	Green Remediation	Evaluate Further?	Protective of Human Health and the Environment?	Ability to Meet SCGs	Initial Implementability and Cost-Effectiveness	Viable Option?
Subsurface Soil AOC #1 AOC #2 AOC #3 AOC #4	Prevent human exposures via direct contacts with impacted subsurface soil Remove the source of groundwater contamination to the extent practical (AOC #1) Restore groundwater to pre-release conditions to the extent practical (AOCs #1,#2,#4)	*Presumptive:* Remedial excavation method of removal	-Provides quick definitive results with no on-going O&M -Nuances in subsurface geology and contaminant distribution not a key factor -Site currently not in use (favorable for on-site excavation activities) -Soil will likely be acceptable as solid waste in local landfill -Will likely require some excavation shoring and dewatering	-Considerable use of diesel-burning equipment (short-term) -Short-term construction disruptions -Provides a permanent remedy and readily implementable	YES	YES	Good	Feasible; construction shoring and dewatering elements would add to cost	YES
		Landfill disposal of excavated soils	-Soil can be handled as solid waste and disposed of in local landfills providing landfill disposal criteria are met -Simple disposal solution	-Considerable truck traffic (short-term) -Uses landfill capacity	YES	YES	Good	Feasible; possible soil classification as hazardous-Waste would increase cost	YES
		On-site soil treatment of excavated soils using: -Soil mixing and enhanced chemical oxidation and /or bioremediation	-Potentially applicable for degraded petroleum and lubricating oil -Site currently not in use (favorable for on-site construction activates) -Treated soil could be used as on-site backfill -Requires ongoing site activities and use of facility space -Less amendable to CHCs and not applicable to metals and PCBs (site COCs), if present -Would require pilot test to confirm applicability -Uncertain timeframe to completion ; may interfere with site redevelopment plans	-Reduces toxicity -Avoids landfill, reuses soil -Relatively low energy requirement	NO			Ruled out on basis of uncertain timeframe to completion and need to verify treatment feasibility;	NO
		-On-site thermal desorption	-Feasible treatment option for oily material and CHCs -Treated soil could be used as on-site backfill -Not well suited for treating metals, if present -Not cost effective for small volume projects -Wet and clayey-silt soils more costly to treat	-High energy use -Avoids landfilling soil -Reuses soil	YES	YES	Expected to be good	Would not be a cost advantage if soil can be disposed of in local landfill for use as cover soil	NO
		Presumptive: In-situ treatment method using remediation wells with soil vapor extraction/bioventing and enhanced bioremediation via oxygen enrichment	-Site currently not in use (favorable for on-site construction D49) -Nuances in subsurface geology and contaminant distribution will be difficult to target all impact -Not a highly volatile contaminant type; oil material sorbed to soil may be difficult to degrade -Some of impact is below the water table not amendable to SVE -Pilot testing recommended to confirm treatment feasibility -Uncertain timeframe to completion	-Relatively low energy requirement -Avoids landfilling soil -Less disruptions -Toxicity reduction -Effectiveness uncertain	NO				
		Innovative: In-situ methods, using injection wells, points or trenches with chemical oxidation and enhanced bioremediation	-Some commercial products are available for chemical oxidation and bioremediation of CHCs -Suitable for impact below the water table -Site currently not in use (favorable for on-site activities) -Uncertain timeframe to completion -Oily material sorbed to soil may be difficult to treat -Most impact is in permeable sand unit (potentially amendable to in-situ treatment) -Nuances in subsurface geology and contaminant distribution will be difficult to target all impact -Pilot testing recommended to confirm treatment feasibility		NO				
		Engineering and Institutional Controls: No Action: Leave impact in place	-Institutional Controls and Site Management Plan can mitigate potential human health exposures -No mobile, free product in oil impacted AOCs and soil has few, low-level exceedances; impact not a source of dissolved phase contamination -Impact in AOC 3 and 5 above the water table -No significant source area indicated /found in AOC #1 Building 2K area		YES	YES	Reasonable	Good	YES
Groundwater AOC #1 Dissolved Phase Plume	Prevent human exposures via direct contacts with impacted groundwater Prevent inhalation of contaminants volatizing from impacted groundwater into future buildings Restore groundwater contamination to the extent practical	*Presumptive:* Extraction and treatment, using remediation wells and onsite groundwater treatment and discharge	-Dissolved phase plume contained in the more permeable sand unit -Thin aquifer condition would require many, closely spaced wells or horizontal wells/trenches -Site currently not in use (favorable for on-site activates) -Relatively complicated, O&M intensive approach -Uncertain timeframe to completion	-Ongoing energy requirement -May involve some waste generation	YES	YES	Reasonable reductions expected	Implementation good, but less cost effective	NO
		Air sparging	-Thin aquifer condition not conducive to air sparging -Portions of impacted soils beneath a confining bed		NO				
		Innovative: In-situ methods, using remediation wells, injection points or trenches with chemical oxidation (via periodic injections using portable equipment) coupled with enhanced bioremediation	-Some commercial injection products available for CHCs -Site currently not in use (favorable for on-site construction activates) -Dissolved phase plume contained primarily in the more permeable sand unit -Less complicated than Extraction and treatment -Thin aquifer condition would require multiple wells or horizontal wells/trenches -Uncertain timeframe to completion; significant reductions may be difficult to achieve given complex geology and low concentrations present	-Less energy consumption -Reduces toxicity	YES	YES	Reasonable reductions expected	Good	YES
		Engineering and Institutional Controls: No action: Leave in place for natural attenuation	-Institutional controls and Site Management Plan can mitigate potential human health exposures -No grossly impacted source areas indicated -Would not eliminate or reduce groundwater plume and possible releases to the creek in the short term		YES	YES - low risk of any significant impact to the creek	Relies on long term natural attenuation	Good	YES
Soil Vapor AOC #1 AOC #2 AOC #3 AOC #4 AOC #5	-Prevent inhalation of contaminants migrating from subsurface soil into occupied buildings	*Presumptive:* Install a sub-slab depressurization system if building is reoccupied Remediate sources of vapors	-Feasible but more involved retrofitting an existing building compared with new construction -Refer to remedial technologies, above		YES	YES	Good	Good	YES
		Engineering and Institutional Controls: -Conduct complete soil vapor intrusion evaluation if building becomes reoccupied or for new buildings -SMP would specify Installing subslab depressurization or soil vapor barrier if new construction takes place at location	-Soil vapor intrusion analysis may indicate vapor intrusion is not a completed pathway -Site management plan can detail a soil vapor intrusion management plan covering future building reoccupation or new construction on the AOC locations		YES	YES	Good	Good	YES

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TABLE 14 - REMEDIAL ALTERNATIVES ANALYSIS

ALTERNATIVE	Applicable AOCs	COSTS			Remedial Timeframe	Total Cost	Cost Estimate Table No.
		Engineering	Construction	Post-Construction Monitoring			
Alternative 1: No Action							
A. Drafting and implementation of Institutional Controls and Site Management Plan	Site Wide	$75,000	**$0**	**$0**		$75,000	
Total Cost Alternative 1						**$75,000**	
Alternative 2: Unrestricted Use							
A. Excavate all outdoor AOC areas with soil impact for off site landfill disposal	AOCs #1, 2, 3	$74,297	$854,410	$0	1 construction season	$928,706	1
B. Remediate groundwater site-wide with in situ chemical oxidation	AOC #1	$53,353	$497,397	$39,960	2 years	$589,700	2A,2B
and bio-remediation, to include 2 years of groundwater monitoring							
C. Building demolition and remedial excavation of impacted soils inside building for landfill disposal	AOC#4	$58,572	$841,973	$0	1 construction season	$900,545	4
D. Excavation of surface soils and shallow subsurface soils not meeting unrestricted use criteria	Site-Wide	$7,461	$286,011	$0	1 construction season	$293,472	3
E. Eliminate source of soil vapors into future building in 3/5k area by completing remedial excavation	AOC#5	(Included Item A)	$29,280	$0	1 construction season	$29,280	7
of vapor impacted soils in area of building 14k							
F. Permanent erosion and control measures (all areas stabilized)	AOC #6	$1,913	$43,988	$0	1 construction season	$45,900	8A
G. Drafting and implementation of Institutional Controls and Site Management Plan	Site wide	$55,000	$0	$0	1 construction season	$55,000	
Subtotals		$250,595	$2,553,058	$39,960			
Total Cost Alternative 2						**$2,842,603**	
Alternative 3: Proposed action							
A. Remediate subsurface soils in AOCs #1, #2 and #3 by excavation and landfill disposal		$74,297	$854,410	$0		$928,706	1
B. Investigate and mitigate potential soil vapor intrusion in future occupied buildings at the site;	AOC#5	Deferred to future users of the site governed by SMP				$0	
complete a soil vapor intrusion investigation and/or provide vapor abatement controls							
C. Drafting and implementation of institutional controls and Site Management Plan	Site Wide	$65,000	$0	$0		$65,000	
D. Site restoration; permanent erosion and control measures all areas stabilized; provide	Site Wide	$3,623	$72,450	$0		$76,073	8B
min. 12" thick soil cover over all AOC areas; excavate 12" soil from retention pond for disposal							
E. Groundwater monitoring plan for dissolved phase groundwater in AOC #1	AOC #1	$0	$0	$35,432	4 years	$35,432	9
Total Cost Alternative 3:						**$1,105,210**	
Total Cost if sheet piling and groundwater controls are not needed:						**$651,710**	

TABLE 14 - ALTERNATIVES ANALYSIS

ALTERNATIVE	Total Cost	6NYCRR 375-1.8(F) EVALUATION CRITERIA									"Green" Remediation
		Overall Protectiveness of Public Health and Environment	Conformance With Project SCGs	Long-Term Effectiveness and Permanence	Reduction of Toxicity	Short-Term Impact and Effectiveness	Implementability	Cost-Effectiveness	Land Use	Community Acceptance	
Alternative 1: No Action	$75,000	Reasonably eliminates potential human health exposure pathways via institutional controls and a SMP; does not address dissolved-phase groundwater impact (AOC #1)	Relies on long term natural attenuation for reduction of groundwater COCs; does not remediate impacted soils, however SCG exceedances are few	Permanent reliance on SMP	Does not reduce degree of impact; no highly toxic source areas present	SMP can be in force in short timeframe	Easily implementable	Effective, lowest cost	Restricted to industrial uses; any future construction will need to comply with SMP addressing AOCs	Likely to be acceptable	Not evaluated
Alternative 2: Unrestricted Use	$2,843,000	Directly eliminates potential human health exposure pathways; reduces the potential release of groundwater COCs to the creek	Compliance expected to be achievable in soil-excavated areas; significant remedial reductions in AOC #1 groundwater COCs expected	Provides permanent remedies for AOCs with no reliance on SMP	Reduces degree of impact at the site; does not reduce toxicity of excavated soil disposed of in landfill, however no highly toxic sources areas present; groundwater contaminant toxicity reduction expected	Remedial excavations provide good short term effectiveness; groundwater remediation will not be accomplished in a short time frame; remedial excavations could result in some uncontrolled subsurface releases and short term construction nuisances	All methods readily understood and straight forward to implement; anticipated need for sheet piling and dewatering complicates the cleanup	Much higher cost to render site suitable for unrestricted use versus proposed restricted industrial	Renders site usable for unrestricted uses; however site is zoned industrial and will remain so in the distant future	Obtrusive site activities and increased traffic over many days could raise some community concerns; Endpoint of remedial activities is to meet SCGs, acceptance of the objectives and general approach expected	Highest energy use and GHG omissions; Considerable construction disruption and traffic; Considerable soil waste for landfill; Effective, low impact groundwater cleanup; Permanently effective, considerable reduction in Site contaminants
Alternative 3: Proposed Action	$1,105,000	Eliminates potential human health exposure pathways via SMP and shallow subsurface soil by removal or capping; further reduces risk of potential low-level releases to creek	Some deeper subsurface soils left in place but with few exceedances of SCGs; source area reductions in AOCs #1 and #2 and long-term natural attenuation expected to reduce groundwater concentrations	Permanent reliance on SMP	No toxic source areas present; groundwater contaminant toxicity unchanged in short term	No adverse impacts expected; goals can be accomplished in short term; reductions in groundwater contaminants will not be accomplished in a short time frame	All methods readily understood and straight forward to implement	Cost-Effective	Renders site usable for commercial and industrial uses; reliance on SMP	Less obtrusive and less traffic; acceptance expected	Lower energy use and GHG omissions; Less construction disruptions and traffic; Less soil waste for landfill; Permanently effective with SMP

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TABLE 15 - ALTERNATIVES ANALYSIS FOR SITE-WIDE GROUNDWATER REMEDIATION

ALTERNATIVE	Applicable AOCs	COSTS			Remedial Timeframe	Total Cost	Cost Estimate Table No.
		Engineering	Construction	Post-Construction Monitoring			
Alternative 1: No Action							
A. Drafting and implementation of Institutional Controls and Site Management Plan	Site Wide	$75,000	**$0**	**$0**		$75,000	
Total Cost Alternative 1						**$75,000**	
Alternative 2: Active Remediation							
A. Complete test trenches in AOC #1;remove source soil impact for off site landfill disposal, if any	AOCs #1	$5,375	$61,813	$0	1 month	$67,188	5
B. Remediate groundwater plume associated with building 2K area (AOC #1) with in situ	AOC #1	$40,715	$298,762	$26,960	2 years	$366,437	2A
chemical oxidation and bio-remediation, to include2 years of groundwater monitoring							
C. Remediate lower-level plume areas in eastern portion of the site with in situ chemical	AOCs #2, #3, #5	$12,638	$197,625	$13,000	2 years	$223,263	2B
oxidation and bio-remediation, to include2 years of groundwater monitoring							
Total Cost Alternative 2						**$656,887**	
Alternative 3: Passive Remediation and Long Term Monitoring							
A. Drafting and implementation of Institutional Controls and Site Management Plan	Site-Wide	$75,000	$0	$0		$75,000	
B. Site-wide monitored natural attenuation of dissolved phase groundwater plume	AOC #1	$55,787	$0	$0	5 years	$55,787	9B
Total Cost Alternative 3:						**$130,787**	

COST ESTIMATE TABLES

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COST ESTIMATE TABLE 1
AOCs #1, #2 AND #3: REMEDIAL EXCAVATION OF ALL OUTDOOR SUBSURFACE SOIL IMPACT AREAS

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
AOC#1,#2 and #3 (data evaluation areas 1,2,4 and 6): Remedial excavation of subsurface soil. Assume: impact 2 feet thick at 8-10 feet below grade over 1,000 SF in AOC 1; impacted soil averages 2 feet thick beginning at 6-8 feet below grade over 12,000 SF in AOC 2; shallow impact in AOC 3 is 4 feet thick over 3,000 SF; soil weight 1.8 tons per CY; sheet pile used in AOC #2 and #1.						
1	**Excavation of Impacted Soil in AOCs #1, #2 and #3**					$ 141,840
	Mobilization/demobilization charges for excavation contractor, HASP	1	LS	$ 5,000	$ 5,000	
	Utility disconnect, preservation where needed	1	LS	$ 3,500	$ 3,500	
	Confirm utility locations and sheet pile lines	1	LS	$ 1,000	$ 1,000	
	CAMP during excavation activities	20	Day	$ 1,250	$ 25,000	
	Erosion and control plan and provisions	1	LS	$ 1,000	$ 1,000	
	Excavate clean overburden soil & stockpile on site-AOCs 1,2	2,970	CY	$ 7	$ 20,790	
	Excavation of contaminated soil; load for hauling to landfill or dewatering	1,400	CY	$ 12	$ 16,800	
	Handle and load out of soil from dewatering boxes or stockpiles	850	CY	$ 3	$ 2,550	
	Injection piping installed into excavation of AOCs #1	1	LS	$ 500	$ 500	
	Import clean backfill for excavated portion of excavation, placed; lab test results	1,400	CY	$ 25	$ 35,000	
	Replace clean soil excavated; complete					
	backfilling of excavations; blend remaining on site	2,970	CY	$ 10	$ 29,700	
	Initial restoration of excavation areas	1	LS	$ 1,000	$ 1,000	
	Total Estimated Cost, Item 1				***$ 141,840***	
2	**Sheet Piling, AOCs #1 and #2**					$ 375,000
	1 000 LF, ~25 feet deep for AOCs 1 and 2	25,000	SF	$ 15	$ 375,000	
	Total Estimated Cost, Item 2				***$ 375,000***	
3	**Groundwater Control; Storage, Treatment, Discharge and Monitoring**					$ 78,500
	Provide groundwater pump, storage and treatment equipment	30,000	LS	$ 1	$ 30,000	
	Operation and maintenance of dewatering equipment	12	Day	$ 3,000	$ 36,000	
	Water disposal and discharge plan and testing	1	LS	$ 12,500	$ 12,500	
	Total Estimated Cost, Item 3				***$ 78,500***	
4	**Soil Disposal**					$ 117,000
	Collect (Geoprobe) and analyze samples for profiling; obtain approvals from receiving facility	1	LS	$ 15,000	$ 15,000	
	Assume approval from Oneida-Herkimer Solid Waste Management Authority, Ava Landfill with material passing TCLP sampling; trucking and tipping fee - assume approval for obtained	2,550	ton	$ 40	$ 102,000	
	Total Estimated Cost, Item 4				***$ 117,000***	
6A	**Post Excavation Soil Confirmation Sampling Program**					$ 21,125
	VOCs, SVOCs, Metals and PCBs	45	EA	$ 425	$ 19,125	
	Logistics, delivery	1	LS	$ 2,000	$ 2,000	
	Total Estimated Cost, Item 6A				***$ 21,125***	
6B	**Soil confirmation sampling program for "clean" stripped from**	20	EA	$ 425.00	$ 8,500	$ 9,500
	AOC dig areas	1	LS	$ 1,000.00	$ 1,000	
	Total Estimated Cost, Item 6B				***$ 9,500***	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					$ 742,965
	CONTINGENCY	15%				$ 111,445
	TOTAL ESTIMATED CONSTRUCTION COST					$ 854,410
	ESTIMATED ENGINEERING COST	10%				$ 74,297
TOTAL ESTIMATED COST						$ 928,706

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
DEC Site No. C63307

COST ESTIMATE TABLE 2A
AOC #1: IN-SITU CHEMICAL OXIDATION AND BIOREMEDIATION OF GROUNDWATER PLUME

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
	AOC #1: Chemical oxidation of dissolved phase groundwater plume downgradient of Building 2K (data evaluation areas 1 and 6) using fixed wells and injection trenches.					
1	**Well System**					**$ 86,775**
	Mobilization - driller	1	LS	$ 650	$ 650	
	Utility clearance; stake out	1	LS	$ 750		
	HASP; prepared prior; update for drilling	1	LS	$ 500	$ 500	
	Install fixed, 2" dia. injection wells; top of wells at grade	25	EA	$ 625	$ 15,625	
	Cuttings handling (dispose w/ excavation work)	1	LS	$ 250		
	Excavate and backfill injection trenches mid- to end- points in plume; 100' x 3' x 11' deep, 130 cy; soil disposed w/ main digs	200	Ft	$ 300	$ 60,000	
	Install buried 2" PVC header pipes to wells	1	LS	$ 10,000	$ 10,000	
	Total Estimated Cost, Item 1				***$ 86,775***	
2	**Initial Injection; Wells and Excavation**					**$ 37,700**
	Portable equipment, mobilization/demobilization	1	LS	$ 1,000	$ 1,000	
	Injection materials for wells; Regenox*, 200lbs/well	5,000	LBS	$ 3.50	$ 17,500	
	Injection materials; Regenox, 1000lbs for excavation, trench	1,800	LBS	$ 3.50	$ 6,300	
	Placement in excavation and trench	1	LS	$ 500	$ 500	
	Water; ~50,000 gal; frac tank	1	LS	$ 3,000	$ 3,000	
	Labor and travel for injection	4	DAY	$ 2,350	$ 9,400	
	Total Estimated Cost, Item 2				***$ 37,700***	
3	**Follow-up Injections**					**$ 120,000**
	Chemox followed by bioremediation	4	LS	$ 30,000	$ 120,000	
	Total Estimated Cost, Item 3				***$ 120,000***	
4	**Groundwater Monitoring; Assume 2 Years**					**$ 26,960**
	4 quarters, 6 wells ea = 24/yr x2= 48 samples VOCs	48	EA	$ 95.00	$ 4,560	
	Sampling and logistics	8	EA	$ 1,050.00	$ 8,400	
	Quarterly data input, reports	8	EA	$ 1,750.00	$ 14,000	
	Total Estimated Cost, Item 4				***$ 26,960***	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 271,435**
	CONTINGENCY	20%				**$ 54,287**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 325,722**
	ESTIMATED ENGINEERING COST	15%				**$ 40,715**
TOTAL COST						**$ 366,437**

*Material budget also suitable for H2O2 or other oxidant

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
DEC Site No. C63307

COST ESTIMATE TABLE 2B
IN-SITU CHEMICAL OXIDATION AND BIOREMEDIATION OF
GROUNDWATER CONTAMINATION IN EASTERN AREA OF THE SITE

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
Chemical oxidation of dissolved phase groundwater contaminants in the eastern area of the site (data evaluatio areas 2,4 and 5), where concentrations are lower, using fixed wells.						
1	**Well System**					**$ 45,650**
	Mobilization - driller; assume second mobilization needed for eastern area	1	LS	$ 650	$ 650	
	Utility clearance; stake out, drilling locations	1	LS	$ 750		
	HASP; prepared prior	0		$ -	$ -	
	Install fixed, 2" dia. injection wells; top of wells at grade; wells are deeper	50	EA	$ 900	$ 45,000	
	and will require a closer spacing than in AOC #1					
	Cuttings handling (dispose w/ excavation work)	1	LS	$ 350		
	Total Estimated Cost, Item 1				***$ 45,650***	
2	**Initial Injection**					**$ 49,850**
	Portable equipment, mobilization/demobilization	1	LS	$ 1,800	$ 1,800	
	Injection materials for wells; Regenox*, 150 lbs/well (150 x50=7500)	7,500	LBS	$ 3.50	$ 26,250	
	Water; ~50,000 gal; frac tank	1	LS	$ 3,000	$ 3,000	
	Labor and travel for injection	8	DAY	$ 2,350	$ 18,800	
	Total Estimated Cost, Item 2				***$ 49,850***	
3	**Follow-up Injections**					**$ 60,000**
	Chemox followed by bioremediation	2	LS	$ 30,000	$ 60,000	
	Total Estimated Cost, Item 3				***$ 60,000***	
4	**Groundwater Monitoring; Assume 2 Years**					**$ 13,000**
	4 quarters, 5 wells ea = 20/yr x2= 40 samples VOCs	40	EA	$ 95.00	$ 3,800	
	Sampling and logistics	8	EA	$ 850.00	$ 6,800	
	Quarterly data input, reports	8	EA	$ 300.00	$ 2,400	
	Total Estimated Cost, Item 4				***$ 13,000***	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 168,500**
	CONTINGENCY	25%				**$ 42,125**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 210,625**
	ESTIMATED ENGINEERING COST	8%				**$ 12,638**
TOTAL ESTIMATED COST						**$ 223,263**

*Material budget also suitable for H_2O_2 or other oxidant

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
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COST ESTIMATE TABLE 3
REMEDIAL EXCAVATION OF SURFACE SOIL FOR UNRESTRICTED SITE USE

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
	Excavation and landfill disposal of surface and subsurface soil site-wide not meeting unrestricted cleanup criteria; assume 35,000 SF of site with surface soil not meeting unrestricted use criteria; assume removal to 2.0 feet is adequate = 2,592 CY = 4667 tons @ 1.8 tons/CY.					
1	**Excavate Soils to 2 Feet**					**$ 229,455**
	Mobilization tasks (included w/ outdoor AOCs)					
	Excavate soils to 2 feet, load for haul to landfill	2,592	CY	$ 8	$ 19,440	
	Soil disposal; approval from Oneida-Herkimer Solid Waste	4,667	ton	$ 45	$ 210,015	
	Total Estimated Cost, Item 1				***$ 229,455***	
2	**Post Excavation Soil Confirmation Sampling Program**					**$ 19,250**
	VOCs, SVOCs, Metals and PCBs	40	EA	$ 425	$ 17,000	
	Logistics, delivery	1	LS	$ 2,250	$ 2,250	
	Total Estimated Cost, Item 2				***$ 19,250***	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 248,705**
	CONTINGENCY		15%			**$ 37,306**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 286,011**
	ESTIMATED ENGINEERING COST		3%			**$ 7,461**
TOTAL ESTIMATED COST						**$ 293,472**

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COST ESTIMATE TABLE 4
AOC #4: DEMOLITION OF BUILDING AND REMEDIAL EXCAVATION
OF SUBSURFACE SOIL BENEATH BUILDING

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
	AOC#4 building interior (data evaluation area 3): 8,000 SF, assume impact layer 4' thick variably 2-12 feet below basement grade, 1,200 CY at 1.8 tons per CY; building is demolished and disposed; excavate impacted soil for landfill disposal; collect and process groundwater as needed; backfill with clean imported fill.					
1	**Excavation**					**$ 68,300**
	Mobilization tasks (included w/ outdoor AOCs)	0	LS			
	Excavation of contaminated soil in AOC #4; investigate and remove any other odorous soil found in building footprint	1,350	CY	$ 15	$ 20,250	
	CAMP during excavation activities	12	Day	$ 1,250	$ 15,000	
	Handle and load out soil from dewatering boxes or stockpiles	850	CY	$ 3	$ 2,550	
	Import backfill & place	1,200	CY	$ 25	$ 30,000	
	Initial restoration of excavation area	1	LS	$ 500	$ 500	
	Total Estimated Cost, Item 1				***$ 68,300***	
2	**Building Demolition and Disposal**					**$ 500,000**
	(based on quotes from contractors)	1	LS	$ 500,000	$ 500,000	
	Total Estimated Cost, Item 2				***$ 500,000***	
2	**Groundwater Control (Setup Included w/AOC #2)**					**$ 44,000**
	System provided with outdoor AOCs					
	Operation and maintenance of dewatering equipment	8	Day	$ 3,000	$ 24,000	
	Water disposal, discharge plan and testing	1	LS	$ 20,000	$ 20,000	
	Total Estimated Cost, Item 2				***$ 44,000***	
3	**Soil Disposal**					**$ 109,350**
	Approval from Ava/OHC Landfill; truck, tipping fee	2,430	ton	$ 45	$ 109,350	
	Total Estimated Cost, Item 3				***$ 109,350***	
4	**Post Excavation Soil Confirmation Sampling Program**					**$ 10,500**
	VOCs, SVOCs, Metals and PCBs	20	EA	$ 425	$ 8,500	
	Logistics, delivery	1	LS	$ 2,000	$ 2,000	
	Total Estimated Cost, Item 4				***$ 10,500***	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 732,150**
	CONTINGENCY	15%				**$ 109,823**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 841,973**
	ESTIMATED ENGINEERING COST	8%				**$ 58,572**
TOTAL ESTIMATED COST						**$ 900,545**

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COST ESTIMATE TABLE 5
AOC #1: REMEDIAL TEST TRENCHES IN SOURCE AREA

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
	Remedial test trenches and excavation of subsurface soil as needed in data evaluation area 6/ AOC#1. Assume impact 2 feet thick at 8-10 feet below grade over 1,000 sf area.					
1	**Excavation of Impacted Soil in AOCs #1**					**$ 20,700**
	Mobilization/demobilization charges, excavation crew, HASP	1	LS	$ 3,000	$ 3,000	
	Confirm utility locations, preservation where needed	1	LS	$ 1,500	$ 1,500	
	Complete test trenches	1	Day	$ 950	$ 950	
	CAMP during excavation activities	3	Day	$ 1,250	$ 3,750	
	Excavate clean overburden soil & stockpile on site	300	CY	$ 10	$ 3,000	
	Excavation of contaminated soil and load out; assume 2-foot zone of impact	75	CY	$ 10	$ 750	
	Import clean backfill for excavated portion of excavation, placed; lab test results	100	CY	$ 25	$ 2,500	
	Replace clean soil excavated; complete backfilling of excavations; blend remaining on site	300	CY	$ 15	$ 4,500	
	Restoration of excavation area	1	LS	$ 750	$ 750	
	Total Estimated Cost, Item 1				***$ 20,700***	
2	**Soil Disposal**					**$ 25,575**
	Collect and analyze samples for profiling; obtain approvals from receiving facility	1	LS	$ 1,500	$ 1,500	
	Trucking and tipping fee for disposing of soil in project landfill	135	Ton	$ 45	$ 6,075	
	Disposal of soil from construction of injection trenches	400	Ton	$ 45	$ 18,000	
	Total Estimated Cost, Item 4				***$ 25,575***	
3	**Post Excavation Soil Confirmation Sampling Program**					**$ 3,075**
	VOCs, SVOCs, Metals and PCBs	5	EA	$ 425	$ 2,125	
	Logistics, delivery	1	LS	$ 950	$ 950	
	Total Estimated Cost, Item 6A				***$ 3,075***	
4	**Soil confirmation sampling program for "clean" stripped from**	8	EA	$ 425.00	$ 3,400	**$ 4,400**
	dig area	1	LS	$ 1,000.00	$ 1,000	
	Total Estimated Cost, Item 6B				***$ 4,400***	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 53,750**
	CONTINGENCY	15%				**$ 8,063**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 61,813**
	ESTIMATED ENGINEERING COST	10%				**$ 5,375**
TOTAL ESTIMATED COST						**$ 67,188**

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COST ESTIMATE TABLE 6
AOC #3: CAPPING SHALLOW SOIL IMPACT

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
	Cap area of shallow soil impact in AOC#3/Area 4 with pavement.					
AOC #3/Area 4: Cap Area with Shallow Soil Impact and Include in SMP						
	Strip topsoil and grade area, blending with driveway-parking lot, compact subgrade	1	LS	$ 3,500.00	$ 3,500	**$ 32,710**
	Import and place iomported crusher run fill at 6" lift; compact	80	CY	$ 32.00	$ 2,560	
	Pave area with min. 4 inch pavement section	4,200	SF	$ 3.25	$ 13,650	
	Grade retaining wall margin and place stripped topsoil under soil cap; compact	1	LS	$ 1,000.00	$ 1,000	
	Dispose of topsoil in landfill as part of remedial program	300	Ton	$ 40.00	$ 12,000	
	Total Estimated Cost				$ 32,710	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 32,710**
	CONTINGENCY	15%				**$ 4,907**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 37,617**
	ESTIMATED ENGINEERING COST	10%				**$ 3,271**
TOTAL ESTIMATED COST						**$ 40,888**

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COST ESTIMATE TABLE 7
AOC #5: MITIGATION OF SUB-SLAB BUILDING VAPOR

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
AOC#5: Mitigate soil vapor intrusion if existing building becomes occupied or if future building is built in same area.						
1	**Option: Sub-Slab and Indoor Air Testing Program**					**$ 87,500**
	Work Plan	1	LS	$ 7,500	$ 7,500	
	Testing program	1	LS	$ 25,000	$ 25,000	
	Report	1	LS	$ 5,000	$ 5,000	
	Indoor Air	5	YR	$ 10,000	$ 50,000	
	Total Estimated Cost, Item 1				***$ 87,500***	
2	**Eliminate Source of Soil Vapors Beneath Building Slabs, Allowing Unrestricted Use of Site (Assume Building has been Removed)**					**$ 29,280**
	Remove 2 feet of beneath removed slab for landfill disposal; assume 3,200 sf in NW corner of Building 5K requires removal	240	CY	$ 10	$ 2,400	
	Load, haul and dispose soil in project landfill	408	Ton	$ 48	$ 19,380	
	Inspect soil for soil vapors using PID and lab VOC samples	1	LS	$ 1,500	$ 1,500	
	Backfill excavation area and grade	240	CY	$ 25	$ 6,000	
	Total Estimated Cost, Item 2				***$ 29,280***	

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COST ESTIMATE TABLE 8A
SITE RESTORATION FOR UNRESTRICTED USE ALTERNATIVE

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
	Site restoration to prevent any erosion of surface soils from retention pond or site outdoor AOCs; condition to be further detailed in SMP					
1	Place and roll imported topsoil over all AOC excavated areas	5,000	SY	$ 7	$ 35,000	**$ 35,000**
	and former building areas; grade subgrade as needed,					
	seed, fertilize and mulch for grass; former driveway restored					
	using select stone during backfill of remedial excavations					
	Apply stone liner to retention pond (1500 sf)	1	LS	$ 3,250	$ 3,250	**$ 3,250**
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 38,250**
	CONTINGENCY	15%				**$ 5,738**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 43,988**
	ESTIMATED ENGINEERING COST	5%				**$ 1,913**
TOTAL ESTIMATED COST, Item 1						**$ 45,900**
2	Place and roll imported topsoil over AOC 1 excavated area	115	SY	$ 7	$ 805	**$ 805**
	seed, fertilize and mulch for grass					
	Apply stone liner to retention pond (1500 sf)	1	LS	$ 3,250	$ 3,250	**$ 3,250**
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 4,055**
	CONTINGENCY	15%				**$ 608**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 4,663**
	ESTIMATED ENGINEERING COST	10%				**$ 466**
TOTAL ESTIMATED COST, Item 2						**$ 5,130**

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
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COST ESTIMATE TABLE 8B
SITE-WIDE PLACEMENT OF SOIL CAP AND RETENTION POND EXCAVATION

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
	Site actions to prevent any erosion of surface soils from retention pond or outdoor AOCs; condition to be further detailed in SMP					
1	Prep, place, grade and compact 9" imported soil over all outdoor AOC areas	1,000	CY	$ 22	$ 22,000	**$ 53,500**
	Place and roll imported topsoil over all outdoor AOC areas	4,500	SY	$ 7	$ 31,500	
	and former building areas; grade subgrade as needed,					
	seed, fertilize and mulch for grass; former driveway restored					
	using select stone during backfill of remedial excavations					
2	Excavate 12" soil from retention pond for off site disposal	100	tons	$ 50	$ 5,000	**$ 9,500**
	Fill in retention pond to even grade in area	250	CY	$ 18	$ 4,500	
	SUBTOTAL ESTIMATED CONSTRUCTION COST					**$ 63,000**
	CONTINGENCY	15%				**$ 9,450**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 72,450**
	ESTIMATED ENGINEERING COST	5%				**$ 3,623**
TOTAL ESTIMATED COST						**$ 76,073**

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
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COST ESTIMATE TABLE 9A
AOC #1: POST-EXCAVATION GROUNDWATER MONITORING

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
Monitor dissolved-phase groundwater concentrations in AOC #1, data evalautio areas 1,2 and 6 after completing remedial excavation in source area ; program will involve quarterly sampling of 6 monitoring wells for one year for VOCs; subsequently assume 4 wells sampled semi-annually for 3 years.						
1	**Sampling services for 10 sampling events over 4 years**					**$ 13,250**
	Field preparation, sample delivery charges	10	Ea	$ 300	$ 3,000	
	Sampling field work and travel time, 2-person tech crew	10	Ea	$ 875	$ 8,750	
	Sampling equipment and mileage charge	10	Ea	$ 150	$ 1,500	
	Total Estimated Cost, Item 1				**$ 13,250**	
2	**Reporting**					**$ 13,000**
	Quarterly reports, first year	4	Ea	$ 1,750	$ 7,000	
	Annual reports, years 2-4	3	Ea	$ 2,000	$ 6,000	
	Total Estimated Cost, Item 1				**$ 13,000**	
3	**Laboratory charges**					**$ 4,560**
	EPA Method 8260; 24 samples first year, 8 per year for 3 years = 48	48	Ea	$ 95	$ 4,560	
					$ 4,560	
	SUBTOTAL ESTIMATED COST					**$ 30,810**
	CONTINGENCY	15%				**$ 4,622**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 35,432**

FORMER ONEIDA KNIFE PLANT
Village of Sherrill, Oneida County, New York
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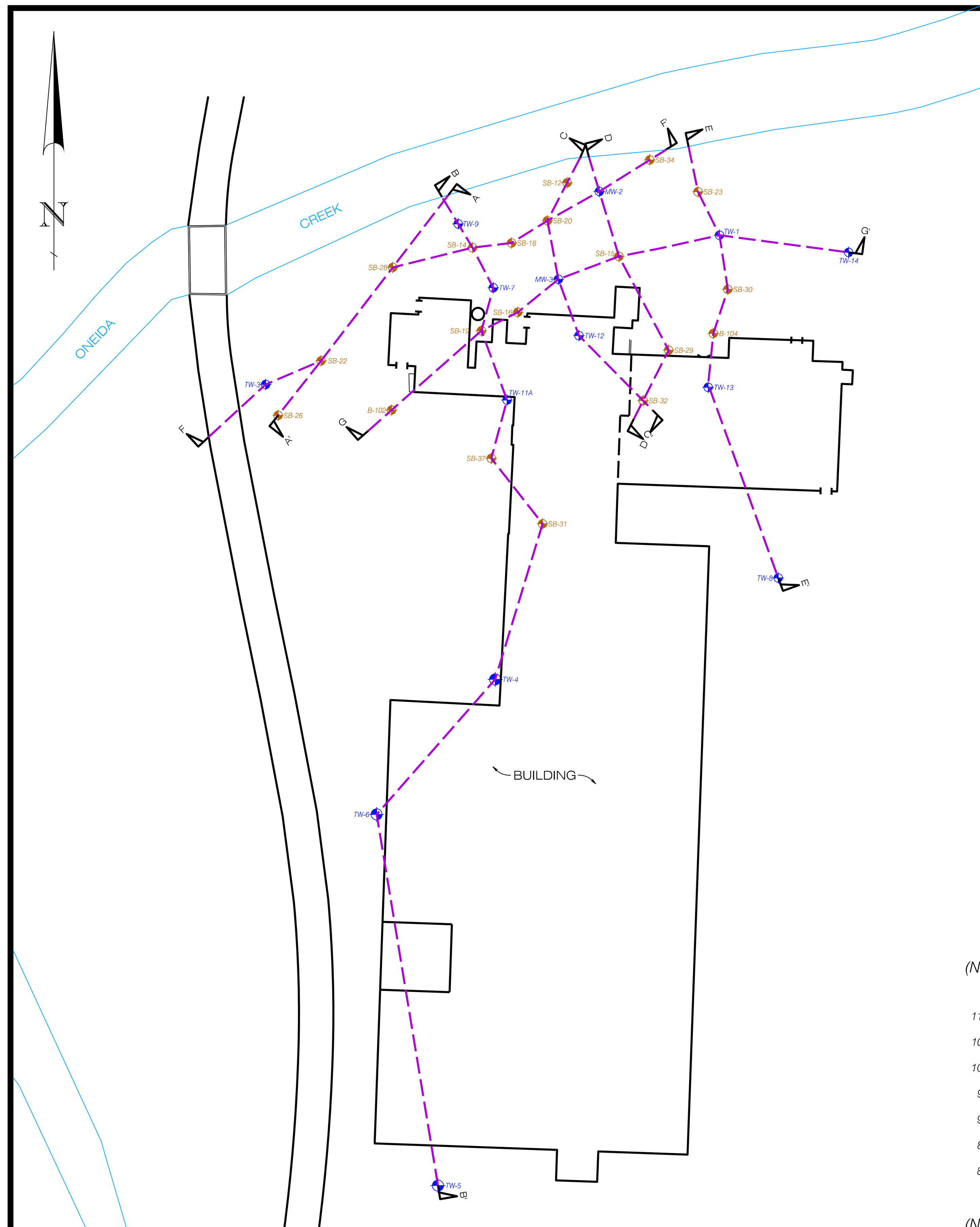
COST ESTIMATE TABLE 9B
SITE-WIDE MONITORED NATURAL ATTENUATION

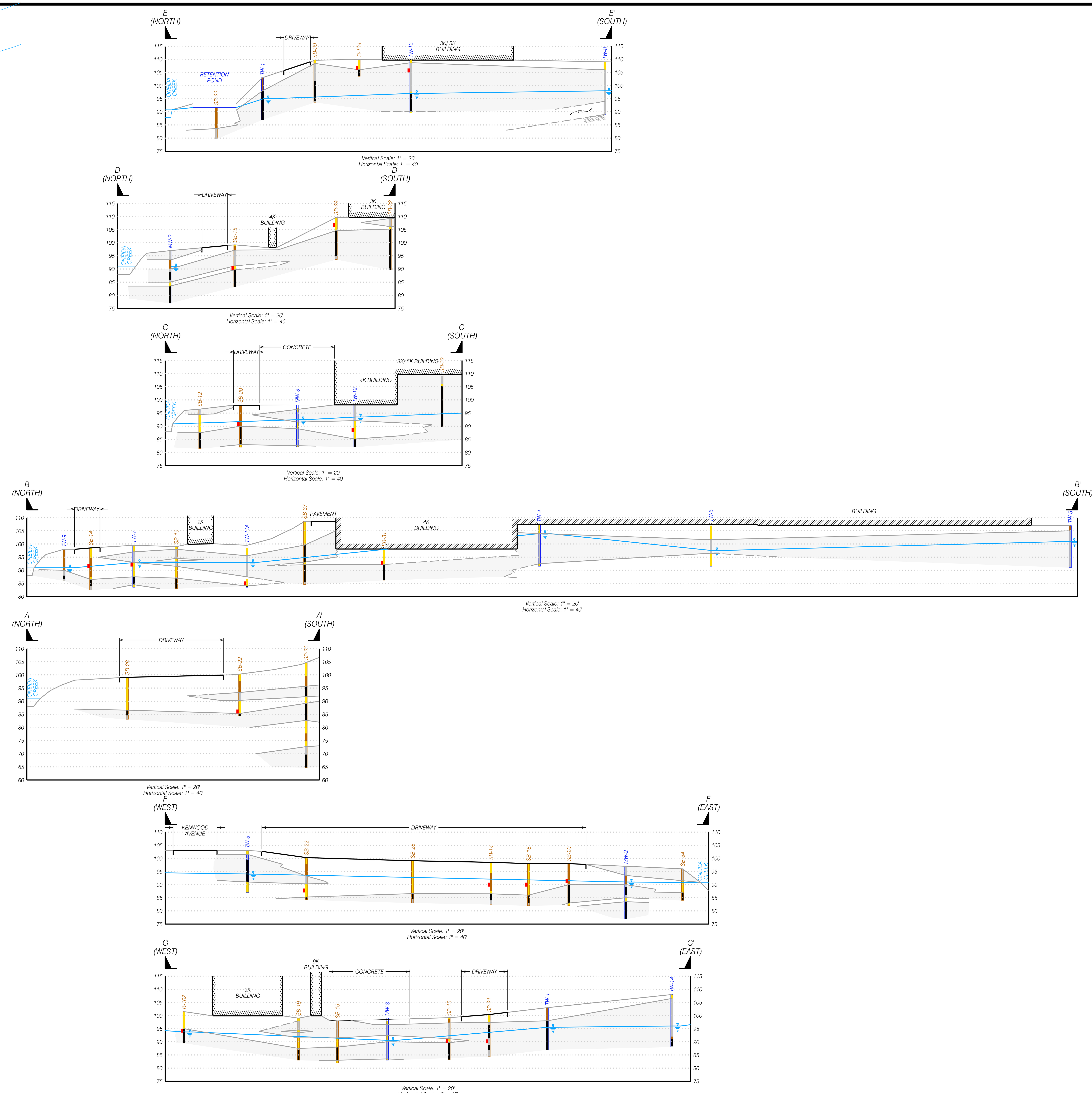
ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE MATERIAL AND LABOR	ESTIMATED COST	TOTAL ESTIMATED COST
Monitor dissolved-phase groundwater concentrations in site monitoring wells to evalaute natural attenuation. Program will involve quarterly sampling of 11 monitoring wells for one year for VOCs; subsequently assume 9 wells sampled semi-annually for 5 years.						
1	**Sampling services for 14 sampling events over 5 years**					**$ 17,990**
	Field preparation, sample delivery charges	14	Ea	$ 225	$ 3,150	
	Sampling field work and travel time, 2-person tech crew	14	Ea	$ 875	$ 12,250	
	Sampling equipment and mileage charge	14	Ea	$ 185	$ 2,590	
	Total Estimated Cost, Item 1				**$ 17,990**	
2	**Reporting**					**$ 15,000**
	Quarterly reports, first year	4	Ea	$ 1,750	$ 7,000	
	Annual reports, years 2-5	4	Ea	$ 2,000	$ 8,000	
	Total Estimated Cost, Item 1				**$ 15,000**	
3	**Laboratory charges**					**$ 16,820**
	EPA Method 8260; 44 samples first year, 18 per year for 4 years = 72	116	Ea	$ 95	$ 11,020	
	Include additional MNA parameters	116	Ea	$ 50	$ 5,800	
	SUBTOTAL ESTIMATED COST					**$ 49,810**
	CONTINGENCY	12%				**$ 5,977**
	TOTAL ESTIMATED CONSTRUCTION COST					**$ 55,787**

PLANS



Section Location Plan

Scale: 1" = 50'



Key

Top of Vernon Shale

Water Level on 6/11/10

Vertical Interval w/ PID Reading > 75 ppm and/ or Visual Staining and Oily Impact

Unified Soil Classification	Description	Color Designation
SM	Silt & Fine Sand, w/ or w/ out Trace - Little Gravel	Brown
SP, SW	Fine - Medium Sand, w/ or w/ out Trace - Some Gravel	Yellow
ML	Clayey Silt, w/ or w/ out Minor Sands & Gravel	Gray
CL	Silty Clay, w/ or w/ out Minor Sands & Gravel	Black

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Civil and Environmental Engineering

REVISIONS:	DATE:	BY:
ALTERNATIVES REPORT	12/11	FAK

PROJECT:
FORMER ONEIDA KNIFE PLANT - LOT 1
REMEDIAL INVESTIGATION REPORT

CLIENT:
ONEIDA SILVERSMITHS, INC.

LOCATION:
CITY OF SHERRILL, ONEIDA COUNTY, NEW YORK

DWG. TITLE:
CROSS SECTIONS

PROJECT No.: 2006065
FILE NAME.: Sections
SCALE: AS NOTED
DATE: NOV. 2010
ENG'D BY: FAK
DRAWN BY: JMD
CHECKED BY: FAK

SHEET NO.:
SHEET 1 OF 1