RECORD OF DECISION

Operable Unit 2 of the General Motors – Inland Fisher Guide
Subsite of the Onondaga Lake Superfund Site
Town of Salina, Onondaga County, New York

New York State Department of Environmental Conservation
and
United States Environmental Protection Agency
Region II
March 2015

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Operable Unit 2 of the General Motors – Inland Fisher Guide
Subsite of the Onondaga Lake Superfund Site
Town of Salina, Onondaga County, New York

Superfund Site Identification Number: NYD986913580
Operable Unit: 09 (Operable Unit 2 of this Subsite)

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the New York State Department of Environmental Conservation (NYSDEC) and U.S. Environmental Protection Agency's (EPA's) selection of a remedy for Operable Unit (OU) 2 of the General Motors Inland Fisher Guide Subsite (Subsite) of the Onondaga Lake Superfund Site (Site), chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. § 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300 (NCP). This decision document explains the factual and legal basis for selecting a remedy to address the contaminated soils and sediments associated with the Subsite. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selected remedy is based.

NYSDEC is the lead agency for this Subsite. The EPA has determined that the selected remedy meets the requirements for a remedial action as set forth in CERCLA Section 121, 42 USC § 9621. As such, for the purpose of satisfying this remedy selection criterion of the NCP, NYSDEC, on behalf of New York State, supports the selected remedy. NYSDOH also supports the selection of this remedy; its letter of concurrence is attached (see Appendix IV).

ASSESSMENT OF THE SUBSITE

The response action selected in this Record of Decision is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances, pollutants or contaminants from this Subsite.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy, which addresses contaminated soil and sediment, includes the following components:

- Mechanical excavation of an estimated 9,600 cubic yards (CY) of sediments in Ley Creek exceeding 1 milligram per kilogram (mg/kg) of Polychlorinated Biphenyls (PCBs). It is assumed that the excavation will be from bank-to-bank and the depths of excavation will be to the unconsolidated bed material, to the extent practicable. Figure 8 depicts the areas of the Creek where sediment will be excavated. The areal footprint of areas to be excavated will be refined during the remedial design.
- Excavation of an estimated 15,000 CY of surface and subsurface floodplain soil to meet the restricted Soil Cleanup Objectives (SCOs) (see Table 7) consistent with current and reasonably anticipated future land use of discrete Subsite areas as follows:[1]
    - continued industrial use for the neighboring National Grid property (except for ecological use within and adjacent to the wetland);
    - ecological use for areas in the Ley Creek floodplain, except for areas of residential use where the residential use SCO is lower than the ecological use SCO (*i.e.*, chromium); and
    - commercial use of the property along Factory Avenue.
- Transport of the excavated Creek and wetland sediments to a staging area where they will be dewatered. It is assumed that this water will require treatment prior to discharge.
- Transport of the excavated contaminated soils and sediments containing greater than 50 mg/kg of PCBs to a Toxic Substances Control Act (TSCA)-compliant facility.
- Transport of those soils and sediments which fail Toxic Characteristic Leaching Procedure testing[2] and are determined to be characteristic hazardous waste and are non-TSCA waste (*i.e.,* less than 50 mg/kg PCBs) to an off-site RCRA-compliant facility.
- Transport of those soils and sediments that are non-TSCA-regulated (less than 50 mg/kg of PCBs) and are not characteristic hazardous waste to a RCRA-compliant facility.[3]

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[1] Most soil excavations are anticipated to be 1 to 4 feet in depth; with some limited areas excavated to depths as deep as 6 feet within the Ley Creek floodplain hot spot. The locations and assumed excavations for soil removal are illustrated on Figures 4 through 7. Confirmatory sampling will be conducted to ensure the excavations are complete.

[2] TCLP testing is a soil sample extraction method for chemical analysis employed as an analytical method to simulate contaminant leaching. The testing methodology is used to determine if a waste is a characteristic hazardous waste under the Resource Conservation and Recovery Act (RCRA).

[3] The September 30, 2014 ROD for the Lower Ley Creek subsite called for either local or non-local disposal of the excavated soils and sediments with PCB concentrations less than 50 mg/kg. Should local disposal of the soils and sediments be employed at the Lower Ley Creek subsite, consideration will be given to similarly disposing of the excavated soil and sediment from the GM-IFG Subsite.

- Clean fill meeting the requirements of DER-10, Appendix 5 will be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Subsite. With the exception of the Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas will be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue will be restored with a cover which will consist of an indicator fabric layer, as needed, overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.
- Appropriate controls and monitoring (*e.g*., community air monitoring) will be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable.
- Habitat restoration of Ley Creek excavated areas which will consist of the placement of at least 0.5 feet of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas will be determined during the remedial design as part of a habitat restoration plan. The main goal of the habitat restoration will be to restore the habitats affected by the remedy, and the restoration will meet the substantive requirements of 6 NYCRR Part 608 and 663. A habitat assessment will be performed to support the restoration design. The habitat assessment will include an assessment of the Ley Creek removal areas for mussels and will determine any actions necessary (if any) to minimize impacts to existing populations. The habitat restoration plan will also describe the specific design for areas impacted by the remediation of sediments and soils and determine the appropriate plantings (including types and locations) necessary to restore habitats. The habitat restoration plan will also include the necessary requirements for monitoring restoration success and for needed restoration maintenance. Monitoring requirements will be determined during the design.
- Institutional controls in the form of environmental easements will be used to restrict intrusive activities in areas where contamination remains unless the activities are in accordance with an approved Site Management Plan (SMP).
- The SMP will provide for the proper management of all post-construction remedy components. Specifically, the SMP will describe procedures to confirm that the requisite engineering (*e.g.,* demarcation layer) and institutional controls are in place and that such controls continue to protect public health and the environment. The SMP will also detail the following: the provision for the management of future excavations in areas where contamination remains; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of any above-noted environmental easements and/or restrictive covenants; a provision for the performance of the operation and monitoring required for the remedy; and a provision that a property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

The environmental benefits of the selected remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with the EPA Region 2's Clean and Green Energy Policy and NYSDEC's DER-31 Green Remediation Policy.[4] Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy.

DECLARATION OF STATUTORY DETERMINATIONS

Part 1- Statutory Requirements

The selected remedy meets the requirements for remedial actions set forth in CERCLA in Section 121, 42 U.S.C. §9621, because as implemented : 1) it is protective of human health and the environment; 2) it meets a level of standard of control of the hazardous substances, pollutants, and contaminants which at least attains the legally applicable or relevant and appropriate requirements under the federal and State laws; 3) it is cost-effective; and 4) it utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Part 2- Statutory Preference for Treatment

CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances as a principal element (or justify not satisfying the preference). For OU2, NYSDEC and the EPA do not believe that treatment of the sediments and soil is practicable or cost effective given the widespread nature of the sediment and soil contamination and the generally low concentrations of contaminants present in the sediment and soils that are being addressed.

Part 3- Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure, statutory reviews will be conducted at least every five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for OU2.

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[4] See http://epa.gov/region2/superfund/green_remediation and http://www.dec.ny.gov/docs/-remediation_hudson_pdf/der31.pdf

- Contaminants of concern and their respective concentrations in the “Summary of Subsite Characteristics” section (see Decision Summary, pages 6-13 and Appendix II, Table 1);

- Baseline risk represented by the contaminants of concern in the “Summary of Subsite Risks” section (see Decision Summary, pages 14-21);

- Cleanup levels established for contaminants of concern and the basis for these levels in the “Remedial Action Objectives” section (see Decision Summary pages 22-23, Appendix II, Table 7);

- Manner of addressing source materials constituting principal threats in the “Principal Threat Waste” section (See Decision Summary, page 38);

- Potential land use that will be available at the Subsite as a result of the selected remedy in the “Expected Outcomes of the Selected Remedy” section (see Decision Summary, pages 43-44);

- Estimated capital, annual operation and maintenance, and present-worth costs; discount rate; and the number of years over which the remedy cost estimates are projected in the “Description of the Selected Remedy” subsection (see Decision Summary, pages 39-43 and Appendix II, Table 9.2); and

- Key factors used in selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) in the “Summary of the Rationale for the Selected Remedy” subsection (see Decision Summary, page 39).

AUTHORIZING SIGNATURES

Robert W. Schick, P.E., Director Division of Environmental Remediation NYSDEC	March 31, 2015 Date
Walter E. Mugdan, Director Emergency and Remedial Response Division EPA, Region 2	March 31, 2015 Date

DECISION SUMMARY

Operable Unit 2 of the General Motors – Inland Fisher Guide
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New York State Department of Environmental Conservation
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TABLE OF CONTENTS

SUBSITE NAME, LOCATION, AND DESCRIPTION

The General Motors – Inland Fisher Guide (GM-IFG) Subsite (Subsite) of the Onondaga Lake Superfund Site[1] (Site) is located in the Town of Salina, Onondaga County, New York. The Subsite consists of the former plant, located south of Ley Creek on Townline Road in the Town of Salina and approximately 9,200 linear feet Ley Creek including the adjacent floodplains between Townline Road and the Route 11 Bridge (a.k.a. Brewerton Road). The Subsite does not include the Ley Creek PCB Dredgings subsite described in the "Site History and Enforcement Activities" section, below. Also included in the Subsite is a 10-acre wetland (referred to as the "National Grid Wetland") located on the northern portion of the National Grid property directly west of the former GM-IFG facility, soil in the approximately 1.8-acre area located directly between the former GM-IFG facility's northern property boundary and Factory Avenue (referred to as the "Factory Avenue Area") and soil in the area located along the northern shoulder of Factory Avenue in the vicinity of LeMoyne Avenue (referred to as the "Factory Avenue/LeMoyne Avenue Intersection Area").

Ley Creek, which drains an area of approximately 30 square miles, flows due west approximately two and a half miles downstream from the facility, where it discharges into Onondaga Lake. The Ley Creek drainage basin can, generally, be described as a highly urbanized area. Portions of the city of Syracuse and the towns of Cicero, Clay, DeWitt, Manlius and Salina are located in the Ley Creek drainage basin. Also located in the Ley Creek watershed are interstate highways, a National Grid electrical transfer station, Syracuse International Airport and the Air National Guard's Hancock Field. Large areas of impermeable surfaces in the Ley Creek watershed cause rapid runoff during storms and corresponding rapid rising of flow and water levels.

The National Grid Wetland is part of the New York State-regulated wetland known as "SYE-6." A drainage ditch is located along the northern edge of the National Grid property along Factory Avenue. Upland drainage flows into this wetland from the south and is discharged north to the ditch and through culverts under Factory Avenue towards Ley Creek. Wetland vegetation, trees and shrubs comprise the dominant vegetation of the wetland. The National Grid property is currently zoned for industrial use.

The Factory Avenue Area extends from the northwestern corner of the facility property to Townline Road. The Factory Avenue Area is characterized by maintained grass and is a corridor for overhead and underground utilities. Specifically, a natural gas pipeline and an Onondaga County sanitary sewer are present underground along this corridor. The Ley Creek PCB Dredgings subsite is located across Factory Avenue to the north of this area. This area is currently zoned for industrial use.

[1] The Onondaga Lake Superfund site's Superfund site Identification Number is NYD986913580. NYSDEC is the lead agency for the Subsite; the EPA is the support agency.

The Factory Avenue/LeMoyne Avenue Intersection Area is located north of Factory Avenue in the vicinity of LeMoyne Avenue down to the Route 11 Bridge. This area is currently zoned for commercial use.

SUBSITE HISTORY AND ENFORCEMENT ACTIVITIES

Industrialization of the area began soon after the completion of the Erie Canal in 1857 and the development of railroads in eastern Syracuse. Several industries have been located near Ley Creek and its branches since the late 19th and early 20th centuries. The industrial nature of this area, as well as the infrastructure and other development, influenced this site and contributed to its current condition.

Assessments have been performed at many areas in the Onondaga Lake drainage basin to determine what sources have contributed to the contamination of Onondaga Lake. The Lake has a footprint of approximately four and a half square miles and a drainage basin of approximately 250 square miles. On June 23, 1989, the Onondaga Lake site was added to the New York State Registry of Inactive Hazardous Waste Disposal sites. The Onondaga Lake Superfund site, which includes the Lake itself, six major and minor tributaries and various upland sources of contamination, was placed on the EPA's National Priorities List (NPL) on December 16, 1994. This NPL listing means that the lake system is among the nation's highest priorities for remedial evaluation and response under the federal Superfund law for sites where there has been a release of hazardous substances, pollutants, or contaminants. New York State Department of Environmental Conservation (NYSDEC) and the EPA have, to date, organized the work for the Onondaga Lake NPL site into discrete subsites. These subsites are also considered by the EPA to be operable units (OUs) of the NPL site. The GM-IFG site is a subsite.

The Subsite consists of two OUs--OU1, which addresses the former plant and groundwater on, and emanating from, the former plant, and OU2 (which is the subject of this ROD), which includes "other media" not addressed under OU1. Specifically, OU2 includes Ley Creek channel sediments, surface water and floodplain soils/sediments in the reach from Townline Road to the Route 11 Bridge, and the National Grid Wetland, Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area described above.

In 1938, the area in the vicinity of Ley Creek was primarily farmland. Since then, commercial and industrial development has occurred in the drainage basin, including in areas bordering the Creek.

GM began operations in the Town of Salina in 1952. Operations conducted at the GM-IFG facility included metal die casting; nickel, chromium and copper cyanide electroplating; stamping; polishing; buffing; painting and machining. During the early 1960s, injection molding operations were added to the existing metal operations. Metal finishing and die casting were subsequently reduced and replaced by injection molding by the early 1970s. PCB-containing hydraulic oil was used in die cast machines and injection molding operations until 1968 and in the diffusion pumps of three vacuum metallizers until 1969. More than 120 injection molding machines operated at the plant until plant operations ceased in December 1993. PCB-containing oil leaked from the machines to floor drains and sumps. During early facility operations, this oil and other process waste was discharged to an on-site swale. The swale discharged to Ley Creek, where PCBs are found in the sediments down to the mouth of the Creek at Onondaga Lake.

Prior to the early 1970s, poor channel conditions and large impermeable areas in the watershed caused extensive flooding of Ley Creek. These flooding events led to the creation of the Ley Creek Drainage District. Beginning in 1970, the Onondaga County Department of Drainage and Sanitation widened, deepened and rerouted the Creek through the Town of Salina Landfill. Dredged materials were spread along the banks of Ley Creek in addition to being disposed of at the Town of Salina Landfill. Areas along the south bank of Ley Creek, upstream of the Route 11 Bridge, where PCB-contaminated dredge spoils were placed, were included on the New York State Registry of Inactive Hazardous Waste sites as the Ley Creek PCB Dredgings subsite. A ROD was issued by NYSDEC for the Ley Creek PCB Dredgings subsite in March 1997, which called for the excavation and disposal of PCB-contaminated material greater than 50 milligrams per kilogram (mg/kg) and the consolidation and on-Site capping of material less than 50 mg/kg in compliance with the Toxic Substances Control Act (TSCA) PCB cleanup and disposal regulations (40 CFR Part 761). The remedy was completed in 2001, and the Ley Creek PCB Dredgings subsite is currently monitored and maintained.

NYSDEC and GM entered into an Administrative Order on Consent (Index # D-7-0001-97-06) (Order), which became effective on September 25, 1997. The Order required GM to conduct an (RI/FS)[2] for the Subsite. Soil, sediment, surface water and biota samples were obtained for chemical analysis as part of the RI. Three significant Interim Remedial Measures (IRMs)[3] were implemented at the Subsite from 2002 to 2004 to prevent further migration of PCBs from the facility to Ley Creek:

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[2] An RI determines the nature and extent of the contamination at a site and evaluates the associated human health and ecological risks and an FS identifies and evaluates remedial alternatives to address the contamination.

[3] The use of the term “Interim Remedial Measure” throughout this document is not intended to mean that this removal action is a “remedial action” as that term is defined in the federal law, CERCLA. An IRM is an activity that is necessary to address either emergency or non-emergency site conditions, which in the short-term need to be undertaken to prevent, mitigate, or remedy environmental damage or the consequences of environmental damage attributable to a site. An IRM is equivalent to a non-time critical removal under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal program pursuant to 40 CFR Section 300.415(b)(2).

- Former Landfill IRM: An industrial landfill at the former GM-IFG facility that contains chromium- and PCB-contaminated material was capped to prevent contaminants from leaching into the groundwater. In addition, hot spots associated with the landfill were excavated.
- Former Drainage Swale IRM: This second action involved the removal of highly-contaminated soil from a former discharge swale. This swale was used in the 1950s and 1960s as a conduit for the discharge of liquid process waste to Ley Creek. The swale was subsequently filled in, but the contaminated soil remained until the performance of this action. Over 26,000 tons of soils containing PCBs were removed from this area of the GM-IFG property.
- SPDES Treatment System IRM: The third action involved the construction of a retention pond and associated water treatment system. This pond collects all water that accumulates on the GM-IFG property in any of the storm sewers or abandoned process sewers. The pond water is then sent through the treatment plant in order to meet permitted discharge limits, prior to discharge to Ley Creek. The purpose of this response action was to stop the intermittent discharge of PCBs and other contaminants that occur during storm events.

In 2005, GM conducted a Phase 1A Cultural Resources Survey for OU1 and OU2. The Cultural Resources Survey Report[4] concluded that no further cultural resources investigation was required. This document was approved by NYSDEC in December 2005.

In 2009, GM filed for bankruptcy, and on March 31, 2011, administration of the remedial activities at the Subsite was taken over by the Revitalizing Auto Communities Environmental Response (RACER) Trust, the current property owner. The RACER Trust completed the RI/FS for OU2. The RI report (March 2013) was approved by NYSDEC in April 2013. The FS report (May 2013) and an FS report addendum (June 2014) will be approved by NYSDEC concurrent with the issuance of this ROD.

An RI/FS is currently underway for OU1. The OU1 RI/FS is investigating the facility property and groundwater. A Proposed Plan for OU1 will be released to the public following the completion of the FS.

In addition the Lower Ley Creek subsite, which is located downstream of OU2, consists of the contaminated sediments and floodplain soils along the lower two miles of Ley Creek, beginning at, and including, the Route 11 Bridge and ending downstream at the mouth of Ley Creek and its confluence with Onondaga Lake, as well as the sediments

[4] Phase 1A Literature Review and Archeological Sensitivity Assessment, Former IFG Facility and Ley Creek Deferred Media, Towns of Salina and Dewitt, Onondaga County, New York, June 2005.

and floodplain soils associated with the “Old Ley Creek Channel” (the pre-1970s dredging route of the Creek). A ROD for the Lower Ley Creek subsite was issued on September 30, 2014. The selected remedy calls for the excavation and disposal of PCB-contaminated creek sediments, wetland sediments and floodplain soils located in areas adjacent to the creek.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI and FS reports and a Proposed Plan supporting the OU2 remedy were released to the public for comment on November 17, 2014. These documents were made available to the public at information repositories maintained at the Salina Library, Atlantic States Legal Foundation, NYSDEC Region 7 office located in Syracuse, New York and the NYSDEC Division of Environmental Remediation office located in Albany, New York. An NYSDEC listserv bulletin notifying the public of the availability for the above-referenced documents, the comment period start and completion dates and the date of the planned public meeting was issued on November 17, 2014. The public comment period ran from November 17, 2014, to December 17, 2014.

A second public comment period ran from January 14, 2015 to February 14, 2015. An NYSDEC listserv bulletin notifying the public of the availability for the RI and FS reports and Proposed Plan and the second comment period’s completion date was issued. This information was also published in *The Post-Standard* on January 14, 2015.

On December 2, 2014, NYSDEC conducted a public meeting at the Town of Salina Town Hall to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for OU2 of the Subsite, including the preferred remedy, to respond to questions, and to accept comments. There were approximately 20 attendees. Responses to the questions and comments received at the public meeting and to comments submitted in writing during the public comment period are included in the Responsiveness Summary (see Appendix V).

The Onondaga Nation reviewed the draft RI and FS reports and draft Proposed Plan, and NYSDEC communicated with representatives of the Onondaga Nation about these documents. NYSDEC intends to continue consultation discussions with the Onondaga Nation throughout the design and construction phases of the implementation of the remedy.

SCOPE AND ROLE OF THE OPERABLE UNIT

Because many Superfund sites are complex and have multiple contamination problems and/or areas, they are often divided into several OUs for the purpose of managing the site-wide response actions. The NCP (at Section 300.5) defines an OU as “a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of OUs, depending on the complexity of the problems associated with the site. OUs may address geographical portions of a site, specific site problems, or initial phases of an action, or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site."

NYSDEC and the EPA have, to date, organized the work for the Onondaga Lake NPL Site into 11 subsites (see Figure 2). These subsites are also considered by the EPA to be OUs of the NPL Site.[5] Four of the subsites (GM-IFG, Ley Creek PCB Dredgings, Salina Landfill, and Lower Ley Creek) are on and/or abut Ley Creek. The Subsite and Ley Creek PCB Dredgings subsite include and/or are adjacent to the reach of Ley Creek from Townline Road to the Route 11 Bridge. The Salina Landfill and Lower Ley Creek subsites include and/or are adjacent to the reach of Ley Creek from the Route 11 Bridge to Onondaga Lake. As was noted in the "Site History and Enforcement Activities" section, above, the Subsite consists of two OUs. OU1 addresses the former plant and groundwater on, and emanating from, the former plant and OU2 includes Ley Creek channel sediments, surface water and floodplain soils/sediments in the reach from Townline Road to the Route 11 Bridge, and the National Grid Wetland, Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area (also referred to as "Ley Creek Deferred Media"). This response action documented in this ROD addresses OU2. An RI/FS for OU1 is currently underway.

As discussed elsewhere in this Decision Summary, Ley Creek is an urban watershed that receives runoff from a large urban area and low levels of sediment contaminants that are attributable to urban background can be found in samples upstream of the Subsite.

SUMMARY OF SUBSITE CHARACTERISTICS

The RI activities that were conducted under OU2 included geological and hydrogeological investigations, an ecological assessment, wetlands delineation and the collection of samples from the soil, surface water, sediment and biota.

Several metals detected on the GM-IFG facility are identified as "Site-related metals" (*i.e*., arsenic, chromium, copper, lead, nickel and zinc) when found in GM-IFG OU2 media. Other metals, (*e.g*., mercury/methylmercury) were found within the watershed and evaluated in the RI/FS, but are not associated with the Subsite and are considered to be "non-site-related" metals.

[5] The terms "subsite" and "OU" are used interchangeably in this document and are meant to be defined as one and the same.

Based upon the results of the RI, NYSDEC and the EPA have concluded that the primary contaminants of concern (COCs) for this Subsite are PCBs, PAHs,[6] chromium, copper, lead, nickel and zinc, with PCBs being the predominant contaminant in the Subsite soils and creek sediments. A review of the sampling results indicates that the PCBs are collocated with the vast majority of other COCs. Soil, sediment, surface water and biota investigations for OU2 are described below.

Subsite Geology and Hydrogeology

Ley Creek Hydrology

Onondaga Lake receives surface runoff from a drainage basin of approximately 250 square miles. Surface water flows into the Lake via six tributaries: Ninemile Creek; Onondaga Creek; Harbor Brook; Bloody Brook; Sawmill Creek and Ley Creek. Ley Creek accounts for approximately eight percent of the total water inflow to the Lake.

Ley Creek flows west to ultimately discharge into Onondaga Lake, approximately 2.5 miles downstream of the GM-IFG facility. Ley Creek was restructured and dredged to aid in storm water drainage in the 1970s. The reach of Ley Creek from Townline Road to the Route 11 Bridge was most recently dredged in 1983. Water depths range from less than three inches to approximately four feet, depending on channel width, flow rates and bottom profile. Flow rates also vary significantly ranging from less than 1 cubic foot per second (cfs) to 1,400 cfs. Ley Creek varies in width from less than 10 feet to more than 30 feet.

The substrate is predominantly gravel and fine inorganic material with little to no submerged or emergent aquatic vegetation. Sediment probing performed during the RI indicated that the main channel of Ley Creek is primarily hard substrate with limited sediment depositional areas. Depositional areas are generally limited to the edges of the channel.

The portion of Ley Creek associated with OU2 is classified as a 6 NYCRR § 701.7 New York State Class B stream. The best usages of Class B fresh surface waters are "primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival." The Creek is not used as a public water supply, although it is accessible for fishing or other recreation. The fish species found during recent investigations include bluegill, pumpkinseed, shiners, bullhead, and carp. There is no commercial transportation use of the Creek. Efforts since 1970 to alleviate the flooding of Ley Creek have been generally successful, though flooding still occurs in portions of the Creek.

[6] It should be noted that all or some of the PAHs are likely from anthropogenic sources such as urban runoff.

Subsite Hydrogeology

The bedrock geology in the area of Ley Creek generally consists of sedimentary rock units from the Paleozoic-age Salina Group which, in order of oldest to youngest, consists of the Vernon Formation, the Syracuse Formation, Camillus Shale and the Bertie Formation. Specifically, the bedrock underlying the Subsite is made up of units of the Vernon Formation, which consists of upper Silurian shale and dolostone. Groundwater discharge to surface water channels accounts for most of the stream flow in the Onondaga Lake Basin. Groundwater discharge accounts for an estimated 56 percent of stream flow in Ley Creek. The groundwater can be found from eight to 12 feet below ground surface (bgs) in the overburden of the Subsite.

Soil

Soil investigations were performed between 1986 and 2009 and are documented in the RI report.[7]

6 NYCRR Part 375 (NYSDEC Division of Environmental Remediation Environmental Remediation Programs, effective December 14, 2006) unrestricted use soil cleanup objectives (SCOs) were used as RI screening values for comparison purposes. Part 375 SCOs for the protection of ecological receptors (Ley Creek Floodplain Area and National Grid Wetland) and Part 375 industrial use SCOs (Factory Avenue Area and portions of the National Grid property) were also used during the screening process to provide a context for the contaminant concentrations detected.

The following sections summarize the soil contamination as characterized in the discrete OU2 areas.

Ley Creek Floodplain Area

Soil in the Ley Creek Floodplain Area (see Figure 2) was investigated through samples collected within the Ley Creek 100-year floodplain between Townline Road and Route 11 (excluding the Ley Creek PCB Dredgings subsite) as part of a series of sampling events conducted by GM between 2003 and 2007, and in connection with an intersection improvement at Lemoyne Avenue and Factory Avenue on behalf of Onondaga County in 2009. The initial samples collected in the Ley Creek Floodplain Area in 2003 indicated the presence of PCBs at concentrations above the Part 375 unrestricted SCO of 0.1 mg/kg, which was used as a screening value during the RI. Sample results ranged from not detected to 35 mg/kg, though most of these detections were below 1 mg/kg PCBs. An additional round of sampling followed in 2004, which identified a localized

[7] Revised Final Off-Site Remedial Investigation, Former IFG Facility and Deferred Media Site, Syracuse, New York, March 2013.

floodplain hot spot. The results of this sampling documented the presence of PCB concentrations ranging from not detected to 130 mg/kg. Soil samples in the vicinity of the 130 mg/kg detection also exhibited visual staining. Subsequent sampling conducted in 2005 and 2007 focused on the area of visual staining. Samples collected between 2003 and 2007 in the vicinity of the stained area exhibited concentrations ranging from 0.11 mg/kg to 61 mg/kg PCBs along an approximately 180-foot long stretch on the northern bank of Ley Creek, down to a depth of 6 feet. Westernmost and northernmost samples exhibited concentrations below 1 mg/kg PCBs, the Part 375 SCO for the protection of ecological resources. The easternmost sample exhibited a concentration of 6.4 mg/kg at the deepest interval sampled (4 to 6 feet below ground surface bgs]).

In connection with rehabilitation work for the Route 11 Bridge, two soil samples were collected by the New York State Department of Transportation from one location on the bank of Ley Creek in November 1992 in the Subsite area. The samples, located east of the northern bridge abutment (upstream), were collected from 0 to 8 inches and 8 to 16 inches below grade. PCBs were detected in each sample at concentrations above the Part 375 unrestricted use SCO of 0.1 mg/kg ranging from 4 mg/kg (8 to 16 inches) to 55 mg/kg (0 to 8 inches). VOCs and SVOCs were not detected in either sample. Detected metals concentrations were within typical ranges for natural soils.

National Grid Wetland Area

Investigation of the National Grid Wetland Area (see Figure 2) has been conducted over various sampling events associated with evaluating conditions within the wetland and the drainage ditch (approximately 760 long by 20 feet wide) that runs north of the wetland along Factory Avenue on this property and in connection with the soil removal IRMs described above.

PCBs were detected in the Factory Avenue drainage ditch soils at concentrations greater than the Part 375 unrestricted SCO, ranging from 0.22 mg/kg to 370 mg/kg, and extending approximately 760 feet along the ditch westward from the former GM-IFG facility property. These concentrations were encountered as deep as 3.5 feet. While the westernmost sample exhibited a concentration of 0.27 mg/kg PCBs, still slightly above the Part 375 unrestricted SCO of 0.1 mg/kg PCBs, concentrations at this location were significantly lower than other samples collected within the wetland area. The extent of Subsite-related metals detected at concentrations above the corresponding Part 375 unrestricted SCOs follows a similar pattern, with exceedances noted in the ditch, though the westernmost sample in the ditch exhibits concentrations below the corresponding Part 375 unrestricted SCOs for Subsite-related metals (arsenic, total chromium, copper, lead, nickel and zinc). In addition, there are relatively limited areas within the

National Grid Wetland Area where Subsite-related metals were detected at concentrations above the corresponding Part 375 ecological SCOs. Samples collected in the National Grid Wetland Area in connection with investigations for National Grid (then Niagara Mohawk) were analyzed for SVOCs and VOCs. Detectable concentrations of SVOCs and VOCs were below the corresponding 6 NYCRR Part 375 SCOs for unrestricted use. PCB concentrations greater than the Part 375 SCO for the protection of ecological resources extended west, approximately 660 feet along the ditch.

The wetland located on the northern portion of the National Grid property was sampled between 2001 and 2008 during a series of efforts to evaluate the extent of contamination within the wetland. Results of these investigations showed PCB Aroclors 1242, 1248, and 1260 in wetland soil at concentrations greater than the Part 375 unrestricted SCO, ranging from 0.11 mg/kg to 14,000 mg/kg PCBs. These detections were encountered as deep as 2.75 feet. Contamination in the western half of the wetland extends approximately 140 feet to the south, and in the eastern half of the wetland extends approximately 230 feet to the south, where detectable concentrations of PCBs and Subsite-related metals were below the corresponding Part 375 unrestricted SCOs.

As part of the Former Landfill IRM hot spot excavation, confirmatory samples were obtained from the National Grid Wetland Area. Analytical results indicated concentrations greater than the Part 375 unrestricted SCO in four samples ranging from 0.1 mg/kg to 42 mg/kg.

Factory Avenue Area

The majority of the soil samples collected in the Factory Avenue Area (see Figure 2) are associated with efforts to bound the northern extent of the excavations from the Former Landfill IRM and the Former Drainage Swale IRM in the vicinity of a National Grid gas line that runs parallel to the northern property boundary and Factory Avenue. Samples collected in the immediate vicinity of the National Grid gas line, exhibiting concentrations greater than the Part 375 unrestricted use SCO, ranged from 0.13 mg/kg to 18,000 mg/kg PCBs. The higher concentrations are associated with the edge of hot spots and the former drainage swale, located approximately 8 to 10 feet bgs (0.13 mg/kg to 18,000 mg/kg PCBs), and surface soils in the vicinity of the new access road to the Former Landfill (1.4 mg/kg to 54 mg/kg PCBs). In addition, samples east of this area exhibited relatively low concentrations of PCBs but greater than the Part 375 unrestricted use SCO ranging from 0.16 mg/kg to 1.25 mg/kg.

Samples collected along the shoulder of Factory Avenue in connection with roadway improvements at the Factory Avenue and LeMoyne Avenue intersection indicated the presence of PCBs (not detected to 8.8 mg/kg) and Subsite-related metals (2.1 mg/kg to 13.6 mg/kg arsenic; 5.17 mg/kg to 265 mg/kg chromium; 9.5 mg/kg to 219 mg/kg copper; 2.3 mg/kg to 398 mg/kg lead; 9.41 mg/kg to 97.9 mg/kg nickel; and 17.9 to 429 mg/kg zinc) at concentrations above corresponding Part 375 unrestricted SCOs, but generally below the commercial SCOs.

Sediment

GM-IFG sediment sample locations are depicted on Figure 2. To evaluate upstream conditions, samples were collected from Ley Creek upstream of Townline Road and from three upstream branches of Ley Creek: North Branch Ley Creek, South Branch Ley Creek and Sanders Creek. Samples collected from Ley Creek between Townline Road and Route 11 (on-site) as well as samples collected upstream of the Subsite exhibited concentrations of PCBs and Subsite-related metals (arsenic, chromium, copper, lead, nickel, zinc) above the NYSDEC sediment criteria (NYSDEC Technical Guidance for Screening Contaminated Sediments, January 1999) at the concentrations denoted in Table 1. Due to the limited deposition of sediment in the upstream and Subsite portions of the Creek, samples were only obtained to depths of two feet.

For comparison purposes, Table 2 provides sediment criteria for the Subsite's metals from the NYSDEC Technical Guidance for Screening Contaminated Sediments (January 1999). It should be noted that PCBs are the primary risk driver for all pathways for this Subsite (see the "Summary of Subsite Risks" section, below).

Surface Water

Surface water samples were collected during four sampling events between 1996 and 2002 in Ley Creek and in the drainage ditch that runs along the south side of Factory Avenue.

Applicable screening values from the NYSDEC's Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1., Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June 1998) were used to evaluate surface water detections.

Analytical results indicate that chlorinated VOCs, PCBs, and metals were detected in the surface water samples. With the exception of PCBs, concentrations were below applicable surface water standards.[8] PCB Aroclor 1248 was detected above the

[8] Technical and Operational Guidance Series Number 1.1.1. New York State Ambient Water Quality Standards and Guidance Values (NYSDEC, 1998b); National Recommended Ambient Water Quality Criteria (EPA, 2009a); EPA Region 3 Biological Technical Assistance Group Freshwater Screening Benchmarks (EPA, 2006A); and ECO Update: Ecotox Thresholds (EPA, 1996)

standards of 0.00012 micrograms per liter (µg/L) (wildlife protection) and 0.000001 µg/L (protection of human consumers of fish) in one sample collected between Townline Road and Route 11 at 0.04 µg/L, and in one sample collected from the drainage ditch along Factory Avenue at 0.51 µg/L. PCBs were not detected in upstream surface water samples (detection limits range from 0.5 to 1 µg/L). It should be noted that typical detection limits for PCBs in water are greater than the surface water standards discussed above (see Figure 2).

Biota

Fish and crayfish tissue were collected as an additional line of evidence to assess risk to the fish and benthic community, respectively, and as measured inputs to the piscivorous food chain models. Biota data are described with respect to samples collected in Ley Creek upstream of Townline Road (including three upstream branches of Ley Creek, North Branch Ley Creek, South Branch Ley Creek and Sanders Creek) and from the Subsite (*i.e*., from Townline Road to Route 11).

SVOCs, PCBs and certain Subsite-related metals (chromium, copper and zinc) were detected in biota samples (fish and macro-invertebrates) collected from the Subsite and in samples collected upstream of the Subsite. Average and maximum detected concentrations for copper in upstream fish tissue samples were higher than in samples collected from the Subsite. Average concentrations of zinc and the maximum concentration of bis(2-ethylhexyl)phthalate were also found to be higher upstream of the Subsite. Average concentrations of non-Subsite-related metals manganese and mercury/methylmercury were also found at higher concentrations in samples collected upstream of the Subsite. In addition, maximum concentrations of mercury and methylmercury were higher upstream than within the Subsite reach.

The average total PCB fish tissue concentration in samples from the Subsite reach were higher than from samples collected upstream of the Subsite (1.91 mg/kg versus 1.14 mg/kg). In fish tissue, the average and maximum detected concentrations for three out of seven inorganic constituents (copper, mercury, methyl mercury) were higher upstream than in the Subsite reach. Average concentrations of manganese and zinc and the maximum concentration of bis(2-ethylhexyl)phthalate were also identified as higher upstream.

Both the average and maximum invertebrate tissue constituent concentrations for three Subsite-related metals (chromium, copper, and zinc) were lower within the Subsite reach than upstream. Both the average and maximum invertebrate tissue concentrations for four non-Subsite-related metals (barium, cadmium, manganese and methylmercury) were lower in the Subsite reach than upstream. Additionally, non-Subsite-related mercury was detected in invertebrate tissue from upstream, but not within the Subsite reach.

The average total PCB invertebrate tissue concentration for samples collected from the Subsite reach were higher than from samples collected upstream of the Subsite (0.52 mg/kg versus 0.25 mg/kg).

In summary, PCB Aroclor 1248 in fish fillets average and maximum tissue concentration exceeded the respective upstream concentration by more than one order of magnitude. For crayfish, PCB Aroclor 1248, lead and nickel were detected in Subsite tissue, but not in upstream tissue. Also, PCB Aroclor 1242 was detected in whole fish tissue from the Subsite but not upstream.

CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

Land Use

As was noted in the “Ley Creek Hydrology” section, above, Ley Creek is a Class B stream. The Ley Creek drainage basin can generally be described as a highly urbanized area. Portions of the city of Syracuse and the towns of Cicero, Clay, DeWitt, Manlius, and Salina are located in the Ley Creek drainage basin. Also located in the Ley Creek watershed are interstate highways, a National Grid electrical transfer station, Syracuse International Airport, and the Air National Guard's Hancock Field. Large areas of impermeable surfaces in the Ley Creek watershed cause rapid runoff during storms and corresponding rapid rising of flow and water levels.

The Ley Creek Floodplain Area is a portion of the Federal Emergency Management Agency (FEMA) 100-year floodplain between Townline Road and Route 11 (excluding the Ley Creek PCB Dredgings subsite). Ley Creek is not currently used as a public water supply, and there is no commercial transportation use of the Creek. The Ley Creek Floodplain Area is zoned as mixed commercial and residential with some stretches of undeveloped land between the northern bank of Ley Creek and the New York State Thruway.

The National Grid Wetland is located in the northern portion of property owned by the utility company National Grid, directly to the west of the former GM-IFG facility. This wetland is an approximately 10-acre portion of a New York State-regulated wetland known as SYE-6. The National Grid property is currently zoned for industrial use.

The Factory Avenue Area is a narrow roadway shoulder and storm water drainage ditch located between the northern former GM-IFG facility property boundary and Factory Avenue. The area extends from the northwestern corner of the facility property to Townline Road. The Factory Avenue Area is characterized by maintained grass and is a corridor for overhead and underground utilities. Specifically, a natural gas pipeline and an Onondaga County sanitary sewer are present underground along this corridor. The Ley Creek PCB Dredgings subsite is located across Factory Avenue to the north of this area. This area is currently zoned for industrial use.

The Factory Avenue/LeMoyne Avenue Intersection Area is located north of Factory Avenue in the vicinity of LeMoyne Avenue down to the Route 11 Bridge. This area is currently zoned for commercial use.

SUMMARY OF SUBSITE RISKS

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario:

- *Hazard Identification* – uses the analytical data collected to identify the contaminants of potential concern (COPC) at the site for each medium, with consideration of a number of factors explained below;
- *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed;
- *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and
- *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the National Contingency Plan (NCP) as an excess lifetime cancer risk greater than 1×10^{-6} – 1×10^{-4} or a Hazard Index greater than 1.0; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, COPCs in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence and bioaccumulation. The area along the Ley Creek corridor mostly commercial properties and some residences, with some stretches of undeveloped land between the northern bank of Ley Creek and the New York State Thruway. Future land use along the creek is expected to remain the same. The baseline risk assessment began by selecting COPCs in surface water, floodplain soil, sediment and fish. The COCs are PCBs in sediment and soil. A comprehensive list of all COPCs can be found in the Baseline Human Health Risk Assessment (BHHRA) in the administrative record. Only the COCs are listed in Table 3.

<u>Exposure Assessment</u>

Consistent with Superfund policy and guidance, the Exposure Assessment assumes no remediation or institutional controls to mitigate or remove hazardous substance releases have been undertaken. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the site. The RME is defined as the highest exposure that is reasonably expected to occur at a site.

Ley Creek is a New York State Class B fresh surface water, which, pursuant to 6 NYCRR § 701.7, means the best usages for the Creek are primary and secondary contact recreation and fishing. Class B waters are suitable for fish, shellfish and wildlife propagation and survival. The Creek itself is not used commercially, although it is accessible for fishing or other recreation. While access to Ley Creek within the OU2 portion of the Subsite is unrestricted, it is difficult to reach in many areas because of thick vegetation. The fish species found during recent investigations include bluegill, pumpkinseed, shiners, bullhead and carp, most of them smaller than six inches in size.

The BHHRA evaluated potential risks to populations associated with both current and potential future land uses. Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for the surface water, sediment, floodplain soils and fish. Based on the current zoning and anticipated future use, the risk assessment focused on a variety of possible receptors, including:

- Current and Future child fish consumers: children (0-6 years old) who may consume fish caught in Ley Creek.
- Current and Future Adult and Older Child Fisherperson: adults and older children/adolescents (6-18 years old) who may consume locally-caught fish, as well as come into contact with surface water, surface sediment in Ley Creek and surface soil in the floodplain of Ley Creek.
- Current and Future Adult and Adolescent Trespassers: adults and adolescents (12-18 years old) who may come in contact with surface water and surface soil in the Ley Creek Floodplain Area, National Grid Wetland and Factory Avenue Area.
- Future Dredge Worker: adults who may come in contact with surface water, surface and subsurface sediment and surface soil in Ley Creek and the Floodplain Area while performing periodic maintenance dredging of Ley Creek.
- Future Utility Workers: adults who may perform short-term intrusive work for underground utility installation, maintenance, or repair and may come in contact with surface and subsurface soil in the Ley Creek Floodplain, National Grid

Wetland and Factory Avenue Area.

Because of different activity patterns and the physical separation of the contaminated areas, the above receptors were evaluated for using exposure units:

- EU1: includes Ley Creek and Ley Creek Floodplain Area (Child Fish Consumer, Older Child Fisherperson, Adult Fisherperson and Dredge Worker).
- EU2: includes Ley Creek Floodplain, National Grid Wetland and Factory Avenue Area (Adolescent Trespasser, Adult Trespasser and Utility Worker).

A summary of all the exposure pathways included in the BHRRA can be found in Table 4 Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper-bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in each medium can be found in Table 3, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the BHHRA.

Toxicity Assessment

In this step, the types of adverse health effects associated with contaminant exposures and the relationship between magnitude of exposure and severity of adverse health effects were determined. Potential health effects are contaminant-specific and may include the risk of developing cancer over a lifetime or other noncancer health effects, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some contaminants are capable of causing both cancer and noncancer health effects.

Under current EPA guidelines, the likelihood of carcinogenic risks and noncarcinogenic hazards due to exposure to site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information is presented in Table 5. Additional toxicity information for all COPCs is presented in the BHHRA.

Risk Characterization

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated drinking water) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the HQs for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (*i.e*., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1.0, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1.0 to evaluate the potential for noncarcinogenic health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. A summary of the noncarcinogenic hazards associated with these chemicals for each exposure pathway is provided in Table 6. The potential for adverse, noncarcinogenic health effects was indicated for:

- Older Child and Adult Fisherpersons in EU1. The hazard was attributable to PCBs in surface sediment.
- Adolescent and Adult Trespassers in EU2. The hazard was attributable to PCBs in surface soil.
- Utility Workers in EU2. The hazard was attributable to PCBs in surface and subsurface soils.

The noncarcinogenic hazards for the COCs estimated for other receptors were less than 1. All noncarcinogenic hazards associated with exposure to surface water and fish consumption are within EPA's acceptable levels.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the National Contingency Plan, the acceptable risk range for site-related exposure is 1×10^{-6} to 1×10^{-4}.

There were no carcinogenic risks for COCs greater than 1×10^{-4}.

In summary, the results of the BHHRA indicate that there are noncarcinogenic health hazards to potentially exposed populations in all exposure units from exposure to sediment and soil contaminated with PCBs. The risks and hazards from the Ley Creek Floodplain Hot-Spot Exposure Area were not quantitatively evaluated in the BHHRA. Based on the screening of this area, the compounds detected would require preventative measures to protect public health under any scenario. The noncarcinogenic hazards and carcinogenic risks from all COPCs can be found in the BHHRA.

<u>Uncertainties</u>

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling

- exposure parameter estimation
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the site, and is highly unlikely to underestimate actual risks related to the site.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the risk assessment report.

Ecological Risk Assessment

A BERA was prepared for the Subsite in accordance with the NYSDEC's Fish and Wildlife Impact Analysis guidance and the EPA's Ecological Risk Assessment Guidance for Superfund. The BERA can be found in Appendix E of the RI report.

The process used for assessing Subsite-related ecological risks includes:

Problem Formulation - a qualitative evaluation of contaminant release, migration, and fate; identification of COCs, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study;

Exposure Assessment - a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations;

Ecological Effects Assessment - literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors; and

Risk Characterization - measurement or estimation of both current and future adverse effects.

The BERA addressed several distinct exposure areas which were most likely to be utilized by ecological receptors. Those areas were defined as the Ley Creek Exposure Area, Ley Creek Floodplain Exposure Area, and the National Grid Wetland Exposure Area. Aquatic receptors were evaluated in the Ley Creek Exposure Area and terrestrial receptors were evaluated in the Ley Creek Floodplain Exposure Area and the National Grid Wetland Exposure Area.

Ley Creek Exposure Area

Potentially unacceptable risks to aquatic ecological receptors in the Ley Creek Exposure Areas were identified and assessed using quantitative lines of evidence. Screening results indicated that risks to the benthic invertebrate community are likely the result of direct contact exposures to total PCBs and PAHs.

Food chain models for piscivorous birds (belted kingfisher and great blue heron) and semi-piscivorous mammals (mink) were evaluated to determine the viability and function of the piscivorous bird and mammal communities at Ley Creek. Two constituents (methylmercury and total PCBs) had NOAEL-based hazard quotients (HQs)[9] greater than or equal to one for the belted kingfisher. Only one constituent (methyl mercury) had a NOAEL-based HQ greater than one for the great blue heron. However, methyl mercury is not a Subsite-related constituent. Therefore, risks to the piscivorous bird community from Subsite-related contaminants are considered to be minimal. Risk from food chain exposures to the semi-piscivorous mammal community (mink) are driven primarily by methyl mercury and total PCBs, with total PCBs having HQ exceedances of both NOAEL and LOAEL values. Risks from methyl mercury are not considered to be Subsite-related.

Ley Creek Floodplain Area

Potentially unacceptable risks to community-level ecological receptors of the Ley Creek Floodplain Area were identified by comparing soil and sediment concentrations to screening values protective of ecological receptors. Evaluation of risk to community-level receptors at the Ley Creek Floodplain Area indicated that there is a potential ecological risk and that the primary risk drivers to the terrestrial plant community are total PCBs and

[9] An HQ is the ratio of the potential exposure to a substance and the level at which no adverse effects are expected. If the HQ is calculated to be less than 1, then no adverse health effects are expected as a result of exposure.

metals (chromium, copper, lead and zinc). Risk to soil invertebrates is also driven by metals (chromium, copper, lead, and zinc) and total PCBs. The food chain model for insectivorous birds (American robin) indicated potential risk from metals and total PCBs. Risk to insectivorous mammals (short-tailed shrew) at the Ley Creek Floodplain Area is driven by metals (copper and zinc) and total PCBs.

National Grid Wetland Area

Potentially unacceptable risks to community-level ecological receptors of the National Grid Wetland Area were identified by comparing soil and sediment concentrations to screening values protective of ecological receptors. Evaluation of risk to community-level receptors at the National Grid Wetland Area indicated that there is a potential ecological risk and that the primary risk drivers to the terrestrial plant community are metals (chromium, copper, lead, and zinc) and total PCBs. Risk to soil invertebrates is also driven by metals (chromium, copper, nickel, and zinc) and total PCBs. The food chain model for insectivorous birds (American robin) indicated potential risk from metals, total PCBs and bis(2-ethylhexyl)phthalate. Risk to insectivorous mammals (short-tailed shrew) at the National Grid Wetland Area is driven by metals (chromium and copper) and total PCBs.

Summary of Human Health Risks and Ecological Risks

The results of the human health risk assessment indicate that the contaminated sediments and soils present an unacceptable human exposure risk and the ecological risk assessment indicates that the contaminated soils and sediments pose an unacceptable ecological exposure risk.

Based upon the results of the RI and the risk assessments, the NYSDEC and the EPA have determined that actual or threatened releases of hazardous substances present at this Subsite, if not addressed by the selected remedy or one of the other active measures considered, may present a current or potential threat to human health and the environment.

Basis for Action

Based upon the quantitative human-health risk assessment and ecological evaluation, the NYSDEC and the EPA have determined that actual or threatened releases of hazardous substances from the Subsite, if not addressed by the response action selected in this ROD, may present a current or potential threat to human health and the environment. The response action selected in the ROD is necessary to protect the public health or welfare of the environment from actual or threatened releases of contaminants into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect public health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels established using the risk assessments.

The following RAOs have been established for OU2:

- Reduce or eliminate any direct contact and ingestion threat to public health associated with contaminated soils and sediments;
- Minimize exposure of ecological receptors to contaminated soils and sediments; and
- Reduce the health hazards associated with eating fish from Ley Creek by reducing the concentration of contaminants in fish.

These RAOs are consistent with the current and reasonably anticipated future use of the discrete Subsite areas, continued industrial use for the neighboring National Grid property (except for ecological use within and adjacent to the wetland); ecological use for areas in the Ley Creek floodplain, except for areas of residential use where the residential use SCO is lower than the ecological use SCO (*i.e.*, chromium); and commercial use of the property along Factory Avenue.

Remediation Goals

To satisfy the direct-contact RAO, for the soils discussed in the “Results of the Remedial Investigation” section, above, NYSDEC and the EPA have adopted NYSDEC’s 6 NYCRR Part 375 (NYSDEC Division of Environmental Remediation Environmental Remediation Programs, effective December 14, 2006) SCOs as the soil remediation goals for this action. SCOs are based on the lowest concentration for the protection of human health, ecological exposure or groundwater depending upon the anticipated future use of a site.

EPA and NYDEC have concluded that the 6 NYCRR Part 375 restricted use soil SCOs are protective for the anticipated current and future human health exposures for the majority of the areas to be addressed under OU2 (see Table 7). SCOs for unrestricted use are also identified (see Table 8) as remediation goals. Soil Alternative 2, below, identifies the areas that would be addressed using the restricted use SCOs. In keeping with Superfund policy, the FS also considered whether using the unrestricted use SCOs might result in a more comprehensive and effective remedy over the long term at a comparable cost (Alternative 3).

There are no federal or New York State cleanup standards for PCB contamination in sediment. For sediments, a 1 mg/kg PCB remedial action objective will be applied, as it is a previously-selected sediment cleanup goal at New York State hazardous waste sites and has been determined to be protective of human health and the environment for this Subsite. In addition, the 1 mg/kg PCB sediment cleanup objective is consistently evaluated and often applied when remediating PCB-contaminated sediments in New York State. PCBs are the primary ecological risk driver and are collocated with the majority of the other sediment COCs. As discussed in the "Summary of Remedial Alternatives" section below, the FS also considered a remediation goal of 0.28 mg/kg that would remediate PCBs in sediments to a level consistent with the average upstream PCB concentration in Ley Creek.

A fish consumption advisory, which is updated annually by the New York State Department of Health (NYSDOH), currently indicates that the consumption of fish from Onondaga Lake and its tributaries (including Ley Creek) should be limited because of, in part, PCBs and mercury which have been found to be present in the tissue of certain Onondaga Lake fish.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA § 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA § 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state ARARs, unless a waiver can be justified pursuant to CERCLA § 121(d)(4), 42 U.S.C. § 9621(d)(4).

Capping was screened out in the FS due to limited implementability. Sediment depths to the hardpan in the Creek are generally two feet or less. Excavation of at least two feet of the sediment would be required in order to install a protective sediment cap and maintain the existing bathymetry for flood control purposes. This would remove the contamination and, thus, eliminate the need for capping of the sediment. In addition, while there are some limited areas (within the National Grid Wetland Area) where soil contamination is present at depths of 8-10 feet, contamination is generally located within the top two feet of soil. If the installation of a soil cap in the floodplains was to occur, then soil excavation to a depth of two feet would be necessary, prior to installing a protective soil cover, to preserve flood control in the floodplain area. A two-foot excavation would result in removal of the contamination in most areas and would, in essence, render the installation of a cap unnecessary.

The remedial alternatives are as follows:

Sediment Alternative 1: No Action

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the problem of sediment contamination at the Subsite.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA would require that the remedy be reviewed at least once every five years. If justified by the review, remedial actions may be required in the future to remove, treat or contain the wastes.

Capital Cost:	$0
Annual O&M[10] Cost:	$0
Present-Worth Cost:	$0
Construction Time:	none

Sediment Alternative 2: Monitored Natural Recovery

This alternative would rely upon monitored natural recovery (MNR) to achieve the RAOs related to the Ley Creek sediments from Townline Road to the Route 11 Bridge. The primary mechanisms of natural recovery that are expected to be acting to lessen the PCB concentrations in Ley Creek include chemical transformation, reduction in contaminant mobility/bioavailability, physical isolation and dispersion.

Long-term modeling and monitoring of the sediment, water column, and biota would be included under this alternative to confirm that contaminant reduction is occurring and that the reduction is achieving the RAOs. Monitoring would be conducted after completion of the other components of the OU remedy (*e.g.*, soils that might be an ongoing source of PCBs to the stream) to determine the effectiveness of MNR over the long term.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA would require that the remedy be reviewed at least once every five years.

[10] "O&M" denotes "operation and maintenance."

Capital Cost:	$0
Annual O&M Cost:	$24,000
Present-Worth Cost:	$300,000
Construction Time:	none

Sediment Alternative 3: Mechanical Excavation to Achieve 1 mg/kg PCB

This alternative would include mechanical excavation of contaminated sediment in the GM-IFG OU2 reach of Ley Creek exhibiting PCB concentrations greater than 1 mg/kg. Because PCBs are collocated with the majority of other COCs, and are the primary risk driver for all pathways for this Subsite (see the “Summary of Site Risks” section, above), they would be used as an indicator compound to ensure that the sediment cleanup goals are achieved. The estimated volume of material would be 9,600 cubic yards (CY) based on PCB concentrations in sediment exceeding the 1 mg/kg sediment cleanup criteria. Of the 9,600 CY of sediment exceeding 1 mg/kg PCB, it is estimated that 550 CY of sediment would require disposal at a TSCA-compliant facility. It is assumed that for reaches indicated for sediment removal, the sediment would be removed from bank to bank, to the extent practicable, until the unconsolidated bed material is reached. For volume estimation, an average excavation depth of 1.25 feet was assumed. It is assumed that excavated sediment would require dewatering prior to final off-site disposal, and that water treatment would be required prior to discharge.

Habitat restoration of Ley Creek would consist of placement of at least 0.5 feet of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas would be determined during the remedial design as part of a habitat restoration plan.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA would requires that the remedy be reviewed at least once every five years.

Capital Cost:	$6,320,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$6,520,000
Construction Time:	two years

Sediment Alternative 4: Mechanical Excavation to Achieve 0.28 mg/kg PCB[11]

This alternative would include the mechanical excavation of sediment exhibiting concentrations exceeding the average upstream PCB concentration of 0.28 mg/kg within Ley Creek. Because PCBs are collocated with the majority of other COCs, and are the primary risk driver for all pathways for this Subsite, they would be used as an indicator compound to ensure that the sediment cleanup goals are achieved. The estimated volume of target material associated with sediment removal in this alternative would be 13,200 CY. Of the 13,200 CY of sediment exceeding 0.28 mg/kg PCB, it is estimated that 550 CY of sediment would require disposal at a TSCA-compliant facility. Excavation limits for Sediment Alternative 4 assume removal of the full depth of sediments from bank to bank within Ley Creek between Townline Road and Route 11. For volume estimation, an average excavation depth of 1.25 feet was assumed. It is assumed that excavated sediment would require dewatering prior to final off-site disposal, and that water treatment would be required prior to discharge.

Habitat restoration of Ley Creek would consist of placement of at least 0.5 feet of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas would be determined during the remedial design as part of a habitat restoration plan.

Because this alternative would be expected to remove all of the sediment, and thus all of the contaminants in on-site sediment, a CERCLA five year review would not be required for this portion of the remedy.

Capital Cost:	$8,710,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$8,910,000
Construction Time:	two years

Soil Alternative 1: No Action

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the problem of soil contamination at the Subsite.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA would require that the

[11] 0.28 mg/kg PCB is the average upstream sediment concentration.

remedy be reviewed at least once every five years. If justified by the review, remedial actions may be required in the future to remove, treat or contain the contaminated soils.

Capital Cost:	$0
Annual O&M Cost:	$0
Present-Worth Cost:	$0
Construction Time:	none

Soil Alternative 2: Soil Excavation to Achieve Restricted SCOs

This alternative would include excavation of surface and subsurface soil to meet the restricted SCOs (see Table 7) consistent with current and reasonably anticipated future land use of discrete Subsite areas as follows:

- continued industrial use for the neighboring National Grid property (except for ecological use within and adjacent to the wetland);
- ecological use for areas in the Ley Creek floodplain, except for areas of residential use where the residential use SCO is lower than the ecological use SCO (*i.e*., chromium); and
- commercial use of the property along Factory Avenue.

The estimated volume of soil to be excavated under this alternative would be 15,000 CY. Most excavations are anticipated to be approximately 1 to 4 feet in depth; with some limited areas excavated to depths as deep as 6 feet within the Ley Creek floodplain hot spot.

It is assumed that National Grid Wetland soil/sediments would require dewatering prior to final soil disposal, and that water treatment would be required prior to discharge to Ley Creek.

Following excavation, the excavated soil and sediment would be subjected to Toxic Characteristic Leaching Procedure (TCLP) testing.[12] Those soils and sediments that are determined to be characteristic hazardous waste and are non-TSCA waste (*i.e.,* less than 50 mg/kg PCBs) would be disposed of at an appropriate Resource Conservation and Recovery Act (RCRA)-compliant facility. Those soils that contain PCBs greater than 50 mg/kg would be disposed of at an off-site TSCA-compliant facility. Those soils that

[12] TCLP testing is a soil sample extraction method for chemical analysis employed as an analytical method to simulate contaminant leaching. The testing methodology is used to determine if a waste is a characteristic hazardous waste under RCRA.

are not TSCA-regulated and are not characteristic hazardous waste would be properly disposed of either locally or at an appropriate nonlocal facility.

Appropriate controls and monitoring (*e.g*., community air monitoring) would be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable.

For costing purposes, approximately 5,800 CY of the soil excavated from the National Grid Wetland, and approximately 1,800 CY of material excavated from the vicinity of Factory Avenue are assumed to exhibit PCB concentrations above 50 mg/kg, and therefore, would need to be disposed of at an off-site TSCA-compliant facility. The remainder of excavated soils would be disposed at an off-site, permitted non-hazardous waste disposal facility.

There are limited areas where underground utilities are present at the Subsite. Due to the potential health and safety threat of excavating around and beneath underground utilities, soil may remain at concentrations above restricted SCOs in some areas following excavation. This would be addressed by a soil cover, institutional controls and as part of the Site Management Plan (SMP).

Clean fill meeting the requirements of the NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10), Appendix 5[13] would be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Subsite. With the exception of the Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas would be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue would be restored with a cover which would consist of an indicator fabric layer, as needed (*e.g*., for soil in the vicinity of underground utilities), overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.

A SMP would provide for the proper management of all post-construction remedy components. Specifically, the SMP would describe procedures to confirm that the requisite engineering (*e.g*., demarcation layer) and institutional controls are in place and that such controls continue to protect public health and the environment. The SMP would also detail the following: the provision for the management of future excavations in areas where contamination remains; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of any above-noted environmental easements and/or restrictive covenants; a provision for the performance of the O&M required for the remedy; and a provision that a property owner or party implementing the

[13] Allowable Constituent Levels for Imported Fill or Soil.

remedy submit periodic certifications that the institutional and engineering controls are in place.

Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA would require that the remedy be reviewed at least once every five years.

Capital Cost:	$7,410,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$7,610,000
Construction Time:	one year

Soil Alternative 3: Soil Excavation to Achieve Unrestricted SCOs

This alternative would include excavation of surface and subsurface soil exhibiting concentrations greater than SCOs for unrestricted use (see Table 8). It should be noted that the presence of underground utilities are likely to hinder full excavation along Factory Avenue and on the National Grid property near the access road.

The approximate volume of soil associated with Soil Alternative 3 would be 31,500 cubic yards with average excavation depths ranging from 0 to 10 feet bgs.

It is assumed that National Grid Wetland soil/sediment would require dewatering prior to final soil disposal, and that water treatment would be required prior to discharge to Ley Creek.

Following excavation, the excavated soil and sediment would be subjected to TCLP testing. Those soils and sediments that are determined to be characteristic hazardous waste and are non-TSCA waste (*i.e.,* less than 50 mg/kg PCBs) would be disposed of at an appropriate RCRA-compliant facility. Those soils that contain PCBs greater than 50 mg/kg would be disposed of at an off-site TSCA-compliant facility. Those soils that are not TSCA-regulated and are not characteristic hazardous waste would be properly disposed of either locally or at an appropriate non-local facility.

Appropriate controls and monitoring (*e.g*., community air monitoring) would be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable.

For cost purposes, approximately 5,800 CY of the soil excavated from the National Grid Wetland and approximately 1,800 CY of material excavated from the vicinity of Factory Avenue are assumed to exhibit PCB concentrations above 50 mg/kg and therefore would need to be disposed of at an off-site TSCA-compliant facility. The remainder of excavated soils would be disposed at an off-site, permitted non-hazardous waste disposal facility.

There are limited areas where underground utilities are present at the Subsite. Due to the potential health and safety threat of excavating around and beneath underground utilities, soil may remain at concentrations above unrestricted SCOs in some areas following excavation. In such a case, a soil cover, institutional controls and a SMP would address such area(s).

Clean fill meeting the requirements of DER-10, Appendix 5 would be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Subsite. With the exception of the Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas would be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue would be restored with a cover which would consist of an indicator fabric layer, as needed (*e.g*., for soil in the vicinity of underground utilities), overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.

A SMP would provide for the proper management of all post-construction remedy components. Specifically, the SMP would describe procedures to confirm that the requisite engineering (*e.g*., demarcation layer) and institutional controls are in place and that such controls continue to protect public health and the environment. The SMP would also detail the following: the provision for the management of future excavations in areas where contamination remains; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of any above-noted environmental easements and/or restrictive covenants; a provision for the performance of the O&M required for the remedy; and a provision that a property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

While the goal of this action would be to achieve the unrestricted use SCOs, the presence of underground utilities is likely to prevent this outcome, resulting in residual contaminated soils, in utility rights-of-way, above levels that allow for unrestricted use and unlimited exposure. Therefore, contaminants remaining on-site, CERCLA would require that the remedy be reviewed at least once every five years.

Capital Cost:	$13,200,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$13,400,000

Construction Time: one year

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA §121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial response measures pursuant to the NCP, 40 CFR §300.430(e)(9) and OSWER Directive 9355.3-01. The detailed analysis consisted of an assessment of the individual response measure against each of the nine evaluation criteria in the FS report. This section profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other alternatives under consideration.

Threshold Criteria *- The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet to be eligible for selection as a remedy.*

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1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

In order to be protective, the sediment remedial alternatives considered would need to address the migration of PCBs from sediments; control contaminated sediment transport; and reduce potential exposures to contaminated sediments, whereas, the soil remedial alternatives considered would need to reduce potential exposures to contaminated soils. Each of the action alternatives presented (Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3) would protect human health and the environment via removal (excavation) of contaminated sediments and soils, respectively, and for the soil alternatives, covering residual contaminated soils as needed. Sediment Alternative 1 and Soil Alternative 1 (the No Further Action alternatives) would not be protective of human health and the environment because they would not address the PCBs in the sediments and soil, which present human health and ecological risks. It is highly uncertain whether the limited action alternative, Sediment Alternative 2 (Monitored Natural Recovery) would eventually lead to PCB levels in sediment that are protective of human health and the environment.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Section 121 (d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA section 121(d)(4). Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those State standards identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those State standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for an invoking waiver.

SCOs are New York State cleanup standards designed for the protection of groundwater, ecological resources and human health, and are identified in 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, effective December 14, 2006. There are currently no federal or state promulgated standards for contaminant levels in sediments. There are, however, other federal or state advisories, criteria, or guidance (which are used as TBC criteria). Specifically, NYSDEC's sediment screening values are a TBC criteria.

The chemical-specific ARARs for PCBs in the water-column are 0.014 µg/L for protection of aquatic life (criterion continuous concentration [chronic] federal water quality criterion for fresh water), 0.00012 µg/L (NYS standard for protection of wildlife) and the 0.000001 µg/L (New York State standard for protection of human consumers of fish). These chemical-specific ARARs for the surface water would not be expected to be met by the implementation of any of the alternatives. This is due to upstream surface water concentrations that likely exceed these ARARs due to the ubiquitous nature of PCBs, especially within an urban drainage system.

Because the contaminated sediments and soils would not be addressed under Sediment Alternative 1 and Soil Alternative 1, these alternatives would not achieve the sediment cleanup goals, the sediment screening criteria, nor the SCOs. There is a high degree of uncertainty that Sediment Alternative 2 would achieve the sediment cleanup goals and, therefore, little evidence that it would be effective in the long-term.

Soil Alternatives 2 and 3 would attain the respective SCOs. Sediment Alternatives 3 and 4 would meet their respective cleanup goals for PCBs in sediment. Sediment Alternative 4, which would meet the sediment screening criteria as achieving the background concentration for PCBs, would require removal of all sediment in the Creek. During sediment excavation for Sediment Alternatives 3 and 4, any increases in PCB concentrations in the surface water of Ley Creek due to excavation would be expected to be short term. Sufficient engineering controls would be utilized during excavation to prevent or minimize resuspension of contaminated sediments and exceedances of surface water ARARs (above background conditions) downstream of the work zone. Furthermore, compliance with the discharge limits (to be established by NYSDEC, as needed) should ensure that there are no exceedances of surface water ARARs caused by the discharge from on-site water treatment to the extent practicable. Also, any water quality impacts would meet the substantive water quality requirements imposed by New York State on entities seeking a dredged material discharge permit under Section 404 of the Clean Water Act (CWA). For the action alternatives, other action-specific ARARs to be met include CWA Sections 401 and 402; the Rivers and Harbors Act Section 10; the New York Environmental Conservation Law (ECL) Article 15 Water Resources, Article 17 Water Pollution Control and Article 27 Collection, Treatment and Disposal of Refuse and Other Solid Waste; and associated implementing regulations.

Under Soil Alternatives 2 and 3, clean fill meeting the requirements of the DER-10, Appendix 5 would be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Subsite. Because Soil Alternatives 2 and 3 would involve the excavation of contaminated soils, and Sediment Alternatives 3 and 4 would require dewatering and processing of sediments, compliance with fugitive dust regulations would be addressed as necessary. In addition, the Soil Alternatives 2 and 3 and Sediment Alternatives 3 and 4 would be subject to New York State and federal regulations related to the transportation and off-site treatment/disposal of wastes.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 would comply with RCRA, which is the federal law addressing the storage, transportation and disposal of solid and hazardous waste. NYSDEC implements RCRA in New York under ECL Article 27. Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 would comply with TSCA's PCB cleanup and disposal regulations (40 CFR Part 761).

***Primary Balancing Criteria** - The next five criteria, criteria 3 through 7, are known as "primary balancing criteria." These criteria involve the assessment of factors between response measures so that the best option will be chosen, given site-specific data and conditions.*

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3. Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain on site following remediation and the adequacy and reliability of controls.

Sediment Alternatives 1 and 2 and Soil Alternative 1 would not provide long-term effectiveness or permanence because they do not take any action to prevent exposures to or mobilization of PCBs.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 are each effective in the long-term and each provides permanent remediation, to varying degrees, by removal and off-site disposal of contaminated sediments and soils. Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 would provide increasing degrees of long-term effectiveness and permanence as each successive alternative calls for further removals of sediment or soil, respectively.

For Soil Alternatives 2 and 3, institutional controls would be needed to restrict intrusive activities in areas where soil contamination remains. Even implementation of Soil Alternative 3, which calls for the excavation of soils exceeding unrestricted SCOs, would likely result in some soils remaining in the vicinity of buried utilities that would warrant institutional controls. The data does not indicate that Sediment Alternative 4 would achieve added benefit over Sediment Alternative 3 to those ecological receptors identified in the BERA as showing risk from PCBs in the sediments.

Because Sediment Alternatives 1, 2 and 3 and all of the soil alternatives would result in residual contamination, five-year reviews would be required. In addition, the fish advisory that applies to Onondaga Lake and all tributaries up to the first impassible barrier would continue to apply to this reach of Ley Creek.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 would maintain reliable protection of public health and the environment over time.

4. Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

None of the alternatives include treatment.

Sediment Alternatives 1 and 2 and Soil Alternative 1 would provide no reduction in toxicity, mobility or volume. Under each of the other alternatives, the mobility of contaminants would be reduced to varying degrees via excavation and proper disposal of excavated soils or sediments.

5. Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Sediment Alternatives 1 and 2 and Soil Alternative 1 do not involve any construction work, so there would be no short-term impacts.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 could present some risk of limited adverse impacts to remediation workers through dermal contact and inhalation (through fugitive dust) related to sediment or soil excavation activities. Noise from the excavation work associated with the action alternatives could impact remediation workers and nearby residents. These potential short-term impacts would, however, be mitigated by following appropriate health and safety protocols, the implementation of engineering controls developed during remedial design, and by following appropriate construction practices.

A wetlands assessment and restoration plan would be prepared for any wetlands impacted or disturbed by the remedial activities. CWA Section 404, Protection of Wetlands E.O. 11990, EPA's Statement of Procedures on Floodplain Management and Wetlands Protection and Management Practices (according to Federal Register Vol. 51, No. 219, Part 330.6) will be followed to minimize unavoidable impacts to wetlands to the maximum extent practicable while designing/implementing the remedy.

There would be some short-term impacts to aquatic and upland wildlife habitat areas for each of the action alternatives due to excavation of soil and sediment. These impacts would be greatest for Sediment Alternative 4, because the entire reach of Ley Creek would be dredged from bank to bank, and Soil Alternative 3, because the greatest surface area of upland habitat would be excavated. Habitat reconstruction and appropriate monitoring provisions would be implemented to mitigate these short-term impacts. Potential for exposures to fish and other biota due to resuspension of sediments caused by excavation under Sediment Alternatives 3 and 4 would be minimized through the use of engineering controls developed during remedial design and appropriate construction practices.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 include off-site transport of several thousand CY of contaminated sediments or soils, but this would have minimal impact on local traffic due to accessibility and proximity to truck routes and the New York State Thruway.

There is a potential for increased storm water runoff and erosion during construction of Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 that would require management to prevent or minimize any adverse water quality impacts.

Because no actions would be performed under Sediment Alternative 1 and Soil Alternative 1, there would be no time required for implementation. Sediment Alternative 2 requires no construction, but would require some time to develop a monitoring plan. Sediment Alternatives 3 and 4 are estimated to be completed within two years from the start of construction, and Soil Alternatives 2 and 3 are estimated to be completed within one year from the start of construction.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Sediment Alternative 1 and Soil Alternative 1 are the easiest alternatives to implement, as there is no action to undertake. Sediment Alternative 2 is the next easiest alternative to implement because it only provides for Subsite monitoring, which is readily implementable.

Sediment Alternatives 3 and 4 and Soil Alternative 2 are readily implementable. Requisite equipment and services for each of these alternatives are readily available and have been used successfully at numerous sites to remediate contaminated soils and sediment. However, attaining unrestricted SCOs called for by Soil Alternative 3 is likely not implementable due to the presence of underground utilities that would likely require an undisturbed buffer zone in order to prevent exposures to site workers and/or damage to utilities.

7. Cost

Includes estimated capital and O&M costs, and net present worth value of capital and O&M costs.

The present-worth costs were calculated using a discount rate of seven percent and a thirty-year time interval for post-construction monitoring and maintenance period.

The estimated capital, annual O&M, and present-worth costs for each of the alternatives are presented below. The estimated costs for the action alternatives are directly related to the given alternative's corresponding total volumes of soil and sediments to be excavated.

Alternatives	Capital	Annual O&M	Total Present Worth
Sediment Alternative 1: No Action	$0	$0	$ 0
Sediment Alternative 2: MNR	$0	$24,000	$300,000
Sediment Alternative 3: Excavation to 1 mg/kg PCB	$6,320,000	$16,000	$6,520,000
Sediment Alternative 4: Excavation to 0.28 mg/kg PCB	$8,710,000	$16,000	$8,910,000
Soil Alternative 1: No Action	$0	$0	$ 0
Soil Alternative 2: Excavation to 1 mg/kg PCB	$7,410,000	$16,000	$7,610,000
Soil Alternative 3: Excavation to 0.1 mg/kg PCB	$13,200,000	$16,000	$13,400,000

***Modifying Criteria** - The final criteria 8 and 9, are known as "modifying criteria." Community and support agency acceptance are factors that are assessed by reviewing comments received during the public comment period, including new information made available after publication of the proposed plan that significantly changes basic features of the remedy with respect to scope, performance, or cost.*

8. State Acceptance

Indicates whether, based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected response measure.

NYSDEC is the lead agency for this Subsite. The EPA has determined that the selected remedy meets the requirements for a remedial action as set forth in CERCLA Section 121, 42 USC § 9621. As such, for the purpose of satisfying this remedy selection criterion of the NCP, NYSDEC, on behalf of New York State, supports the selected remedy. NYSDOH also supports the selection of this remedy; its letter of concurrence is attached (see Appendix IV).

9. Community Acceptance

Summarizes the public's general response to the response measures described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

Comments received during the public comment period are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a site, wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The principal threat concept is applied to the characterization of source materials at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or will present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using those remedy-selection criteria that are described above. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Based upon EPA's guidance, PCBs above 500 mg/kg in industrial areas that cannot be reliably contained and would present a significant risk to human health or the environment should exposure occur are generally considered a principal threat waste. There were only eight discontinuous soil sampling locations within the National Grid Wetland and Factory Avenue Areas where PCB concentrations exceeded 500 mg/kg (most soils are below 50 mg/kg PCBs); therefore, overall, these soils do not constitute a principal threat waste.

Soil Alternatives 2 and 3 would address the PCB-contaminated soil through excavation.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives and public comments, NYSDEC and the EPA have determined that Sediment Alternative 3 (mechanical excavation to achieve 1.0 mg/kg PCB), and Soil Alternative 2 (soil excavation to achieve restricted SCOs), best satisfy the requirements of CERCLA Section 121, 42 U.S.C. § 9621, and provide the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, set forth at 40 CFR § 300.430(e)(9).

With respect to soils, both Soil Alternative 2 and Soil Alternative 3 are protective because their respective soil cleanup objectives are at least as stringent as the NYSDEC restricted use SCOs. The additional environmental benefit associated with Soil Alternative 3 relative to Soil Alternative 2 would not be commensurate with the additional cost ($5.8 million), because the reasonably anticipated future use for the Subsite is a mixture of restricted uses, including industrial, commercial and residential, and Soil Alternative 3 may still result in remaining concentrations above unrestricted SCOs in areas where underground utilities are present.

With respect to sediment, Sediment Alternative 3 and Sediment Alternative 4 are protective because their respective sediment cleanup values are at least as stringent as the risk-based sediment cleanup value derived from the BERA. Data does not indicate that using a cleanup objective of 0.28 mg/kg instead of 1 mg/kg would achieve added benefit to those ecological receptors identified in the BERA as showing risk from PCBs in the sediments. Therefore, while additional sediment would be removed under Sediment Alternative 4, at additional cost ($2.4 million), both alternatives are protective.

The selected remedy is technically and administratively feasible and implementable. All of the necessary personnel, equipment and services required are expected be readily available.

The selected remedy would provide the best balance of tradeoffs among alternatives with respect to the evaluating criteria. The EPA and NYSDEC believe that the selected remedy would be protective of public health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

Description of the Selected Remedy

The selected remedy for OU2 of the Subsite, Sediment Alternative 3: Mechanical Excavation to Achieve 1 mg/kg PCB and Soil Alternative 2: Soil Excavation to Achieve

Restricted SCOs, includes the following components:

- Mechanical excavation of an estimated 9,600 CY of sediment in Ley Creek exceeding 1 mg/kg PCBs. It is assumed that the excavation will be from bank-to-bank and the depths of excavation will be to the unconsolidated bed material, to the extent practicable. Figure 8 depicts the areas of the Creek where sediment will be excavated. The areal footprint of areas to be excavated will be refined during the remedial design.
- Excavation of an estimated 15,000 CY of surface and subsurface floodplain soil to meet the restricted SCOs (see Table 7) consistent with current and reasonably anticipated future land use of discrete Subsite areas as follows:[14]
    - o continued industrial use for the neighboring National Grid property (except for ecological use within and adjacent to the wetland);
    - o ecological use for areas in the Ley Creek floodplain, except for areas of residential use where the residential use SCO is lower than the ecological use SCO (*i.e*., chromium); and
    - o commercial use of the property along Factory Avenue.
- Transport of the excavated Creek and wetland sediments to a staging area where they will be dewatered. The water drained from the sediments will require treatment prior to discharge.
- Transport of the excavated contaminated soils and sediments containing greater than 50 mg/kg of PCBs to a TSCA-compliant facility.
- Transport of those soils and sediments which fail Toxic Characteristic Leaching Procedure testing[15] and are determined to be characteristic hazardous waste and are non-TSCA waste (*i.e.,* less than 50 mg/kg PCBs) to an off-Site RCRA-compliant facility.
- Transport of those soils and sediments that are non-TSCA-regulated (less than 50 mg/kg of PCBs) and are not characteristic hazardous waste to a RCRA-compliant facility.[16]

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[14] Most soil excavations are anticipated to be 1 to 4 feet in depth; with some limited areas excavated to depths as deep as 6 feet within the Ley Creek floodplain hot spot. The locations and assumed excavations for soil removal are illustrated on Figures 4 through 7. Confirmatory sampling will be conducted to ensure the excavations are complete.

[15] TCLP testing is a soil sample extraction method for chemical analysis employed as an analytical method to simulate contaminant leaching. The testing methodology is used to determine if a waste is a characteristic hazardous waste under RCRA.

[16] The September 30, 2014 ROD for the Lower Ley Creek subsite called for either local or non-

- Clean fill meeting the requirements of DER-10, Appendix 5 will be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Subsite. With the exception of the Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas will be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue will be restored with a cover which will consist of an indicator fabric layer, as needed, overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.
- Appropriate controls and monitoring (*e.g.*, community air monitoring) will be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable.
- Habitat restoration of Ley Creek excavated areas which will consist of the placement of at least 0.5 feet of substrate similar to the existing sediments (*e.g.*, sand and gravel) over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas will be determined during the remedial design as part of a habitat restoration plan. The main goal of the habitat restoration will be to restore the habitats affected by the remedy, and the restoration will meet the substantive requirements of 6 NYCRR Part 608 and 663. A habitat assessment will be performed to support the restoration design. The habitat assessment will include an assessment of the Ley Creek removal areas for mussels and will determine any actions necessary (if any) to minimize impacts to existing populations. The habitat restoration plan will also describe the specific design for areas impacted by the remediation of sediments and soils and determine the appropriate plantings (including types and locations) necessary to restore habitats. The habitat restoration plan will also include the necessary requirements for monitoring restoration success and for needed restoration maintenance. Monitoring requirements will be determined during the design.
- Institutional controls in the form of environmental easements will be used to restrict intrusive activities in areas where contamination remains unless the activities are in accordance with an approved SMP.
- The SMP will provide for the proper management of all post-construction remedy components. Specifically, the SMP will describe procedures to confirm that the

---

local disposal of the excavated soils and sediments with PCB concentrations less than 50 mg/kg. Should local disposal of the soils and sediments be employed at the Lower Ley Creek subsite, consideration will be given to similarly disposing of the excavated soil and sediment from the GM-IFG Subsite.

requisite engineering (*e.g.,* demarcation layer) and institutional controls are in place and that such controls continue to protect public health and the environment. The SMP will also detail the following: the provision for the management of future excavations in areas where contamination remains; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of any above-noted environmental easements and/or restrictive covenants; a provision for the performance of the operation and monitoring required for the remedy; and a provision that a property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

The environmental benefits of the selected remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with the EPA Region 2's Clean and Green Energy Policy and NYSDEC's DER-31 Green Remediation Policy.[17] Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and management of the remedy. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Reduction in vehicle idling, including both on and off road vehicles and construction equipment during construction;
- Use of Ultra Low Sulfur Diesel;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

Because this remedy is anticipated to result in hazardous substances, pollutants or contaminants remaining on-site above levels that allow for unlimited use and unrestricted

[17] See http://epa.gov/region2/superfund/green_remediation and http://www.dec.ny.gov/docs/-remediation_hudson_pdf/der31.pdf

exposure, a statutory review will be conducted at least every five years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

It has been determined that remediation is necessary in the portion of Ley Creek that is included in OU2 of the Subsite. Because this area is located immediately upstream of the Lower Ley Creek subsite, the OU2 remedy would need to be implemented prior to the implementation of this Lower Ley Creek subsite remedy to prevent the potential for recontamination (if Lower Ley Creek were addressed first) or engineering controls to prevent recontamination would need to be implemented.

Summary of the Estimated Remedy Costs

The estimated capital cost of the selected remedy is $13,730,000; the annual O&M is $32,000 and the total present-worth costs (using a seven percent discount rate and 30 years of O&M) is $14,130,000. Table 9.2 provides the basis for the cost estimates for Sediment Alternative 3 and Soil Alternative 2.

It should be noted that these cost estimates are expected to be within +50 to -30 percent of the actual project cost. These cost estimates are based on the best available information regarding the anticipated scope of the selected remedy.

Expected Outcomes of the Selected Remedy

Land uses associated with the properties are not anticipated to change as a result of the implementation of the selected remedy.

The results of the HHRA indicate that PCBs present a potentially unacceptable noncancer hazard for recreational receptors engaging in specific activities (*e.g.*, child and adult fisherpersons exposed to soils and sediments) and to receptors that would be involved in intrusive work such as utility workers. Under the selected remedy, the removal of the PCB-contaminated soils and sediment will reduce the potential risks to human health and the environment to acceptable levels.

The results of the BERA indicate that the Subsite, if not remediated, poses an unacceptable ecological exposure risk.

The application of the 1 mg/kg cleanup level for PCBs in sediments will result in the excavation of most of the creek bed to the native clay. At least six inches of cover material that is suitable for habitat will be placed in all excavated sediment areas. As a result, the sediment remedy is expected to result in a significant reduction in the concentration of PCBs and other site-related contaminants in the sediment over the site reach, thereby reducing exposure of human and ecological receptors to contaminated sediment and fish.

The application of the 1 mg/kg cleanup level for PCBs in soils will result in the reduction of exposure of human and ecological receptors to contaminated soil.

Under the selected remedy, potential risks to human health and the environment will be reduced to acceptable levels. It is estimated that it will require one year to achieve soil cleanup levels and one year to achieve cleanup levels in the sediment.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site.

For the reasons discussed below, NYSDEC and the EPA have determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The results of the risk assessments indicate that, if no action is taken, the continued exposure at the Subsite poses an unacceptable increased future ecological and human health risk.

The selected remedy will reduce exposure levels to protective levels below the HI of 1 for noncarcinogens in the soils and sediments. The implementation of the selected remedy will not pose unacceptable short-term risks or cross-media impacts that cannot be mitigated. The selected remedy will be protective of human health and the environment in that the excavation and disposal of the contaminated soil and sediment will mitigate a source of contamination to Onondaga Lake and to the local fisheries. Combined with institutional controls, the selected remedy will provide protectiveness of human health and the environment over both the short- and long-term.

Compliance with ARARs and Other Environmental Criteria

The selected remedy will comply with the location-specific and action-specific ARARs identified, as well as the two out of four chemical-specific ARARs. Because of technical impracticability, two chemical-specific ARARs pertaining to water column concentrations (0.001 nanograms per liter [ng/L] New York State water quality PCB standards for the protection of human consumers of fish and 0.12 ng/L for the protection of wildlife) are hereby waived (see CERCLA Section 121(d)(4)(c) and 40 C.F.R. 300.430(f)(1)(ii)(C)(3)).

The ARARs, TBCs and other guidelines for the selected remedy are provided in Table 10.

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP Section 300.430(f)(1)(ii)(D)). Overall effectiveness is based on the evaluations of: the following: long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness (discussed above) to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost-effective and will achieve the cleanup levels in the same amount of time in comparison to the more costly alternatives. Each of the alternatives underwent a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. In the present-worth cost analysis, annual O&M costs were calculated for the estimated life of the capping alternatives and fish and sediment monitoring using a seven percent discount rate and a 30-year interval. The estimated capital, annual O&M, and total present-worth costs for the selected remedy, assuming local disposal, are $13,730,000, $32,000, and $14,130,000, respectively.

Both Soil Alternatives 2 and 3 would effectively achieve their respective SCOs. However, Soil Alternative 3 (meeting unrestricted soil cleanup objectives) is significantly more expensive than Soil Alternative 2, which will meet the current and future use soil cleanup objectives.

Both Sediment Alternatives 3 and 4 would effectively achieve their respective sediment cleanup objectives. While Sediment Alternative 4 is nearly $2.5 million more costly than Sediment Alternative 3, the implementation of Sediment Alternative 3 will result in the excavation of most of the creek bed to the native clay. As a result, the Sediment Alternative 3 would result in a significant reduction in the concentration of PCBs and other site-related contaminants in the sediment over the site reach, thereby reducing exposure of human and ecological receptors to contaminated sediment and fish.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP Section 300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner at the Subsite.

The selected remedy will permanently address the soil and sediment contamination.

Preference for Treatment as a Principal Element

CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances as a principal element (or justify not satisfying the preference). NYSDEC and the EPA do not believe that treatment of the remaining sediments and soil is practicable or cost effective, given the widespread nature of the sediment and soil contamination and the generally low concentrations of contaminants present in the sediment and soils that are being addressed by the selected remedy.

Five-Year Review Requirements

The selected remedy, once fully implemented, will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure. Consequently, a statutory review will be conducted within five years after initiation of remedial action, and at five-year intervals thereafter, to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan identified Sediment Alternative 3 (mechanical excavation to achieve 1.0 mg/kg PCB), and Soil Alternative 2 (soil excavation to achieve restricted SCOs) as the preferred remedy to address the contaminated sediment and soil, respectively. Based upon its review of the written and verbal comments submitted during the public comment period, NYSDEC and the EPA determined that no significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

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SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX I

FIGURES

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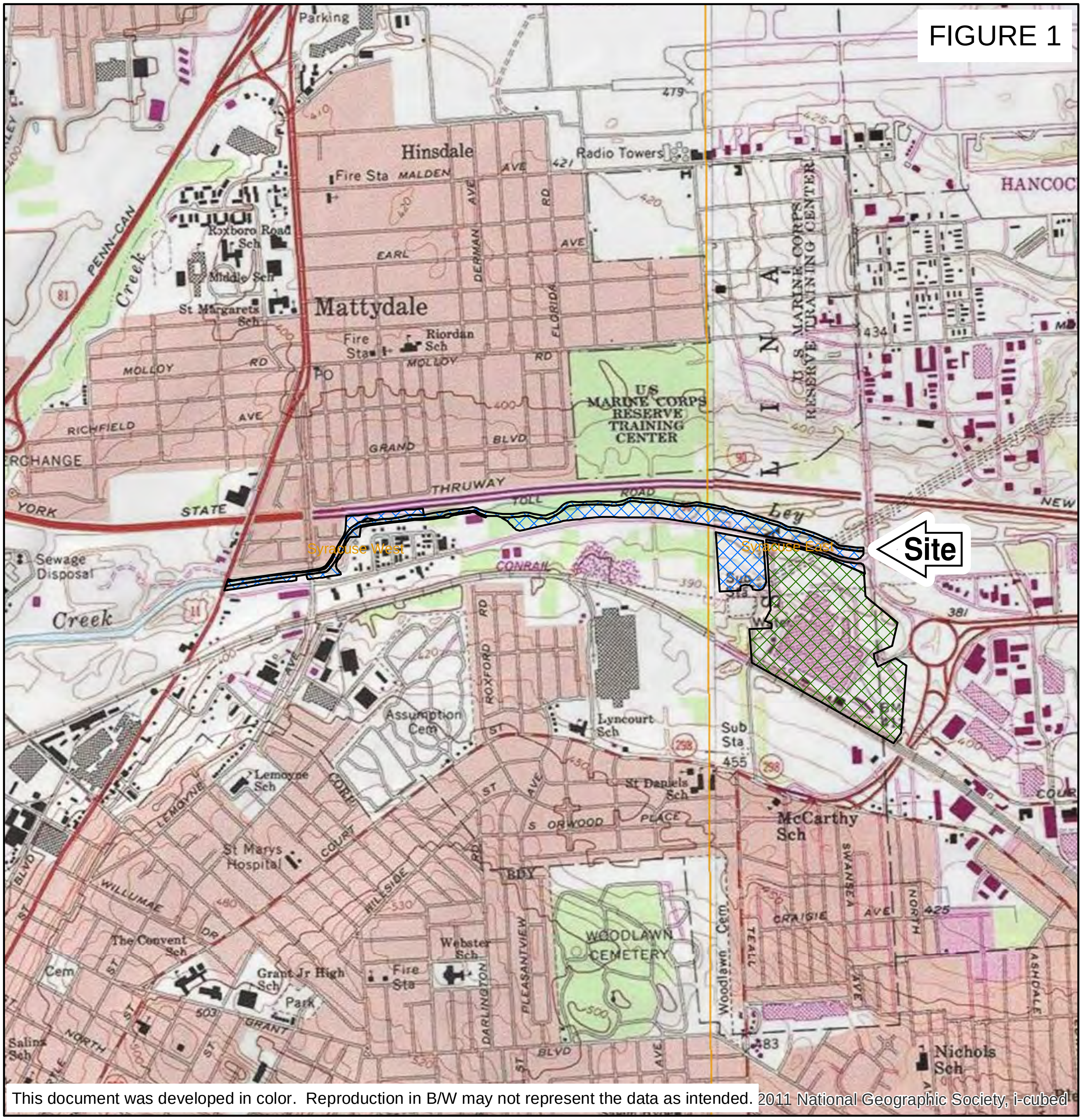
FIGURE 1



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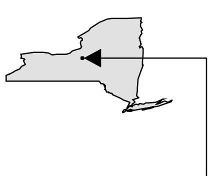
ADAPTED FROM: SYRACUSE WEST, SYRACUSE EAST NEW YORK USGS QUADRANGLE.

GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

SITE LOCATION



QUADRANGLE LOCATION

LEGEND

OFF-SITE AREAS

FORMER IFG FACILITY

N

0 1,000 2,000 4,000 6,000 8,000

Feet

1:24,000

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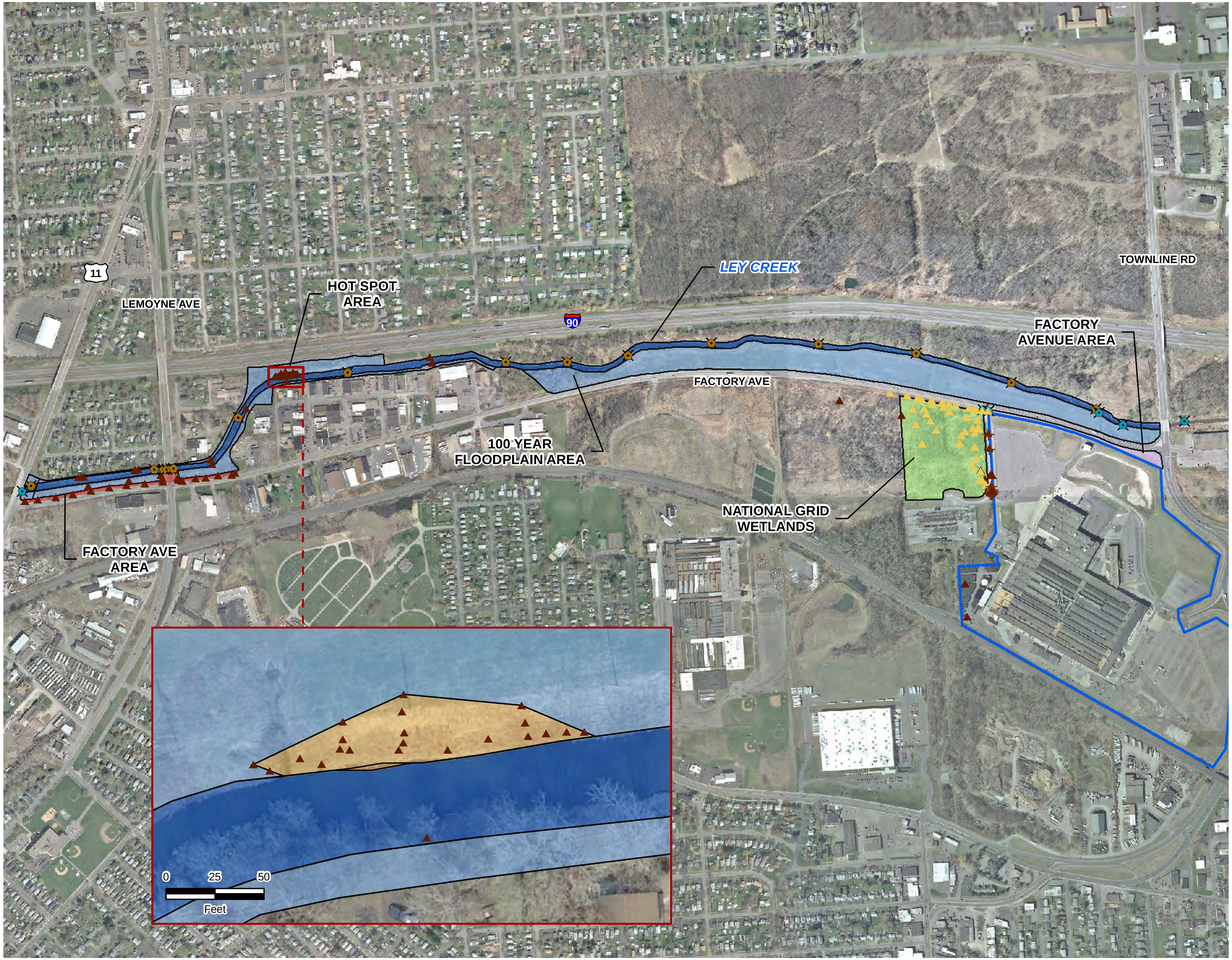
FIGURE 2



N

LEGEND

- SOIL BORING
- SURFACE SOIL
- SOIL SAMPLE
- SEDIMENT SAMPLE
- SURFACE WATER
- FORMER IFG FACILITY PROPERTY BOUNDARY (OU 1)
- FACTORY AVENUE AREA
- LEY CREEK 100-YEAR FLOODPLAIN AREA
- LEY CREEK 100-YEAR FLOODPLAIN HOT SPOT AREA
- LEY CREEK
- NATIONAL GRID WETLANDS
- FACTORY AVENUE / LEMOYNE AVENUE INTERSECTION

GENERAL MOTORS
IFG SITE
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SYRACUSE, NEW YORK

OU 2 AREAS

0 375 750 1,500
Feet

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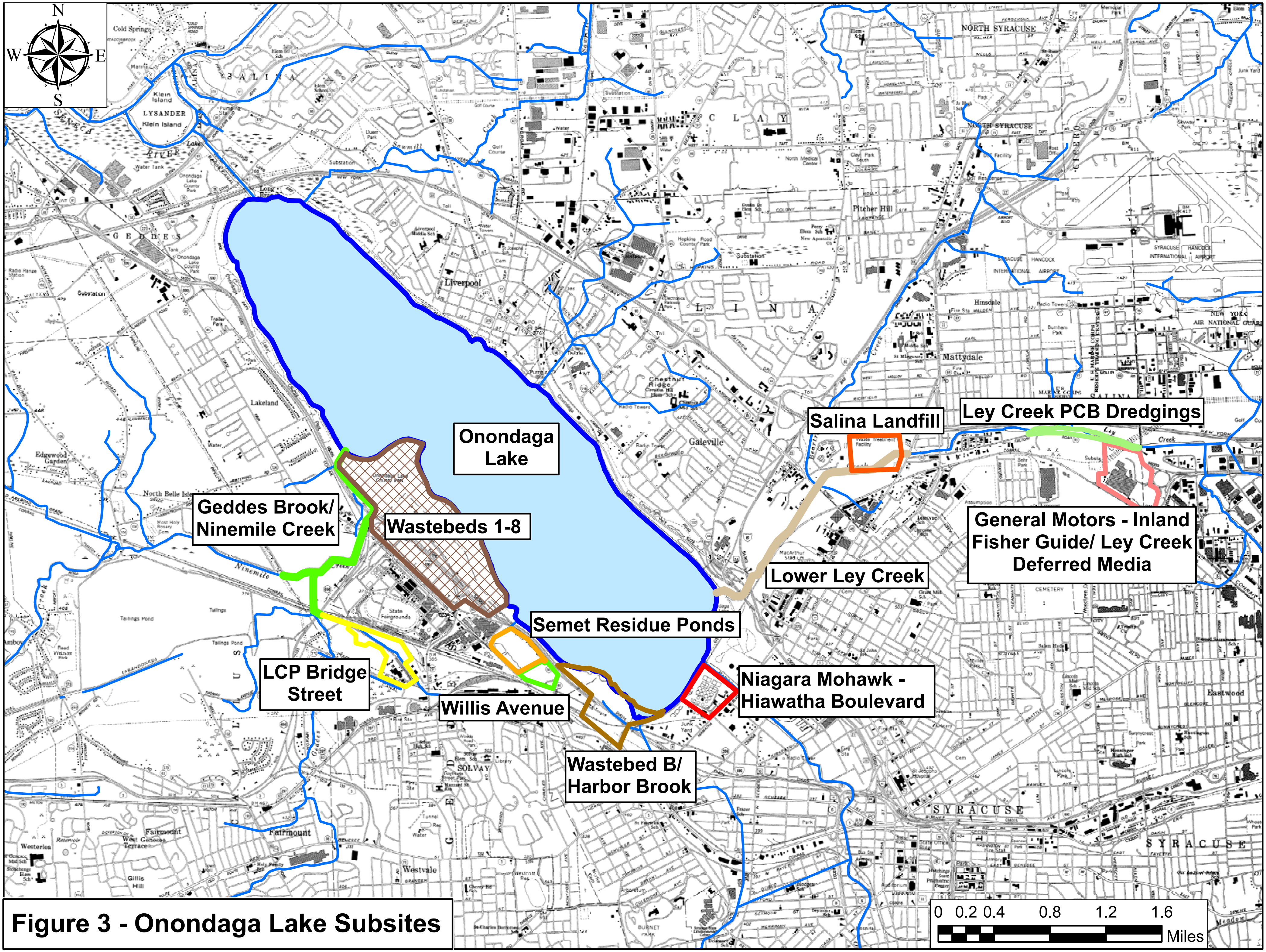
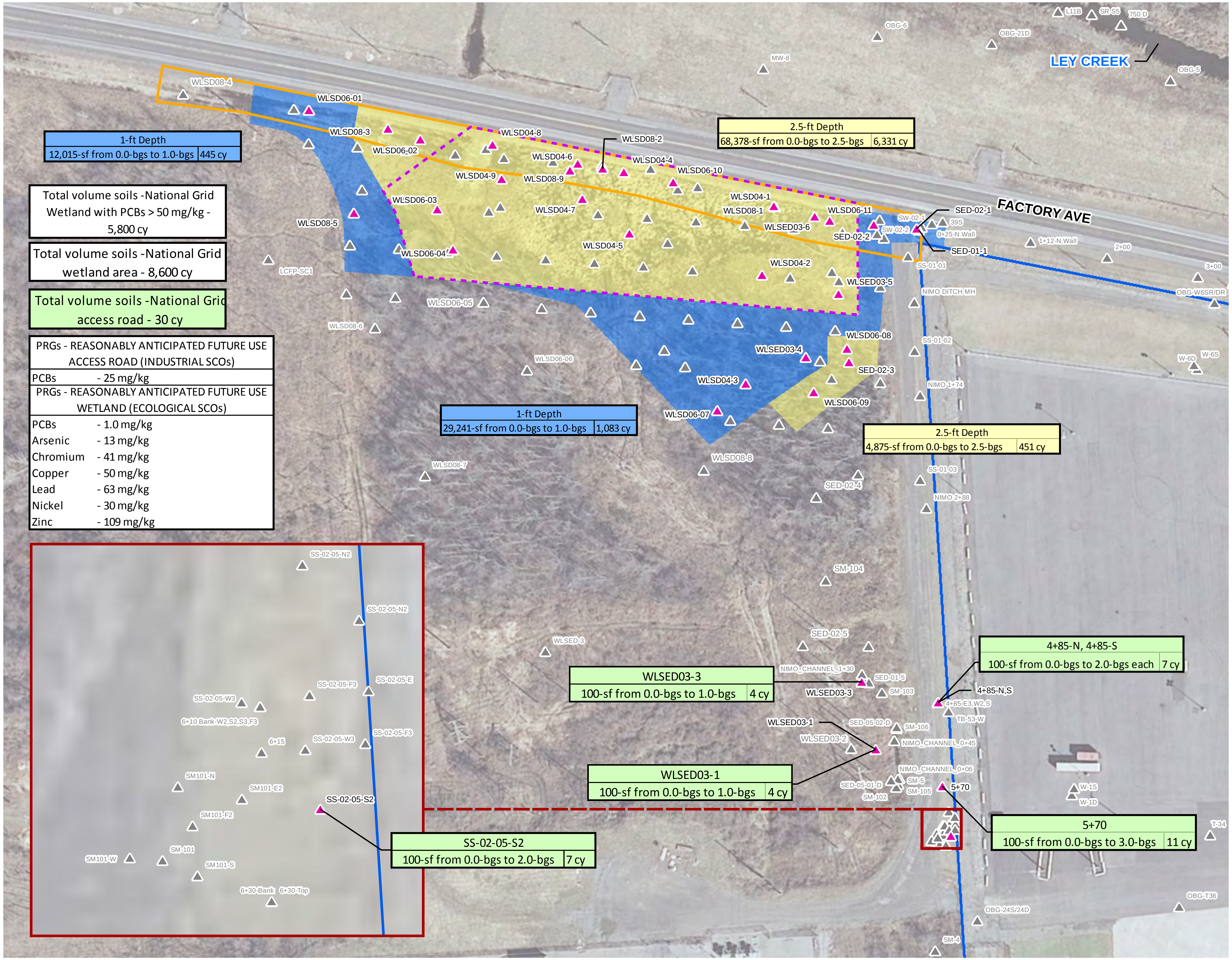


Figure 3 - Onondaga Lake Subsites

FIGURE 4



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N

LEGEND

- ▲ SOIL SAMPLE > PRGs*
- ▲ SOIL SAMPLE
- PCBs > 50 mg/kg
- FACTORY AVENUE DITCH

PROPOSED EXCAVATION EXTENT

- 1 FOOT DEPTH
- 2.5 FOOT DEPTH

NOTE:

* PRGs used for area limits are listed in figure box inset.
- Proposed excavation extent excludes soil sample location WLSD04-8; Nickel (0.5-1 ft bgs) is marginally above PRG.
- Industrial SCOs - NYCRR part 375 Soil Cleanup Objectives (SCOs) for Industrial Land Use
- Ecological SCOs - NYCRR Part 375 SCOs for Protection of Ecological Resources

EXCAVATION LIMITS
WLSED03-3
100-sf from 0.0-bgs to 1.0-bgs | 4 cy
AREA AND DEPTH
VOLUME

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SYRACUSE, NEW YORK

NATIONAL GRID WETLAND AREA

0 50 100 200
Feet

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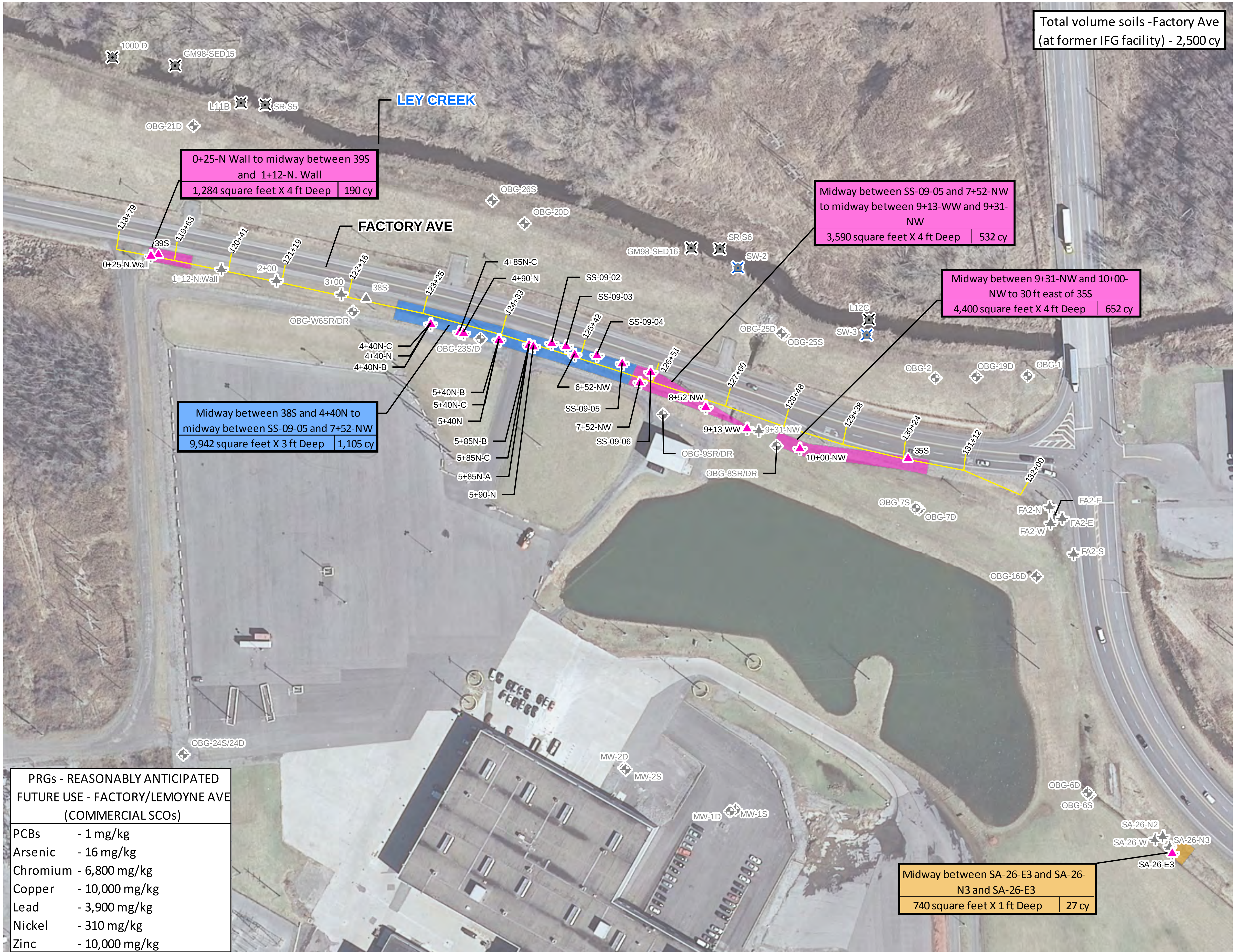
FIGURE 5



PRGs - REASONABLY ANTICIPATED FUTURE USE - FACTORY/LEMOYNE AVE (COMMERCIAL SCOs)	
PCBs	- 1 mg/kg
Arsenic	- 16 mg/kg
Chromium	- 6,800 mg/kg
Copper	- 10,000 mg/kg
Lead	- 3,900 mg/kg
Nickel	- 310 mg/kg
Zinc	- 10,000 mg/kg

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N

LEGEND

- SOIL SAMPLE > PRGs*
- MONITORING WELL
- SOIL BORING
- SURFACE SOIL
- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- FORMER IFG FACILITY PROPERTY BOUNDARY

PROPOSED EXCAVATION EXTENT

- 1 FOOT DEPTH
- 3 FOOT DEPTH
- 4 FOOT DEPTH

NOTES:

* PRGs used for area limits are listed in figure box inset.
- Commercial SCOs - 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for Commercial Land Use

EXCAVATION EXTENT

Midway between SA-26-E3 and SA-26-N3 and SA-26-E3	
740 square feet X 1 ft Deep	27 cy

AREA AND DEPTH VOLUME

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FACTORY AVENUE AREA (AT FORMER IFG FACILITY)

0 70 140 280
Feet

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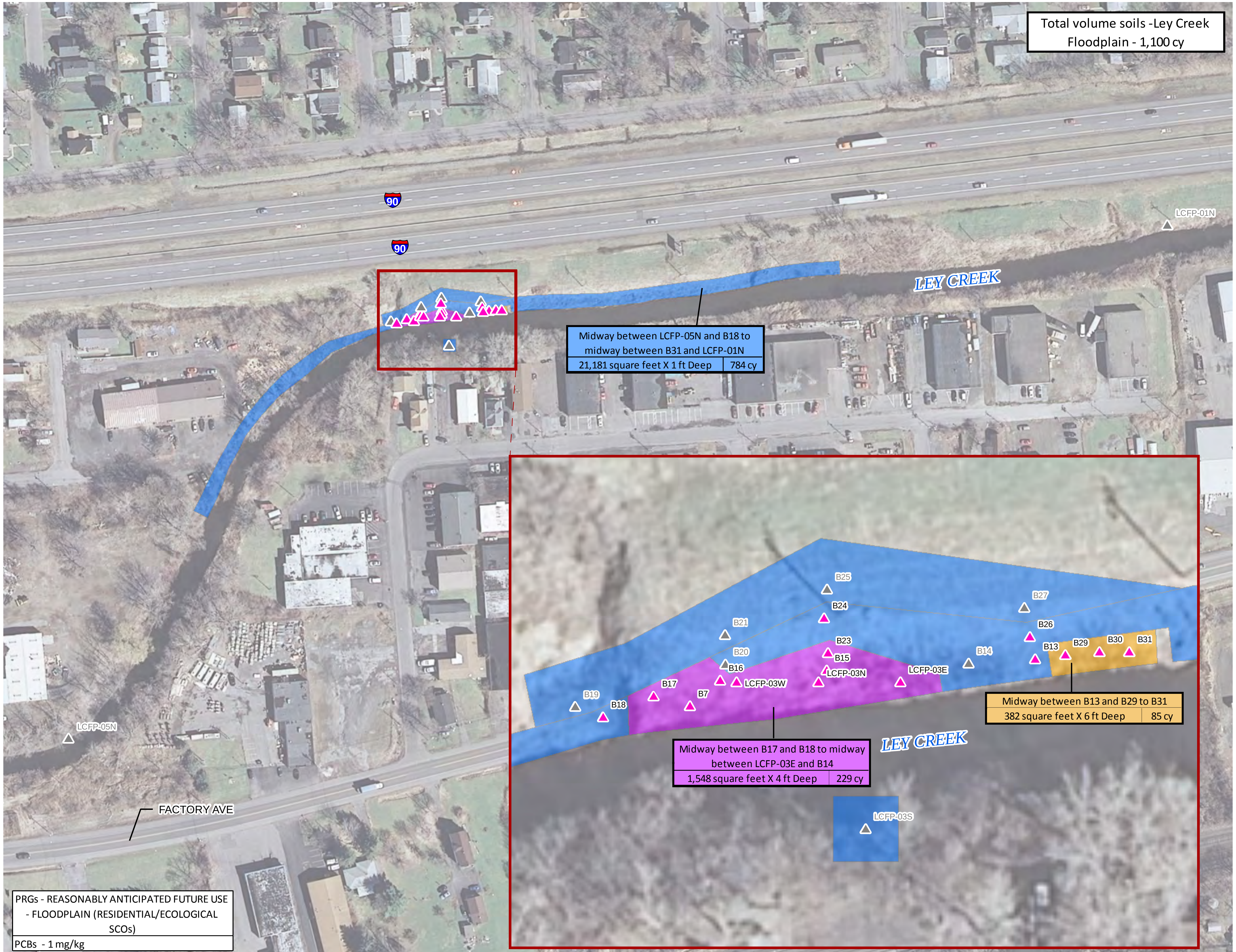

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FIGURE 6

N

LEGEND

- ▲ SOIL SAMPLE > PRG*
- ▲ SOIL SAMPLE < PRG*

PROPOSED EXCAVATION EXTENT

- 1 FOOT DEPTH
- 4 FOOT DEPTH
- 6 FOOT DEPTH

NOTES:

* PRGs used for area limits are listed in figure box inset.
- Boring locations acquired from a Trimble Pro XRS GPS Unit
- Residential SCOs - 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for Residential Land Use
- Ecological SCOs - 6 NYCRR SCOs for Protection of Ecological Resources

EXCAVATION LIMITS

Midway between B17 and B18 to midway between LCFP-03E and B14

1,548 square feet X 4 ft Deep | 229 cy

AREA AND DEPTH — VOLUME

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SYRACUSE, NEW YORK

FLOODPLAIN HOT SPOT AND FLOODPLAIN

0 75 150 300
Feet

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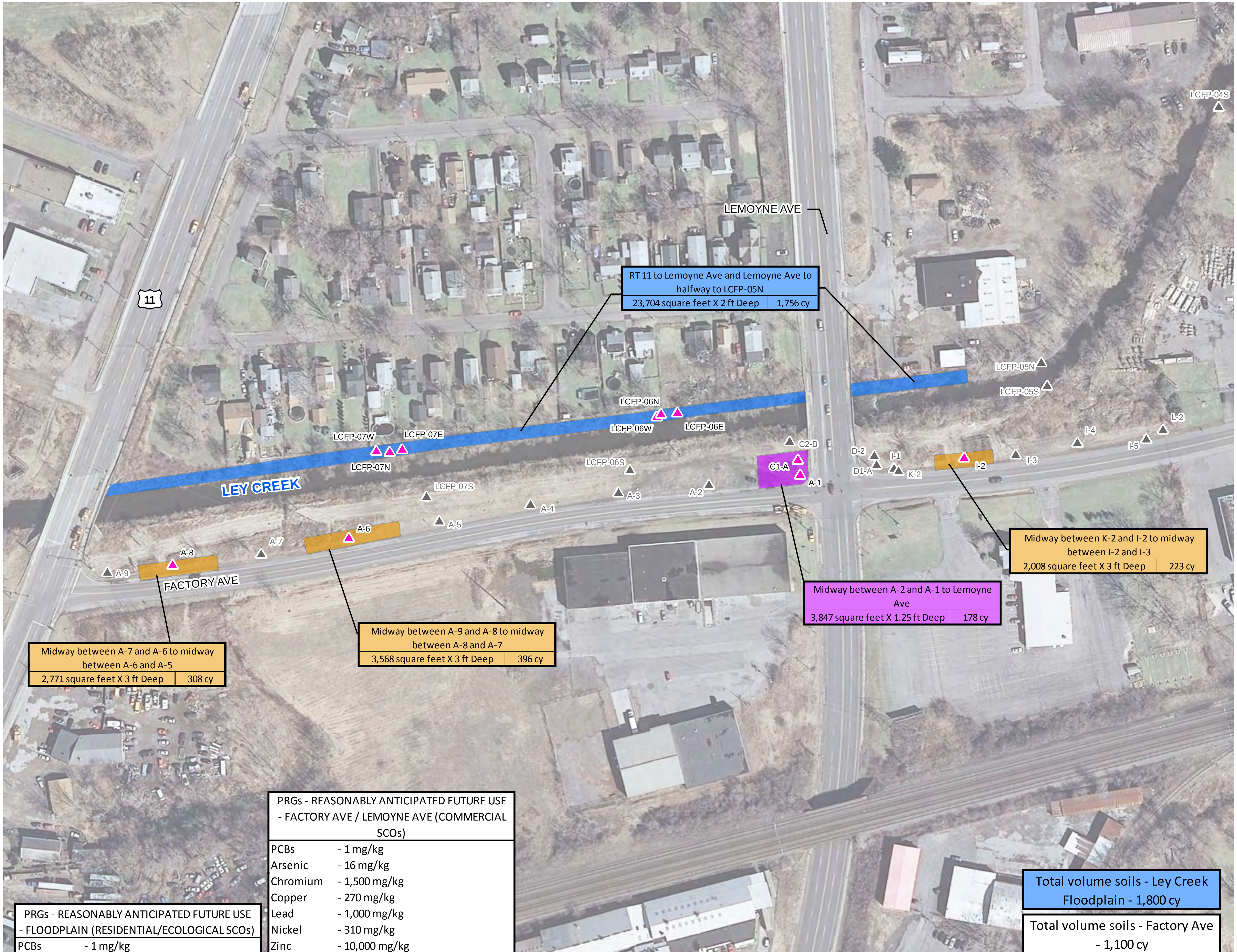
FIGURE 7



PRGs - REASONABLY ANTICIPATED FUTURE USE - FLOODPLAIN (RESIDENTIAL/ECOLOGICAL SCOs)	
PCBs	- 1 mg/kg

PRGs - REASONABLY ANTICIPATED FUTURE USE - FACTORY AVE / LEMOYNE AVE (COMMERCIAL SCOs)	
PCBs	- 1 mg/kg
Arsenic	- 16 mg/kg
Chromium	- 1,500 mg/kg
Copper	- 270 mg/kg
Lead	- 1,000 mg/kg
Nickel	- 310 mg/kg
Zinc	- 10,000 mg/kg

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N

LEGEND

- ▲ (pink) SOIL SAMPLE > PRGs*
- ▲ SOIL SAMPLE

PROPOSED EXCAVATION EXTENT

- 1.25 FOOT DEPTH
- 2 FOOT DEPTH
- 3 FOOT DEPTH

NOTES:
* PRGs used for area limits are listed in figure box inset.
- Residential SCOs - 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for Residential Land Use
- Ecological SCOs - 6 NYCRR SCOs for Protection of Ecological Resources
- Commercial SCOs - 6 NYCRR Part 375 SCOs for Commercial Land Use

EXCAVATION LIMITS
RT 11 to Lemoyne Ave and Lemoyne Ave to halfway to LCFP-05N
23,704 square feet X 2 ft Deep | 1,756 cy
AREA AND DEPTH
VOLUME

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FACTORY AVE AREA (AT LEMOYNE AVE INTERSECTION)

0 75 150 300
Feet

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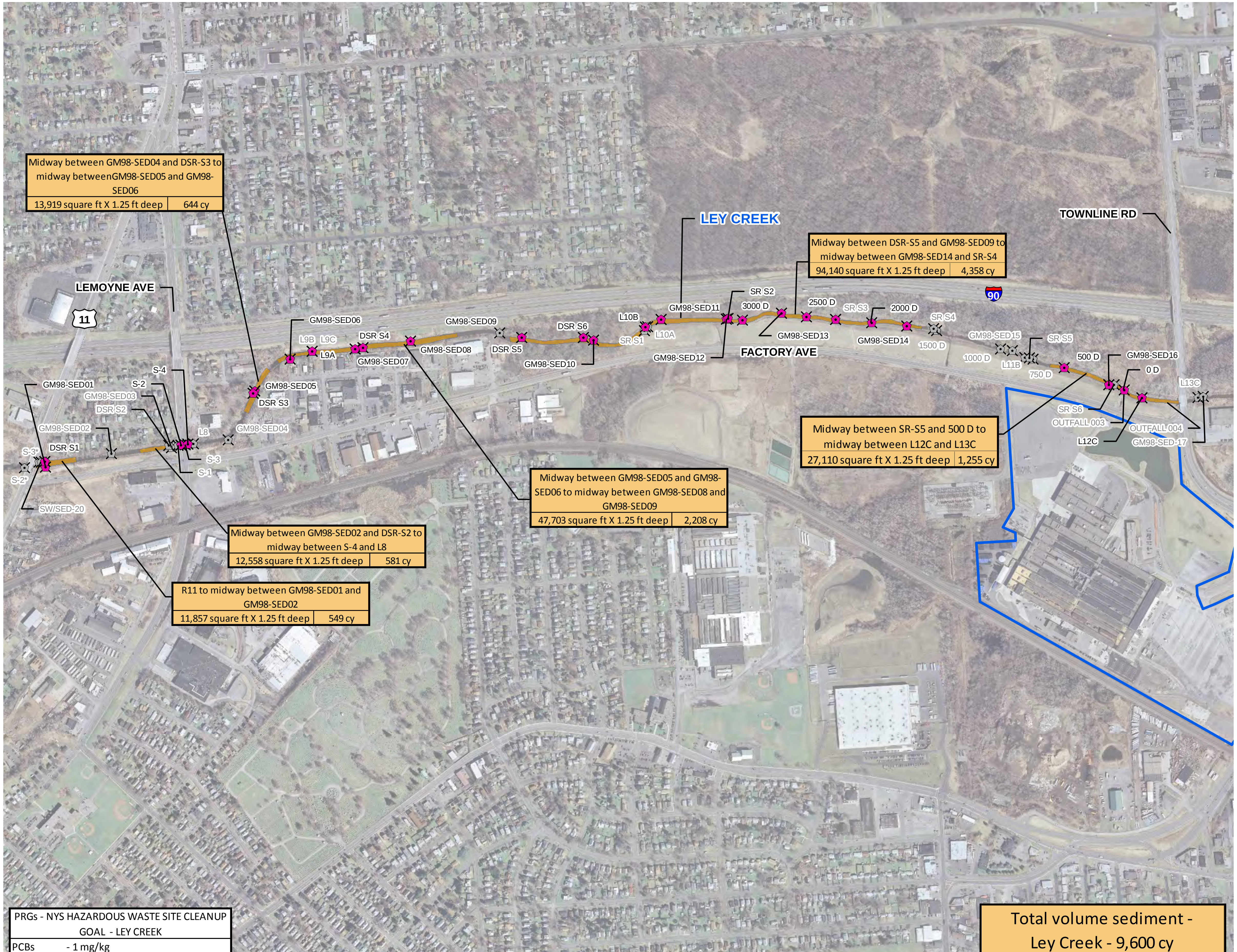

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FIGURE 8

N

LEGEND

- SEDIMENT SAMPLE > PRG*
- SED
- FORMER IFG FACILITY PROPERTY BOUNDARY
- PROPOSED EXCAVATION EXTENT

NOTES:

- Ley Creek length between Townline Rd and Route 11: 9,242 linear ft.
- Proposed excavation extent square footage was estimated using the aerial image of each relevant reach of Ley Creek.
- * PRGs used in area limits are listed in figure box inset.
- PRG of 1 mg/kg for total PCBs based on previously selected cleanup goals for NYS Hazardous Waste Sites.

EXCAVATION LIMITS

R11 to midway between GM98-SED01 and GM98-SED02	
11,857 square ft X 1.25 ft deep	549 cy

AREA AND DEPTH — VOLUME

GENERAL MOTORS
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SYRACUSE, NEW YORK

LEY CREEK SEDIMENT

0 375 750 1,500
Feet

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OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
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RECORD OF DECISION

APPENDIX II

TABLES

Table 1. Summary of Minimum and Maximum Values of the Contaminants of Concern

	OU-2 Soil (mg/kg)							
	Soil		National Grid Wetland		Factory Avenue Area		Ave Intersection	
	Min	Max	Min	Max	Min	Max	Min	Max
PCBs	ND	130	ND	14000	ND	18000	ND	8.8
Arsenic	--	--	0.71	19.3	--	--	2.1	13.6
Chromium	--	--	6.7	16700	--	--	5.17	265
Copper	--	--	4.3	12100	--	--	9.5	219
Lead	--	--	2.7	264	--	--	2.3	398
Nickel	--	--	6.8	10600	--	--	9.41	97.9
Zinc	--	--	14.2	7010	--	--	17.9	429

	Ley Creek Sediment (mg/kg)				Ley Creek Surface Water (ug/L)			
	Upstream		Site Reach		Upstream		Site Reach	
	Min	Max	Min	Max	Min	Max	Min	Max
PCBs	ND	4.76	ND	207	ND	ND	ND	0.51
Arsenic	1.1	19.1	2.2	15.1	ND	ND	ND	ND
Chromium	4.3	45.6	10.9	429	ND	0.008	ND	0.0074
Copper	6.7	423	13.9	183	ND	0.0067	0.0029	0.0087
Lead	2.5	1170	ND	172	ND	0.0045	ND	0.004
Nickel	ND	38.6	6.6	121	0.0014	0.013	0.001	0.01
Zinc	22.7	811	51	390	0.0125	0.0421	0.0112	0.0331

	Biota - Crayfish (ug/kg)				Biota - Whole/Fillet (ug/kg)			
	Upstream		Site Reach		Upstream		Site Reach	
	Min	Max	Min	Max	Min	Max	Min	Max
PCBs	52.4	636	177.5	207.8	ND	2690	ND	6800
Arsenic	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	400	1000	ND	430	ND	500	ND	570
Copper	27200	39900	21800	25900	900	7900	ND	3700
Lead	ND	790	ND	1100	ND	ND	ND	ND
Nickel	ND	ND	ND	ND	ND	ND	ND	ND
Zinc	16800	23600	15900	34000	16300	17500	5400	30700

Notes

1. Data shown is derived from the report titled "Revised Off-Site Remedial Investigation, Former IFG Facility and Deferred Media Site, March 2013 (Operable Unit #2, Site NO. 7-34-057). O'Brien & Gere 2013
2. PCBs includes the sum of all detected aroclors
3. Units are as noted
4. "ND" indicates the compound was not detected in at least one sample
5. "--" indicates the compound was not analyzed for

Table 2 – Sediment Criteria for Subsite-Related Metals

Analyte of Concern	Lowest Effects Level	Severe Effects Level
Arsenic	6.0 mg/kg	33 mg/kg
Total Chromium	26 mg/kg	110 mg/kg
Copper	16 mg/kg	110 mg/kg
Lead	31 mg/kg	110 mg/kg
Nickel	16 mg/kg	50 mg/kg
Zinc	120 mg/kg	270 mg/kg

Table 3
Summary of Chemicals of Concern and
Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
EU 1	Less Chlorinated PCBs[b]	1.3E-01	2.0E+02	mg/kg	8/24	2.0E+02	mg/kg	Max
	Highly Chlorinated PCBs[c]	1.7E-01	3.1E+01	mg/kg	22/24	5.6E+00	mg/kg	95% Approximate Gamma UCL

Scenario Timeframe: Current/Future
Medium: Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
EU2	Highly Chlorinated PCBs[b]	2.0E-02	7.8E+02	mg/kg	63/120	9.2E+01	mg/kg	Use 95% Chebyshev (Mean, Sd) UCL
	Less Chlorinated PBCs[c]	2.6E-01	1.4E+04	mg/kg	21/120	7.3E+03	mg/kg	Use 99% Chebyshev (Mean, Sd) UCL
	Total PCBs[d]	1.0E+00	1.0E+02	mg/kg	10/14	1.0E+02	mg/kg	Max

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Surface and Subsurface Soil

Exposure Point	Chemical of Concern	Concentration		Concentration Units	Frequency of Detection	Exposure Point Concentration	Exposure Point Concentration Units	Statistical Measure
		Min	Max					
EU 2	Highly Chlorinated PCBs[b]	9.3E-03	1.8E+04	mg/kg	144/265	2.7E+02	mg/kg	95% H-UCL
	Less Chlorinated PBCs[c]	5.6E-03	1.4E+04	mg/kg	54/265	2.3E+03	mg/kg	97.5% Chebyshev (Mean, Sd) UCL
	Total PCBs[d]	1.0E+00	1.0E+02	mg/kg	5/6	1.0E+02	mg/kg	Max

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in soil and sediment (i.e., the concentration that was used to estimate the exposure and risk from each COC in these media). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

Max = maximum concentration used

Table 4
Selection of Exposure Pathways

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/ Future	Water	Surface Water	EU-1 Surface Water	Fisherperson	Older Child (Age 6-<18)	Ingestion	None	Incidental ingestion of surface water is expected to be *de minimis.*
						Dermal	Quantitative	It is possible that people will visit EU-1 for recreational purposes; dermal contact with EU-1 surface water could occur.
					Adult (Age >18)	Ingestion	None	Incidental ingestion of surface water is expected to be *de minimis.*
						Dermal	Quantitative	It is possible that people will visit EU-1 for recreational purposes; dermal contact with EU-1 surface water could occur.
	Surface Sediment (0-1 ft)	Surface Sediment (0-1 ft)	EU-1 Sediment	Fisherperson	Older Child (Age 6-<18)	Ingestion	Quantitative	It is possible that people will visit EU-1 for recreational purposes; ingestion with EU-1 surface sediment could occur.
						Dermal	Quantitative	It is possible that people will visit EU-1 for recreational purposes; dermal contact with EU-1 surface sediment could occur.
					Adult (Age >18)	Ingestion	Quantitative	It is possible that people will visit EU-1 for recreational purposes; ingestion with EU-1 surface sediment could occur.
						Dermal	Quantitative	It is possible that people will visit EU-1 for recreational purposes; dermal contact with EU-1 surface sediment could occur.
		Biota	Ley Creek Fish Tissue	Fish Consumer	Child (Age 0 to <6)	Ingestion	Quantitative	Fish collection efforts at Ley Creek support the conclusion of a low abundance and diversity of fish inhabiting the Creek. While it is unlikely that fishing will be conducted in the Creek, the ingestion of fish tissue remains a possibility.
				Fisherperson	Older Child (Age 6-<18)	Ingestion	Quantitative	Fish collection efforts at Ley Creek support the conclusion of a low abundance and diversity of fish inhabiting the Creek. While it is unlikely that fishing will be conducted in the Creek, the ingestion of fish tissue remains a possibility.
					Adult (Age >18)	Ingestion	Quantitative	Fish collection efforts at Ley Creek support the conclusion of a low abundance and diversity of fish inhabiting the Creek. While it is unlikely that fishing will be conducted in the Creek, the ingestion of fish tissue remains a possibility.

Current/ Future	Surface Soil (0-1 ft)	Surface Soil (0-1 ft)	EU-1 Surface Soil	Fisherperson	Older Child (Age 6-<18)	Ingestion	Quantitative	It is possible that people will visit EU-1 for recreational purposes; incidental ingestion with the EU-1 surface soil could occur.
						Dermal	Quantitative	It is possible that people will visit EU-1 for recreational purposes; dermal contact with the EU-1 surface soil could occur.
				Fisherperson	Adult (Age >18)	Ingestion	Quantitative	It is possible that people will visit EU-1 for recreational purposes; incidental ingestion with the EU-1 surface soil could occur.
						Dermal	Quantitative	It is possible that people will visit EU-1 for recreational purposes; dermal contact with the EU-1 surface soil could occur.
		Fugitive dust	Outdoor ambient air	Fisherperson	Older Child (Age 6-<18)	Inhalation	Quantitative	Fisherpersons could inhale fugitive dust as a result of normal activities in this exposure area.
				Fisherperson	Adult (Age >18)	Inhalation	Quantitative	Fisherpersons could inhale fugitive dust as a result of normal activities in this exposure area.
		Volatile emissions	Outdoor ambient air	Fisherperson	Adult (Age >18)	Inhalation	Quantitative	Fisherpersons could be exposed to constituents volatilized from surface soil in this exposure area.
				Fisherperson	Older Child (Age 6-<18)	Inhalation	Quantitative	Fisherpersons could be exposed to constituents volatilized from surface soil in this exposure area.
Future	Water	Surface Water	EU-1 Surface Water	Dredge Worker	Adult (Age >18)	Ingestion	None	Incidental ingestion of surface water during dredging operations is expected to be *de minimis.*
						Dermal	Quantitative	A dredge worker could have dermal contact with surface water during maintenance dredging operations.
	Surface & Subsurface Sediment (0-3 ft)	Surface & Subsurface Sediment (0-3 ft)	EU-1 Sediment	Dredge Worker	Adult (Age >18)	Ingestion	Quantitative	A dredge worker could incidentally ingest sediment during maintenance dredging operations.
						Dermal	Quantitative	A dredge worker could have dermal contact with sediment during maintenance dredging operations.
	Surface Soil (0-1 ft)	Surface Soil (0-1 ft)	EU-1 Surface Soil	Dredge Worker	Adult (Age >18)	Ingestion	Quantitative	A dredge worker could incidentally ingest surface soil during maintenance dredging operations.
						Dermal	Quantitative	A dredge worker could have dermal contact with surface soil during maintenance dredging operations.
		Fugitive dust	Outdoor Ambient Air	Dredge Worker	Adult (Age > 18)	Inhalation	Quantitative	A dredge worker could inhale fugitive dust as a result of normal activities in this exposure area.
		Volatile emissions	Outdoor Ambient Air	Dredge Worker	Adult (Age > 18)	Inhalation	Quantitative	A dredge worker could be exposed to constituents volatilized from surface soil in this exposure area.

Current/ Future	Water	Surface Water	EU-2 Surface Water	Trespasser	Adolescent (Age 12-<18)	Ingestion	None	Incidental ingestion of surface water is expected to be *de minimis.*
						Dermal	Quantitative	It is possible that people will trespass at EU-2; dermal contact with EU-2 surface water could occur.
					Adult (Age >18)	Ingestion	None	Incidental ingestion of surface water is expected to be *de minimis.*
						Dermal	Quantitative	It is possible that people will trespass at EU-2; dermal contact with EU-2 surface water could occur.
	Surface Soil (0-1 ft)	Surface Soil (0-1 ft)	EU-2 Surface Soil	Trespasser	Adolescent (Age 12-<18)	Ingestion	Quantitative	It is possible that people will trespass at EU-2; ingestion with EU-2 surface soil could occur.
						Dermal	Quantitative	It is possible that people will trespass at EU-2; dermal contact with EU-2 surface soil could occur.
					Adult (Age >18)	Ingestion	Quantitative	It is possible that people will trespass at EU-2; ingestion with EU-2 surface soil could occur.
						Dermal	Quantitative	It is possible that people will trespass at EU-2; dermal contact with EU-2 surface soil could occur.
		Fugitive dust	Outdoor Ambient Air	Trespasser	Adolescent (Age 12-<18)	Inhalation	Quantitative	Trespassers could inhale fugitive dust as a result of normal activities in EU-2
					Adult (Age > 18)	Inhalation	Quantitative	Trespassers could inhale fugitive dust as a result of normal activities in EU-2
		Volatile emissions	Outdoor Ambient Air	Trespasser	Adolescent (Age 12-<18)	Inhalation	Quantitative	Trespassers could be exposed to constituents volatilized from surface soil in EU-2.
					Adult (Age > 18)	Inhalation	Quantitative	Trespassers could be exposed to constituents volatilized from surface soil in EU-2.
Future	Surface & Subsurface Soil (0-10 ft)	Surface & Subsurface Soil (0-10 ft)	EU-2 Surface & Subsurface Soil	Utility Worker	Adult (Age >18)	Ingestion	Quantitative	A utility worker could incidentally ingest surface and subsurface soil while performing duties.
						Dermal	Quantitative	A utility worker could have occasional dermal contact with surface and subsurface soil while performing duties.
		Fugitive dust	Outdoor Ambient Air	Utility Worker	Adult (Age > 18)	Inhalation	Quantitative	A utility workers could inhale fugitive dust from surface and subsurface soil as a result of normal activities in this exposure area.
		Volatile emissions	Outdoor Ambient Air	Utility Worker	Adult (Age > 18)	Inhalation	Quantitative	A utility workers could be exposed to constituents volatilized from surface and subsurface soil in this exposure area.

Summary of Selection of Exposure Pathways

The table describes the exposure pathways associated with the media that were evaluated for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included.

Table 5
Non-Carcinogenic Toxicity Data Summary

Pathway: Ingestion/Dermal

Chemicals of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD Target Organ	Dates of RfD
LESS CHLORINATED PCBs *	Chronic	7.0E-05	mg/kg-day	9.6E-01	7.0E-05	mg/kg-day	Reduced birth weights (W)	100/1	IRIS	02/01/2008
HIGHLY CHLORINATED PCBs *	Chronic	2.0E-05	mg/kg-day	9.6E-01	2.0E-05	mg/kg-day	Ocular exudate (OC), inflamed and prominent Meibomian glands, distorted growth of finger and toe nails; decreased antibody (IgG and IgM) response to sheep erythrocytes	300/1	IRIS	02/01/2008
TOTAL PCBs *	Chronic	2.0E-05	mg/kg-day	9.6E-01	2.0E-05	mg/kg-day	Ocular exudate (OC), inflamed and prominent Meibomian glands, distorted growth of finger and toe nails; decreased antibody (IgG and IgM) response to sheep erythrocytes	300/1	IRIS	02/01/2008

Pathway: Inhalation

Chemicals of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD (If available)	Inhalation RfD Units (If available)	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD Target Organ	Dates of RfC
LESS CHLORINATED PCBs *	NA	NA	NA	NA	NA	NA	NA	NA	NA
HIGHLY CHLORINATED PCBs *	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL PCBs *	NA	NA	NA	NA	NA	NA	NA	NA	NA

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference concentrations (RfCs).

NA: Not Available
IRIS: Integrated Risk Information System, U.S. EPA

Table 6 Risk Characterization Summary - Non-Carcinogens

Scenario Timeframe: Current/Future
Receptor Population: Fisherperson
Receptor Age: Older Child (6-18 yrs)

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Surface Sediment	EU 1	Less Chlorinated PCBs	Birth Weight	2E+00	--	2E+01	2E+01
			Highly chlorinated PCBs	Eye; Nails; Immunological	2E-01	--	2E+00	2E+00
			Chemical Total		2E+00	--	2E+01	2E+01
		Exposure Point Total						2E+01
	Exposure Medium Total							2E+01
Medium Total								2E+01

Scenario Timeframe: Current/Future
Receptor Population: Fisherperson
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Surface Sediment	EU 1	Less Chlorinated PCBs	Birth Weight	5E-01	--	1E+00	2E+00
			Chemical Total		5E-01	--	1E+00	2E+00
		Exposure Point Total						2E+00
	Exposure Medium Total							2E+00
Medium Total								2E+00

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent (12-18 yrs)

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	EU 2	Less Chlorinated PCBs	Birth Weight	2E+01	--	3E+01	5E+01
			Highly Chlorinated PCBs	Eye; Nails; Immunological	1E+00	--	1E+00	2E+00
			Total PCBs *	Eye; Nails; Immunological	1E+00	--	1E+00	2E+00
			Chemical Total		2E+01	--	3E+01	5E+01
		Exposure Point Total						5E+01
	Exposure Medium Total							5E+01
Medium Total								5E+01

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface Soil	EU 2	Less Chlorinated PCBs	Birth Weight	2E+01	--	2E+01	4E+01
			Highly Chlorinated PCBs	Eye; Nails; Immunological	8E-01	--	9E-01	2E+00
			Total PCBs *	Eye; Nails; Immunological	9E-01	--	1E+00	2E+00
			Chemical Total		2E+01	--	2E+01	4E+01
		Exposure Point Total						4E+01
	Exposure Medium Total							4E+01
Medium Total								4E+01

Scenario Timeframe: Future
Receptor Population: Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical Of Concern	Primary target Organ	Non-Carcinogenic Hazard Quotient			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Surface and Subsurface Soil	EU 2	Less Chlorinated PCBs	Birth Weight	4E+01	--	5E+01	9E+01
			Highly Chlorinated PCBs	Eye; Nails; Immunological	2E+01	--	2E+01	4E+01
			Total PCBs *	Eye; Nails; Immunological	6E+00	--	8E+00	1E+01
			Chemical Total		7E+01	--	8E+01	1E+02
		Exposure Point Total						1E+02
	Exposure Medium Total							1E+02
Medium Total								1E+02

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

* Some soil samples were analyzed for total PCBs as opposed to individul Aroclors.

TABLE 7: Summary of Soil Cleanup Objectives for Soil Alternative 2

		SCO (mg/kg)			
COC	AREA	Residential	Commercial	Industrial	Ecological
PCB	Factory Avenue Area (North of GM-IFG facility)		1		
	National Grid Property (along access road)			25	
	Factory Avenue Area (at Lemoyne Avenue)		1		
	Ley Creek Floodplain				1
	National Grid Wetland				1
Arsenic	Factory Avenue Area (North of GM-IFG facility)		16		
	National Grid Property (along access road)			16	
	Factory Avenue Area (at Lemoyne Avenue)		16		
	Ley Creek Floodplain				13
	National Grid Wetland				13
Chromium[3]	Factory Avenue Area (North of GM-IFG facility)		1500		
	National Grid Property (along access road)			6800	
	Factory Avenue Area (at Lemoyne Avenue)		1500		
	Ley Creek Floodplain	36			41
	National Grid Wetland				41
Copper	Factory Avenue Area (North of GM-IFG facility)		270		
	National Grid Property (along access road)			10000	
	Factory Avenue Area (at Lemoyne Avenue)		270		
	Ley Creek Floodplain				50
	National Grid Wetland				50
Lead	Factory Avenue Area (North of GM-IFG facility)		1000		
	National Grid Property (along access road)			3900	
	Factory Avenue Area (at Lemoyne Avenue)		1000		
	Ley Creek Floodplain				63
	National Grid Wetland				63
Nickel	Factory Avenue Area (North of GM-IFG facility)		310		
	National Grid Property (along access road)			10000	
	Factory Avenue Area (at Lemoyne Avenue)		310		
	Ley Creek Floodplain				30
	National Grid Wetland				30
Zinc	Factory Avenue Area (North of GM-IFG facility)		10000		
	National Grid Property (along access road)			10000	
	Factory Avenue Area (at Lemoyne Avenue)		10000		
	Ley Creek Floodplain				109
	National Grid Wetland				109

Notes:
1. Ley Creek Floodplain uses the ecological SCO unless the residential SCO is lower and that portion of the Ley Creek Floodplain is zoned residential.
2. Chromium refers to trivalent chromium.
3. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

TABLE 8: Summary of Soil Cleanup Objectives for Soil Alternative 3

COC	AREA	Unrestricted SCO (mg/kg)
PCB	Site Soil	0.1
Arsenic	Site Soil	13
Chromium[3]	Site Soil	30
Copper	Site Soil	50
Lead	Site Soil	63
Nickel	Site Soil	30
Zinc	Site Soil	109

Notes:
1. Chromium refers to trivalent chromium.
2. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

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Syracuse, New York
Off-Site Feasibility Study

TABLE 9.1: ALTERNATIVE 1 - NO FURTHER ACTION

	QTY	UNIT	UNIT COST	TOTAL COST	Notes
DIRECT CAPITAL CONSTRUCTION COSTS					
TOTAL DIRECT CAPITAL COST				**0**	
Engineering/Design/Oversight			15%	**0**	
Legal			5%	**0**	
Contingency			20%	**0**	
TOTAL ALTERNATIVE CAPITAL COST				**0**	
OPERATION AND MAINTENANCE COSTS					
TOTAL ANNUAL O&M COST (rounded)				**$0**	

PRESENT WORTH ANALYSIS (YEARS 1-30)		**Discount**		
Cost Type	**Total Cost**	**Factor (7%)**	**Cost Per Yr**	**Present Value**
Capital Cost - Year 0	$0	1.000	$0	$0
Annual O&M - Years 1-30		12.4081	$0	$0
TOTAL PROJECT PRESENT WORTH (rounded)				**$0**

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Syracuse, New York
Off-Site Feasibility Study

TABLE 9.2: REASONABLY ANTICIPATED FUTURE USE

	QTY	UNIT	UNIT COST	TOTAL COST	Notes
DIRECT CAPITAL CONSTRUCTION COSTS					
General Conditions, Surveys and Permits					
General Conditions	1	LS	$626,000	$626,000	Trailer, electrical, CAMP, Construction Management, H&S
Plan Development	1	LS	$56,000	$56,000	Dewatering Plan, HASP, Traffic Control Plan
Permits	1	LS	$46,000	$46,000	Permits and SWPP
Surveys	1	LS	$35,000	$35,000	
Access, Erosion Control, and Site Security	1	LS	$155,000	$155,000	
Pre-design Investigations	1	LS	$100,000	$100,000	Geotechnical investigation, materials testing.
General Conditions, Surveys and Permits Subtotal				**$1,018,000**	
Ley Creek Sediment and Floodplain Soil Removal					
Construction Road	2,800	LF	$39	$109,200	Stone base road.
Cofferdam	6	EA	$37,400	$224,400	50-ft long Port-a-dams.
Creek Dewatering	7	MONTH	$99,200	$694,400	Bypass pumps (up to 50-60 CFS), Maintenance, Fuel.
Sediment Dewatering Pad	1	EA	$52,400	$52,400	1,900 SY HDPE lined Pad.
Treatment of Dewatering Fluids (Bag Filters, Act Carbon)	1	LS	$156,400	$156,400	up to 60 gpm, pump, bag filters, 4000 lbs carbon total. (50% of sed; inc %solids by 17%)
Mechanical Excavation and Dewatering - Non-TSCA	9,600	CY	$107	$1,027,200	Average 1.25 ft depth, bank to bank, volume per Fig 5-5b, assumes 60 to 103 CY/day.
Mechanical Excavation and Dewatering - TSCA	550	CY	$145	$79,750	Assumes 200 - ft length of Ley Creek at Route 11, assumes 60 CY/day.
In-creek restoration; sand	3,620	CY	$51	$184,620	0.5-ft layer of clean sand.
Floodplain Soil Mechanical Excavation	2,900	CY	$58	$168,200	Exc depth ranges 1 to 4-ft, volume per Figs. 5-1b and 5-2, assumes 150 CY/day.
Floodplain Soil Backfill	1,807	CY	$39	$70,489	Exclusive of top 0.5-ft of soil.
Floodplain Soil Restoration; topsoil and seed	59,000	SF	$1.07	$63,130	0.5-ft layer of topsoil
Sediment and Soil Loading	13,050	CY	$7.00	$91,350	
Sediment and Soil Off-site Transport/Disposal - Non-TSCA	12,500	CY	$116.00	$1,450,000	High Acres Landfill, PCBs < 50 ppm; incl fees and 41% fuel surcharge.
Sediment Off-site Transport/Disposal - TSCA	550	CY	$244.00	$134,200	Model City Landfill, PCBs > 50 ppm, land disposal; incl fees and 41% fuel surcharge.
Ley Creek Sediment and Floodplain Soil Removal Subtotal				**$4,505,739**	
National Grid Soil Removal					
Construction Road	560	LF	$36	$20,160	Stone base road
Nat Grid Prop Clearing (Ditch wetland)	0.6	AC	$2,700	$1,620	
Nat Grid Prop Clearing (forested wetland)	3.6	AC	$4,400	$15,840	
Dewatering Pad	1	EA	$108,700	$108,700	4,000 SY HDPE lined Pad.
Treatment of Dewatering Fluids (Bag Filters, Act Carbon)	1	LS	$167,300	$167,300	up to 60 gpm, pump, bag filters, 4000 lbs carbon total. (50% of sed; inc %solids by 17%)
Mechanical Excavation(Nat Grid Area)	8,600	CY	$22	$189,200	Depth Varies; within tree'd area; following tree removal, assumes 400 CY/day, Fig 5-4b
Mechanical Excavation (Access Road)	30	CY	$22	$660	Within wetland area, assumes 400 CY/day, Fig 5-4b
Loading, Transportation and Off-site Disposal - Non-TSCA	2,770	CY	$123	$340,710	High Acres Landfill, PCBs < 50 ppm; incl fees and 41% fuel surcharge.
Loading, Transportation and Off-site Disposal - TSCA	5,830	CY	$244	$1,422,520	Model City Landfill, PCBs > 50 ppm, land disposal; incl fees and 41% fuel surcharge.
Backfill	1,960	CY	$35	$68,600	
Restoration; forest	155,200	SF	$2.35	$364,720	exclusive of topsoil.
Restoration; wetland	24,000	SF	$1.41	$33,840	1-ft layer of topsoil.
Nat Grid Access Road Restoration (gravel)	300	SF	$1.85	$555	1-ft layer of topsoil.
National Grid Soil Removal Subtotal				**$2,734,425**	
Factory Avenue Soil Removal					
Traffic Control	1	LS	$6,600	$6,600.00	
Shoring	7,445	SF	$40	$297,800.00	
Mechanical Excavation	3,600	CY	$22	$79,200.00	4-ft depth, volume per Fig. 5-3b, assumes 400 CY/day.
Loading, Transportation and Off-site Disposal - Non-TSCA	1,800	CY	$123	$221,400.00	High Acres Landfill, PCBs < 50 ppm; incl fees and 41% fuel surcharge.
Loading, Transportation and Off-site Disposal - TSCA	1,800	CY	$244	$439,200.00	Model City Landfill, PCBs > 50 ppm, land disposal; incl fees and 41% fuel surcharge.
Backfill	3,280	CY	$35	$114,800.00	
Restoration; topsoil and seed	17,200	SF	$0.85	$14,620.00	0.5-ft layer of topsoil.
Restoration; Asphalt	100	SF	$11	$1,100.00	Access road entrance from Factory Avenue.
Restoration; gravel	20,000	SF	$1.85	$37,000.00	Factory Avenue Shoulder, 0.5 ft gravel.
Factory Avenue Soil Removal Subtotal				**$1,211,720**	
TOTAL DIRECT CAPITAL COST (rounded)				**$9,470,000**	
Engineering/Design/Oversight			15%	1,420,500	
Legal			5%	473,500	
Contingency			25%	2,367,500	
TOTAL INDIRECT CAPITAL COST (rounded)				**$4,262,000.00**	
TOTAL ALTERNATIVE CAPITAL COST (rounded)				**$13,732,000.00**	

RACER Trust
Former Inland Fisher Guide Facility and Ley Creek Deferred Media Site
Syracuse, New York
Off-Site Feasibility Study

TABLE 9.2: REASONABLY ANTICIPATED FUTURE USE

	QTY	UNIT	UNIT COST	TOTAL COST	Notes
OPERATION AND MAINTENANCE COSTS			**$15,000.00**		Assumes up to 1 acre of maintenance required.
Annual Costs (Years 1-7)					
Wetland monitoring and Reporting	1	LS	$12,500.00	12,500	
Contingency Planting and Invasive Species Control	1	LS	$15,000.00	15,000	Assumes up to 0.5 acre of maintenance required.
TOTAL ANNUAL O&M COST (rounded)				**$27,500**	
Periodic Costs (Years 5, 10, 15, 20, 25, 30))					
5-yr reviews	1	ea	$5,000.00	$7,000	

PRESENT WORTH ANALYSIS (YEARS 1-30)		**Discount**		
Cost Type	**Total Cost**	**Factor (7%)**	**Cost Per Yr**	**Present Value**
Capital Cost - Year 0	$13,732,000	1.000	$13,732,000	$13,732,000
Annual O&M - Years 1-7		12.4081	$27,500	$341,200
Periodic Costs - Years 5, 10, 15, 20, 25, 30		2.1577	$7,000	$15,100
TOTAL PROJECT PRESENT WORTH (rounded)				**$14,088,000**

Notes:
Estimate excludes the following:
- Pre-characterization sampling in Ley Creek and National Grid Wetland
- Tax on construction and materials
- Wetland dewatering and water treatment
- Construction water treatment
- Confirmatory sampling (production rates also assume no confirmatory sampling)
- Additivies to dewater sediment
- Expenses related to obtaining property access and right-of-ways.

RACER Trust
Former Inland Fisher Guide Facility and Ley Creek Deferred Media Site
Syracuse, New York
Off-Site Feasibility Study

TABLE 9.3: UNRESTRICTED USE

		QTY	UNIT	UNIT COST	TOTAL COST	Notes
DIRECT CAPITAL CONSTRUCTION COSTS						
General Conditions, Surveys and Permits						
	General Conditions	1	LS	$1,103,000	$1,103,000	Trailer, electrical, CAMP, Construction Management, H&S
	Plan Development	1	LS	$56,000	$56,000	Const WP, Dewatering Plan, HASP, Traffic Control Plan
	Permits	1	LS	$46,000	$46,000	Permits and SWPP
	Surveys	1	LS	$69,000	$69,000	
	Access, Erosion Control, and Site Security	1	LS	$155,000	$155,000	
Pre-design Investigations		1	LS	$100,000	$100,000	Geotechnical investigation, materials testing.
	General Conditions, Surveys and Permits Subtotal				**$1,529,000**	
Ley Creek Sediment and Floodplain Soil Removal						
	Construction Road	2,800	LF	$39	$109,200	Stone base road.
	Cofferdam	10	EA	$37,400	$374,000	50-ft long Port-a-dams.
	Creek Dewatering	10	MONTHS	$99,200	$992,000	Bypass pumps (up to 50-60 CFS), Maintenance, Fuel.
	Sediment Dewatering Pad	1	EA	$136,100	$136,100	4,740 SY HDPE lined Pad.
	Treatment of Dewatering Fluids (Bag Filters, Act Carbon)	1	LS	$169,900	$169,900	up to 60 gpm, pump, bag filters, 4000 lbs carbon total. (50% of sed; inc %solids by 17%)
	Mechanical Excavation and Dewatering - Non-TSCA	13,200	CY	$104	$1,369,764	Average 1.25 ft depth, bank to bank, volume per Fig 5-10, assumes 60 to 103 CY/day.
	Mechanical Excavation and Dewatering - TSCA	550	CY	$145	$79,750	Assumes 200 - ft length of Ley Creek at Route 11, assumes 60 CY/day.
	In-creek restoration; sand	5,060	CY	$51	$258,060	0.5-ft layer of clean sand.
	Floodplain Soil Mechanical Excavation - Non-TSCA	8,400	CY	$58	$487,200	Exc. depth ranges 1 to 4-ft, volume per Figs. 5-6 and 5-7.
	Floodplain Soil Backfill	6,140	CY	$39	$239,460	Exclusive of top 0.5-ft of soil.
	Floodplain Soil Restoration; topsoil and seed	121,900	SF	$1.07	$130,433	0.5-ft layer of topsoil
	Sediment and Soil Loading	22,150	CY	$7.00	$155,050	
	Sediment and Soil Off-site Transport/Disposal - Non-TSCA	21,600	CY	$116.00	$2,505,600	High Acres Landfill, PCBs < 50 ppm; incl fees and 41% fuel surcharge.
	Sediment Off-site Transport/Disposal - TSCA	550	CY	$238.00	$130,900	Model City Landfill, PCBs > 50 ppm, land disposal; incl fees and 41% fuel surcharge.
	Ley Creek Sediment and Floodplain Soil Removal Subtotal				**$7,137,417**	
National Grid Soil Removal						
	Construction Road	560	LF	$36	$19,980	Stone base road.
	Nat Grid Prop Clearing (Ditch wetland)	0.6	AC	$2,700	$1,620.00	
	Nat Grid Prop Clearing (forested wetland)	4.5	AC	$4,400	$19,800.00	
	Dewatering Pad	1	EA	$156,100	$156,100.00	5,672 SY HDPE lined Pad.
	Treatment of Dewatering Fluids (Bag Filters, Act Carbon)	1	LS	$149,800	$149,800.00	up to 60 gpm, pump, bag filters, 4000 lbs carbon total. (50% of sed; inc %solids by 17%)
	Mechanical Excavation	14,400	CY	$22	$316,800	Average 1.75 ft depth, volume per Fig 5-10, assumes 400 CY/day, Fig 5-9
	Mechanical Excavation (Access Road)	760	CY	$27	$20,520	Average 2 ft depth, volume per Fig 5-10, assumes 400 CY/day, Fig 5-9
	Loading, Transportation and Off-site Disposal - Nonhaz	8,830	CY	$123	$1,086,090	High Acres Landfill, PCBs < 50 ppm; incl fees and 41% fuel surcharge.
	Loading, Transportation and Off-site Disposal - Haz	6,330	CY	$244	$1,544,520	Model City Landfill, PCBs > 50 ppm, land disposal; incl fees and 41% fuel surcharge.
	Backfill	7,200	CY	$35	$252,000	Exclusive of top 1-ft.
	Restoration; forest wetland	170,800	SF	$2.35	$401,380	1-ft layer of topsoil.
	Restoration; wetland	23,500	SF	$1.41	$33,135	1-ft layer of topsoil.
	Restoration; gravel	8,160	SF	$1.85	$15,096	0.5-ft layer gravel.
	National Grid Soil Removal Subtotal				**$4,016,841**	
Factory Avenue Soil Removal						
	Traffic Control	1	LS	$6,600	$6,600.00	
	Shoring	11,950	SF	$40	$478,000.00	20-ft Sheet pile.
	Mechanical Excavation	7,900	CY	$22	$173,800.00	1 to 10-ft depth, volume per Fig. 5-8, 400 CY/day.
	Loading, Transportation and Off-site Disposal - Nonhaz	3,950	CY	$123	$485,850.00	High Acres Landfill, PCBs < 50 ppm; incl fees and 41% fuel surcharge.
	Loading, Transportation and Off-site Disposal - Haz	3,950	CY	$244	$963,800.00	Model City Landfill, PCBs > 50 ppm, land disposal; incl fees and 41% fuel surcharge.
	Backfill	7,010	CY	$35	$245,350.00	Exclusive of top 0.5-ft.
	Restoration; topsoil and seed	26,000	SF	$0.85	$22,099.58	0.5-ft layer of topsoil.
	Restoration; Asphalt	100	SF	$11	$1,100.00	Access road entrance from Factory Avenue.
	Restoration; gravel	24,800	SF	$1.85	$45,880.00	Factory Avenue Shoulder, 0.5 ft gravel.
	Factory Avenue Soil Removal Subtotal				**$2,422,480**	
TOTAL DIRECT CAPITAL COST (rounded)					**$15,106,000**	
	Engineering/Design/Oversight			15%	2,265,900	
	Legal			5%	755,300	
	Contingency			25%	3,776,500	`
TOTAL INDIRECT CAPITAL COST (rounded)					**$6,798,000.00**	
TOTAL ALTERNATIVE CAPITAL COST (rounded)					**$21,904,000.00**	

RACER Trust
Former Inland Fisher Guide Facility and Ley Creek Deferred Media Site
Syracuse, New York
Off-Site Feasibility Study

TABLE 9.3: UNRESTRICTED USE

	QTY	UNIT	UNIT COST	TOTAL COST	Notes
OPERATION AND MAINTENANCE COSTS					
Annual Costs (Years 1-7)					
Wetland monitoring and Reporting	**1**	**LS**	**$12,500.00**	**12,500**	
Contingency Planting and Invasive Species Control	1	LS	**$15,000.00**	**15,000**	Assumes up to 1 acre of maintenance required.
TOTAL ANNUAL O&M COST (rounded)				**$27,500**	
Periodic Costs (Years 5, 10, 15, 20, 25, 30))			**$15,000.00**		Assumes up to 0.5 acre of maintenance required.
5-yr reviews	1	ea	$7,000.00	$7,000	

PRESENT WORTH ANALYSIS (YEARS 1-30)		Discount		
Cost Type	**Total Cost**	**Factor (7%)**	**Cost Per Yr**	**Present Value**
Capital Cost - Year 0	$0	1.000	$0	$21,904,000
Annual O&M - Years 1-7		12.4081	$27,500	$341,200
Periodic Costs - Years 5, 10, 15, 20, 25, 30		2.1577	$7,000	$15,100
TOTAL PROJECT PRESENT WORTH (rounded)				**$22,260,000**

Notes:
Estimate excludes the following:
- Pre-characterization sampling in Ley Creek and National Grid Wetland
- Tax on construction and materials
- Wetland dewatering and water treatment
- Construction water treatment
- Confirmatory sampling (production rates also assume no confirmatory sampling)
- Additivies to dewater sediment
- Expenses related to obtaining property access and right-of-ways.

TABLE 10: EVALUATION OF POTENTIAL STANDARDS, CRITERIA AND GUIDANCE (SCGs)

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alt(s)
Potential Chemical-Specific SCGs					
Soil	6 New York Code of Rules and Regulations (NYCRR) Part 375-6 Remedial Program Soil Cleanup Objectives (SCOs)	Provides SCOs for various property uses. Property uses for which SCOs are provided are Unrestricted, Residential, Restricted Residential, Commercial and Industrial Uses. SCOs are also provided for the protection of ecological receptors and groundwater.	Potentially applicable to off-site area soils, based on current and reasonable future property use.	Yes	All
	New York State Department of Environmental Conservation (NYSDEC) Commissioner's Policy - Soil Cleanup Guidance	Guidance that provides framework and procedures for the selection of soil cleanup levels. As part of the procedures, supplemental soil cleanup levels are provided.	Potentially applicable to off-site area soils, based on current and reasonable future property use.	Yes	All
Ley Creek Surface Water	NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 - Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations	This TOGS presents NYSDEC Division of Water ambient water quality standards and guidance values and groundwater effluent limitations. The authority for these values is derived from Article 17 of the Environmental Conservation law and 6 NYCRR Parts 700-706, Water Quality.	Potentially applicable to Ley Creek surface water.	Yes	All
Ley Creek Sediment	NYSDEC 1999 Technical Guidance for Screening of Contaminated Sediments - Sediment Quality Criteria	State guidance document that provides sediment quality criteria for aquatic sediments.	Potentially applicable to Ley Creek sediment.	Yes	All
Potential Location-Specific SCGs					
Wetlands	6 NYCRR 663 - Freshwater wetland permit requirements	Actions occurring in a designated freshwater wetland (within 100 ft) must be approved by NYSDEC or its designee. Activities occurring adjacent to freshwater wetlands must: be compatible with preservation, protection, and conservation of wetlands and benefits; result in no more than insubstantial degradation to or loss of any part of the wetland; and be compatible with public health and welfare.	Potentially applicable based on available mapping which shows that the wetland area on the National Grid property west of the facility is a portion of State-mapped wetland SYE 6. In addition, wetland SYE 6 extends north and south of the NYS Thruway, north and south side of Factory Avenue, and east and west of Townline Road.	Yes	2A, 2B and 3
Wetlands and 100-yr floodplain	United States Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response (OSWER) Directive 9280.0-02 (August 1985) - Policy on Floodplains and Wetlands Assessments for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Actions	Superfund actions must meet the substantive requirements of Executive Order 11988 (Floodplain Management) and Executive Order 11990 (Protection of Wetlands). Executive Order 11988 requires that consideration of flood hazards and floodplain management including restoration and preservation as natural undeveloped floodplains be included in the evaluation of the potential effects of remedial actions. Executive Order 11990 requires that activities occurring in wetlands be conducted in such a manner as to minimize the destruction, loss and degradation of wetlands.	Potentially applicable because portions of off-site areas are within floodplain and/or wetland areas. Specifically, portions of off-site areas are located in the 100-yr floodplain for Ley Creek and based on available mapping, the wetland area on the National Grid property west of the facility is a portion of State-mapped wetland SYE 6. In addition, wetland SYE 6 extends north and south of the NYS Thruway, north and south side of Factory Avenue, and east and west of Townline Road.	Yes	2A, 2B and 3

TABLE 10: EVALUATION OF POTENTIAL STANDARDS, CRITERIA AND GUIDANCE (SCGs)

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alt(s)
		Potential Location-Specific SCGs (continued)			
100-yr floodplain	6 NYCRR 373-2.2 - Location standards for hazardous waste treatment, storage, and disposal facilities - 100-yr floodplain	Hazardous waste treatment, storage, or disposal facilities located in a 100-yr floodplain must be designed, constructed, operated and maintained to prevent washout of hazardous waste during a 100-yr flood.	Portions of off-site areas are located in the 100-yr floodplain for Ley Creek. Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as hazardous waste in New York State. Potentially applicable for soil, sediment or construction waters found to be hazardous waste and requiring temporary storage or treatment as part of remedy implementation.	Yes	All
Within 61 meters (200 ft) of a fault displaced in Holocene time	40 Code of Federal Regulations (CFR) Part 264.18	New treatment, storage, or disposal of hazardous waste is not allowed.	Not applicable. Off-site areas are not located within 200 ft of a fault displaced in Holocene time, as listed in 40 CFR 264 Appendix VI.	No	None
River or stream	16 United States Code (USC) 661 - Fish and Wildlife Coordination Act	Requires protection of fish and wildlife in a stream when performing activities that modify a stream or river.	Potentially applicable to remediation of Ley Creek sediment.	Yes	2A, 2B and 3
Habitat of an endangered or threatened species	6 NYCRR 182	Provides requirements to minimize damage to habitat of an endangered species.	Not applicable, as no endangered or threatened species or their habitat were found in the off-site areas.	No	None
	Endangered Species Act	Provides a means for conserving various species of fish, wildlife, and plants that are threatened with extinction.	Not applicable, as no endangered or threatened species or their habitat were found in the off-site areas.	No	None
Historical property or district	National Historic Preservation Act	Remedial actions are required to account for the effects of remedial activities on any historic properties included on or eligible for inclusion on the National Register of Historic Places.	Not applicable, as no historic properties were identified in the off-site areas.	No	None
Construction in a floodplain	6 NYCRR 500 - Floodplain management regulations development permits	Hazardous waste treatment, storage, or disposal facilities located in a 100-yr floodplain must be designed, constructed, operated and maintained to prevent washout of hazardous waste during a 100-yr flood.	Portions of off-site areas are located in the 100-yr floodplain for Ley Creek. Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as hazardous waste in New York State. Potentially applicable.	Yes	2A, 2B and 3
Treatment actions	6 NYCRR 373 - Hazardous waste management facilities	Provides requirements for managing hazardous wastes.	Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as hazardous waste in New York State. Potentially applicable to excavated soil and sediment.	Yes	2A, 2B and 3

TABLE 10: EVALUATION OF POTENTIAL STANDARDS, CRITERIA AND GUIDANCE (SCGs)

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alt(s)
		Potential Action-Specific SCGs			
General excavation	6 NYCRR 257-3 - Air Quality Standards	Provide limitations for generation of constituents including particulate matter.	Not applicable because dust emissions would not be from a point source. May be relevant for consideration during dust generating activities such as earth moving, grading and excavation of soil.	Yes	2A, 2B and 3
	40 CFR 50.1 through 50.12 - National Ambient Air Quality Standards.	Provides air quality standards for pollutants considered harmful to public health and the environment. The six principle pollutants include carbon monoxide, lead, nitrogen dioxide, particulates, ozone, and sulfur oxides.	Potentially applicable during dust generating activities such as earth moving, grading, and excavation of soil.	Yes	2A, 2B and 3
Generation and disposal of hazardous material and treatment residuals	6 NYCRR 360 - Solid Waste Management Facilities	Provides requirements for management of solid wastes, including disposal and closure of disposal facilities.	Potentially applicable to excavated soil and sediment, and to treatment residuals associated with construction water management.	Yes	2A, 2B and 3
Construction	29 CFR Part 1910 - Occupational Safety and Health Standards - Hazardous Waste Operations and Emergency Response	Remedial activities must be in accordance with applicable Occupational Safety and Health Administration (OSHA) requirements.	Applicable for construction phase of remediation.	Yes	2A, 2B and 3
	29 CFR Part 1926 - Safety and Health Regulations for Construction	Remedial construction activities must be in accordance with applicable OSHA requirements.	Applicable for construction phase of remediation.	Yes	2A, 2B and 3
Transportation	6 NYCRR 364 - Waste Transporter Permits	Hazardous waste transport must be conducted by a hauler permitted under 6 NYCRR 364.	Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as hazardous waste in New York State. Potentially applicable.	Yes	2A, 2B and 3
	6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities	Substantive hazardous waste generator and transportation requirements must be met when hazardous waste is generated for disposal. Generator requirements include obtaining a USEPA Identification Number and manifesting hazardous waste for disposal.	Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as hazardous waste in New York State. Potentially applicable.	Yes	2A, 2B and 3
	49 CFR 172-174 and 177-179 - Department of Transportation (DOT) Regulations	Hazardous waste transport to off-site disposal facilities must be conducted in accordance with applicable DOT requirements	Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as hazardous waste in New York State. Potentially applicable.	Yes	2A, 2B and 3

TABLE 10: EVALUATION OF POTENTIAL STANDARDS, CRITERIA AND GUIDANCE (SCGs)

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alt(s)
		Potential Action-Specific SCGs (continued)			
Land disposal of hazardous waste	6 NYCRR 376 - Land disposal restrictions	Provides treatment standards to be met prior to land disposal of hazardous wastes.	Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as hazardous waste in New York State. Potentially applicable.	Yes	2A, 2B and 3
Disposal of Toxic Substances Control Act (TSCA) waste	40 CFR 761	Provides requirements for disposal of TSCA wastes.	Based on analytical results of soil and sediment, there is the potential for some excavated materials to exhibit concentrations of PCBs in excess of 50 mg/kg, and thus, be categorized as TSCA waste. Potentially applicable.	Yes	2A, 2B and 3
Discharge to surface water	6 NYCRR 750 through 758 - State Pollutant Discharge Elimination System (SPDES) Regulations	Substantive requirements associated with discharge to a water body (limitations and monitoring requirements) would be set by NYSDEC.	Applicable to treated water from dewatering operations in the event that these are discharged to Ley Creek.	Yes	2A, 2B and 3
Generation of air emissions	NYS Air Guide 1	Provides annual guideline concentrations (AGLs) and short-term guideline concentrations (SGCs) for specific chemicals. These are property boundary limitations that would result in no adverse health effects.	Potentially applicable.	Yes	2A, 2B and 3
	NYS Technical Administration Guidance Memorandum (TAGM) 4031 - Dust Suppressing and Particle Monitoring at Inactive Hazardous Waste Disposal Sites	Provides limitations on dust emissions.	Potentially applicable.	Yes	2A, 2B and 3
Construction storm water management	NYSDEC General permit for storm water discharges associated with construction activities. Pursuant to Article 17 Titles 7 and 8 and Article 70 of the Environmental Conservation Law.	The regulation prohibits discharge of materials other than storm water and all discharges that contain a hazardous substance in excess of reportable quantities established by 40 CFR 117.3 or 40 CFR 302.4, unless a separate NPDES permit has been issued to regulate those discharges. A permit must be acquired if activities involve disturbance of 5 acres or more. If the project is covered under the general permit, the following are required: development and implementation of a storm water pollution prevention plan; development and implementation of a monitoring program; all records must be retained for a period of at least 3 years after construction is complete.	Potentially applicable.	Yes	2A, 2B and 3

TABLE 10: EVALUATION OF POTENTIAL STANDARDS, CRITERIA AND GUIDANCE (SCGs)

Medium/Location/ Action	Citation	Requirements	Comments	Potential SCG	Alt(s)

Notes:
CFR - Code of Federal Regulations
DOT - Department of Transportation
NPDES - National Pollutant Discharge Elimination Discharge System
NYCRR - New York Code of Rules and Regulations
NYSDEC - New York State Department of Environmental Conservation
PCB - Polychlorinated biphenyl
SCO - Soil Cleanup Objective
TAGM - NYS Technical Administration Guidance Memorandum
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX III

ADMINISTRATIVE RECORD INDEX

Administrative Record Index
Operable Unit 2 of the General Motors – Inland Fisher Guide
Subsite of the Onondaga Lake Superfund Site

RI/FS Activities	Document
Remedial Investigation/ Feasibility Study Work Plan	Final Work Plan, Supplemental Remedial Investigation/Feasibility Study, Former Inland Fisher Guide Facility and Ley Creek Deferred Media (October 1999)
Remedial Investigation Reports	Problem Formulation Document, Former IFG Facility and Ley Creek Deferred Media (April 2000)
	Exposure Pathway Analysis Report for the Human Health Risk Assessment, Former IFG Facility and Deferred Media, Syracuse, New York (June 2000)
	Revised Off-Site Remedial Investigation Report, Former Syracuse IFG Facility and Deferred Media Site (March 2013)
	Fish and Wildlife Impact Analysis, Former Syracuse Inland Fisher Guide Facility (October 2013)
Feasibility Studies	Off-Site Feasibility Study, Former IFG Facility and Deferred Media Site (May 2013)
	Revised Draft Addendum, Off-Site Feasibility Study, Former IFG Facility and Deferred Media Site, Addendum, Syracuse, New York (June 2014)
Proposed Plan Released	Proposed Plan (November 17, 2014)
Public Meeting Held	Documentation and Transcript of December 2, 2014 Public Meeting (Attached to the ROD as Appendix V-d)
	Written Comments on Selected Remedy (Attached to the ROD as Appendix V-e)
Record of Decision Issued	Record of Decision and Responsiveness Summary (March 31, 2015)
Enforcement Documents	Administrative Consent Order (September 25, 1997)

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX IV

NEW YORK STATE DEPARTMENT OF HEALTH LETTER OF CONCURRENCE

Howard A. Zucker, M.D., J.D.
Acting Commissioner of Health

Sue Kelly
Executive Deputy Commissioner

October 23, 2014

Mr. Robert Schick, Director
NYS Dept. of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233

Re: **Proposed Plan — Operable Unit 2**
General Motors - Fisher Guide
Site #734057
Salina (T), Onondaga County

Dear Mr. Schick:

At your Department's request, staff reviewed the US EPA's and your Department's *Proposed Plan* for Operable Unit 2 (as defined in the plan) of the referenced site to determine whether the proposed remedy is protective of public health. I understand that sediment and soil within and along Lower Ley Creek, floodplains and wetlands are contaminated. Human exposures to this contamination will be addressed by the proposed remedy as follows:

- Sediment: All sediment that is contaminated with polychlorinated biphenyls at levels above 1 mg/kg will be removed for off-site disposal. Removal areas will be restored in accordance with an approved habitat restoration plan.
- Soil: Soil and subsurface soil will be removed to meet ecological or land use soil cleanup objectives depending upon the current and reasonably anticipated future land use of discrete areas. Residual contamination will be managed in place (in accordance with voluntary agreements that are obtained when individual property owners grant permission to your Department or the US EPA to do so) and cover systems will be maintained to allow for continued use of the properties in accordance with 6NYCRR Part 375. Future excavations will be conducted in accordance with an approved excavation plan to ensure that human exposures to contaminated soil are properly managed.

Periodic reviews will be completed to certify that these elements of the remedy are being implemented and remain effective. This remedy is dependent upon agreements with third parties. If these agreements cannot be obtained, I understand that appropriate next steps will be discussed. Based on this information, I believe the remedy is protective of public health and concur with the *Proposed Plan*. If you have any questions, please contact Ms. Maureen Schuck or me at 518-402-7860.

Sincerely,

Krista M. Anders

Krista M. Anders, Director
Bureau of Environmental Exposure Investigation

ec: A. Salame-Alfie, Ph.D.
M. Schuck / M. Sergott / e-File
J. Strepelis – NYSDOH CRO
K. Zimmerman – OCHD
M. Ryan / D. Hesler / R. Mustico – NYSDEC Central Office
H. Warner – NYSDEC Region 7

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OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
FOR THE RECORD OF DECISION
OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE SUBSITE
ONONDAGA LAKE SUPERFUND SITE
TOWN OF SALINA, ONONDAGA COUNTY, NEW YORK

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns received during the public comment period related to the General Motors – Inland Fisher Guide Subsite (Subsite) of the Onondaga Lake Superfund site (Site) Proposed Plan and provides the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (EPA) responses to those comments and concerns. All comments summarized in this document have been considered in the final decision in the selection of a remedy to address the contamination at the Subsite.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

NYSDEC and General Motors Corporation (GM) entered into an Administrative Order on Consent in 1997 that required GM to conduct a remedial investigation and feasibility study (RI/FS)[1] for the Subsite. GM conducted field investigations at the Subsite that culminated in the completion of an RI report in March 2013, FS report in May 2013 and FS report addendum in June 2013 for Operable Unit 2 (OU2)[2] of the Subsite by the Revitalizing Auto Communities Environmental Response (RACER) Trust.[3] Based upon the results of the RI/FS, NYSDEC and EPA identified a preferred remedy for OU2. The preferred remedy and the basis for that preference were identified in a Proposed Plan.[4] The RI/FS reports and a Proposed Plan were released to the public for comment on November 17, 2014. These documents were made available to the public at information repositories maintained at the Salina Library, 100 Belmont Street, Mattydale, New York; Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York; NYSDEC, Division of Environmental Remediation, 625 Broadway, Albany, New York; NYSDEC Region 7, 615 Erie Boulevard West, Syracuse, New York; and at EPA's Region 2 Records Center, 290 Broadway, 18th Floor, New York, New York. An

[1] An RI determines the nature and extent of the contamination at a site and evaluates the associated human health and ecological risks and an FS identifies and evaluates remedial alternatives to address the contamination.

[2] The Subsite consists of two OUs--OU1, which addresses the former plant and groundwater on, and emanating from, the former plant, and OU2, which includes "other media" not addressed under OU1. Specifically, OU2 includes Ley Creek channel sediments, surface water and floodplain soils/sediments in the reach from Townline Road to the Route 11 Bridge, and the National Grid Wetland, Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area described in the ROD.

[3] In 2009, General Motors filed for bankruptcy, and on March 31, 2011, administration of the remedial activities at the GM-IFG Subsite was taken over by RACER, the current property owner.

[4] A Proposed Plan describes the remedial alternatives considered for a site and identifies the preferred remedy with the rationale for this preference.

NYSDEC listserv bulletin notifying the public of the availability for the above-referenced documents, the comment period start and completion dates and the date of the planned public meeting was issued on November 14, 2014. The public comment period ran from November 17, 2014 to December 17, 2014.

A second public comment period ran from January 14, 2015 to February 14, 2015. An NYSDEC listserv bulletin notifying the public of the availability for the RI and FS reports and Proposed Plan and the second comment period's completion date was issued on January 14, 2015. This information was also published in *The Post-Standard* on January 14, 2015.

On December 2, 2014, NYSDEC held a public meeting at the Town of Salina Town Hall, 201 School Road, Liverpool, New York, to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for the OU2 portion of the Subsite, including the preferred remedy, and to respond to questions and comments from the public. Approximately 20 people, including local business people and local government officials, attended the public meeting.

SUMMARY OF COMMENTS AND RESPONSES

Comments were received at the public meeting and in writing.

Comments at the public meeting were received from Robert A. Papworth, Trustee, The Nature Conservancy, Central Western New York. The transcript from the public meeting can be found in Appendix V-d.

Written comments were received from:

- Michael E. Hooker, Executive Director of the Onondaga County Water Authority, transmitted *via* a November 25, 2014, e-mail.
- Julia Braunmueller and David Palmerton, Palmerton Group on behalf of Carrier Corporation, Cooper Crouse-Hinds, LLC, Syracuse China Company, and Niagara Mohawk Power Company d/b/a National Grid, transmitted *via* a December 16, 2014, e-mail from Julia Braunmueller, Assistant Project Manager, Palmerton Group, LLC.
- Richard Capozza, Partner, Hiscock and Barclay, on behalf of Niagara Mohawk Power Company d/b/a National Grid, transmitted *via* a December 17, 2014, letter.
- Kevin C. Murphy, The Wladis Law Firm P.C., on behalf of Onondaga County, transmitted *via* a December 17, 2014, e-mail.
- Alma Lowery, Of Counsel, Law Office of Joseph J. Heath, on behalf of the Onondaga Nation, transmitted *via* a December 17, 2014, e-mail.
- Steve Apelman, President and Tim Cook, V.P. of Operations of Greenfield Restorations, transmitted *via* a January 20, 2015, e-mail.

The written comments submitted during the public comment period can be found in Appendix V-e.

A summary of the comments provided at the public meeting and in writing, as well as the NYSDEC and EPA responses to them, are provided below.

Coordination with the Lower Ley Creek Subsite

Comment #1: A commenter opines that it is critical that if the entirety of the Creek is not going to be subject to primary oversight by a single government regulator, whether that be EPA or NYSDEC, that the regulators work cooperatively and in harmony to secure an overall result that is protective of human health and the environment without actual or perceived differences in the remedy and in a manner that is cost-effective and efficient for all parties concerned, especially given the impact of the GM bankruptcy. Another commenter opines that the remedy for Ley Creek upstream of the Route 11 bridge and the remedy for Lower Ley Creek should be coordinated if not integrated into a single remediation project to increase the efficiency of the cleanup, reduce the environmental footprint of the project, limit the duration and extent of impacts on the local community, and increase the overall protectiveness of the remedies.

Response #1: The remedies for both Lower Ley Creek and GM-IFG will comply with applicable or relevant and appropriate requirements of federal and state environmental statutes and requirements. As both Lower Ley Creek and GM-IFG are part of the Site, they must comply with the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. Therefore, the remedial programs for both will have to be consistent and protective of public health and the environment. The remedial alternatives for both were developed under the joint review of EPA and NYSDEC. EPA and NYSDEC have discussed with the potentially responsible parties (PRPs) for Lower Ley Creek and the RACER Trust the importance of coordinating the implementation of the two remedies.

It should be noted that the physical characteristics and the nature of the contamination present in Ley Creek, from the Route 11 bridge downstream to Onondaga Lake (Lower Ley Creek), are significantly different than the Creek upstream of the Route 11 bridge (OU2 portion of the GM-IFG). For example, the sediment depths in Ley Creek upstream of the Route 11 are typically 1 to 2 feet thick, whereas sediment depths in Lower Ley Creek are significantly thicker (1 to 8 feet thick). Nevertheless, the sediment remedies for both of the subsites are similar in their end result. Lower Ley Creek calls for a 1 milligram per kilogram (mg/kg) PCB cleanup number in sediments, as does the OU2 portion of GM-IFG. The remedy for the OU2 portion of GM-IFG calls for complete removal of sediment to native clay where any PCB concentrations are above 1 mg/kg.

In addition, the soil remedies for both of the subsites are similar. The Lower Ley Creek remedy calls for a PCB-soil cleanup of 1 mg/kg in the top 2 feet and of 10 mg/kg in deeper soils, and the OU2 portion of the GM-IFG remedy calls for a PCB-soil cleanup of 1 mg/kg in ecological, residential and commercial use areas irrespective of depth (the extent of PCB-contaminated soil at the OU2 portion of GM-IFG is generally in the top 1-4 feet).

Comment #2: A commenter questions the proposed timing of the implementation of the remedy given that the source areas are subject to continuing investigation and have not yet been remediated, while at the same time the former GM-IFG facility continues to discharge PCBs to Ley Creek. Given these deficiencies, the commenter states that the projected costs are based on poorly defined remedial endpoints and insufficient field data and, thus, the Proposed Plan's comparison of remedies is of limited utility.

Response #2: Analyses of samples collected from Ley Creek surface water and sediments upstream of the contaminated areas indicate that current upstream conditions will not impact the remedy, since PCBs were not detected in upstream surface water, and upstream sediment samples averaged only 0.28 mg/kg for PCBs, well below the cleanup goal.

In addition, three Interim Remedial Measures (IRMs) were performed at the former GM-IFG facility from 2002 to 2004 to prevent the former GM facility from acting as a source of PCBs to Ley Creek or, as termed by the commenter, to prevent "the discharge of PCBs to Ley Creek," that could impact the remedy. An industrial landfill at the former GM-IFG facility that contains chromium- and PCB-contaminated material was capped to prevent contaminants from leaching into the groundwater. A second response action involved the removal of highly-contaminated soil from a former discharge swale used in the 1950s and 1960s as a conduit for the discharge of liquid process waste to Ley Creek. The swale was subsequently filled in, but the contaminated soil remained until removed by the IRM. Over 26,000 tons of soil containing PCBs were removed by this IRM for off-Site disposal. The third response action involved the construction of a retention pond and associated water treatment system to stop the intermittent discharge of PCBs and other contaminants to Ley Creek that could occur during storm events. This pond collects all water that accumulates on the GM-IFG property in any of the storm sewers or abandoned process sewers. The pond water is then treated by the on-Site treatment plant, prior to discharge to Ley Creek. The discharge from the former GM-IFG facility to Ley Creek is regulated by the NYSDEC through a State Pollutant Discharge Elimination System (SPDES) permit.

Furthermore, the sampling performed during the RI provided sufficient information to estimate soil and sediment removal volumes and to develop suitable, corresponding FS level cost estimates. During the remedial design (RD), additional sampling will be performed to refine the limits of soil and sediment excavation.

Comparison to the Lower Ley Creek Remedy

Comment #3: A commenter states that the sediment remedy for Lower Ley Creek is more conservative than the remedy for the OU2 portion of GM-IFG.

Response #3: Both remedies have PCB cleanup levels of 1 mg/kg in sediment, which means that sediment areas that exhibit less than 1 mg/kg total PCBs will not be excavated under either remedy. Because of the relatively shallow depth of sediment in Ley Creek between Townline Road and Route 11 (generally 1 to 2 feet), any area of sediment excavation under the OU2 portion of the GM-IFG remedy is expected to remove all of the sediment to the underlying native clay. For Lower Ley Creek, the remedy generally addresses deeper sediment excavations. The differences between the two remedies are not differences in protectiveness; they reflect differences in the sediment deposition and the nature and extent of contamination between the two subsites.

Comment #4: A commenter states that the Lower Ley Creek remedy is unnecessarily over-protective due to the greater soil backfill thicknesses. The commenter states that the post-excavation fill placement for the two subsites should be the same.

Response #4: For the OU2 portion of GM-IFG, soil contamination has been identified in floodplains areas and other discrete areas, including the National Grid Wetland Area and the Factory Avenue Area, with an estimated two foot average depth of soil contamination. For Lower Ley Creek, on the other hand, the soil contamination is significantly deeper, to depths of 14 feet in limited areas. As a result, the deeper excavations at Lower Ley Creek will generally require more backfill.

For the Lower Ley Creek remedy, the limited hotspot excavation areas on the southern bank will not be backfilled to grade since reducing the elevation of this area will increase the flood storage capacity of the floodplain. The extent of backfilling in these areas will be determined during the RD based on the consideration of various factors, including flooding potential and desired habitat conditions.

Where it may not be possible to excavate soil to achieve the soil cleanup objectives (SCOs), such as in the vicinity of underground utilities, both remedies call for a demarcation layer and a one-foot soil cover. In such cases, protectiveness is being provided by a combination of excavation and a soil cover.

As stated in Response #3, the differences between the two remedies are not indicative of any difference in protectiveness but rather reflect differences in the nature and extent of contamination between the two subsites.

Comment #5: A commenter states that there appears to be a discrepancy between the sediment remedies between Lower Ley Creek and the OU2 portion of GM-IFG, and that, absent an explanation that resolves the apparent discrepancy, NYSDEC should select Sediment Alternative 4 (0.28 mg/kg PCB sediment cleanup goal) for the OU2 portion of GM-IFG. The commenter maintains that because the Lower Ley Creek remedy will remove all of the contaminated sediment above cleanup levels in the Creek, it is more conservative than the OU2 portion of the GM-IFG remedy.

Response #5: The PCB sediment cleanup goals for the OU2 portion of the GM-IFG and Lower Ley Creek are both 1 mg/kg. As such there is not a discrepancy between the PCB sediment cleanup goals of the two remedies.

Utility Infrastructure

Comment #6: Two commenters state that the maintenance of the existing utilities (such as buried pipelines in contaminated areas) and the future need to inspect, maintain and improve the existing utility infrastructure will be significantly impacted by contaminants that are not removed. One of the commenters further stated that the final RD needs to allow for future utility access.

Response #6: During the RD, utility entities will be consulted to insure that the remedy design and construction protects utilities and does not prevent maintenance personnel from accessing the utility infrastructure, as needed. A Site Management Plan (SMP) will be developed to ensure that any future construction and/or maintenance projects within this area are performed in a manner that is protective of workers and the long-term integrity of the remedy.

Comment #7: Two commenters inquire as to what steps will be taken to coordinate with local municipalities, utilities, *etc*., to ensure proper mark-out and protection of the utilities' property.

Response #7: NYSDEC will inform property owners and utilities in advance of work being conducted on their property. Insofar as there may be specific access or utility considerations raised, the NYSDEC project manager or authorized representative will meet with the involved party to work through any issues. Also see Response 6 above.

Flood Control

Comment #8: A commenter states that the Ley Creek channel is flat and has little fall from the upper drainage areas to the mouth of the creek at Onondaga Lake. The commenter inquires as to how the remedy will assure that the flood district residents are protected from flooding; what effort will be made to assure that the future flood mitigation meets or exceeds the current channel capacity; and what opportunities are envisioned to expand the floodway to offer greater flood protection as either a necessary aspect of the proposed remedy or as an added/modified design feature (*e.g*., less capping material).

Response #8: Maintaining sufficient flood capacity of the Ley Creek channel and floodplains will be one of the design requirements.

Capping is not envisioned to be part of the OU2 portion of the GM-IFG remedy. Sediments exceeding 1 mg/kg PCB in this reach of Ley Creek will be removed to the native clay material. On average, sediment excavation is expected to be approximately 1.25 feet deep over approximately 72% of the creek reach. Approximately 6 inches of sand will be replaced in the excavated areas for habitat restoration purposes. The net result is expected to be an increase to the Creek channel capacity resulting in improved flood protection compared to current conditions.

Remedy Implementation

Comment #9: A commenter inquires as to how the environment will be protected from the mobilization of pollutants during the implementation of the remedy.

Response #9: The RD and/or remedial construction work plan will address the details of sediment and soil excavation; measures to reduce sediment resuspension; measures to ensure that erosion is controlled; provisions for monitoring operations to ensure they are protective of the environment; and any corrective or other mitigative measures that may be warranted.

Comment #10: A commenter inquires as to what cost saving or efficiency opportunities have been identified.

Response #10: As discussed in the Proposed Plan and the Record of Decision, a RD will be developed to provide the details necessary for the construction of the remedial program. Green remediation, as set forth in DEC's DER-31, identifies many measures that are both green and cost saving those to be considered will include, but not be limited to:

- Reduction in vehicle idling, including both on and off road vehicles and construction equipment during construction;
- Increasing energy efficiency and minimizing use of non-renewable energy; and
- Conserving and efficiently managing resources and materials.

Comment #11: A commenter states that current and future discharges from the former GM facility, including an SPDES violation from as recently as November 2012, will impact the remedies selected for Ley Creek and Onondaga Lake.

Response #11: As was noted in Response #2, under an IRM, a retention pond and associated water treatment system were constructed to stop the intermittent discharge of PCBs and other contaminants that occur during storm events. There have been two SPDES discharge violations for PCBs from the former GM-IFG facility since the implementation of the IRM. The violations were for 0.05 micrograms per liter (ug/L) and 0.02 ug/L over the PCB discharge limit. Relative to the cleanup goal of 1 mg/kg PCB in sediment, these violations would not impact the remedy.

Finally, based on the data collected as part of the RI for the OU1 portion of GM-IFG, PCB-contaminated groundwater is not discharging from the former GM-IFG facility to Ley Creek.

Comment #12: A commenter inquires as to whether or not the Metropolitan Syracuse Wastewater Treatment Plant (METRO) wastewater treatment plant will be used during the remediation, what potential volume is envisioned, if pretreatment of wastewater is envisioned, and what provisions will be made to cease pumping to the system will be made during wet weather conditions.

Response #12: It is likely that the water generated from dewatering the excavated sediments will require on-Site treatment prior to discharge to surface water. The design will determine if the treatment discharge will be to Ley Creek or to METRO. If it is determined that discharge to METRO is the most efficient way of properly discharging the construction waters, the RACER Trust would need to obtain proper approvals and permits from Onondaga County. Details regarding the volume of discharge and the size and type of treatment units in the water treatment train will be determined during the design process. Discharged, treated water will be required to meet appropriate discharge limits and provisions regardless of whether the discharge is to Ley Creek or to METRO.

Comment #13: A commenter notes that National Grid expects that surface soils located within the Natural Gas Pipeline 50 corridor that do not meet SCOs should be excavated and immediately backfilled, thereby obviating the need for a demarcation layer and soil cover over the pipeline. The commenter states that based on the RI data, the vast majority of the contamination within the Factory Avenue Area is located within the top 3 feet, and, thus, the remedy should include excavation and disposal of soils to a depth of 3 feet in areas designated for soil removal within the Pipeline 50 corridor.

Response #13: The remedy calls for soil removal to meet SCOs regardless of depth. Also, see Response 6, above.

Comment #14: A commenter states that NYSDEC should provide flexibility in the ROD to design and build appropriate sediment caps to contain sediments with unacceptable post-removal residual PCB contamination, as well as sediments which should be remediated but cannot be efficiently removed due to physical limitations.

Response #14: As the sediment depositions in this reach of Ley Creek are fairly shallow, NYSDEC and EPA do not anticipate any impediments to excavation.

Comment #15: A commenter states that the ROD should allow for the use of adaptive management in the description of long-term operation and maintenance (O&M) to allow for appropriate modifications of O&M activities over the long-term.

Response #15: A SMP will be developed to provide for the proper management of all post-construction remedy components. The SMP will allow flexibility to facilitate O&M modifications, as may be appropriate, over the long-term.

Institutional Controls

Comment #16: A commenter inquires as to how the institutional controls will impact the Ley Creek Drainage District; what restrictions will be placed on properties incorporated in the District, and if the restrictions will preclude upgrades in the District.

Response #16: The purpose of institutional controls is to protect the integrity of a remedy and to prevent exposure to contamination that remains after the remediation is completed. It is anticipated that the institutional controls (*e.g*., environmental easements) will restrict intrusive activities in areas, where residual contamination remains, unless the activities are in accordance with an approved SMP. It is not envisioned that the institutional controls will preclude upgrades to the District.

Funding

Comment #17: A commenter requests that the ROD include an itemized financial update from the GM bankruptcy settlement.

Response #17: This comment seeks detailed information that is outside the scope of the Proposed Plan, there is approximately $19 million dollars available in the trust fund for remediation of GM-IFG Operable Units 1 and 2.

Disposal

Comment #18: A commenter states that the ROD should provide an option for disposal of excavated soils and sediment having PCB concentrations less than 50 mg/kg in a suitable local landfill in the same manner as the ROD for the Lower Ley Creek. Assuming that the technical requirements for disposal in either the Town of Salina Landfill or the Cooper Crouse-Hinds North Landfill can be met, such disposal would reduce the risks and the environmental footprint of waste transport relative to off-Site disposal. Considering that essentially all of contamination being managed in the proposed cleanup upstream of the Route 11 bridge and the planned cleanup downstream of the Route 11 Bridge emanated from the former GM-IFG facility, the same disposal methods should be available for both projects.

Response #18: The selected remedy calls for the proper disposal at a RCRA-compliant facility of approximately 20,000 cubic yards of non-TSCA soil and sediment for the OU2 portion of GM-IFG, in comparison to approximately 140,000 cubic yards of disposal for the non-TSCA soil and sediment for Lower Ley Creek. The ROD for Lower Ley Creek called for either local or non-local disposal of the excavated soils and sediments with PCB concentrations less than 50 mg/kg. Should it be determined that local disposal of soils and sediments is a viable option for Lower Ley Creek, then consideration will be given to similarly disposing of the excavated soil and sediment from GM-IFG OU2.

Protectiveness

Comment #19: A commenter states that the “remedial action levels” for PCB sediments and soils should be based upon site-specific risk assessments rather than the generic soil and sediment cleanup objectives, such as the 1 mg/kg PCB value identified in the Proposed Plan. The assumptions underlying the generic values are not applicable to the circumstances of the OU2 portion of GM-IFG.

Response #19: A Superfund site-specific baseline risk assessment determines whether a site poses an unacceptable risk to human health or the environment. The baseline human health risk assessment can inform the selection of remediation goals, particularly for less common contaminants where there is an absence of promulgated standards or guidelines; however, for PCBs, there is a strong basis for the selection of the 1 mg/kg SCO, as discussed below.

Regarding establishing cleanup objectives for soils, SCOs are identified in 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, effective December 14, 2006. The 1 mg/kg PCB SCO is protective of the ecosystem and commercial, restricted residential, and residential, use areas.

There are no federal or state promulgated standards for contaminant levels in sediments. There are, however, other federal or state advisories, criteria or guidance (which are used as "To-Be-Considered" criteria). Specifically, NYSDEC's "Technical Guidance for Screening Contaminated Sediments" (January 1999) sediment screening values are a To-Be-Considered criteria. The 1 mg/kg PCB sediment clean up criteria is routinely evaluated and often selected by NYSDEC for contaminated sediment sites. It is protective for this Subsite. It should be noted that this is the same sediment clean up criteria selected by EPA for Lower Ley Creek.

Comment #20: The Onondaga Nation expressed a strong preference for remedial alternatives that directly remove contaminants from the areas on or around Onondaga Lake and ensure the greatest degree of public safety. Accordingly, the Nation states that the remedy for the OU2 portion of GM-IFG will relegate Ley Creek to a permanently contaminated state.

Response #20: NYSDEC and EPA recognize the Onondaga Nation's strong preference for remedial alternatives that remove all contaminants from the areas on or around Onondaga Lake. This remedy was determined by USEPA and NYSDEC to be protective of human health and the environment, comply with ARARs, and represent the best balance of the criteria established in the National Oil and Hazardous Substances Pollution Contingency Plan. The selected remedy for the OU2 portion of GM-IFG will remove the majority of contamination in the sediments and soils. Specifically, the application of the 1 mg/kg cleanup level for PCBs in sediments will result in the excavation to the native clay soil over 70% of the creek bed, and the utilization of the 1 mg/kg PCB cleanup level in soil will result in excavations of 1 to 4 feet, with a Ley Creek floodplain hot spot being excavated to as deep as 6 feet. The removal of these sediments and soils will reduce the potential risks to human health and the environment to acceptable levels.

Comment #21: The Onondaga Nation expresses concern with the reliance on the current fish advisory to limit human exposure to PCBs from fish consumption to acceptable levels. The Nation stated that, traditionally, it relied heavily on fish caught in Onondaga Lake and its tributaries. The continued contamination of these resources significantly damages or altogether precludes such traditional uses. The remedy, opines the Nation, should allow for the lifting of fish consumption restrictions at some identifiable point in the future. Similarly, the Nation supports relying on unrestricted use standards for soil remediation, which would provide for the broadest possible future uses at the Subsite.

Response #21: There is a State-wide advisory for all fresh waters that recommends that fish consumption be limited, primarily due to the presence of PCBs and mercury in fish, because of the ubiquitous nature of these environmental contaminants. In addition, due to local conditions, there is a more stringent advisory for Onondaga Lake and its tributaries, including Ley Creek, to the first impassible barrier to fish. Contaminants found in fish from Onondaga Lake and its tributaries which give rise to the need to advise that consumption be limited are attributed to many potential sources, including contaminated lake bottom and tributary sediments, urban run-off *via* storm-water discharges and non-point sources, and atmospheric deposition. The selected remedy for the OU2 portion of GM-IFG is expected to significantly reduce the potential source of PCB to fish and other biota attributed to this Subsite. However, the remediation of this Subsite is not expected, in and of itself, to significantly impact PCB concentrations in fish that drive the consumption advice specific to Onondaga Lake and its tributaries. Until such time that the cumulative impacts of the many ongoing and completed remedial actions and other lake-basin water management improvements lead to sufficient reductions in fish contaminant levels to enable a relaxation of the consumption advisory, the advisory serves an important role to help protect public health.

Comment #22: The Onondaga Nation states that an unrestricted use SCO would provide greater assurance that these contaminated areas of the OU2 portion of the GM-IFG will not discharge PCBs or other hazardous substances to Ley Creek in the future.

Response #22: The SCO of 1 mg/kg PCB is protective of the ecosystem and protective for current and reasonably anticipated future uses of the area by the public.

Comment #23: The Onondaga Nation notes that because there are no cleanup standards for PCB-contaminated sediment, the Proposed Plan relies on a "risk-based" remediation goal of 1 mg/kg PCBs in sediment. The derivation of this value is not explained in the Proposed Plan, which simply notes that the standard has been adopted in other New York State hazardous waste sites and is "protective of human health and the environment for this site." In addition, notes the Nation, the supporting documents fail to provide a valid reason to discard other "risk-based clean-up levels" considered in during the FS. Sediment Alternative 4, for example, would set a remediation goal of 0.28 mg/kg PCBs, which is described as the average upstream sediment concentration for PCBs, and as suggested by the Nation, would be economically and technically viable. Other remedial alternatives that would have set a preliminary remediation goal of 0.2 mg/kg PCBs were, apparently, eliminated from consideration as infeasible, because they also incorporated remediation goals for trivalent chromium, copper, and nickel lower than the levels that could be documented in clean fill (GM-IFG OU2 FS Addendum, June 2014). However, the Nation states that this explanation fails to recognize the fact that the PCB-remediation goals incorporated in the rejected alternative were apparently achievable. In addition, the Proposed Plan acknowledges that PCB levels in fish tissue and invertebrates are significantly higher within the OU2 portion of GM-IFG than in upstream regions, meaning that the Subsite is contributing to the on-going contamination of Onondaga Lake, its tributaries and its natural resources. Rather than eliminating this contribution by remediating the sediments to a level as clean as or cleaner than upstream sources, NYSDEC appears to have selected a remediation goal which simply reduces contamination to more acceptable levels. The Nation is concerned that even the most protective clean-up level considered presumes that Ley Creek will remain contaminated by man-made pollutants in perpetuity.

While the Nation's preferred alternatives may be slightly more expensive, the Nation believes that these costs are more than justified by their potential to support a fully restored Ley Creek and the permanent removal of potential contaminants to Ley Creek and Onondaga Lake.

Response #23: Because there are no NYSDEC or EPA cleanup standards for PCB-contaminated sediment, a remedial goal for sediment has been selected for this Subsite using other New York State hazardous waste sites as a reference, where a cleanup value of 1 mg/kg PCBs in sediment has proven effective.

In regards to consideration of "other risk based clean-up levels", the baseline ecological risk assessment (BERA), indicated that PCB sediment concentrations of 2.2 mg/kg would be protective for mink and 8.0 mg/kg would be protective for belted kingfisher. Therefore, based on the BERA, the 1 mg/kg PCB clean-up value is protective of ecological receptors.

The PRG value of "0.2 ppm" referenced in the comment above was a soil cleanup value evaluated in the feasibility study addendum, not a sediment cleanup value, and it would therefore, not be applicable to sediments.

Although the selected remedy sediment clean-up value of 1 mg/kg is greater than the 0.28 mg/kg value included under Proposed Plan's Alternative 4, where sediment excavation is required, over 70% of the creek bed, the excavation will occur down to the native clay , which is uncontaminated.

Additional Remedial Alternatives

Comment #24: A commenter opines that thermal desorption treatment should be evaluated as a remedial technology for this Subsite, and that a thermal desorption treatment facility should be built to treat contamination from other hazardous waste sites in the area.

Response #24: Thermal desorption was screened out in the FS due to high capital costs and because the technology would not be effective for metals.

Comment #25: A vender comments that it would like to show NYSDEC how its biological treatment technology could be used for remediation.

Response #25: Biological treatment was not evaluated in the FS because the technology would not be effective for metals.

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX V-a

NOVEMBER 2014 PROPOSED PLAN

General Motors – Inland Fisher Guide Site Operable Unit 2

Subsite of the Onondaga Lake Superfund Site
Town of Salina, Onondaga County, New York

NYSDEC | November 2014 | EPA Region 2

PURPOSE OF THIS DOCUMENT

This document describes the remedial alternatives considered to address contamination related to Operable Unit 2 (OU2) of the General Motors – Inland Fisher Guide Site (Site), which is a subsite of the Onondaga Lake Superfund Site, and identifies the preferred remedial alternative with the rationale for this preference.

This Proposed Plan was developed by the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (EPA) in consultation with the New York State Department of Health (NYSDOH). NYSDEC and EPA are issuing this Proposed Plan as part of their public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as well as the New York State Environmental Conservation Law (ECL) and Title 6 New York Code of Rules and Regulations (NYCRR) Part 375. The nature and extent of the contamination at the Site and the remedial alternatives summarized in this Proposed Plan are described in the *Revised Final Off-Site Remedial Investigation (RI) of the Former General Motors Facility and Deferred Media Site, and the Feasibility Study (FS) and FS Addendum* reports, contained in the Administrative Record file for this Site. NYSDEC and EPA encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

This Proposed Plan is being provided as a supplement to the reports listed above to inform the public of NYSDEC and EPA's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred remedy.

NYSDEC and EPA's preferred remedy consists of excavating approximately 25,000 cubic yards of polychlorinated biphenyl (PCB)-contaminated sediment and soil from the areas of Ley Creek included in this Site, including wetlands, floodplain areas and roadway shoulders near the facility and the northern side of Factory Avenue in the vicinity of LeMoyne Avenue. The excavated material would be dewatered and stabilized prior to disposal at an off-Site facility. The remedy would also include institutional controls, restoration of impacted habitats and monitoring of the biota, water column and sediment in Ley Creek.

The remedy described in this Proposed Plan is the preferred remedy for the Site. Changes to the preferred remedy, or a change from the preferred remedy to another remedy, may be made if public comments or additional data indicate that such a change would result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after NYSDEC and EPA have taken into consideration all public comments. NYSDEC and EPA are soliciting public comment on all of the alternatives considered in the Proposed Plan and in the detailed analysis section of the FS and FS Addendum reports because NYSDEC and EPA may select a remedy other than the preferred remedy.

MARK YOUR CALENDAR

November 17, 2014 – December 17, 2014*: Public comment period on the Proposed Plan.*

Public Meeting:

December 2, 2014 at 6:00 P.M.*:*
Town of Salina Town Hall
201 School Road
Liverpool, NY 13088

Community Role in the Selection Process

The NYSDEC and EPA rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, this Proposed Plan has been made available to the public for a public comment period which begins on November 17, 2014 and concludes on December 17, 2014.

A public meeting will be held during the comment period to present the conclusions of the remedial investigation and feasibility study (RI/FS), further elaborate on the reasons for recommending the preferred remedy and receive public comments.

Comments received at the public meetings, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document that formalizes the selection of the remedy.

Written comments on this Proposed Plan should be addressed to:

Richard Mustico, P.E.
NYS Department of Environmental Conservation
625 Broadway
Albany, NY 12233
E-mail: richard.mustico@dec.ny.gov

INFORMATION REPOSITORIES

The administrative record file, which contains copies of the Proposed Plan and supporting documentation are available at the following locations:

Salina Library
100 Belmont Street, Mattydale, NY 13211
315-454-4524

New York State Department of Environmental Conservation
615 Erie Blvd. West
Syracuse, NY 13204
315-426-7400

New York State Department of Environmental Conservation
Attn.: Richard Mustico
625 Broadway
Albany, NY 12233
518-402-9676
(richard.mustico@dec.ny.gov)

Atlantic States Legal Foundation
Attn.: Samuel Sage
658 West Onondaga Street
Syracuse, NY 13204
315-475-1170

SCOPE AND ROLE OF ACTION

On June 23, 1989, the Onondaga Lake Site was added to the New York State Registry of Inactive Hazardous Waste Disposal Sites. On December 16, 1994, Onondaga Lake, its tributaries and the upland hazardous waste sites which have contributed or are contributing contamination to the lake (subsites) were added to EPA's National Priorities List (NPL). This NPL listing means that the lake system is among the nation's highest priorities for remedial evaluation and response under the federal Superfund law for sites where there has been a release of hazardous substances, pollutants, or contaminants.

Because many Superfund sites are complex and have multiple contamination problems and/or areas, they are often divided into operable units for the purpose of managing the site-wide response actions. NYSDEC and EPA have, to date, identified 12 subsites to the Onondaga Lake NPL Site, including the General Motors – Inland Fisher Guide (GM-IFG) Site. These subsites are also considered to be operable units of the NPL Site by EPA, and actions at these subsites have and will need to meet all CERCLA requirements.

The GM-IFG Site includes two operable units. The first operable unit (OU1) addresses the former GM-IFG facility, which is located south of Ley Creek on Townline Road in the Town of Salina. In addition to a series of interim remedial measures (IRMs) implemented by General Motors at NYSDEC's direction (discussed in more detail, below), a remedial investigation and feasibility study (RI/FS) is currently underway for the OU1 portion of the GM-IFG Site. The OU1 RI/FS is investigating the facility property and groundwater. A separate Proposed Plan for OU1 will be released to the public when it becomes available.

The second operable unit (OU2), which is the focus of this Proposed Plan, includes "other media" not addressed under OU1: Ley Creek channel sediments; surface water; and floodplain soils/sediments in the reach from Townline Road to the Route 11 Bridge. OU2 also includes an adjacent wetland and roadway shoulders near the facility and on the northern side of Factory Avenue in the vicinity of LeMoyne Avenue. The primary objective of this response action is to address risks to public health and the environment due to PCBs and other contaminants of concern (COCs) in sediments, surface water and soils under this operable unit.

See Figure 1 for the location of the two operable units of the GM-IFG Site.

A Record of Decision for the Lower Ley Creek Site (from the Route 11 Bridge to the mouth of Ley Creek at Onondaga Lake) was issued by the EPA on September 30, 2014.

SITE BACKGROUND

Site Description

The GM-IFG Site is located in the Town of Salina, in Onondaga County, New York. OU2 consists of:

- approximately 9,200 linear feet of Ley Creek between Townline Road and Route 11;
- soil in the Ley Creek Floodplain Area (generally along the creek banks), defined as the portion of the Federal Emergency Management Agency (FEMA) 100-year floodplain of Ley Creek between Townline Road and Route 11, exclusive of the Ley Creek PCB Dredgings Site;
- soil/sediment in the 10-acre wetland (referred to as the “National Grid Wetland”) located on the northern portion of the National Grid property directly west of the former GM-IFG facility;
- soil in the approximately 1.8-acre area located directly between the former GM-IFG facility’s northern property boundary and Factory Avenue (referred to as the “Factory Avenue Area”); and
- soil in the area located along the northern shoulder of Factory Avenue in the vicinity of LeMoyne Avenue (referred to as the “Factory Avenue/LeMoyne Avenue Intersection Area”).

Current Zoning and Land Use

Ley Creek is a Class B stream which means the best usages for the creek are “primary and secondary contact recreation and fishing”. The creek is located approximately 150 feet north of the former GM-IFG facility property boundary and flows due west approximately 2.5 miles downstream from the facility, where it discharges into Onondaga Lake. Ley Creek drains an area of approximately 30 square miles. The Ley Creek drainage basin can generally be described as a highly urbanized area. Portions of the city of Syracuse and the towns of Cicero, Clay, DeWitt, Manlius, and Salina are located in the Ley Creek drainage basin. Also located in the Ley Creek watershed are interstate highways, a National Grid electrical transfer station, Syracuse International Airport, and the Air National Guard's Hancock Field. Large areas of impermeable surfaces in the Ley Creek watershed cause rapid runoff during storms and corresponding rapid rising of flow and water levels.

The Ley Creek Floodplain Area is a portion of the Federal Emergency Management Agency (FEMA) 100-year floodplain between Townline Road and Route 11 (excluding the Ley Creek PCB Dredgings Site). Ley Creek is not currently used as a public water supply, and there is no commercial transportation use of the creek. The Ley Creek Floodplain Area is zoned as mixed commercial and residential with some stretches of undeveloped land between the northern bank of Ley Creek and the New York State Thruway.

The National Grid Wetland is located in the northern portion of property owned by the utility company National Grid, directly to the west of the former GM-IFG facility. This wetland is an approximately 10-acre portion of a New York State-regulated wetland known as SYE-6. A drainage ditch is present along the northern edge of the National Grid property along Factory Avenue. Upland drainage flows into this wetland from the south and is discharged north to the ditch and through culverts under Factory Avenue towards Ley Creek. Wetland vegetation, trees and shrubs comprise the dominant vegetation of the wetland. The National Grid property is currently zoned for industrial use.

The Factory Avenue Area is a narrow roadway shoulder and storm water drainage ditch located between the northern former GM-IFG facility property boundary and Factory Avenue. The area extends from the northwestern corner of the facility property to Townline Road. The Factory Avenue Area is characterized by maintained grass and is a corridor for overhead and underground utilities. Specifically, a natural gas pipeline and an Onondaga County sanitary sewer are present underground along this corridor. The Ley Creek PCB Dredgings Site is located across Factory Avenue to the north of this area. This area is currently zoned for industrial use.

The Factory Avenue/LeMoyne Avenue Intersection Area is located north of Factory Avenue in the vicinity of LeMoyne Avenue down to the Route 11 Bridge. This area is currently zoned for commercial use.

Site History

In 1938, the area in the vicinity of Ley Creek was primarily farmland. Since then, commercial and industrial development has occurred in the drainage basin, including in areas bordering the creek.

General Motors began operations in Salina in 1952. Operations conducted at the GM-IFG facility included metal die casting; nickel, chromium and copper cyanide electroplating; stamping; polishing; buffing; painting and machining. During the early 1960s injection molding operations were added to the existing metal operations. Metal finishing and die casting were subsequently reduced and replaced by injection molding by the early 1970s. PCB-containing hydraulic oil was used in die cast machines and injection molding operations until 1968 and in the diffusion pumps of three vacuum metallizers until 1969. More than 120 injection molding machines operated at the plant until plant operations ceased in December 1993. PCB-containing oil leaked from the machines to floor drains and sumps. During early facility operations, this oil and other process waste was discharged to an on-Site swale. The swale discharged to Ley Creek, where PCBs are found in the sediments down to the mouth of the creek at Onondaga Lake.

As part of a flood control project in the 1970s, several sections of Ley Creek were dredged. Dredged material contaminated with PCBs was placed along the banks of the creek. Areas along the south bank of Ley Creek upstream of the Route 11 Bridge, where PCB-contaminated dredge spoils were placed, were included on the New York State Registry of Inactive Hazardous Waste sites as the Ley Creek PCB Dredgings Site. A ROD was issued by NYSDEC for the Ley Creek PCB Dredgings Site in March 1997, which called for the excavation and disposal of PCB-contaminated material greater than 50 milligrams per kilogram (mg/kg) and the consolidation and on-site capping of material less than 50 mg/kg in compliance with the Toxic Substances Control Act (TSCA) PCB cleanup and disposal regulations (40 CFR Part 761). The remedy was completed in 2001, and the Ley Creek PCB Dredgings Site is currently monitored and maintained.

NYSDEC and General Motors entered into an Administrative Order on Consent (Index # D-7-0001-97-06) (Order), which became effective on September 25, 1997. The Order required General Motors to conduct an RI/FS for the GM-IFG Site. Soil, sediment, surface water and biota samples were obtained for chemical analysis as part of the RI.

Three significant IRMs to prevent further migration of PCBs from the facility to Ley Creek were implemented. The IRMs, which were performed from 2002 to 2004, included the following activities:

- Former Landfill IRM An industrial landfill at the former GM-IFG facility that contains chromium- and PCB-contaminated material was capped to prevent contaminants from leaching into the groundwater. In addition, hot spots associated with the landfill were excavated.

- Former Drainage Swale IRM A second action involved the removal of highly-contaminated soil from a former discharge swale. This swale was used in the 1950s and 1960s as a conduit for the discharge of liquid process waste to Ley Creek. The swale was subsequently filled in, but the contaminated soil remained until the performance of this action. Over 26,000 tons of soils containing PCBs were removed from this area of the GM-IFG property.

- SPDES Treatment System IRM The third action involved the construction of a retention pond and associated water treatment system. This pond collects all water that accumulates on the GM-IFG property in any of the storm sewers or abandoned process sewers. The pond water is then sent through the treatment plant in order to meet permitted discharge limits, prior to discharge to Ley Creek. The purpose of this response action was to stop the intermittent discharge of PCBs and other contaminants that occur during storm events.

In 2005, General Motors conducted a Phase 1A Cultural Resources Survey for OU1 and OU2 of the GM-IFG Site. The Cultural Resources Survey Report[1] concluded that no further cultural resources investigation was required. This document was approved by NYSDEC in December 2005.

In 2009, General Motors filed for bankruptcy, and on March 31, 2011, administration of the remedial activities at the GM-IFG Site was taken over by the Revitalizing Auto Communities Environmental Response (RACER) Trust, the current property owner, who completed the RI/FS for OU2. The RI report (March 2013) for the OU2 was approved by NYSDEC in April 2013. The FS report (May 2013) and the FS report addendum (June 2014) will be approved by NYSDEC concurrent with the issuance of the ROD.

The Lower Ley Creek Site, which is downstream of the OU-2, consists of the sediments and floodplain soils along the lower two miles of Ley Creek, beginning at, and including, the Route 11 Bridge and ending downstream at the mouth of Ley Creek and its confluence with Onondaga Lake, as well as the sediments and floodplain soils associated with the "Old Ley Creek Channel" (the pre-1970s dredging route of the Creek). A Proposed Plan for the Lower Ley Creek Site was

[1] Phase 1A Literature Review and Archeological Sensitivity Assessment, Former IFG Facility and Ley Creek Deferred Media, Towns of Salina and Dewitt, Onondaga County, New York, June 2005.

released by the EPA to the public on July 15, 2014, and the ROD was issued on September 30, 2014.

SITE HYDROLOGY/HYDROGEOLOGY

Ley Creek Hydrology

Ley Creek is located approximately 150 feet north of the GM-IFG facility property boundary and flows west to ultimately discharge into Onondaga Lake, approximately 2.5 miles downstream of the facility. Ley Creek was restructured and dredged to aid in storm water drainage in the 1970s. The reach of Ley Creek from Townline Road to the Route 11 Bridge was most recently dredged in 1983. Water depths range from less than three inches to approximately four feet, depending on channel width, flow rates and bottom profile. Flow rates also vary significantly ranging from less than 1 cubic foot per second (cfs) to 1,400 cfs. Ley Creek varies in width from less than 10 feet to more than 30 feet.

The substrate is predominantly gravel and fine inorganic material with little to no submerged or emergent aquatic vegetation. Sediment probing performed during the RI indicated that the main channel of Ley Creek is primarily hard substrate with limited sediment depositional areas. Depositional areas are generally limited to the edges of the channel.

Onondaga Lake receives surface runoff from a drainage basin of approximately 250 square miles. Surface water flows into the Lake via six tributaries: Ninemile Creek, Onondaga Creek, Harbor Brook, Bloody Brook, Sawmill Creek and Ley Creek. Ley Creek accounts for approximately eight percent of the total water inflow to the Lake.

Efforts since 1970 to alleviate the flooding of Ley Creek have been generally successful, though flooding still occurs in portions of the Creek.

Site Hydrogeology

The bedrock geology in the area of Ley Creek generally consists of sedimentary rock units from the Paleozoic-age Salina Group which, in order of oldest to youngest, consists of the Vernon Formation, the Syracuse Formation, Camillus Shale and the Bertie Formation. Specifically, the bedrock underlying the GM-IFG Site is made up of units of the Vernon Formation, which consists of upper Silurian shale and dolostone.

Groundwater discharge to surface water channels accounts for most of the stream flow in the Onondaga Lake Basin. Groundwater discharge accounts for an estimated 56 percent of stream flow in Ley Creek. The groundwater can be found from eight to 12 feet below ground surface (bgs) in the overburden of the Site.

RESULTS OF THE REMEDIAL INVESTIGATION

Summary of Sampling Results

Several metals detected on the GM-IFG facility are identified as "Site-related metals" (*i.e*., arsenic, chromium, copper, lead, nickel and zinc) when found in GM-IFG OU2 media. Other metals, (*e.g*., mercury/methylmercury) were found within the watershed and evaluated in the RI/FS, but are not associated with the GM-IFG Site and are considered to be "non-Site-related" metals.

Based upon the results of the RI, NYSDEC and EPA have concluded that the primary COCs for this Site are PCBs, PAHs,[2] chromium, copper, lead, nickel and zinc, with PCBs being the predominant contaminant in the Site soils and creek sediments. A review of the sampling results indicates that the PCBs are collocated with the vast majority of other COCs. Soil, sediment, surface water and biota investigations for OU2 are described below.

Soil

Soil investigations were performed between 1986 and 2009 and are documented in the RI report[3].

6 NYCRR Part 375 (NYSDEC Division of Environmental Remediation Environmental Remediation Programs, effective December 14, 2006) unrestricted use soil cleanup objectives (SCOs) were used as RI screening values for comparison purposes. Part 375 SCOs for the protection of ecological receptors (Ley Creek Floodplain Area and National Grid Wetland) and Part 375 industrial use SCOs (Factory Avenue Area and portions of the National Grid property) were also

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[2] It should be noted that all or some of the PAHs are likely from anthropogenic sources such as urban runoff.

[3] Revised Final Off-Site Remedial Investigation, Former IFG Facility and Deferred Media Site, Syracuse, New York, March 2013.

used during the screening process to provide a context for the contaminant concentrations detected. The following sections summarize the soil contamination as characterized in the discrete OU2 areas.

Ley Creek Floodplain Area

Soil in the Ley Creek Floodplain Area (see Figure 2) was investigated through samples collected within the Ley Creek 100-year floodplain between Townline Road and Route 11 (excluding the Ley Creek PCB Dredgings Site) as part of a series of sampling events conducted by General Motors between 2003 and 2007, and in connection with an intersection improvement at Lemoyne Avenue and Factory Avenue on behalf of Onondaga County in 2009. The initial samples collected in the Ley Creek Floodplain Area in 2003 indicated the presence of PCBs at concentrations above the Part 375 unrestricted SCO of 0.1 mg/kg. Sample results ranged from not detected to 35 mg/kg, though most of these detections were below 1 mg/kg PCBs. An additional round of sampling followed in 2004, which identified a localized floodplain hot-spot. The results of this sampling documented the presence of PCB concentrations ranging from not detected to 130 mg/kg. Soil samples in the vicinity of the 130 mg/kg detection also exhibited visual staining. Subsequent sampling conducted in 2005 and 2007 for the Ley Creek Floodplain Area focused on the area of visual staining. Samples collected between 2003 and 2007 in the vicinity of the stained area exhibited concentrations ranging from 0.11 mg/kg to 61 mg/kg PCBs along an approximately 180-foot long stretch on the northern bank of Ley Creek, down to a depth of 6 feet. Westernmost and northernmost samples exhibited concentrations below 1 mg/kg PCBs, the Part 375 SCO for the protection of ecological resources. The easternmost sample exhibited a concentration of 6.4 mg/kg at the deepest interval sampled [4 to 6 feet below ground surface (bgs)]. This portion of the investigation was limited to analysis of PCBs in soil.

In connection with rehabilitation work for the Route 11 Bridge, two soil samples were collected by the New York State Department of Transportation from one location on the bank of Ley Creek in November 1992 in the Site area. The samples, located east of the northern bridge abutment (upstream), were collected from 0 to 8 inches and 8 to 16 inches below grade. PCBs were detected in each sample at concentrations above the Part 375 unrestricted use SCO of 0.1 mg/kg ranging from 4 mg/kg (8 to 16 inches) to 55 mg/kg (0 to 8 inches). VOCs and SVOCs were not detected in either sample. Detected metals concentrations were within typical ranges for natural soils.

What are PCBs?

The main COCs at OU2 are PCBs.

Due to their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were widely used in many industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics, and rubber products; in pigments, dyes, and carbonless copy paper; and many other industrial applications. The former GM-IFG facility started using PCBs in hydraulic oils in the 1960s.

PCBs are a group of chemicals consisting of 209 individual compounds, known as congeners. PCBs were sold in mixtures containing dozens of congeners. In the United States, the most common commercial mixtures were known as Aroclors.

Although manufacturing of PCBs was banned in 1979, they can still be released into the environment from poorly maintained hazardous waste sites that contain PCBs, from leaks or releases from electrical transformers containing PCBs, or from the disposal of PCB-containing consumer products into landfills not designed to handle hazardous waste. PCBs may also be released into the environment by the burning of some wastes in municipal and industrial incinerators. At OU2, PCB-contaminated sediment and soil act as a potential ongoing source of PCB releases to the environment.

PCBs have been demonstrated to cause cancer and are linked to other adverse health effects such as developmental effects, reduced birth weights and reduced ability to fight infection.

National Grid Wetland Area

Investigation of the National Grid Wetland Area (see Figure 2) has been conducted over various sampling events associated with evaluating conditions within the wetland and the drainage ditch (approximately 760 long by 20 feet wide) that runs north of the wetland along Factory Avenue on this property and in connection with the soil removal IRMs described above.

PCBs were detected in the Factory Avenue drainage ditch soils at concentrations greater than the Part 375 unrestricted SCO, ranging from 0.22 mg/kg to 370 mg/kg, and extending approximately 760 feet along the ditch westward from the former GM-IFG facility property. These concentrations were encountered as deep as 3.5 feet. While the westernmost sample exhibited a concentration of 0.27 mg/kg PCBs, still slightly above the Part 375 unrestricted SCO of 0.1 mg/kg PCBs, concentrations at this location were significantly lower than other samples collected within the wetland area. The extent of Site-related metals detected at concentrations above the corresponding Part 375 unrestricted SCOs follows a similar pattern, with exceedances noted in the ditch, though the westernmost sample in the ditch exhibits concentrations below the corresponding Part 375 unrestricted SCOs for Site-related metals (arsenic, total chromium, copper, lead, nickel and zinc). In addition, there are relatively limited areas within the National Grid Wetland Area where Site-related metals were detected at concentrations above the corresponding Part 375 ecological SCOs. Samples collected in the National Grid Wetland Area in connection with investigations for National Grid (then Niagara Mohawk) were analyzed for SVOCs and VOCs. Detectable concentrations of SVOCs and VOCs were below the corresponding 6 NYCRR Part 375 SCOs for unrestricted use. PCB concentrations greater than the Part 375 SCO for the protection of ecological resources extended west, approximately 660 feet along the ditch.

The wetland located on the northern portion of the National Grid property was sampled between 2001 and 2008 during a series of efforts to evaluate the extent of contamination within the wetland. Results of these investigations showed PCB Aroclors 1242, 1248, and 1260 in wetland soil at concentrations greater than the Part 375 unrestricted SCO, ranging from 0.11 mg/kg to 14,000 mg/kg PCBs. These detections were encountered as deep as 2.75 feet. Contamination in the western half of the wetland extends approximately 140 feet to the south, and in the eastern half of the wetland extends approximately 230 feet to the south, where detectable concentrations of PCBs and Site-related metals were below the corresponding Part 375 unrestricted SCOs.

As part of the Former Landfill IRM hot spot excavation, confirmatory samples were obtained from the National Grid Wetland Area. Analytical results indicated concentrations greater than the Part 375 unrestricted SCO in four samples ranging from 0.1 mg/kg to 42 mg/kg.

Factory Avenue Area

The majority of the soil samples collected in the Factory Avenue Area (see Figure 2) are associated with efforts to bound the northern extent of the excavations from the Former Landfill IRM and the Former Drainage Swale IRM in the vicinity of a National Grid gas line that runs parallel to the northern property boundary and Factory Avenue. Samples collected in the immediate vicinity of the National Grid gas line, exhibiting concentrations greater than the Part 375 unrestricted use SCO, ranged from 0.13 mg/kg to 18,000 mg/kg PCBs. The higher concentrations are associated with the edge of hot spots and the former drainage swale, located approximately 8 to 10 feet bgs (0.13 mg/kg to 18,000 mg/kg PCBs), and surface soils in the vicinity of the new access road to the Former Landfill (1.4 mg/kg to 54 mg/kg PCBs). In addition, samples east of this area exhibited relatively low concentrations of PCBs but greater than the Part 375 unrestricted use SCO ranging from 0.162 mg/kg to 1.25 mg/kg.

Samples collected along the shoulder of Factory Avenue in connection with roadway improvements at the Factory Avenue and LeMoyne Avenue intersection indicated the presence of PCBs (not detected to 8.8 mg/kg) and Site-related metals (2.1 mg/kg to 13.6 mg/kg arsenic; 5.17 mg/kg to 265 mg/kg chromium; 9.5 mg/kg to 219 mg/kg copper; 2.3 mg/kg to 398 mg/kg lead; 9.41 mg/kg to 97.9 mg/kg nickel; and 17.9 to 429 mg/kg zinc) at concentrations above corresponding Part 375 unrestricted SCOs, but generally below the commercial SCOs.

Sediment

GM-IFG sediment sample locations are depicted on Figure 2. To evaluate upstream conditions, samples were collected from Ley Creek upstream of Townline Road and from three upstream branches of Ley Creek: North Branch Ley Creek, South Branch Ley Creek and Sanders Creek. Samples collected from Ley Creek between Townline Road and Route 11 (on-Site) as well as samples collected upstream of the Site exhibited concentrations of PCBs and Site-related metals (arsenic, chromium, copper, lead, nickel, zinc) above the NYSDEC sediment criteria (NYSDEC Technical Guidance for Screening Contaminated Sediments, January 1999) at the following concentrations.

PCBs on-Site: not detected to 207 mg/kg
Arsenic on-Site: not detected to 15.1 mg/kg
Chromium on-Site: 10.9 mg/kg to 429 mg/kg
Copper on-Site: 13.9 mg/kg to 183 mg/kg
Lead on-Site: not detected to 172 mg/kg
Nickel on-Site: 6.6 mg/kg to 121 mg/kg
Zinc on-Site: 51 mg/kg to 390 mg/kg

PCBs upstream: not detected to 1.3 mg/kg
Arsenic upstream: 1.1 mg/kg to 19.1 mg/kg
Chromium upstream: 4.3 mg/kg to 42.2 mg/kg
Copper upstream: 7.5 mg/kg to 423 mg/kg
Lead upstream: 2.5 mg/kg to 1,170 mg/kg
Nickel upstream: not detected to 38.6 mg/kg
Zinc upstream: 22.7 mg/kg to 811 mg/kg

For comparison purposes, Table 1, below provides sediment criteria for the Site's metals from the NYSDEC Technical Guidance for Screening Contaminated Sediments (January 1999). It should be noted that PCBs are the primary risk driver for all pathways for this Site (see the "Summary of Site Risks" section, below).

Table 1 – Sediment Criteria for Site-Related Metals

Analyte of Concern	Low Effect Level	Severe Effect Level
Arsenic	6.0 mg/kg	33 mg/kg
Total Chromium	26 mg/kg	110 mg/kg
Copper	16 mg/kg	110 mg/kg
Lead	31 mg/kg	110 mg/kg
Nickel	16 mg/kg	50 mg/kg
Zinc	120 mg/kg	270 mg/kg

Surface Water

Surface water samples were collected during four sampling events between 1996 and 2002 in Ley Creek and in the drainage ditch that runs along the south side of Factory Avenue.

Applicable screening values from the NYSDEC's Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1., Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations (June 1998) were used to evaluate surface water detections.

Analytical results indicate that chlorinated VOCs, PCBs, and metals were detected in the surface water samples. With the exception of PCBs, concentrations were below applicable surface water standards.[4] PCB Aroclor 1248 was detected above the standards of 0.00012 micrograms per liter (µg/L) (wildlife protection) and 0.000001 µg/L (protection of human consumers of fish) in one sample collected between Townline Road and Route 11 at 0.04 µg/L, and in one sample collected from the drainage ditch along Factory Avenue at 0.51 µg/L. PCBs were not detected in upstream surface water samples (detection limits range from 0.5 to 1 µg/L). It should be noted that typical detection limits for PCBs in water are greater than the surface water standards discussed above (see Figure 2).

Biota

Fish and crayfish tissue were collected as an additional line of evidence to assess risk to the fish and benthic community, respectively, and as measured inputs to the piscivorous food chain models. Biota data are described with respect to samples collected in Ley Creek upstream of Townline Road (including three upstream branches of Ley Creek, North Branch Ley Creek, South Branch Ley Creek and Sanders Creek) and from the Site (*i.e*., from Townline Road to Route 11).

SVOCs, PCBs and certain Site-related metals (chromium, copper and zinc) were detected in biota samples (fish and macro-invertebrates) collected from the Site and in samples collected upstream of the Site. Average and maximum detected concentrations for copper in upstream fish tissue samples were higher than in samples collected from the Site. Average concentrations of zinc and the maximum concentration of bis(2-ethylhexyl)phthalate were also found to be higher upstream of the Site. Average concentrations of non-Site-related metals manganese and mercury/methylmercury were also found at higher concentrations in samples collected upstream of the Site. In addition, maximum concentrations of mercury and methylmercury were higher upstream than within the Site reach.

The average total PCB fish tissue concentration in samples from the Site reach were higher than from samples collected upstream of the Site (1.91 mg/kg versus 1.14 mg/kg). In fish tissue, the average and maximum detected concentrations for three out of seven inorganic constituents (copper, mercury, methyl mercury) were higher upstream than in the Site reach. Average concentrations of manganese and zinc and the maximum concentration of bis(2-ethylhexyl)phthalate were also identified as higher upstream.

Both the average and maximum invertebrate tissue constituent concentrations for three Site-related metals (chromium, copper, and zinc) were lower within the Site reach than upstream. Both the average and maximum invertebrate tissue

[4] Technical and Operational Guidance Series Number 1.1.1. New York State Ambient Water Quality Standards and Guidance Values (NYSDEC 1998b); National Recommended Ambient Water Quality Criteria (USEPA 2009a); USEPA Region 3 Biological Technical Assistance Group Freshwater Screening Benchmarks (USEPA 2006A); and ECO Update: Ecotox Thresholds (USEPA 1996)

concentrations for four non-Site-related metals (barium, cadmium, manganese and methylmercury) were lower in the Site reach than upstream. Additionally, non-Site-related mercury was detected in invertebrate tissue from upstream, but not within the Site reach.

The average total PCB invertebrate tissue concentration for samples collected from the Site reach were higher than from samples collected upstream of the Site (0.52 mg/kg versus 0.25 mg/kg).

In summary, PCB 1248 in fish fillets average and maximum tissue concentration exceeded the respective upstream concentration by more than one order of magnitude. For crayfish, PCB Aroclor 1248, lead and nickel were detected in Site tissue, but not in upstream tissue. Also, PCB Aroclor 1242 was detected in Site tissue (whole fish) but not upstream.

Summary of Site Risks

Based upon the results of the RI, a baseline human health risk assessment (HHRA) was conducted to estimate the risks associated with current and anticipated future property conditions. A HHRA is an analysis of the potential adverse human health effects caused by exposure to hazardous substances in the absence of any actions to control or mitigate these under current and reasonably anticipated future land uses (see "What is Risk and How is it Calculated?" box on the next page).

The human health estimates summarized below are based on reasonable maximum exposure scenarios and were developed by taking into account various conservative estimates about the frequency and duration of an individual's exposure to the COCs, as well as the toxicity of these contaminants.

In addition, a baseline ecological risk assessment (BERA) was conducted to assess the risk posed to ecological receptors as a result of Site-related contamination.

Based upon the results of the RI and the risk assessments, the NYSDEC and EPA have determined that actual or threatened releases of hazardous substances present at the Site, if not addressed by the preferred remedy or one of the other active measures considered, may present a current or potential threat to human health and the environment.

Human Health Risk Assessment

Although the areas surrounding Ley Creek are mainly commercial/industrial in nature, it is not used for commercial/industrial purposes. The Creek is currently accessible for recreational uses and is expected to remain so. A four-step process was used for assessing Site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification of contaminants of concern (COCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization. Consistent with EPA policy and guidance, cancer risks and non-cancer health hazards were evaluated for the reasonably maximally exposed (RME) individual and the central tendency exposed (CTE) individual. The RME is considered the maximum exposure that is reasonably estimated to occur at the Site and is not a worst-case scenario. The CTE is the average exposure to an individual.

The HHRA evaluated potential risks to receptors under current and future land use scenarios. The HHRA addressed several distinct exposure areas. Those areas were defined as the Ley Creek Exposure Area; Ley Creek Floodplain Exposure Area; Ley Creek Floodplain Hot-Spot Exposure Area; National Grid Wetland Exposure Area; and Factory Avenue Exposure Area. Health risks were evaluated for the following potential human receptor populations:

- Current and future child fish consumers exposed to fish tissue;
- Current and future older child (6-17 years old) fisherpersons exposed to surface water, surface sediment (0-1 feet bgs), fish tissue, surface soil, and outdoor air;
- Current and future adult fisherpersons exposed to surface water, surface sediment (0-1 feet bgs), fish tissue, surface soil, and outdoor air;
- Future dredge workers exposed to surface water, surface and subsurface sediment (0-3 feet bgs), surface soil (0-1 feet bgs), and outdoor air;
- Current and future adolescent (12-17 years old) trespassers exposed to surface water, surface soil (0-1 feet bgs), and outdoor air;

- Current and future adult trespassers exposed to surface water, surface soil (0-1 feet bgs), and outdoor air; and
- Future utility workers exposed to, surface and subsurface soil (0-10 feet bgs), and outdoor air.

Within each exposure scenario, the HHRA identified potential exposure pathways for receptors and constituents. An exposure pathway was deemed complete if there was a constituent source; a mechanism for release, retention, or transport of the contaminant; human contact with the medium; and an exposure route at the contact point.

COCs for the HHRA were identified for each exposure area. For each medium, the maximum detected concentration of the constituent was compared to a conservative screening value for the protection of human health. In general, constituents that exceed the screening value or did not have screening values available were retained as HHRA COCs for further evaluation, while those below the screening value were excluded.

Cancer risks and non-cancer hazards were quantified for the reasonable maximum exposure and central tendency scenarios. The range for acceptable cancer risk is 10^{-6} to 10^{-4}, whereas non-cancer hazards are considered acceptable if they are less than or equal to 1. Total risk and hazard for each receptor was summed over all media, pathways, and constituents.

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of concern (COCs) at the Site, in various media (*i.e.*, soil, groundwater, surface water, and air), are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" (RME) scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses (RfDs). The key concept for a non-cancer HI is that a threshold (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the Site and are referred to as contaminants of concern (COCs) in the ROD.

Ley Creek is a New York State Class B fresh surface water, which, pursuant to 6 NYCRR § 701.7, means the best usages for the Creek are primary and secondary contact recreation and fishing. Class B waters are suitable for fish, shellfish and wildlife propagation and survival. The Creek itself is not used commercially, although it is accessible for fishing or other recreation. While access to Ley Creek within the GM-IFG OU2 Site is unrestricted, it is difficult to reach in many areas because of thick vegetation. The fish species found during recent investigations include bluegill, pumpkinseed, shiners, bullhead and carp.

The HHRA indicated that cancer risks were within acceptable limits for all receptors. Non-cancer hazard for the dredge worker was also within acceptable regulatory limits. Non-cancer hazards for all other receptors exceeded the acceptable threshold. Unacceptable RME hazard indices ranged from 4.0 for the child fish consumer to 200 for the utility worker. These hazards were driven by:

- PCBs in fish tissue;
- PCBs in surface sediment (0-1 foot depth); and
- PCBs in surface soil and subsurface soil (0-10 feet bgs).

The risks and hazards from the Ley Creek Floodplain Hot-Spot Exposure Area were not quantitatively evaluated in the HHRA. Based on the screening of this area, the compounds detected would require preventative measures to protect public health under any scenario.

The HHRA may be found in Appendix D of the RI Report.

A fish consumption advisory, which is updated annually by the New York State Department of Health (NYSDOH), currently indicates that the consumption of fish from Onondaga Lake and its tributaries (including Ley Creek) should be limited because of, in part, PCBs and mercury which have been found to be present in the Onondaga Lake fish tissue.

Ecological Risk Assessment

A BERA was prepared for the Site in accordance with the NYSDEC's Fish and Wildlife Impact Analysis guidance and the EPA's Ecological Risk Assessment Guidance for Superfund. The BERA can be found in Appendix E of the RI report.

The process used for assessing Site-related ecological risks includes:

Problem Formulation - a qualitative evaluation of contaminant release, migration, and fate; identification of COCs, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study;

Exposure Assessment - a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations;

Ecological Effects Assessment - literature reviews, field studies, and toxicity tests, linking contaminant concentrations to effects on ecological receptors; and

Risk Characterization - measurement or estimation of both current and future adverse effects.

The BERA addressed several distinct exposure areas which were most likely to be utilized by ecological receptors. Those areas were defined as the Ley Creek Exposure Area, Ley Creek Floodplain Exposure Area, and the National Grid Wetland Exposure Area. Aquatic receptors were evaluated in the Ley Creek Exposure Area and terrestrial receptors were evaluated in the Ley Creek Floodplain Exposure Area and the National Grid Wetland Exposure Area.

Ley Creek Exposure Area

Potentially unacceptable risks to aquatic ecological receptors in the Ley Creek Exposure Areas were identified and assessed using quantitative lines of evidence. Screening results indicated that risks to the benthic invertebrate community are likely the result of direct contact exposures to total PCBs and PAHs.

Food chain models for piscivorous birds (belted kingfisher and great blue heron) and semi-piscivorous mammals (mink) were evaluated to determine the viability and function of the piscivorous bird and mammal communities at Ley Creek. Two constituents (methylmercury and total PCBs) had NOAEL-based hazard quotients (HQs)[5] greater than or equal to one for the belted kingfisher. Only one constituent (methyl mercury) had a NOAEL-based HQ greater than one for the great blue heron. However, methyl mercury is not considered to be a Site-related constituent. Therefore risks to the piscivorous bird community are considered to be minimal. Risk from food chain exposures to the semi-piscivorous

[5] An HQ is the ratio of the potential exposure to a substance and the level at which no adverse effects are expected. If the HQ is calculated to be less than 1, then no adverse health effects are expected as a result of exposure.

mammal community (mink) are driven primarily by methyl mercury and total PCBs; with total PCBs having HQ exceedances of both NOAEL and LOAEL values. Risks from methyl mercury are not considered to be Site-related.

Ley Creek Floodplain Area

Potentially unacceptable risks to community-level ecological receptors of the Ley Creek Floodplain Area were identified. Evaluation of risk to community-level receptors at the Ley Creek Floodplain Area indicated that there is a potential ecological risk and that the primary risk drivers to the terrestrial plant community are total PCBs and metals (chromium, copper, lead and zinc). Risk to soil invertebrates is also driven by metals (chromium, copper, lead, and zinc) and total PCBs. The food chain model for insectivorous birds (American robin) indicated potential risk from metals and total PCBs. Risk to insectivorous mammals (short-tailed shrew) at the Ley Creek Floodplain Area is driven by metals (copper and zinc) and total PCBs

National Grid Wetland Area

Potentially unacceptable risks to community-level ecological receptors of the National Grid Wetland Area were identified. Evaluation of risk to community-level receptors at the National Grid Wetland Area indicated that there is a potential ecological risk and that the primary risk drivers to the terrestrial plant community are metals (chromium, copper, lead, and zinc) and total PCBs. Risk to soil invertebrates is also driven by metals (chromium, copper, nickel, and zinc) and total PCBs. The food chain model for insectivorous birds (American robin) indicated potential risk from metals, total PCBs, and bis(2-ethylhexyl)phthalate. Risk to insectivorous mammals (short-tailed shrew) at the National Grid Wetland Area is driven by metals (chromium and copper) and total PCBs.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect public health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific risk-based levels established using the risk assessments.

The following RAOs have been established for OU2:

- Reduce or eliminate any direct contact and ingestion threat to public health associated with contaminated soils and sediments;
- Minimize exposure of ecological receptors to contaminated soils and sediments; and
- Reduce the health hazards associated with eating fish from Ley Creek by reducing the concentration of contaminants in fish.

These RAOs are consistent with current and reasonably anticipated future use of the discrete Site areas, continued industrial use for the neighboring National Grid property (except for ecological use within and adjacent to the wetland); ecological use for areas in the Ley Creek floodplain, except for areas of residential use where the residential use SCO is lower than the ecological use SCO (*i.e*., chromium); and commercial use of the property along Factory Avenue.

REMEDIAL GOALS

To satisfy the direct-contact RAO, for the soils discussed in the "Results of the Remedial Investigation" section, above, the EPA has adopted NYSDEC's 6 NYCRR Part 375 (NYSDEC Division of Environmental Remediation Environmental Remediation Programs, effective December 14, 2006) SCOs as the soil remediation goals for this action. SCOs are based on the lowest concentration for the protection of human health, ecological exposure or groundwater depending upon the anticipated future use of a site. Several areas along the Creek are considered ecologically sensitive. SCOs for unrestricted site use are also evaluated (see Tables 2 and 3). There are no federal or New York State cleanup standards for PCB contamination in sediment. For sediments, a 1 mg/kg PCB remedial action objective will be applied, as it has been established to be protective of human health and the environment for this site. In addition, the 1 mg/kg PCB sediment cleanup objective is consistently evaluated and often applied at contaminated sediment sites in New York State. PCBs are the primary ecological risk driver and are collocated with the majority of the other sediment COCs.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA § 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA § 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA § 121(d)(4), 42 U.S.C. § 9621(d)(4).

Capping was screened out of the FS due to limited implementability and therefore not retained for further evaluation. Sediment depths to hardpan in the stream are generally 2 feet or less. Excavation of at least 2 feet of the sediment would be required to install a protective sediment cap and maintain the existing bathymetry for flood control purposes. This would remove the contamination, and capping would not be required. In addition, soil contamination is generally in the top 2 feet. Excavation in the floodplain would be required for flood control purposes prior to installing a protective soil cover. A 2-foot excavation would remove the contamination in most Site areas, and in general, a soil cover would not be required.

Based upon EPA's guidance on Remedial Actions for Superfund Sites with PCB Contamination, PCBs above 500 mg/kg in industrial areas, that cannot be reliably contained and would present a significant risk to human health or the environment should exposure occur, are generally considered principal threat waste. The concentrations of PCBs and other contaminants found in the soils and sediments at the Site do not constitute principal threat waste.

The remedial alternatives are as follows:

Sediment Alternative 1: No Action

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the problem of sediment contamination at the Site.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated sediments.

Capital Cost:	$0
Annual O&M Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 years

Sediment Alternative 2: Monitored Natural Recovery to Achieve 1 mg/kg PCB[6]

This alternative would rely upon monitored natural recovery (MNR) to achieve the RAOs related to the Ley Creek sediments from Townline Road to the Route 11 Bridge. Natural recovery processes include biodegradation, biotransformation, bioturbation, diffusion, dilution, adsorption, volatilization, chemical reaction or destruction, resuspension, downstream transport, and burial by clean material. Long-term monitoring of the sediment, water column, and biota would be included under this alternative to confirm that contaminant reduction is occurring and that the reduction is achieving the RAOs.

This alternative would include monitoring and modeling to determine whether the human health and ecological risks are being reduced, and a study would be conducted during the design phase to determine the feasibility of MNR.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated sediments.

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[6] 1.0 mg/kg PCB is a previously selected sediment cleanup goal at New York State hazardous waste sites.

Capital Cost:	$0
Annual O&M Cost:	$24,000
Present-Worth Cost:	$300,000
Construction Time:	0 years

Sediment Alternative 3: Mechanical Excavation to Achieve 1 mg/kg PCB

This alternative would include mechanical excavation of contaminated sediment in the GM-IFG OU2 reach of Ley Creek exhibiting PCB concentrations greater than 1 mg/kg. The estimated volume of material would be 9,600 cubic yards based on PCB concentrations in sediment exceeding the 1 mg/kg sediment cleanup criteria. It is assumed that for reaches indicated for sediment removal, the sediment would be removed from bank to bank, to the extent practicable, until the unconsolidated bed material is reached. For volume estimation, an average excavation depth of 1.25 feet was assumed. Because PCBs are collocated with the majority of other COCs, and are the primary risk driver for all pathways for this Site (see the “Summary of Site Risks” section, above), they would be used as an indicator compound (1 mg/kg PCBs) to ensure that the sediment cleanup goals are achieved. It is assumed that excavated sediment would require dewatering prior to final off-Site disposal, and that water treatment would be required prior to discharge.

Habitat restoration of Ley Creek would consist of placement of at least 0.5 feet of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas would be determined during the remedial design as part of a habitat restoration plan.

Because this alternative would result in contaminants remaining on-Site above levels that allow for unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the remaining contaminated sediments.

Capital Cost:	$6,320,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$6,520,000
Construction Time:	2 years

Sediment Alternative 4: Mechanical Excavation to Achieve 0.28 mg/kg PCB[7]

This alternative would include the mechanical excavation of sediment exhibiting concentrations exceeding the average upstream PCB concentration of 0.28 mg/kg within Ley Creek. The estimated volume of target material associated with sediment removal in this alternative would be 13,200 cubic yards. Excavation limits for Sediment Alternative 4 assume removal of the full depth of sediments from bank to bank within Ley Creek between Townline Road and Route 11. For volume estimation, an average excavation depth of 1.25 feet was assumed. It is assumed that excavated sediment would require dewatering prior to final off-Site disposal, and that water treatment would be required prior to discharge.

Habitat restoration of Ley Creek would consist of placement of at least 0.5 feet of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas would be determined during the remedial design as part of a habitat restoration plan.

Because this alternative would remove all of the sediment, and thus all of the contaminants in on-Site sediment, a CERCLA five year review would not be required for this portion of the remedy.

Capital Cost:	$8,710,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$8,910,000
Construction Time:	2 years

[7] 0.28 mg/kg PCB is the average upstream sediment concentration.

Soil Alternative 1: No Action

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the problem of soil contamination at the Site.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Capital Cost:	$0
Annual O&M Cost:	$0
Present-Worth Cost:	$0
Construction Time:	0 years

Soil Alternative 2: Soil Excavation to Achieve Restricted SCOs

This alternative would include excavation of surface and subsurface soil to meet the restricted SCOs (see Table 2) consistent with current and reasonably anticipated future land use of discrete Site areas as follows:

- continued industrial use for the neighboring National Grid property (except for ecological use within and adjacent to the wetland);
- ecological use for areas in the Ley Creek floodplain, except for areas of residential use where the residential use SCO is lower than the ecological use SCO (*i.e*., chromium); and
- commercial use of the property along Factory Avenue.

The estimated volume of soil to be excavated under this alternative would be 15,000 cubic yards. Most excavations are anticipated to be approximately 1 to 4 feet in depth; with some limited areas excavated to depths as deep as 6 feet within the Ley Creek floodplain hot spot.

It is assumed that National Grid Wetland soil/sediments would require dewatering prior to final soil disposal, and that water treatment would be required prior to discharge to Ley Creek.

Appropriate controls and monitoring (*e.g*., community air monitoring) would be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable.

For costing purposes, approximately 5,800 cubic yards of the soil excavated from the National Grid Wetland, and approximately 1,800 cubic yards of material excavated from the vicinity of Factory Avenue are assumed to exhibit PCB concentrations above 50 mg/kg, and therefore, would need to be disposed of at an off-Site TSCA-compliant facility. The remainder of excavated soils would be disposed at an off-Site, permitted non-hazardous waste disposal facility.

There are limited areas where underground utilities are present at the Site. Due to the potential health and safety threat of excavating around and beneath underground utilities, soil may remain at concentrations above restricted SCOs in some areas following excavation. This would be addressed by a soil cover, institutional controls and as part of the Site Management Plan.

Clean fill meeting the requirements of the NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10), Appendix 5[8] would be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Site. With the exception of the Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas would be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue would be restored with a cover which would consist of an indicator fabric layer, as needed (*e.g*., for soil in the vicinity of underground utilities), overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.

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[8] Allowable Constituent Levels for Imported Fill or Soil.

A Site Management Plan would provide for the proper management of all post-construction remedy components. Specifically, the Site Management Plan would describe procedures to confirm that the requisite engineering (*e.g.*, demarcation layer) and institutional controls are in place and that such controls continue to protect public health and the environment. The Site Management Plan would also detail the following: the provision for the management of future excavations in areas where contamination remains; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of any above-noted environmental easements and/or restrictive covenants; a provision for the performance of the O&M required for the remedy; and a provision that a property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Capital Cost:	$7,410,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$7,610,000
Construction Time:	1 year

Soil Alternative 3: Soil Excavation to Achieve Unrestricted SCOs

This alternative would include excavation of surface and subsurface soil exhibiting concentrations greater than SCOs for unrestricted use (see Table 3). It should be noted that the presence of underground utilities may hinder full excavation along Factory Avenue and on the National Grid property near the access road.

The approximate volume of soil associated with Soil Alternative 3 would be 31,500 cubic yards with average excavation depths ranging from 0 to 10 feet bgs.

It is assumed that National Grid Wetland soil/sediment would require dewatering prior to final soil disposal, and that water treatment would be required prior to discharge to Ley Creek.

Appropriate controls and monitoring (*e.g.*, community air monitoring) would be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable.

For cost purposes, approximately 5,800 cubic yards of the soil excavated from the National Grid Wetland and approximately 1,800 cubic yards of material excavated from the vicinity of Factory Avenue are assumed to exhibit PCB concentrations above 50 mg/kg and therefore would need to be disposed of at an off-Site TSCA-compliant facility. The remainder of excavated soils would be disposed at an off-Site, permitted non-hazardous waste disposal facility.

There are limited areas where underground utilities are present at the Site. Due to the potential health and safety threat of excavating around and beneath underground utilities, soil may remain at concentrations above unrestricted SCOs in some areas following excavation. In such a case, a soil cover, institutional controls and a Site Management Plan would address such area(s).

Clean fill meeting the requirements of DER-10, Appendix 5 would be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Site. With the exception of the Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas would be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue would be restored with a cover which would consist of an indicator fabric layer, as needed (*e.g.*, for soil in the vicinity of underground utilities), overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.

A Site Management Plan would provide for the proper management of all post-construction remedy components. Specifically, the Site Management Plan would describe procedures to confirm that the requisite engineering (*e.g.*, demarcation layer) and institutional controls are in place and that such controls continue to protect public health and the environment. The Site Management Plan would also detail the following: the provision for the management of future excavations in areas where contamination remains; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of any above-noted environmental easements and/or restrictive covenants; a provision for the performance of the O&M required for the remedy; and a provision that a property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

Because this alternative would result in soil with concentrations above levels that allow for unrestricted use and unlimited exposure due to the presence of underground utilities, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove, treat, or contain the contaminated soils.

Capital Cost:	$13,200,000
Annual O&M Cost:	$16,000
Present-Worth Cost:	$13,400,000
Construction Time:	1 year

COMPARATIVE ANALYSIS OF ALTERNATIVES

The detailed analysis consists of an assessment of the individual alternatives against each of the nine evaluation criteria (see box below) and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

A comparative analysis of these alternatives based upon the evaluation criteria noted below follows.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall protection of human health and the environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative would meet all of the applicable or relevant and appropriate requirements of federal and state environmental statutes and other requirements that pertain to the Site, or provide grounds for invoking a waiver.
Long-term effectiveness and permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies an alternative may employ.
Short-term effectiveness considers the period of time needed to implement an alternative and the risks the alternative may pose to workers, residents, and the environment during implementation.
Implementability is the technical and administrative feasibility of implementing the alternative, including the availability of materials and services.
Cost includes estimated capital and annual operation and maintenance costs, as well as present-worth costs. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
Support agency acceptance indicates if, based on its review of the RI/FS and Proposed Plan, NYSDOH (the support agency for NYSDEC) concurs with the preferred remedy.
Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports. Comments received on the Proposed Plan are an important indicator of community acceptance.

Overall Protection of Human Health and the Environment

In order to be protective, the sediment remedial alternatives considered would need to address the migration of PCBs from sediments; control contaminated sediment transport; and reduce potential exposures to contaminated sediments, whereas, the soil remedial alternatives considered would need to reduce potential exposures to contaminated soils. Each of the action alternatives presented (Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3) would protect human health and the environment *via* removal (excavation) of contaminated sediments and soils, respectively, and for the soil alternatives, covering residual contaminated soils as needed. Sediment Alternative 1 and Soil Alternative 1 (the No Further Action alternatives) and Sediment Alternative 2 (Monitored Natural Recovery) would not be protective of human health and the environment since they would not address the PCBs in the sediments and soil, which present human health and ecological risks.

Compliance with ARARs

SCOs are identified in 6 NYCRR Part 375, Environmental Remediation Programs, Subpart 375-6, effective December 14, 2006. There are currently no federal or state promulgated standards for contaminant levels in sediments. There are, however, other federal or state advisories, criteria, or guidance (which are used as TBC criteria). Specifically, NYSDEC's sediment screening values are a TBC criteria.

The chemical-specific ARARs for PCBs in the water-column are 0.014 µg/L for protection of aquatic life (criterion continuous concentration [chronic] federal water quality criterion for fresh water), 0.00012 µg/L (NYS standard for protection of wildlife) and the 0.000001 µg/L (NYS standard for protection of human consumers of fish). These chemical-specific ARARs for the surface water would not be expected to be met by any of the alternatives during the implementation of the alternatives. This is due to Site background PCB water concentrations that likely exceed these ARARs due to the ubiquitous nature of PCBs, especially within an urban drainage system.

Since the contaminated sediments and soils would not be addressed under Sediment Alternative 1, Sediment Alternative 2 and Soil Alternative 1, these alternatives would not achieve the sediment cleanup goals, the sediment screening criteria, nor the SCOs.

The Soil Alternatives 2 and 3 would attain the respective SCOs. Sediment Alternatives 3 and 4 would meet their respective cleanup goals for PCBs in sediment. Sediment Alternatives 4 would meet the sediment screening criteria as achieving the background concentration for PCBs would require removal of all sediment in the creek. During sediment excavation for Sediment Alternatives 3 and 4, any increases in PCB concentrations in the surface water of Ley Creek due to excavation would be expected to be short term. Sufficient engineering controls would be utilized during excavation to prevent or minimize resuspension of contaminated sediments and exceedances of surface water ARARs (above background conditions) downstream of the work zone. Furthermore, compliance with the discharge limits (to be established by NYSDEC, as needed) should ensure that there are no exceedances of surface water ARARs caused by the discharge from on-Site water treatment to the extent practicable. Also, any water quality impacts would meet the substantive water quality requirements imposed by New York State on entities seeking a dredged material discharge permit under Section 404 of the Clean Water Act (CWA). For the action alternatives, other action-specific ARARs to be met include CWA Sections 401 and 402; the Rivers and Harbors Act Section 10; the New York Environmental Conservation Law (ECL) Article 15 Water Resources, Article 17 Water Pollution Control and Article 27 Collection, Treatment and Disposal of Refuse and Other Solid Waste; and associated implementing regulations.

Under Soil Alternatives 2 and 3, clean fill meeting the requirements of the DER-10, Appendix 5 would be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Site. Since Soil Alternatives 2 and 3 would involve the excavation of contaminated soils, and Sediment Alternatives 3 and 4 would require dewatering and processing of sediments, compliance with fugitive dust regulations would be addressed as necessary. In addition, the Soil Alternatives 2 and 3 and Sediment Alternatives 3 and 4 would be subject to New York State and federal regulations related to the transportation and off-Site treatment/disposal of wastes.

The Resource Conservation and Recovery Act (RCRA) is the federal law addressing the storage, transportation and disposal of solid and hazardous waste. NYSDEC implements RCRA in New York under ECL Article 27. Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 would comply with TSCA's PCB cleanup and disposal regulations (40 CFR Part 761).

Long-Term Effectiveness and Permanence

Sediment Alternatives 1 and 2 and Soil Alternative 1 would not provide long-term effectiveness or permanence because they do not take any action to prevent exposures to or mobilization of PCBs.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 are each effective in the long-term and each provide permanent remediation, to varying degrees, by removal and off-Site disposal of contaminated sediments and soils. Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 would provide increasing degrees of long-term effectiveness and permanence as each successive alternative calls for further removals of sediment or soil, respectively.

For Soil Alternatives 2 and 3, institutional controls would be needed to restrict intrusive activities in areas where soil contamination remains. Even implementation of Soil Alternative 3, which calls for the excavation of soils which exceed unrestricted SCOs, would likely result in some soils remaining in the vicinity of buried utilities that would warrant institutional controls. Since Sediment Alternatives 1, 2 and 3 and all of the soil alternatives would result in residual contamination, five-year reviews would be required. In addition, the fish advisory that applies to Onondaga Lake and all tributaries up to the first impassible barrier would continue to apply to this reach of Ley Creek.

Sediment Alternative 3 and 4 and Soil Alternatives 2 and 3 would maintain reliable protection of public health and the environment over time.

Reduction in Toxicity, Mobility, or Volume Through Treatment

None of the alternatives include treatment.

Sediment Alternatives 1 and 2 and Soil Alternative 1 would provide no reduction in toxicity, mobility or volume. Under each of the other alternatives, the mobility of contaminants would be reduced to varying degrees *via* excavation and proper disposal of excavated soils or sediments.

Short-Term Effectiveness

Sediment Alternatives 1 and 2 and Soil Alternative 1 do not involve any construction work, so there would be no short-term impacts.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 could present some risk of limited adverse impacts to remediation workers through dermal contact and inhalation (through fugitive dust) related to sediment or soil excavation activities. Noise from the excavation work associated with the action alternatives could impact remediation workers and nearby residents. These potential short-term impacts would, however, be mitigated by following appropriate health and safety protocols, the implementation of engineering controls developed during remedial design, and by following appropriate construction practices.

A wetlands assessment and restoration plan will be prepared for any wetlands impacted or disturbed by the remedial activities (CWA Section 404, Protection of Wetlands E.O. 11990, 40 CFR 6 App A) and Management Practices (according to Federal Register Vol. 51, No. 219, Part 330.6) will be followed to minimize unavoidable impacts to wetlands to the maximum extent practicable while designing/implementing the remedy.

There would be some short-term impacts to aquatic and upland wildlife habitat areas for each of the action alternatives due to excavation of soil and sediment. These impacts would be greatest for Sediment Alternative 4, since the entire reach of Ley Creek would be dredged from bank to bank, and Soil Alternative 3, since the greatest surface area of upland habitat would be excavated. Habitat reconstruction and appropriate monitoring provisions would be implemented to mitigate these short-term impacts. Potential for exposures to fish and other biota due to resuspension of sediments caused by excavation under Sediment Alternatives 3 and 4 would be minimized through the use of engineering controls developed during remedial design and appropriate construction practices.

Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 include off-Site transport of several thousand cubic yards of contaminated sediments or soils, but this would have minimal impact on local traffic due to accessibility and proximity to truck routes and the New York State Thruway.

There is a potential for increased storm water runoff and erosion during construction of Sediment Alternatives 3 and 4 and Soil Alternatives 2 and 3 that would require management to prevent or minimize any adverse water quality impacts.

Since no actions would be performed under Sediment Alternative 1 and Soil Alternative 1, there would be no time required for implementation. Sediment Alternative 2 requires no construction, but would require some time to develop a monitoring plan. Sediment Alternatives 3 and 4 are estimated to be completed within 2 years from the start of construction, and Soil Alternatives 2 and 3 are estimated to be completed within 1 year from the start of construction.

Implementability

Sediment Alternative 1 and Soil Alternative 1 are the easiest alternatives to implement, as there is no action to undertake. Sediment Alternative 2 is the next most implementable alternative since it only provides for Site monitoring, which is readily implementable.

Sediment Alternatives 3 and 4 and Soil Alternative 2 are readily implementable. Requisite equipment and services for each of these alternatives are readily available and have been used successfully at numerous sites to remediate contaminated soils and sediment. However, attaining unrestricted SCOs called for by Soil Alternative 3 is likely not implementable due to the presence of underground utilities that would likely require an undisturbed buffer zone in order to prevent exposures to Site workers and/or damage to utilities.

Cost

The present-worth costs were calculated using a discount rate of seven percent and a thirty-year time interval for post-construction monitoring and maintenance.

The estimated capital, O&M, and present-worth costs for each of the alternatives are presented in the table below. The estimated costs for the action alternatives are directly related to the given alternative's corresponding total volumes of soil and sediments to be excavated.

Alternatives	Capital	Annual O&M	Total Present Worth
Sediment Alternative 1: No Action	$0	$0	$ 0
Sediment Alternative 2: MNR	$0	$24,000	$300,000
Sediment Alternative 3: Excavation to 1 mg/kg PCB	$6,320,000	$16,000	$6,520,000
Sediment Alternative 4: Excavation to 0.28 mg/kg PCB	$8,710,000	$16,000	$8,910,000
Soil Alternative 1: No Action	$0	$0	$ 0
Soil Alternative 2: Excavation to 1 mg/kg PCB	$7,410,000	$16,000	$7,610,000
Soil Alternative 3: Excavation to 0.1 mg/kg PCB	$13,200,000	$16,000	$13,400,000

Support Agency Acceptance

NYSDOH has reviewed this Proposed Plan and concurs with the preferred alternative.

Community Acceptance

Community acceptance of the preferred alternative will be addressed in the ROD following review of the public comments received on the Proposed Plan.

PREFERRED REMEDY

Based upon an evaluation of the various alternatives, NYSDEC and EPA recommend Sediment Alternative 3 (Mechanical Excavation to Achieve 1.0 mg/kg PCB), and Soil Alternative 2 (Soil Excavation to Achieve Restricted SCOs) as the preferred remedy to address the contaminated sediment and soil, respectively. The total present worth cost of the alternatives is estimated to be $14.1 million.

The recommended alternatives include:

1. A remedial design program to provide the details necessary for the construction (including any design sampling), operation, optimization, maintenance, and monitoring of the remedial program. The environmental benefits of the preferred remedy may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with the EPA Region 2's Clean and Green Energy Policy and NYSDEC's DER-31 Green Remediation Policy[9]. Green remediation principles and techniques would be implemented to the extent feasible in the design, implementation, and site management of the remedy. The major green remediation components are as follows;

    - Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
    - Reducing direct and indirect greenhouse gases and other emissions;
    - Reduction in vehicle idling, including both on and off road vehicles and construction equipment during construction;
    - Use of Ultra Low Sulfur Diesel (ULSD);
    - Increasing energy efficiency and minimizing use of non-renewable energy;
    - Conserving and efficiently managing resources and materials;

[9] see http://epa.gov/region2/superfund/green_remediation and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Mechanical excavation of sediment in Ley Creek exceeding 1 mg/kg PCBs. The estimated volume of material would be 9,600 cubic yards. Figure 8 depicts the areas of the creek where sediments would be excavated. It is assumed that within reaches included for sediment removal, the excavations would be from bank to bank and the depths of excavation would be to the unconsolidated bed material, to the extent practicable. The areal foot-print of areas to be excavated would be refined during the remedial design. It is assumed that excavated sediment would require dewatering prior to final off-Site disposal, and that water treatment would be required prior to discharge.

3. Habitat restoration of Ley Creek excavated areas which would consist of the placement of at least 0.5 feet of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas would be determined during the remedial design as part of a habitat restoration plan. The main goal of the habitat restoration would be to restore the habitats affected by the remedy, and the restoration would meet the substantive requirements of 6 NYCRR Part 608 and 663. A habitat assessment would be performed to support the restoration design. The habitat assessment would include an assessment of the Ley Creek removal areas for mussels and would determine any actions necessary (if any) to minimize impacts to existing populations. The habitat restoration plan would also describe the specific design for areas impacted by the remediation of sediments and soils and determine the appropriate plantings (including types and locations) necessary to restore habitats. The habitat restoration plan would also include the necessary requirements for monitoring restoration success and for needed restoration maintenance.

4. Excavation of surface and subsurface soil to meet the restricted SCOs (see Table 2) consistent with current and reasonably anticipated future land use of discrete Site areas as follows:

   - continued industrial use for the neighboring National Grid property (except for ecological use within and adjacent to the wetland);
   - ecological use for areas in the Ley Creek floodplain, except for areas of residential use where the residential use SCO is lower than the ecological use SCO (*i.e*., chromium); and
   - commercial use of the property along Factory Avenue.

   The estimated volume of soil to be excavated would be 15,000 cubic yards. Most excavations are anticipated to be approximately 1 to 4 feet in depth; with some limited areas excavated to depths as deep as 6 feet within the Ley Creek floodplain hot spot. The locations and assumed excavations for soil removal are illustrated on Figures 4 through 7. Confirmatory sampling would be conducted to ensure the excavations are complete.

   It is assumed that National Grid Wetland soils would require dewatering prior to final soil disposal, and that water treatment would be required prior to proper discharge.

   Clean fill meeting the requirements of DER-10, Appendix 5 would be brought in to replace the excavated soil or complete the backfilling of the excavation and establish the designed grades at the Site. With the exception of the Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas would be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue would be restored with a cover which would consist of an indicator fabric layer, as needed, overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.

   For cost estimating purposes, approximately 5,800 cubic yards of the soil excavated from the National Grid Wetland and approximately 1,800 cubic yards of material excavated from the vicinity of Factory Avenue are assumed to exhibit PCB concentrations above 50 mg/kg and therefore would need to be disposed of at an off-Site TSCA-compliant facility. The remainder of excavated soils would be disposed at an off-Site, permitted non-hazardous waste disposal facility.

5. Appropriate controls and monitoring (*e.g.*, community air monitoring) would be utilized to ensure that during remediation activities, airborne particulate and volatile organic vapor concentrations surrounding the excavation area are acceptable.

6. Institutional controls in the form of environmental easements would be used to restrict intrusive activities in areas where contamination remains unless the activities are in accordance with an approved Site Management Plan.

7. A Site Management Plan would provide for the proper management of all post-construction remedy components. Specifically, the Site Management Plan would describe procedures to confirm that the requisite engineering (*e.g.*, demarcation layer) and institutional controls are in place and that such controls continue to protect public health and the environment. The Site Management Plan would also detail the following: the provision for the management of future excavations in areas where contamination remains; an inventory of any use restrictions; the necessary provisions for the implementation of the requirements of any above-noted environmental easements and/or restrictive covenants; a provision for the performance of the O&M required for the remedy; and a provision that a property owner or party implementing the remedy submit periodic certifications that the institutional and engineering controls are in place.

8. Because this remedy would result in contaminants remaining on-Site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years.

BASIS FOR THE REMEDY PREFERENCE

Under the NCP, the “Overall Protection of Human Health and the Environment” and “Compliance with ARARs” evaluation criteria are threshold requirements that an alternative must meet in order to be eligible for selection. The preferred remedy, Sediment Alternative 3 and Soil Alternative 2, is protective of public health and the environment and would achieve the ARARs. This remedy would reduce the human health and ecological risks through the removal of the PCB-contaminated sediment and soil and the placement of soil covers over residual soil contamination.

With respect to soils, both Soil Alternative 2 and Soil Alternative 3 are protective since their respective soil cleanup objectives are at least as stringent as the NYSDEC promulgated restricted use soil cleanup objectives. The additional environmental benefit in regard to soil cleanup associated with Soil Alternative 3 relative to Soil Alternative 2 would not be commensurate with the additional costs ($5.8 million).

With respect to sediments, Sediment Alternative 3 and Sediment Alternative 4 are protective since their respective sediment cleanup values are at least as stringent as the risk-based sediment value derived from the baseline ecological risk assessment, and in areas targeted for cleanup, excavation would be down to native material resulting in Site-wide residual contaminant concentrations much lower than the respective alternative’s sediment criteria. The additional environmental benefit and risk reduction, in regards to sediment cleanup associated with Sediment Alternative 4 relative to Sediment Alternative 3, would not be commensurate with the additional costs ($2.4 million) since Alternative 3 would achieve the Site risk-based sediment value for PCBs.

The preferred remedy is technically and administratively feasible and implementable. All of the necessary personnel, equipment, and services required are expected be readily available.

The preferred remedy would provide the best balance of tradeoffs among alternatives with respect to the evaluating criteria. The EPA and NYSDEC believe that the preferred remedy would be protective of public health and the environment, comply with ARARs, be cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

TABLE 2: Summary of Soil Cleanup Objectives for Soil Alternative 2

		SCO (mg/kg)			
COC	AREA	Residential	Commercial	Industrial	Ecological
PCB	Factory Avenue Area (North of GM-IFG facility)		1		
	National Grid Property (along access road)			25	
	Factory Avenue Area (at Lemoyne Avenue)		1		
	Ley Creek Floodplain				1
	National Grid Wetland				1
Arsenic	Factory Avenue Area (North of GM-IFG facility)		16		
	National Grid Property (along access road)			16	
	Factory Avenue Area (at Lemoyne Avenue)		16		
	Ley Creek Floodplain				13
	National Grid Wetland				13
Chromium[3]	Factory Avenue Area (North of GM-IFG facility)		1500		
	National Grid Property (along access road)			6800	
	Factory Avenue Area (at Lemoyne Avenue)		1500		
	Ley Creek Floodplain	36			41
	National Grid Wetland				41
Copper	Factory Avenue Area (North of GM-IFG facility)		270		
	National Grid Property (along access road)			10000	
	Factory Avenue Area (at Lemoyne Avenue)		270		
	Ley Creek Floodplain				50
	National Grid Wetland				50
Lead	Factory Avenue Area (North of GM-IFG facility)		1000		
	National Grid Property (along access road)			3900	
	Factory Avenue Area (at Lemoyne Avenue)		1000		
	Ley Creek Floodplain				63
	National Grid Wetland				63
Nickel	Factory Avenue Area (North of GM-IFG facility)		310		
	National Grid Property (along access road)			10000	
	Factory Avenue Area (at Lemoyne Avenue)		310		
	Ley Creek Floodplain				30
	National Grid Wetland				30
Zinc	Factory Avenue Area (North of GM-IFG facility)		10000		
	National Grid Property (along access road)			10000	
	Factory Avenue Area (at Lemoyne Avenue)		10000		
	Ley Creek Floodplain				109
	National Grid Wetland				109

Notes:

1. Ley Creek Floodplain uses the ecological SCO unless the residential SCO is lower and that portion of the Ley Creek Floodplain is zoned residential.
2. Chromium refers to trivalent chromium.
3. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

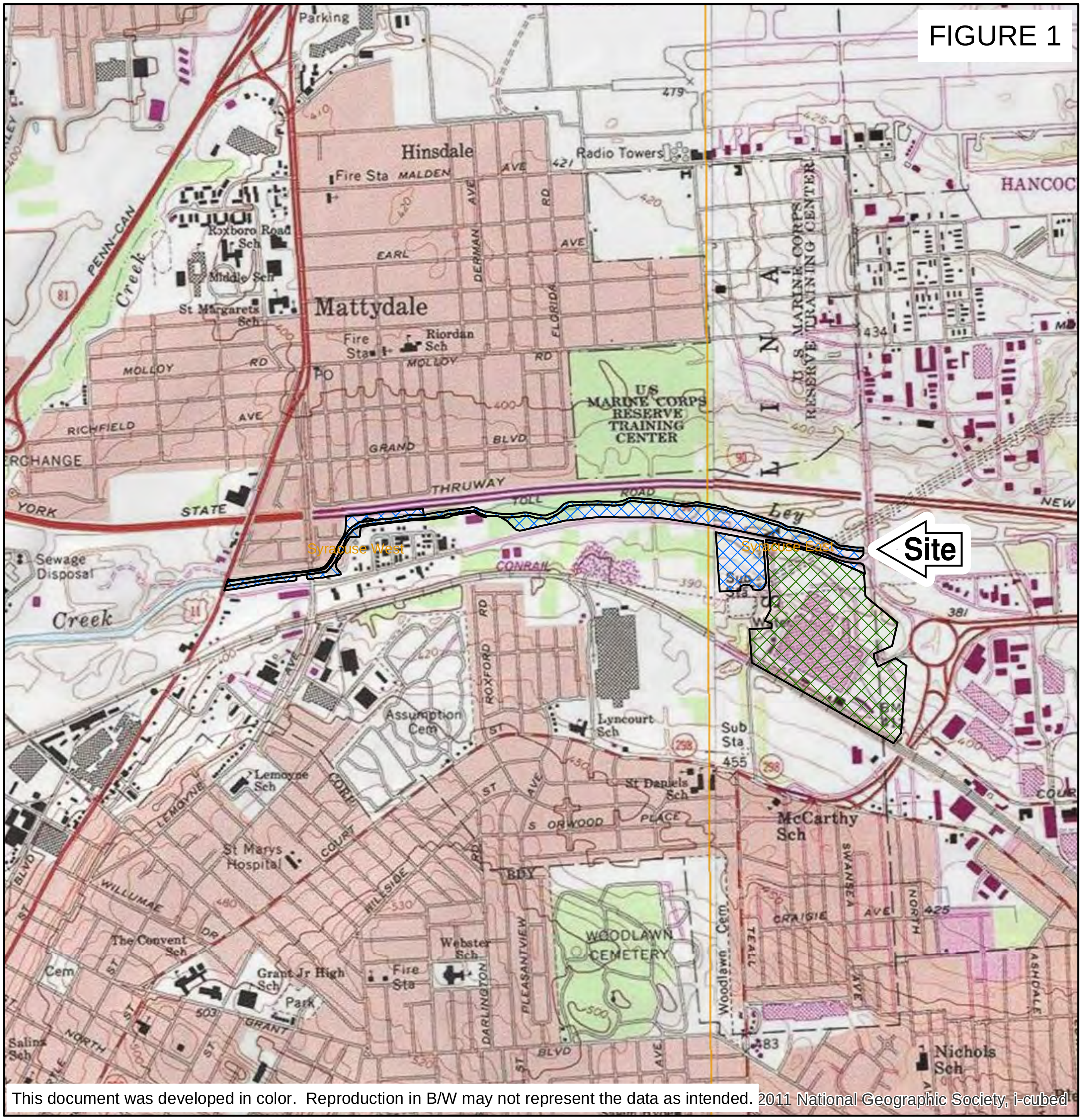
TABLE 3: Summary of Soil Cleanup Objectives for Soil Alternative 3

COC	AREA	Unrestricted SCO (mg/kg)
PCB	Site Soil	0.1
Arsenic	Site Soil	13
Chromium[3]	Site Soil	30
Copper	Site Soil	50
Lead	Site Soil	63
Nickel	Site Soil	30
Zinc	Site Soil	109

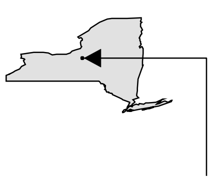
Notes:

1. Chromium refers to trivalent chromium.
2. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of this contaminant is below the specific SCO.

FIGURE 1



ADAPTED FROM: SYRACUSE WEST, SYRACUSE EAST NEW YORK USGS QUADRANGLE.



GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

PROPOSED PLAN
SITE LOCATION

LEGEND
- OFF-SITE AREAS
- FORMER IFG FACILITY

N

0 1,000 2,000 4,000 6,000 8,000
Feet

APRIL 2014
15388.51418

1:24,000

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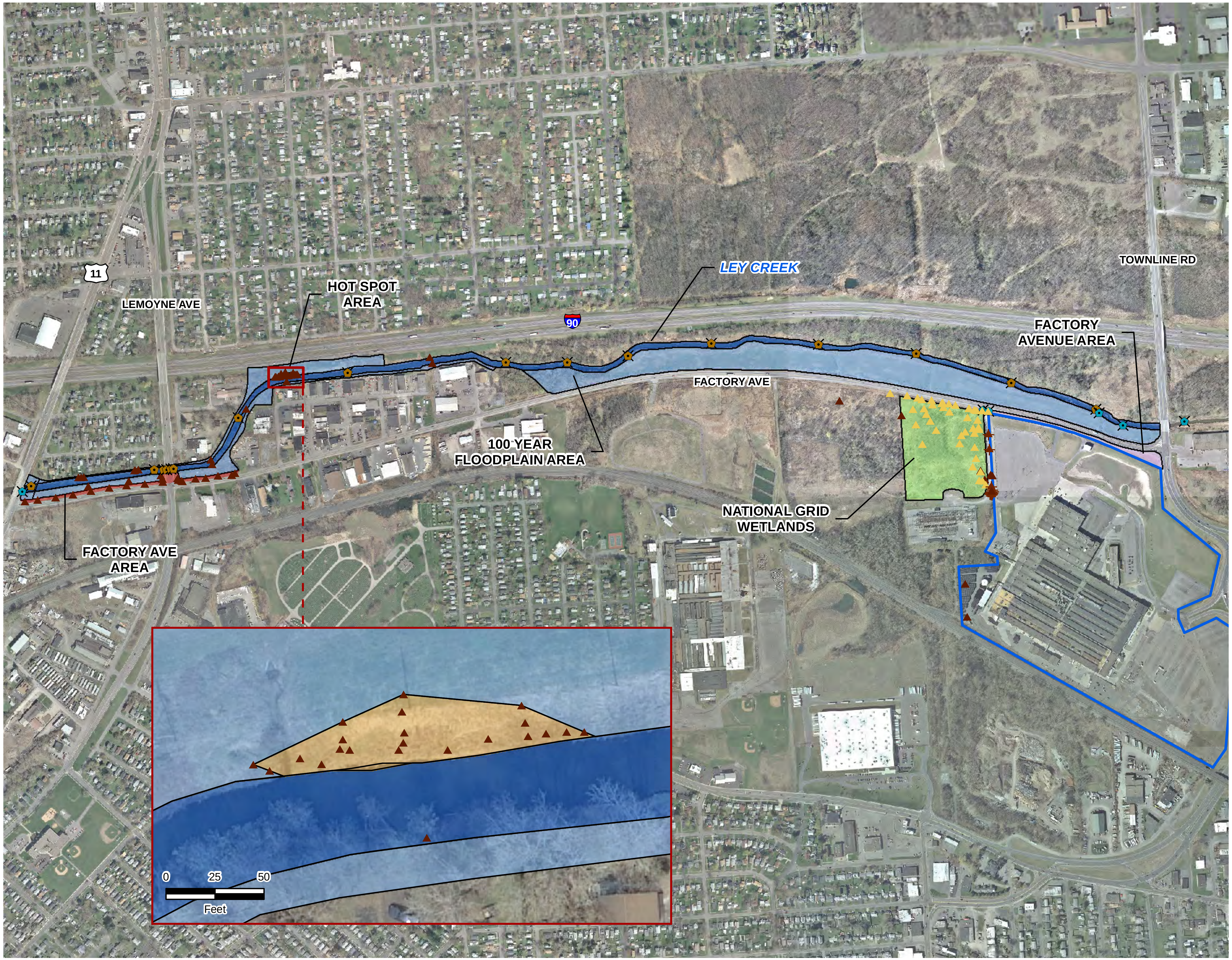

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FIGURE 2

N

LEGEND

- SOIL BORING
- SURFACE SOIL
- SOIL SAMPLE
- SEDIMENT SAMPLE
- SURFACE WATER
- FORMER IFG FACILITY PROPERTY BOUNDARY (OU 1)
- FACTORY AVENUE AREA
- LEY CREEK 100-YEAR FLOODPLAIN AREA
- LEY CREEK 100-YEAR FLOODPLAIN HOT SPOT AREA
- LEY CREEK
- NATIONAL GRID WETLANDS
- FACTORY AVENUE / LEMOYNE AVENUE INTERSECTION

GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

PROPOSED PLAN
OU 2 AREAS

0 375 750 1,500
Feet

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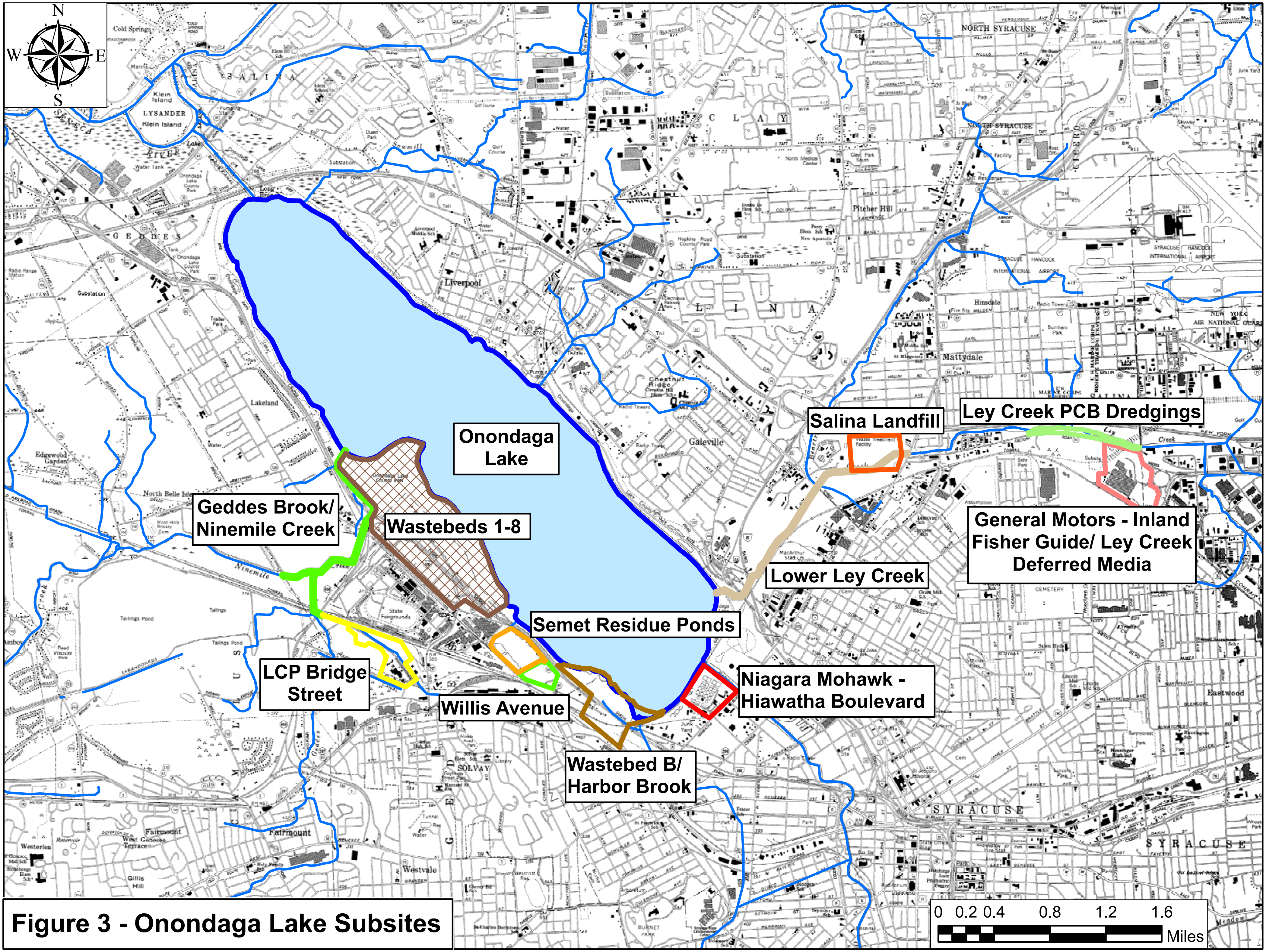
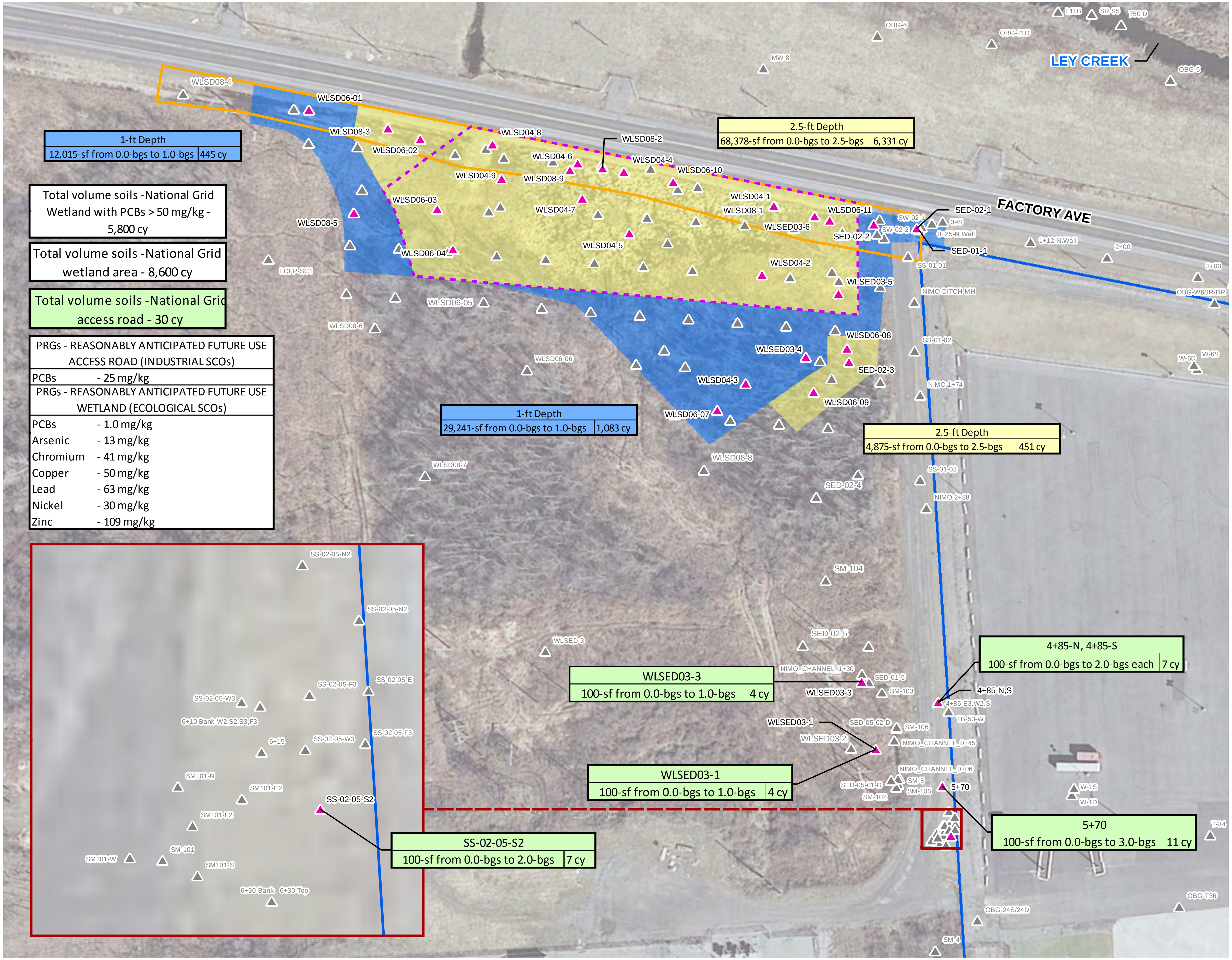


Figure 3 - Onondaga Lake Subsites

FIGURE 4



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N

LEGEND

- ▲ SOIL SAMPLE > PRGs*
- ▲ SOIL SAMPLE
- PCBs > 50 mg/kg
- FACTORY AVENUE DITCH

PROPOSED EXCAVATION EXTENT

- 1 FOOT DEPTH
- 2.5 FOOT DEPTH

NOTE:

* PRGs used for area limits are listed in figure box inset.
- Proposed excavation extent excludes soil sample location WLSD04-8; Nickel (0.5-1 ft bgs) is marginally above PRG.
- Industrial SCOs - NYCRR part 375 Soil Cleanup Objectives (SCOs) for Industrial Land Use
- Ecological SCOs - NYCRR Part 375 SCOs for Protection of Ecological Resources

EXCAVATION LIMITS

WLSED03-3	
100-sf from 0.0-bgs to 1.0-bgs	4 cy

AREA AND DEPTH — VOLUME

GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

PROPOSED PLAN NATIONAL GRID WETLAND AREA

0 50 100 200
Feet

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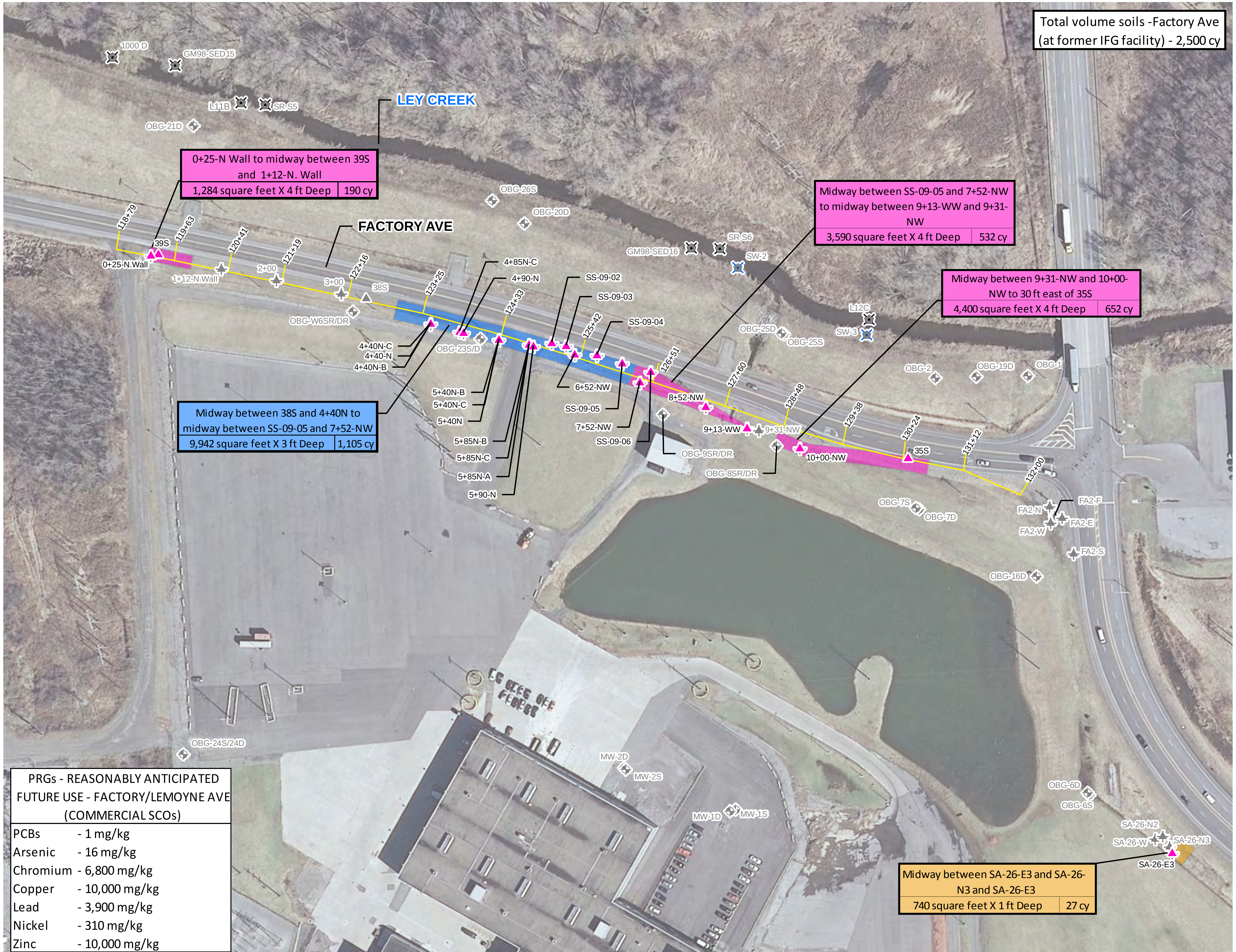
FIGURE 5



PRGs - REASONABLY ANTICIPATED FUTURE USE - FACTORY/LEMOYNE AVE (COMMERCIAL SCOs)	
PCBs	- 1 mg/kg
Arsenic	- 16 mg/kg
Chromium	- 6,800 mg/kg
Copper	- 10,000 mg/kg
Lead	- 3,900 mg/kg
Nickel	- 310 mg/kg
Zinc	- 10,000 mg/kg

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N

LEGEND

- SOIL SAMPLE > PRGs*
- MONITORING WELL
- SOIL BORING
- SURFACE SOIL
- SEDIMENT SAMPLE
- SURFACE WATER SAMPLE
- FORMER IFG FACILITY PROPERTY BOUNDARY

PROPOSED EXCAVATION EXTENT

- 1 FOOT DEPTH
- 3 FOOT DEPTH
- 4 FOOT DEPTH

NOTES:

* PRGs used for area limits are listed in figure box inset.
- Commercial SCOs - 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for Commercial Land Use

EXCAVATION EXTENT

Midway between SA-26-E3 and SA-26-N3 and SA-26-E3
740 square feet X 1 ft Deep | 27 cy

AREA AND DEPTH — VOLUME

GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

PROPOSED PLAN FACTORY AVENUE AREA (AT FORMER IFG FACILITY)

0 70 140 280
Feet

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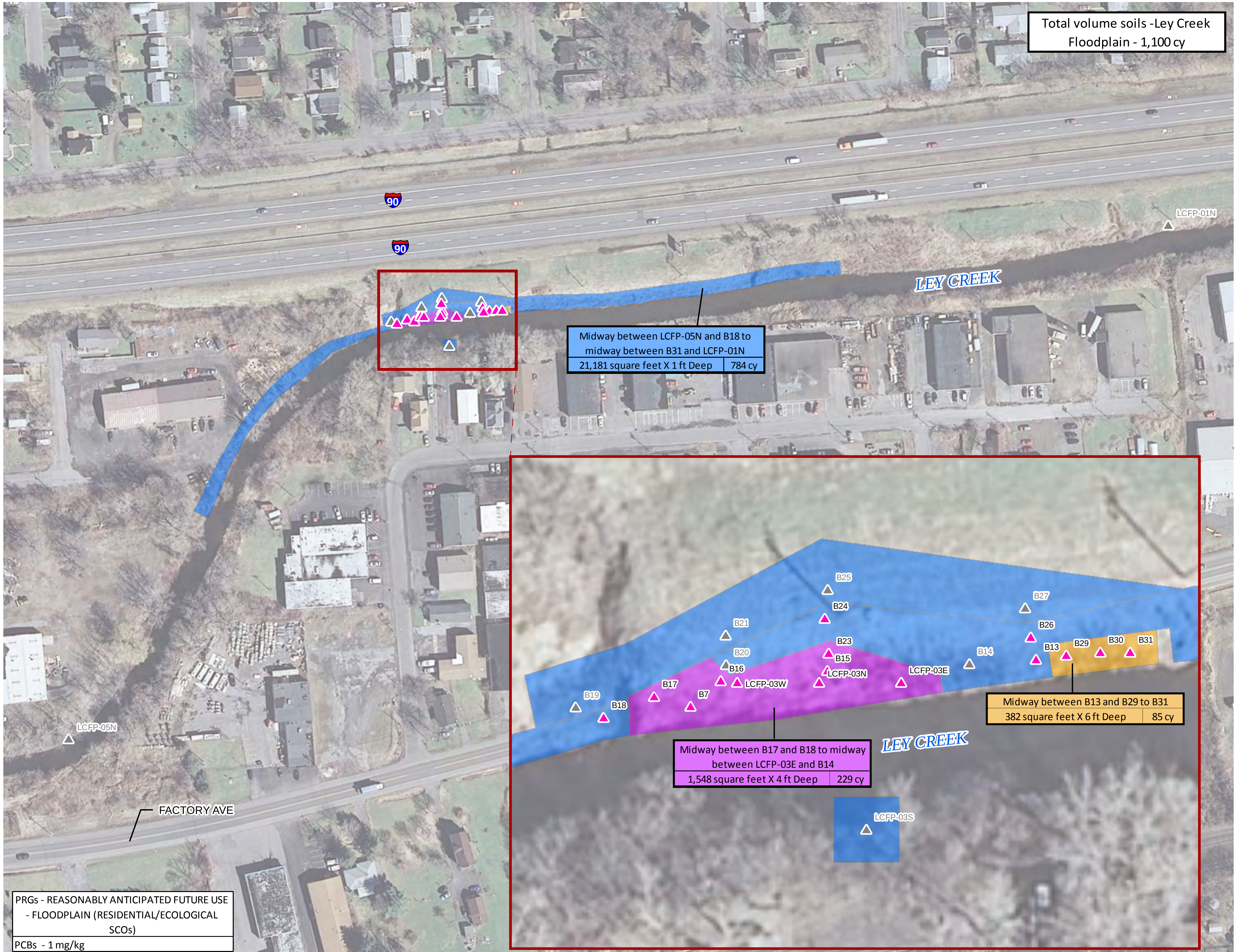

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FIGURE 6

N

LEGEND

- ▲ SOIL SAMPLE > PRG*
- ▲ SOIL SAMPLE < PRG*

PROPOSED EXCAVATION EXTENT

- 1 FOOT DEPTH
- 4 FOOT DEPTH
- 6 FOOT DEPTH

NOTES:

* PRGs used for area limits are listed in figure box inset.
- Boring locations acquired from a Trimble Pro XRS GPS Unit
- Residential SCOs - 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for Residential Land Use
- Ecological SCOs - 6 NYCRR SCOs for Protection of Ecological Resources

EXCAVATION LIMITS

Midway between B17 and B18 to midway between LCFP-03E and B14

1,548 square feet X 4 ft Deep | 229 cy

AREA AND DEPTH — VOLUME

GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

PROPOSED PLAN FLOODPLAIN HOT SPOT AND FLOODPLAIN

0 75 150 300
Feet

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FIGURE 7

N

LEGEND

▲ SOIL SAMPLE > PRGs*

▲ SOIL SAMPLE

PROPOSED EXCAVATION EXTENT

- 1.25 FOOT DEPTH
- 2 FOOT DEPTH
- 3 FOOT DEPTH

NOTES:

* PRGs used for area limits are listed in figure box inset.
- Residential SCOs - 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) for Residential Land Use
- Ecological SCOs - 6 NYCRR SCOs for Protection of Ecological Resources
- Commercial SCOs - 6 NYCRR Part 375 SCOs for Commercial Land Use

EXCAVATION LIMITS

RT 11 to Lemoyne Ave and Lemoyne Ave to halfway to LCFP-05N	
23,704 square feet X 2 ft Deep	1,756 cy

AREA AND DEPTH — VOLUME

GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

PROPOSED PLAN FACTORY AVE AREA (AT LEMOYNE AVE INTERSECTION)

0 75 150 300
Feet

APRIL 2014
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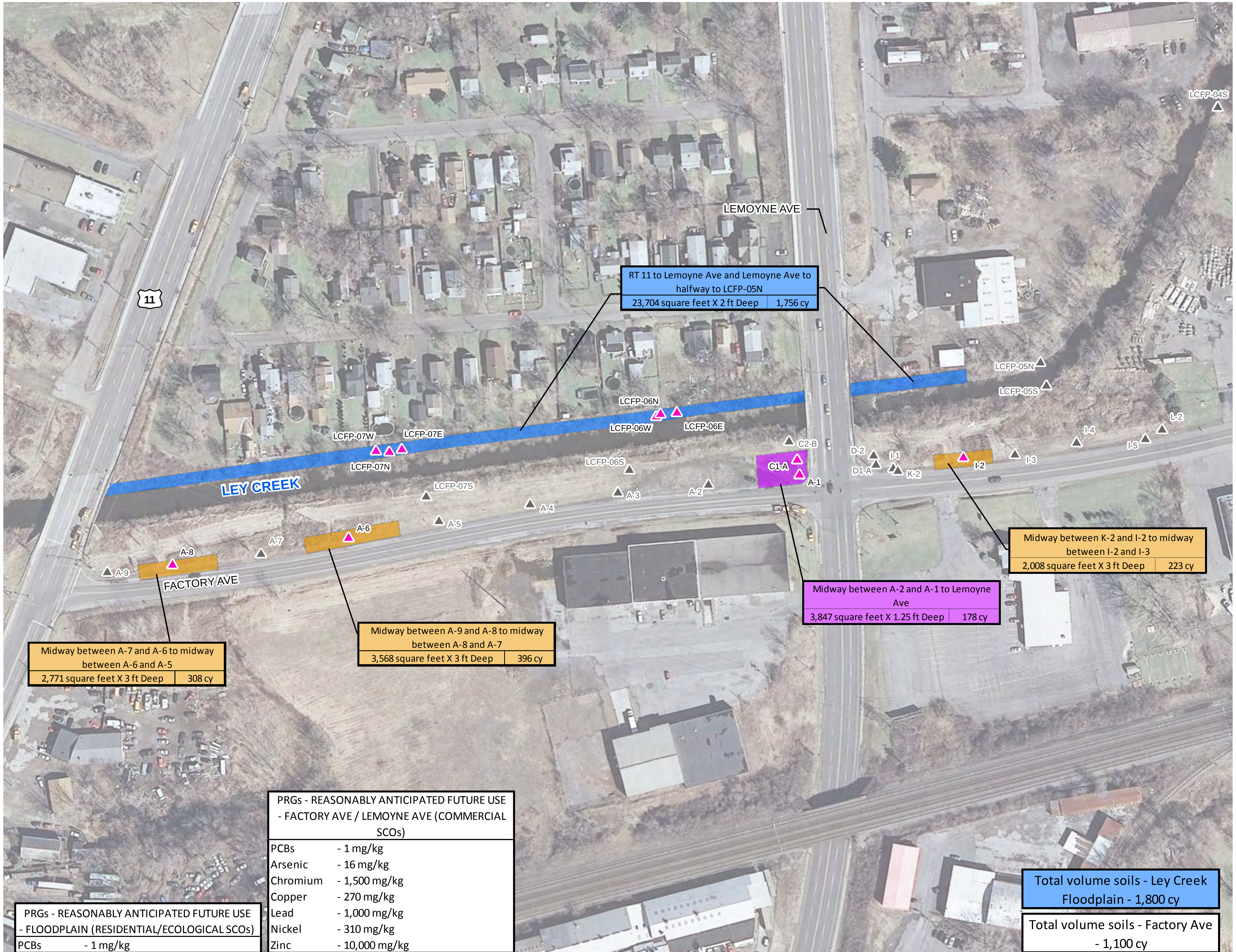


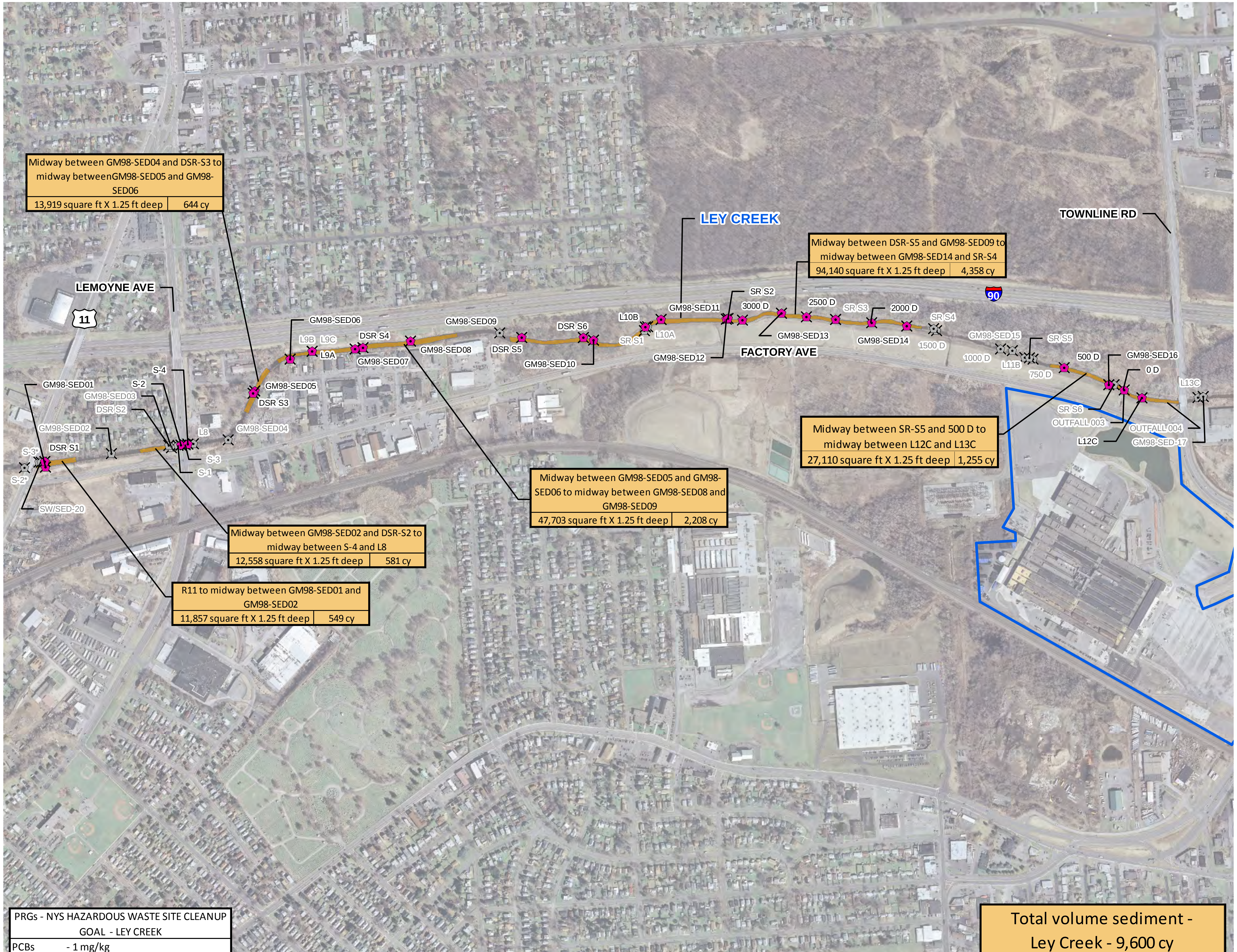
PRGs - REASONABLY ANTICIPATED FUTURE USE - FLOODPLAIN (RESIDENTIAL/ECOLOGICAL SCOs)	
PCBs	- 1 mg/kg

PRGs - REASONABLY ANTICIPATED FUTURE USE - FACTORY AVE / LEMOYNE AVE (COMMERCIAL SCOs)	
PCBs	- 1 mg/kg
Arsenic	- 16 mg/kg
Chromium	- 1,500 mg/kg
Copper	- 270 mg/kg
Lead	- 1,000 mg/kg
Nickel	- 310 mg/kg
Zinc	- 10,000 mg/kg

This document was developed in color. Reproduction in B/W may not represent the data as intended.

I:\Racer-Trust.15388\50292.For-Ifg-Fac-Rif\Docs\DWG\MXD\Off-Site PDI WP\Proposed Plan\Fig5_Prop_Factory.mxd
PLOTDATE: 04/24/13 9:47:45 AM stantosa

FIGURE 8



This document was developed in color. Reproduction in B/W may not represent the data as intended.

N

LEGEND

- SEDIMENT SAMPLE > PRG*
- SED
- FORMER IFG FACILITY PROPERTY BOUNDARY
- PROPOSED EXCAVATION EXTENT

NOTES:
- Ley Creek length between Townline Rd and Route 11: 9,242 linear ft.
- Proposed excavation extent square footage was estimated using the aerial image of each relevant reach of Ley Creek.
* PRGs used in area limits are listed in figure box inset.
- PRG of 1 mg/kg for total PCBs based on previously selected cleanup goals for NYS Hazardous Waste Sites.

EXCAVATION LIMITS

R11 to midway between GM98-SED01 and GM98-SED02	
11,857 square ft X 1.25 ft deep	549 cy

AREA AND DEPTH — VOLUME

GENERAL MOTORS
IFG SITE
OPERABLE UNIT 2
SYRACUSE, NEW YORK

PROPOSED PLAN LEY CREEK SEDIMENT

0 375 750 1,500
Feet

APRIL 2014
15388.51418

O'BRIEN & GERE

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX V-b

PUBLIC NOTICE PUBLISHED IN THE
SYRACUSE POST STANDARD
ON JANUARY 15, 2015

Notices

Other Legals

al, Defendant(s) Attorney (s) for Plaintiff (s) ROSICKI, ROSICKI & ASSOCIATES, P.C., 2 Summit Court, Suite 301, Fishkill, New York, 12524, 845.897.1600 Pursuant to judgment of foreclosure and sale granted herein on or about May 2, 2014, I will sell at Public Auction to the highest bidder at West Lobby 2nd floor Courthouse, 401 Montgomery Street, Syracuse, NY 13202, On February 10, 2015 at 9:00 AM. Premises known as 700 OAK ST, SYRACUSE, NY 13203 Section 19 Block 5 Lot 40 All that tract or parcel of land, situate in the City of Syracuse, County of Onondaga and State of New York, known and distinguished as Lot No 7 of Block No Four hundred fifty six (456) of said City, according to a map of said premises made by R. Griffin, C.E and filed by Joseph T.M. Meatyard, George Dean and George H Mann in Onondaga County Clerk's Office March 18, 1890; said lot being thirty nine (39) feet wide on Oak Street and having a depth of One Hundred and thirty two (132) feet. Also, all that other tract or parcel of land, being part of Lot No. Six (6) in Block No. Four Hundred fifty six (456). As more particularly described in the judgment of foreclosure and sale. Sold subject to all of the terms and conditions contained in said judgment and terms of sale. Approximate amount of judgment $126,871.16 plus interest and costs. INDEX NO. 2013-0981 RALPH DEMASI, ESQ., REFEREE

NOTICE OF SALE SUPREME COURT ONONDAGA COUNTY WELLS FARGO BANK, N.A., Plaintiff(s) vs. KRISTINE P. FLEURY, et al, Defendant(s) Attorney (s) for Plaintiff (s): ROSICKI, ROSICKI & ASSOCIATES, P.C., 2 Summit Court, Suite 301, Fishkill, New York, 12524, 845.897.1600 Pursuant to judgment of foreclosure and sale granted herein on or about October 23, 2014, I will sell at Public Auction to the highest bidder at Second Floor of the Onondaga County Courthouse, 401 Montgomery Street, Syracuse, New York 13202. On February 2, 2015 at 10:00 AM Premises known as 6572 CANTON STREET, WARNERS, NY 13164 Section 53 Block 3 Lot 4 ALL THAT TRACT OR PARCEL OF LAND situate in the Town of Van Buren, County of Onondaga and State of New York and being part of Great Lot #40 in said Town. As more particularly described in the judgment of foreclosure and sale. Sold subject to all of the terms and conditions contained in said judgment and terms of sale. Approximate amount of judgment $119,457.74 plus inter-

Other Legals

certified D/M/WBE firms to send quotes for services and/or supplies. Plans are available through the NYS DOT website at WWW.dot.ny.gov/doing business/opportunities/const-notices or call our office at 607-756-2819. Please fax quotes to 607-756-4742 or email to jjump@economypaving.com. We are an equal opportunity employer.

N.Y.S. DEPARTMENT OF ENVIRONMENTAL CONSERVATION AND U.S. ENVIRONMENTAL PROTECTION AGENCY EXTEND PUBLIC COMMENT ON THE PROPOSED PLAN FOR OPERABLE UNIT 2 OF THE GENERAL MOTORS INLAND FISHER GUIDE SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE TOWN OF SALINA, ONONDAGA COUNTY, NEW YORK The N.Y.S. Department of Environmental Conservation and the U.S. Environmental Protection Agency have issued a Proposed Plan for addressing contamination at Operable Unit 2 of the General Motors Inland Fisher Guide subsite of the Onondaga Lake Superfund site and have extended the comment period to February 14, 2015. Written comments on the Proposed Plan should be mailed (postmarked) to Richard Mustico, Project Manager, N.Y.S. Department of Environmental Conservation, Division of Environmental Remediation, 625 Broadway, Albany, NY 12233-7013 or e-mailed to richard.mustico@dec.ny.gov no later than February 14, 2015. The preferred cleanup plan outlined in the Proposed Plan consists of excavation of contaminated creek sediment, excavation of contaminated soil in the vicinity of the creek, off-site disposal of the excavated material, restoration of all of the remediated areas, development of a site management plan, institutional controls and long-term monitoring. The Proposed Plan and other site-related documents are available for public review at the following locations: Salina Library 100 Belmont Street Mattydale, NY 13211 Phone: 315-454-4524 NYSDEC 615 Erie Blvd., West Syracuse, NY 13204 Phone: 315-426-7400 Please call for an appointment. NYSDEC Attn: Richard Mustico 625 Broadway Albany, NY 12233 Phone: 518-402-9676 (Richard.Mustico@dec.ny.gov) Atlantic States Legal Foundation Attn: Samuel Sage 658 West Onondaga Street Syracuse, NY 13204 Phone: 315-475-1170 Please call for an appointment. The Proposed Plan is also available online at: http://www.dec.ny.gov/docs/remediation_hudson_pdf/734057ou2gmifg.pdf

Please take notice that the regular meetings for the Jamesville Fire

Other Legals

SYRACUSE, and JOHN DOE, Defendants. To the above named Defendants: You are hereby summoned to answer the complaint in this action and to serve a copy of your answer, or if the complaint is not served with this summons, to serve a notice of appearance on the plaintiff's attorneys within thirty days after the service of this summons, exclusive of the day of service, and in case of your failure to appear or answer, judgment will be taken against you by default for the relief demanded in the complaint. NOTICE YOU ARE IN DANGER OF LOSING YOUR HOME If you do not respond to this summons and complaint by serving a copy of the answer on the attorney for the mortgage company who filed this foreclosure proceeding against you and filing the answer with the court, a default judgment may be entered and you can lose your home. Speak to an attorney or go to the court where your case is pending for further information on how to answer the summons and protect your property. Sending a payment to your mortgage company will not stop this foreclosure action. YOU MUST RESPOND BY SERVING A COPY OF THE ANSWER ON THE ATTORNEY FOR THE PLAINTIFF (MORTGAGE COMPANY) AND FILING THE ANSWER WITH THE COURT. This is an attempt to collect a debt and any information obtained will be used for that purpose. The foregoing summons is served upon you by publication pursuant to an order of Honorable Donald A. Greenwood, Justice of the Supreme Court of the State of New York, signed the 18th day of December, 2014 at Onondaga County, New York. Property Address: 331 Park Street, Syracuse, NY 13203 Tax I.D. No. 015.-12-14.0 ALL that tract or parcel of land, situate in the City of Syracuse, County of Onondaga and State of New York, being known and distinguished as Lot Number three (3) of the Price Tract, in Block Number Four Hundred fifty five (455) of the City of Syracuse, New York, as the same is laid out on a map of said tract made by Allen, Farrington & Co. and filed in the Onondaga County Clerk's Office July 1st, 1896 as Map No. 897 said lot being fortyfour (44) feet front on Park Street, the same in the rear and one hundred thirty two (132) feet deep. Subject to easements, covenants, and restrictions of record.

SUPPLEMENTAL SUMMONS Index No. 2014-1352 STATE OF NEW YORK SUPREME COURT - COUNTY OF ONONDAGA HSBC BANK USA, N.A. Plaintiff, -vs- THE HEIRS AT LARGE OF

STATEMENT OF OFFICIAL CANVASS AND DETERMINATION OF ELECTION

We, the Board of County Canvassers of the County of Onondaga, New York, having met at the Office of the Commissioners of Elections of said County at 1000 Erie Blvd West in the City of Syracuse, New York on the 25nd day of November, 2014, and canvassed the votes given in the several election districts of said county at the General Election held on the 4th day of November, 2014, do hereby certify that the total number of votes cast in the County of Onondaga, City of Syracuse and the various towns of Onondaga County, for the offices hereafter set forth, are as follows and we do further certify, determine and declare that the hereafter named person so designated were duly elected to office hereafter set forth and we further do hereby certify that the total number of votes cast in the County of Onondaga specified for the ballot proposals hereafter set forth and the number of votes cast for each is as follows, to wit

MEMBER OF ASSEMBLY - 127th DISTRICT		
Albert A Stripe Jr (D,WF)	23220	(Elected)
Robert J DeMarco (R,C,I)	20814	
Write Ins	38	
MEMBER OF ASSEMBLY - 128th DISTRICT		
Sam Roberts (D,WF)	19241	(Elected)
John W Sharon (R,C,I)	14818	
Write Ins	38	
MEMBER OF ASSEMBLY - 129th DISTRICT		
William B Magnarelli (D,WF,I)	19788	(Elected)
Richard G Zaccaria (R,C)	7652	
Write Ins	42	
ONONDAGA COUNTY SHERIFF		
Toby Shelley (D)	61643	
Gene Conway (R,C,I)	69945	(Elected)
Write Ins	176	
CITY OF SYRACUSE - CITY COURT JUDGE		
Ross P Andrews (D,WF)	22097	(Elected)
Write Ins	210	
TOWN OF CAMILLUS - TOWN COUNCILOR 4th WARD (To Fill Vacancy)		
Steven C James (R,C,I)	1312	(Elected)
Write Ins	20	
TOWN OF CICERO - TOWN JUSTICE		
Douglas M DeMarche Jr (R,C,I)	7873	(Elected)
Write Ins	50	
TOWN OF DEWITT - TOWN CLERK (To Fill Vacancy)		
Angela Epolito (D)	4744	(Elected)
Karen A Beseth (R,I)	3705	
Write Ins	3	
TOWN OF ELBRIDGE - TOWN JUSTICE		
George L Betts (D,R,C,I)	1648	(Elected)
Write Ins	4	
TOWN OF GEDDES - TOWN COUNCILOR (To Fill Vacancy)		
Michael Maloney (D)	2813	
James L Jerome (R)	2847	(Elected)
Write Ins	12	
TOWN OF LAFAYETTE - TOWN COUNCILOR (To Fill Vacancy)		
Melanie J Palmer (R,I)	1495	(Elected)
Write Ins	9	
TOWN OF MARCELLUS - TOWN COUNCILOR (To Fill Vacancy)		
Christopher P Hunt (R,C,I)	2094	(Elected)
Write Ins	35	
TOWN OF OTISCO - TOWN CLERK (To Fill Vacancy)		
Linda L Vanderhoof (R)	712	(Elected)
Write Ins	19	
TOWN OF OTISCO - TOWN COUNCILOR (To Fill Vacancy)		
Peter J Murphy (R)	723	(Elected)
Write Ins	4	
VILLAGE OF CAMILLUS - TRUSTEE (To Fill Vacancy)		
Susan J Hines (CAM)	200	(Elected)
Samuel A Maxsween (VIL)	67	
Write Ins	5	
TOWN OF TULLY PROPOSITION	YES 580	NO 454 (Adopted)

WITNESS our hands and Official Seal of the Office of the Board of Elections in Onondaga County, New York, this 25th day of November 2014

Helen Kiggins Walsh
Dustin M Czarny
Commissioners of Elections and
Members of the County Board of Canvassers
Onondaga County, New York

Montessori School of Syracuse
155 Waldorf Parkway
Syracuse, NY 13224
(315) 449-9033

NOTICE OF NONDISCRIMINATION POLICY

The Montessori School of Syracuse admits students of any race, color, national and ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the school. We do not discriminate on the basis of race, color, national and ethnic origin in administration of its educational policies, admissions policies

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX V-c

PUBLIC MEETING SIGN-IN SHEETS

GM-IFG PRAP

Public Meeting

12/2/14

Name	Affiliation
Clare Leary	RACER
Carl Garvey	RACER
BRENDAN MULLEN	RACER
Brendan Pilawski	Progressive Waste
Julia Braunmueller	Palmerton Group
Judy Rank	RACER
DAN GEORGE	NRC
Doug Crawford	O'Brien + Gere
Aimee Clinkhammer	OCWP
MARK WESTCOTT	BEHAN
Laura Mona	Hiscock & Barclay LLP
ROBERT PAPWORTH	NATURE CONSERVANCY
STEVE MILLONEY	OBRIEN + GERE
Michael Bliss	NRC
Jack Ramsden	CPWG
Mark Nicotra	Town of Salina
CHADD GENEME	NRC
DAN GEORGE	NRC

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX V-d

NOVEMBER 17, 2014 PUBLIC MEETING TRANSCRIPT

IN THE MATTER OF:

Remedy Proposed for Operable Unit 2

General Motors - Inland Fisher Guide plant and Ley Creek

a Subsite of the Onondaga Lake Superfund Site

Public Meeting

December 2, 2014

6:00 p.m.

Salina Town Hall
201 School Road
Liverpool, New York 13088

Eileen McDonough, RPR, CRR
Official United States Court Reporter
P.O. Box 7367
Syracuse, New York 13261
(315)234-8546

MR. RICK MUSTICO: Welcome, everybody. This public meeting is for the presentation of the proposed plan for the former General Motors - Inland Fisher Guide site, Operable Unit 2. My name is Richard Mustico. I'm the site project manager for the New York State Department of Environmental Conservation.

Also with me today is my supervisor Don Hesler. Don is also one of the site geologists. Our other geologist for the site is Bob Edwards back in the back corner over there. We also have Mark Sergott of the New York State Department of Health. And from EPA we have Patricia Pierre, who is the Environmental Protection Agency site project manager. And Chloe Metz also from EPA who is a risk assessor.

Tonight we'll be going over the general investigation and cleanup process, background information and also some site specific information. Then we'll be discussing the proposed remedy for the site. We have a stenographer recording the meeting tonight. So I would ask for you to wait until the end of the presentation if you have any questions or comments and then come up to the microphone over there, state your name, identify yourself, and then ask your question or state your comment for the record.

General Motors - Inland Fisher Guide site, this is just the location figure. Don, if you could point out Route

11 and the Thruway and Town Line Road all the way over. And then Factory Avenue. Just kind of down a little bit. That's the Thruway. Yep. Just for a location where we're talking about.

The General Motors - Inland Fisher Guide site consists of two operable units. An operable unit is a portion of the site that for either technical or administrative purposes may be addressed separately from the rest of the site. For example, as in this case we have contamination on the former GM property and off of the former GM property.

The first operable unit, or OU1, consists of the former GM plant property and groundwater. And that's the blue outline. There is the plant site there.

And the second operable unit, or OU2, consists of property off of the plant property from Town Line Road to Route 11, and that's shaded on this figure in blue and green.

Also we have Ley Creek which is in darker blue. Can you point out Ley Creek too? Thank you. And Ley Creek from the Route 11 bridge to the mouth of Ley Creek is a separate site called Lower Ley Creek. So there is another site that continues on downstream below Route 11.

The site consists of approximately 9,200 linear feet of Ley Creek from Town Line Road to Route 11, and soil in the Ley Creek floodplain area, which is generally along the creek banks between Town Line Road and Route 11.

There is soil and sediment in the 10-acre wetland, sometimes referred to as the National Grid Wetland, located on the northern portion of the National Grid property and it's directly west of the GM facility property, which is designated by the GM-IFG OU1 facility.

We have approximately 1.8 acres located between the former GM facility's northern property boundary and Factory Avenue. And we refer to this as the Factory Avenue area. It's shaded in light purple up there.

Finally, an area located along the northern shoulder of Factory Avenue in the vicinity of LeMoyne Avenue. And we refer to this as the Factory Avenue/LeMoyne Avenue Intersection Area.

Remedial investigation. Remedial investigation is conducted to determine the nature and extent of contamination. In order to determine the nature and extent of contamination, we take samples of the various environmental media which may be impacted. Environmental media for this site includes soil, sediment and surface water.

The nature of contamination would be the type of contaminants of concern. A contaminant of concern is a contaminant that is sufficiently present in both frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. In this case for this site the contaminants of concern are polychlorinated biphenyls, more commonly known as PCBs, along with some metals, such as lead, nickel, zinc, and there are some other metals too. Main contaminants of concern at the site are PCBs, however.

The extent of contamination would be how far the contamination has migrated in each of the various media. During the remedial investigation we obtained samples of environmental media and sent them to laboratories for analysis. Soil sample results for PCBs for this site were from below laboratory detection limits or non-detect to 18,000 parts per million. And one particle in one million particles would be one part per million.

For sediment the sediment results for PCBs were from non-detect to 1.3 parts per million upstream of the site, and from non-detect to 207 parts per million in the site reach of the creek. PCBs were not detected in surface water in the site portion of Ley Creek except for one sample at 0.04 parts per billion, with a B. And PCBs were not detected in surface water upstream of the site.

Crawfish and fish were collected and analyzed for contaminants also. For PCBs, the average PCB fish tissue and invertebrate tissue concentrations in samples from the site reach were approximately twice as high as from samples collected upstream of the site.

After the investigation has been completed, that is after we've determined the nature and extent of contamination, various remedial alternatives are reviewed and compared to each other.

The New York State DEC in concert with the United States Environmental Protection Agency and the New York State Department of Health propose a remedy for the site, which is why we're here tonight. At a minimum the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

After the public comment period has ended, a final remedy is selected. The final remedy is written in a document called the Record of Decision. The remedy is designed and then implemented. And after the remedy has been completed, monitoring is typically required to ensure the effectiveness of the remedy or to make sure that the remedy is working as we intended it.

Main highlights of the proposed remedy for the site. Sediment excavation. Sediment excavation would include bank to bank excavation in areas greater than one part per million PCB. In areas of excavation, all of the creek's -- all of the sediment to the creek's clay layer would be removed.

Soil excavation. Soil would be excavated to a cleanup goal also of one part per million PCB. Depths of excavation would typically be one to two feet, but are deeper in some areas depending upon the concentration and the depth of the PCBs. After an area is excavated, the area will be restored. For restoration some areas are envisioned to be simple clean soil backfill, topsoil and seeding. Other areas such as wetland restoration will be more complicated, envisioned to be more complicated with the need to determine appropriate tree, plant, seed species, final elevations.

And then monitoring would occur to make sure the remedy remained as intended. Some examples would be bank inspections or wetland monitoring. As a side note, the proposed remedy that we're going over today is consistent with the remedy chosen for the Lower Ley Creek site downstream of this site.

We've broken up the proposed remediation over the next five figures. This figure is the National Grid wetland remediation area. If you can point out Factory Avenue. The figure depicts the excavation that would be required to meet one part per million PCB in this area, and there is one foot excavation depth in blue and two and a half foot excavation depth in yellow. And also in this area there are some small removals toward the bottom of the figure that would be for metals contamination.

This is a slide of the Factory Avenue area proposed remediation to meet the soil cleanup goal of one part per million PCB. Point out Town Line Road and Factory Avenue. The excavation in this area is proposed to be one to four feet deep with most of the excavation being three feet depicted in blue and four feet depicted in pink-ish purple-ish color.

This figure depicts part of the proposed excavation along the bank of the stream. During the remedial investigation sampling this area showed a little bit more extensive contamination than the typical bank or floodplain area. The remedy, the proposed remedy envisions excavation typically to one foot shaded in blue, but a couple of small areas to four feet shaded in purple and six feet shaded in yellow.

This area is the Factory Avenue/LeMoyne Avenue Intersection Area. And if you could point out Route 11. That is Factory Avenue. That is LeMoyne Avenue. And Route 11. Here again we have the various proposed soil excavation depth depicted by the different shades. We have one and a quarter feet in purple. We have two feet in blue and three feet in yellow to meet one part per million PCB for soil.

And the final remediation figure depicts the proposed sediment removal shaded in yellow from Ley Creek over the 9,200-foot stretch from Town Line Road to the Route 11 bridge. The sediment would be removed from approximately 78 percent of the stream in the area to meet the sediment cleanup goal of one part per million. Any excavation in the area would remove all of the loose sediment to the clay stream bottom. And it's envisioned that any area excavated will be backfilled with approximately six inches of clean sand.

To summarize, we've got a cleanup goal of one part per million PCB in both soil and sediment. We have a cost of approximately $14 million. For soil and sediment we have approximately 25,000 cubic yards of removal and we're looking at approximately two years of construction work/field work. We are scheduled to select the remedy in the Record of Decision this winter and commence the design in 2015 and we hope to commence construction toward the middle or end of 2015.

And then the last slide, public comment period ends December 17th and you can send comments to me at the address up there or via e-mail. And that's it.

Do we have any questions or comments? If you would like to come up to the mic again, state your name and then state your question or comment.

MR. BOB PAPWORTH: My name is Bob Papworth. And I live in Syracuse. I'm affiliated with the Nature Conservancy as a trustee for Central New York. This summer I appeared at the Ley Creek presentation and I told everybody at that time the same thing I'm going to tell you, which is that there is a major alternative available called thermal treatment by which the sand can be cleaned. It's called thermal desorption treatment specifically. It refers to a treatment which is limited to no more than about a thousand degrees Fahrenheit and it removes the light metals, PCBs and so forth from sand. And then any heavy metals which remain have to be removed by a mechanical method. And the gases which are created have to be captured by an off-gas capture system. The three major components of it.

There is a lot of information about this on the internet. The EPA, if you want to look at the EPA's website, type in EPA/thermal desorption, and get a citizens guide to thermal desorption there, and in addition to a Wikipedia page and a lot of other information and a lot of vendors.

It's a technique that's frequently used in the mining business in the west. And I did get one proposal from a company to do so for lower Ley Creek. They quoted a price for capital expense of about $10 million for a plant and an additional $10 million to clean up the sand in the lower Ley Creek.

The point then of course is that you can apply the same plant to the upper sections of Ley Creek as well so you reallocate the capital costs and you bring the cost down on a per site basis so that the $25 million which has been quoted or budgeted for lower Ley Creek plus the 14 for this one here gets you north of, you know, close to 40 million bucks. I think you can do a better job for less money using thermal desorption.

Now there are some things to be thought about. First of all, in choosing a vendor, you would like to talk to two or three vendors simultaneously, negotiate with them simultaneously, compare notes, work them back and forth.

Secondly, you would like to have a vendor, a set of vendors for whom this particular kind of project is right in the middle of their line of business. You don't want something that is tangential to what they would normally be doing.

The third point is that you want to have very good communications from the vendor because you've got a lot to learn from the vendor and they've got a lot to learn from you. Done a lot of meticulous work obviously here preparing this presentation, so there is a lot to be communicated.

And then finally, very importantly you need a high service type of contract, a turnkey contract, for the plant, for the operating people, for the operation to get to a final result. And the analogy there is the Covanta contract with OCRRA, which has been working successfully for 20 years. Covanta supplies the operating people and the supervision of repairs and maintenance for the plant, so it seems to be working quite well. It's a very good model to follow.

So to sum it up, I think you can clean up the whole of Ley Creek on the eastern side of the lake with a single thermal desorption plant, take a number of years, but you're into a number of years of the project anyway. And I think you can do a better job and leave no toxic landfills in the township of Salina in the aftermath of the project. That's it.

MR. RICK MUSTICO: Thank you. Anybody else? Okay. I guess that concludes the public meeting for tonight. Thank you all for coming out. I appreciate it.

(6:28 p.m.)

* * *

C E R T I F I C A T I O N

I, EILEEN MCDONOUGH, RPR, CRR, Court Reporter, do hereby certify that the foregoing is a true and correct transcript of the stenographically reported proceedings held in the above-entitled matter.

EILEEN MCDONOUGH, RPR, CRR

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX V-e

WRITTEN COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

Mustico, Richard (DEC)

From: Hooker, Michael <mehooker@ocwa.org>
Sent: Tuesday, November 25, 2014 12:13 PM
To: Mustico, Richard (DEC); doh.sm.BEEI
Cc: psherlock@ocwa.org
Subject: General Motors – Inland Fisher Guide Site #734057 (Salina, Onondaga Co.)

Richard Mustico
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7013
518-402-9676
Richard.Mustico@dec.ny.gov

Mark Sergott
NYS Department of Health
Empire State Plaza
Corning Tower, Room 1787
Albany, NY 12237
518-402-7860
BEEI@health.ny.gov

Gentlemen:

Regarding the subject project (General Motors – Inland Fisher Guide Site #734057 (Salina, Onondaga Co.)), please be advised that OCWA has concerns related the protection of OCWA's infrastructure at the following locations:

- 16" service to former GM plant (OCWA transmission main on south side of tracks, we maintain a 16" service under the tracks, stopping at the former GM property adjacent to the tracks).
- 12" A.C. Airbase water main that crosses Factory Ave, just east of the Town of Salina Highway Garage.
- 8" water main that crosses under Ley Creek, on east side of Lemoyne Ave.
- 12" water main that crosses under Ley Creek, on the west side of Route 11.

Accordingly OCWA respectfully requests that the Authority's Managing Engineer, Patrick M. Sherlock, P.E., be contacted prior to the start of work in and around the vicinity of the aforementioned sites to ensure proper mark-out and protection of Authority property.

Thank you for your attention related to our concerns,

Sincerely,

Michael E. Hooker, Executive Director
Onondaga County Water Authority
PO Box 4949

Syracuse, New York 13221-4949
Phone: 315-455-7061 ext. 3114
email: mehooker@ocwa.org

Please consider the environment before printing hard copies.

PALMERTON GROUP
A Division of GZA GeoEnvironmental, Inc.

6296 Fly Road
East Syracuse, NY 13057
315-800-1800
315-437-5444

December 16, 2014

Richard Mustico, P.E.
NYS Department of Environmental Conservation
625 Broadway
Albany, NY 12233

Re: General Motors- Inland Fisher Guide Site Operable Unit 2 Proposed Plan Comments

Dear Mr. Mustico:

Palmerton Group (Palmerton), A Division of GZA GeoEnvironmental, Inc. (GZA) is submitting the following comments on behalf of four companies (Carrier Corporation, Cooper Crouse-Hinds LLC., Syracuse China Company, and Niagara Mohawk Power Company, d/b/a National Grid) collectively referred to as the "Companies" on the Proposed Plan for the General Motors- Inland Fisher Guide Site Operable Unit 2 Also included as Appendix A are the previously submitted recommendations regarding the benefits of consolidating the Upper Ley Creek and Lower Ley Creek projects.

The State's consideration of these comments is appreciated in developing the Record of Decision for the Operable Unit 2 of the General Motors- Inland Fisher Guide Site. Should you or others have questions about the recommendations and comments provided, please do not hesitate to contact David Palmerton at (d.palmerton@palmertongroup.com), or Julia Braunmueller at (j.braunmueller@palmertongroup.com).

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Julia Braunmueller
Assistant Project Manager

David L. Palmerton, Jr.
Principal & Sr. Vice President

Enclosed:
Comments on Operable Unit 2 Proposed Plan
Attachment A: Ley Creek Project Consolidation Recommendations

The following provides comments on the Proposed Plan for the General Motors- Inland Fisher Guide Site Operable Unit 2 (Proposed Plan). These comments are submitted on behalf of four companies (Carrier Corporation, Cooper Crouse-Hinds LLC., Syracuse China Company, and Niagara Mohawk Power Company, d/b/a National Grid) collectively referred to as the "Companies."[1] Also included with the comments herein are recommendations intended to promote a more efficient, implementable, and cost-effective remedy, and to ensure consistency with the National Contingency Plan ("NCP").

1. The proposed remedy for Ley Creek upstream of the Route 11 Bridge and the planned remedy for Lower Ley Creek should be coordinated if not integrated into a single remediation project to increase the efficiency of the cleanup; reduce the environmental footprint of the project; limit the duration and extent of impacts on the local community, and, increase the overall protectiveness of the remedies. The Companies previously commented on the Proposed Plan for Lower Ley Creek Subsite with regard to the benefits of integration of the upstream and downstream cleanups into a single construction project. These recommendations are resubmitted as Attachment A for inclusion in the administrative record as well as for consideration in development of the Record of Decision (ROD).
2. The Record of Decision (ROD) should provide an option for disposal of excavated soils and sediment having PCB concentrations less than 50 mg/kg in a suitable local landfill in the same manner as the ROD for the Lower Ley Creek Subsite. Assuming that the technical requirements for disposal in either the Town of Salina Landfill or the Cooper Crouse-Hinds North Landfill can be met, such disposal would reduce the risks and the environmental footprint of waste transport relative to offsite disposal. Considering that essentially all of contamination being managed in the proposed cleanup upstream of the Route 11 Bridge and the planned cleanup downstream of the Route 11 Bridge emanated from the former GM Fisher-Guide Facility, the same disposal methods should be available for both projects.
3. Remedial action levels for PCB sediments and soils should be based upon site-specific risk assessments rather than generic soil and sediment cleanup objectives of 1 mg/kg identified in the Proposed Plan. The assumptions underlying the generic values are not applicable to the circumstances of the Upper Ley Creek Site.
4. NYSDEC should provide flexibility in the ROD to design and build appropriate sediment caps to contain sediments with unacceptable post-removal residual PCB contamination as well as sediments which should be remediated but cannot be efficiently removed due to physical limitations.
5. The ROD should allow for use of adaptive management in the description of long-term O&M to allow for appropriate modifications of O&M activities over the long term.

[1] The Companies have been identified by EPA as potentially responsible parties for the contiguous Lower Ley Creek Site, which was created as a separate site from the Upper Ley Creek Site based solely on an artificial geographic boundary despite the fact that the General Motors Inland Fisher Guide and Upper Ley Creek Site is the primary, if not sole, source of the conditions that EPA has determined require remediation at the Lower Ley Creek Site.

ATTACHMENT A

MEMORANDUM

Consolidation Options for Remedial Activities
At Upper and Lower Ley Creek Subsites
June 3, 2013

Recently reported investigations of sediment and floodplain contamination along Ley Creek further support the conclusion that the release of contaminants from the GM Inland Fisher Guide Plant (IFG) will result in the active remediation of Ley Creek; moreover, but for those releases, there would be no active remediation of the Creek. PCBs were handled and lost in massive quantities at IFG over many years. PCBs released by IFG to Ley Creek and its floodplain will drive remedies entailing soil and sediment removal and disposal for both the NYSDEC-lead Site upstream of the Route 11 crossing and the USEPA-lead Site downstream of Route 11 (the "upstream" and "downstream," respectively). The common origin of the contamination driving active remediation at both Sites overarches the set of technical and policy reasons for unifying the upstream and downstream remedies for Ley Creek.

The similar nature of contamination throughout upstream and downstream Ley Creek, existing cooperative agreements and partnerships, green remediation policies, and common sense, argue for USEPA and NYSDEC to consider optimizing the cleanup of Ley Creek sediments and floodplain soils through development of a single, integrated cleanup-project design to minimize the overall environmental footprint of the remediation. Precedents for cost-share/work-share sediment remedies which coordinate work and funding by government and nongovernment (*e.g.*, RACER Trust) entities point to one possible avenue for a single optimized project design to be developed and implemented. The likely benefits would be to increase the overall protection of human health and the environment; reduce the overall costs; and minimize the environmental footprint of the remedy for Ley Creek sediments and floodplain soils.

The recently reported findings of elevated levels of PCB (>100 mg/kg) in sediment and floodplain soil samples upstream and downstream warrant a single construction project design to substantially reduce the overall environmental footprint and cost of the Ley Creek cleanup and avoid the unreasonable expense of two or more independent remedial design and construction projects for both upstream and downstream. The reports, prepared by O'Brien and Gere (2013) and Los Alamos Technical Associates, Inc. (2012), confirm the similar characteristics of sediment and floodplain soil contamination as well as physical characteristics on both sides of the dividing line between the NYSDEC-lead and USEPA-lead sites. The findings, in separate reports authored by two different consultants, along with knowledge of remedy precedents make clear that USEPA and NYSDEC will determine that active remediation of sediments and floodplain soils will be necessary in both upstream and downstream sections and the design and implementation for each segment will face nearly identical challenges. There are so many clearly foreseeable common project design elements and common challenges posed by site conditions both upstream and downstream that the opportunity to substantially reduce the overall environmental footprint and costs of the cleanup of Ley Creek through a single optimized project has to be taken seriously. Agency decisions regarding the extent of soil and sediment remediation upstream and downstream are scheduled within four months of each other and it appears that NYSDEC and USEPA have been coordinating some work. So, it appears inherently feasible to consider development of an optimized single project design.

Project elements for remediation upstream and downstream that will be very similar if not identical include: engineering design process, pre-design sampling, securing property access, procurement and staging of materials, public outreach, site security, contracting and procurement, mobilization, construction of access roads and support facilities for processing sediment and soils, sediment and soil removal, mitigation of potential environmental releases, sediment/soil dewatering, materials handling and disposal, stormwater control and management, environmental monitoring, restoration of disturbed areas, demobilization, and post-construction O&M.

A few examples of common design elements and challenges for the upstream and downstream sections of Ley Creek which suggest the common sense of attempting to optimize the remediation of Ley Creek through a single project design are offered in the following:

- The uncertainty regarding sediment PCB distributions in both sections of the Creek is relatively high from the perspective of remedial design and additional sampling is likely to be one of the ways that the uncertainty will be addressed during design. A single larger scale pre-design sampling program spanning both sections is likely to reduce the overall amount of time, effort and environmental footprint of that activity. Furthermore, the development of a common design approach to interpreting sediment PCB data to determine the spatial extent of targeted sediment remediation should be considered.
- Decision protocols to determine the completion of excavation and use of contingency measures, including cap designs to contain residuals, are likely to be common elements of sediment remediation in both sections of Ley Creek. Having two designers simultaneously developing two different protocols would not be sensible.
- The removal of sediment and/or construction of sediment caps close to roads and associated structures crossing the Creek is likely to be a common element to the design of sediment remediation both upstream and downstream. This includes areas immediately upstream and possibly downstream of the Route 11 bridge (and perhaps underneath the bridge). Engagement of State and local government stakeholders during design and tradeoff decisions regarding the extent of removal near such structures, whether incorporated in a design protocol or made in the field during construction, are likely.

Development of a common approach to construction near bridges and other structures and review with appropriate stakeholders would be more efficient and sensible than covering the same administrative and technical ground twice.

An important set of benefits to the single-project design and implementation are those of adaptive management. Adaptation of field operations based upon experience and the findings of field conditions different than expected is the rule rather than exception in sediment remediation. Some adaptations are part of the usual “learning curve” of field personnel who may be operating excavators, stabilizing excavated sediments, or performing some other task. Other adaptations entail changes in design, such as modification of aforementioned protocols, based upon experience. The benefits of the adaptations are improved performance such as increased productivity, increased efficiency, or reduced environmental impact. The most efficient way for those adaptations to be incorporated and efficiently applied in the remediation of the Lower Ley Creek sediments is to have a single design and implementation process.

There are also a number of easily envisioned economy-of-scale benefits to be considered that might result in greater productivity and lower costs for elements of project design, support facility construction, sediment removal, dewatering, disposal, restoration and monitoring. Additional synergies would likely be identified during a collaborative planning of a single optimized project which would recognize the differing capabilities of stakeholders and the opportunities resulting from combining resources. A hypothetical example involves mitigation of PCB and sediment releases during sediment excavation, a foreseeable element of the sediment removal both upstream and downstream. Highly effective systems such as temporary damming and bypass pumping, which could accommodate faster rates of sediment removal and backfilling operations might be appropriate to a larger-scale sediment remedy but may not be justifiable in each of two separate smaller-scale remedies. Such opportunities for better overall performance at lower cost need to be explored.

The overall duration of construction work along Ley Creek is one obviously important aspect of the environmental footprint of the cleanup of Ley Creek. Considering the sediment remediation component, it is easy to envision a two-to-three-year period of construction impacts to the Creek (i.e. two construction seasons of work possibly separated by a year), if the work proceeds as two separate projects. It is feasible to complete the work in the Creek during a single construction season, and thereby reduce the duration of impacts, if a single optimized design is pursued.

Besides the potential practical benefits of an integrated project, existing cooperative and partnership agreements, and agency policy call for serious consideration of optimization such as the integrated project recommended here. The 1993 CERCLA Cooperative Agreement for the Onondaga Lake Superfund Site (since amended at least eighteen times) and supporting submittals by NYSDEC to USEPA recognize the need to address numerous sub-sites impacting Onondaga Lake, including Ley Creek-related sub-sites, through development and implementation of a comprehensive site-wide coordination effort to assist with regulatory consistency and achievement of overall remediation objectives. The agencies agreed as part of their Cooperative Agreement to coordinate remedial actions such that all remediation meets CERCLA and NCP requirements.

This need for cooperation and coordination of effort was mandated further by the 1999 federal legislation which created the Onondaga Lake Partnership. The Partnership formed by federal, state, and local governments and other involved parties is directed by law to coordinate the myriad Onondaga Lake management activities, including coordinating actions taken under federal laws such as CERCLA. The legislation is designed to promote consistencies and efficiencies of action, and to maximize the benefit of invested resources. Coordinating efforts upstream and downstream to the extent feasible and appropriate is entirely in line with these goals.

Both USEPA and NYSDEC have green remediation policies in place which effectively call for consideration of minimizing the environmental footprint of the Ley Creek cleanup. USEPA's recently published National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion (OSWER directive 9200.3-75 September 2012) calls for an increased focus on optimization of Superfund Sites and identifies tools and resources to help the regions optimize projects. The challenges and opportunities of a single project design for the cleanup of Ley Creek would make this Site a good candidate project as sought by the optimization guidance.

The mixed elements of RACER Trust and USEPA funding, differing procurement capabilities, and potentially divergent interests among stakeholders present administrative and potential legal challenges to development and implementation of a single integrated cleanup project; however, elsewhere such challenges are being overcome due to the greater common interest in cost-effective site remediation. For example, USEPA, USACOE, NJDOT, and NJDEP entered into a federal-state partnership to jointly undertake a complex remedial investigation and feasibility study for the Lower Passaic River. A Project Management Plan was prepared by the governmental entities which allocated among the partners the various tasks and costs necessary to complete the project.

The sediment remediation program authorized by the Great Lakes Legacy Act (GLLA) has also advanced approaches for integrating government and private work and funding that may be useful to consider for Ley Creek. Co-funding of GLLA projects is required and federal dollars are matched at some level by private and/or local or state governments. The typical GLLA project starts with meetings of stakeholders who jointly consider the potential opportunities and obstacles to such projects. The cooperative work starts small with the identification of tasks that would lead to the larger remediation project - typically RI/FS-type tasks - and consideration of the costs of those tasks and the extent to which the work or costs will be shared. The initial cooperative phase allows stakeholders to become comfortable with the process as the initial tasks are completed and before more substantial commitments of resources would be made. Meanwhile the costs and benefits of the larger remedial project become clearer as the initial work proceeds. That "start-small" opportunity exists for the development of an integrated Ley Creek remedy.

A good starting point for Ley Creek would be collaborative identification and collection of needed pre-design data. Such a planning process would likely entail initial consideration of the current level of uncertainty regarding contaminant distributions, particularly PCB distribution, and an exchange of ideas about how that level of uncertainty can be reduced by pre-design sampling or compensated for by design and construction methods. Specific tasks such as obtaining property access, sample collection, survey, chemical analysis, geotechnical analysis, investigation waste disposal and reporting could be defined on a site-wide basis and estimates of costs for each such task reviewed by USEPA and RACER Trust. The individual funding parties could use these estimates with standalone estimates by USEPA and RACER Trust to decide whether there are savings to be achieved as well as other benefits of work sharing (the extent to which USEPA or RACER Trust performs a task) or cost sharing.

A collaborative approach to implementing pre-design investigations could be extended in similar fashion to remedial design and implementation by first defining design and construction tasks and subsequently working through the division of work-sharing and cost-sharing. The single optimized project would reduce costs and, by reducing overall environmental impacts of construction, increase overall protectiveness of the Ley Creek cleanup.

In summary, it is imperative for USEPA and NYSDEC to maximize the efficient use of the limited funding secured from the GM Bankruptcy settlement because the IFG facility is the source of contamination driving the remedies for both Upper Ley Creek and Lower Ley Creek (including the Old Ley Creek Channel). Unifying the remediation of these areas must be explored as a way to maximize the use of funding. Existing agreements, partnerships, site precedent, policies and guidance all support consideration of a single optimized project design by the agencies for both Upper and Lower Ley Creek.

References

Los Alamos Technical Associates, Inc. Data Evaluation Report, Lower Ley Creek Subsite of the Onondaga Lake Superfund Site, Syracuse New York. December 2012.

O'Brien and Gere. Revised Off-Site Remedial Investigation Former IFG Facility and Deferred Media Site, Syracuse, New York. March 2013.

NYSDEC and U.S. EPA, Onondaga Lake Site Cooperative Agreement and related documents. Circa 1993 and later.

Onondaga Lake Partnership Charter. August 9, 2000.

USACOE, U.S. EPA, and NJDOT, Project Management Plan, Lower Passaic River, New Jersey. April 2003.

HISCOCK & BARCLAY LLP

Richard R. Capozza
Partner

December 17, 2014

VIA ELECTRONIC MAIL
&VIA UPS OVERNIGHT MAIL

Richard Mustico, P.E.
NYS Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Re: Comments to the General Motors – Inland Fisher Guide Site, Operable Unit 2, Subsite of the Onondaga Lake Superfund Site, Town of Salina, Onondaga County, New York

Dear Mr. Mustico:

Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid") submits the enclosed comments regarding the New York State Department of Environmental Conservation's ("NYSDEC") and U.S. Environmental Protection Agency's ("EPA") Proposed Plan for General Motors – Inland Fisher Guide Site, Operable Unit 2, Subsite of the Onondaga Lake Superfund Site, Town of Salina, Onondaga County, New York, dated November 2014. The purpose of National Grid's comments is to ensure that the final selected remedy accommodates the continued safe, uninterrupted operation of National Grid's electric and natural gas facilities located within the project boundary.

These comments are submitted solely on behalf of National Grid, and are in addition to comments submitted by "the Companies," a group of which National Grid is a member. National Grid reserves the right to rely on and use the public comments submitted by any other person on the Proposed Plan and supporting documents.

National Grid is available to meet with NYSDEC and EPA as well as their technical consultants to discuss the enclosed comments in further detail.

Very truly yours,

Richard R. Capozza
Counsel for National Grid

RRC:lm
Enclosure

One Park Place – 300 South State Street – Syracuse, New York 13202 hblaw.com
rcapozza@hblaw.com Direct: 315.425.2710 Fax: 315.425.8580

NIAGARA MOHAWK POWER CORPORATION D/B/A NATIONAL GRID'S ("NATIONAL GRID") COMMENTS REGARDING THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S AND U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED PLAN FOR THE REMEDIATION OF GENERAL MOTORS – INLAND FISHER GUIDE SITE OPERABLE UNIT 2, SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE

December 17, 2014

1. National Grid's subsurface Natural Gas Pipeline 50, overhead electric transmission facilities, and ancillary structures are located within areas designated for soil excavation within the site boundary for Operable Unit 2 of the General Motors – Inland Fisher Guide Site. *Proposed Plan for the General Motors – Inland Fisher Guide Site Operable Unit 2* at 7, 15, and 21 (Nov. 2014). The Proposed Plan, Record of Decision, remedial design and remedial action should address and accommodate National Grid's continued safe, reliable, and uninterrupted operation of these facilities.

2. The Proposed Plan contemplates installation of a cover within excavated areas of the Factory Avenue Area. The cover would consist of an indicator fabric layer overlain by a minimum of 12 inches of clean soil and a top layer consisting of vegetation, asphalt, or gravel, as appropriate. *Proposed Plan* at 21. The vicinity of National Grid's subsurface utilities is specifically called out as an example area for which a cover would be installed. *Proposed Plan* at 15. However, installation of a cap and demarcation layer over Natural Gas Pipeline 50 presents safety concerns, including the potential for migration of natural gas and an increased risk for fire and explosion. Installation of a cap and demarcation layer also presents long-term technical and feasibility issues in the event of pipeline replacement or repair. As such, National Grid cannot permit capping within the Natural Gas Pipeline 50 corridor. National Grid expects that surface soils located within the Natural Gas Pipeline 50 corridor that do not meet the Soil

Cleanup Objectives will be excavated and immediately backfilled, thereby obviating the need for a cover over the Pipeline.

3. The exact location of the National Grid Natural Gas Pipeline 50 relative to the areas designated for excavation or relative to sample locations is not shown on any drawing in the Proposed Plan or Remedial Investigation Report documents. While it is generally assumed that Pipeline 50 runs parallel to Factory Avenue, National Grid respectfully requests that the Figures in the Proposed Plan be revised to reflect the need to locate the exact location and depth of Natural Gas Pipeline 50 prior to the commencement of any activities.

4. The Proposed Plan states that higher concentrations of PCB contamination in the Factory Avenue Area were found at a depth of eight (8) to ten (10) feet below grade surface ("bgs"). *Proposed Plan* at 7. However, data from the March 2013 Revised Off-Site Remedial Investigation Report for OU2 indicates that the vast majority of contamination within the Factory Avenue Area is present in the zero (0) to three (3) foot interval, not at deeper depths. *O'Brien & Gere*, *Revised Offsite Remedial Investigation, Former IFG Facility and Deferred Media Site*, Table 4-1c (March 2013). Only one sample, 8+52-NW, which was collected in the eight (8) to ten (10) foot interval, showed PCBs above industrial SCOs. The remaining samples that exhibited PCB concentrations above industrial SCOs were from the zero (0) to three (3) foot interval. In light of this information, the remedy should include excavation and disposal of soils to a depth of three (3) feet in areas designated for soil removal within the Pipeline 50 corridor. Lateral excavation should extend to a twenty (20) foot clean zone around the pipeline, as discussed below. Excavated areas should be immediately backfilled with clean fill to maintain pipeline protection. Backfill material must meet National Grid specifications. Backfill

elevations within the Natural Gas Pipeline 50 corridor should match that of abutting areas to maintain a consistent grade.

5. The following ***minimum*** requirements must be met with regard to any field activities to be performed within National Grid's Natural Gas Pipeline 50 corridor. Field activities must be approved by National Grid prior to commencement.

a. Final construction drawings must be submitted and approved by National Grid one hundred and twenty (120) days in advance of any field activities.

b. Extreme caution must be taken when working in the general vicinity of the Natural Gas Pipeline 50 corridor. When excavating within two (2) feet of the pipeline, the pipeline shall be physically located by hand in order to protect the pipe and its coating.

c. Random travel across the pipeline in grass areas with heavy equipment and loaded trucks is not permitted. Travel across the pipeline shall be confined to designated crossing areas designed and stamped by a New York State certified Professional Engineer.

d. Extreme care shall be taken to avoid damage to natural gas witness posts, test stations, and other related natural gas facilities. Any damage of such facilities shall be reported to National Grid immediately.

e. Blasting, if any, will not be permitted near or on the Natural Gas Pipeline 50 corridor without the advanced, written approval of the Regional Gas Superintendent or the Manager of System Gas Engineering at National Grid.

f. Notice must be provided to National Grid, via Dig Safely NY, a minimum of two (2) weeks prior to the scheduled activity date for any subsurface activities within the Natural Gas Pipeline 50 corridor.

6. The remedial design should require that a clean zone (*i.e.* soil meets Soil Cleanup Objectives) be maintained around Natural Gas Pipeline 50. To ensure a clean zone is established, the lateral extent of excavation should be a minimum of twenty (20) feet within the Natural Gas Pipeline 50 corridor (at least ten (10) feet on either side of the pipeline).

7. National Grid recommends incorporating hand-driven test holes during the pre-design investigation to verify depths of the Natural Gas Pipeline 50, determine whether contaminated soil abuts the pipeline, and compile data necessary to determine the minimum requirements for a clean zone around the pipeline.

8. National Grid requests that it be given the opportunity to review and comment on (i) the removal of abutting, subsurface contaminated soil within the Natural Gas Pipeline 50 corridor, (ii) any Natural Gas Pipeline 50 crossing locations, (iii) specifications for replacement fill material and, (iv) compaction requirements for backfilling adjacent to, around, and over the gas pipeline.

9. In the event that relocation of any of National Grid's electric or natural gas facilities is necessary to accommodate any aspect of the Site remedy, all costs associated with such relocation will be reimbursable to National Grid by the party(ies) performing the remedy. Any relocation design costs must be pre-paid by the party(ies) performing the remedy to National Grid. National Grid will provide relocation cost estimates (including design costs) prior

to any relocation work. Following the completion of any relocation work, a reconciliation will be completed by National Grid based on actual costs.

10. As previously stated, National Grid must be fully compensated should any of its facilities require relocation because of the Site remedy.

11. An access agreement with National Grid will be required prior to performing any field activities around National Grid's pipelines, equipment, overhead lines, or other facilities, whether such is located on National Grid-owned property or through an easement, and for all areas located outside the area designated as the "National Grid Wetland Area."

12. A separate agreement for access to property owned by National Grid will be required prior to commencement of any work within the area designated as the "National Grid Wetland Area."

13. During the Site's remedial design and construction field work, National Grid must have uninhibited ingress and egress at all times to its gas and electric facilities for operation, maintenance and emergency purposes.

14. After the Site's remedial construction has been implemented, National Grid must have uninhibited ingress and egress to access its gas and electric facilities to ensure safe, uninterrupted operation and service to its customers. This would include, at a minimum, the ability to excavate around the gas pipeline, and below and around the electric transmission and subtransmission facilities, and the ability to operate equipment. Accordingly, to avoid damage to any soil capped areas, heavy duty access roads must be incorporated into the remedial design to

allow access for the equipment necessary for operation, maintenance, repair and/or replacement of gas and/or electric facility components.

15. All remedial work within the vicinity of the National Grid transmission, subtransmission and distribution lines, must comply with the attached **Exhibit A** "Engineering Document, Conditions for Proposed Activities Within Transmission Line Rights-of-Way."

16. Any movement of equipment or surface work including excavation, capping, or cover to be performed below or adjacent to the National Grid transmission, subtransmission and distribution lines cannot result in a violation of minimum clearance requirements between the ground and the electrical line(s) taking into account current line sag and potential future line sag resulting from upgrades to the National Grid transmission system. Minimum clearing distances must be maintained at all times.

17. National Grid requests that the ROD include a discussion regarding the plans for funding the remedy including the amount available from the GM bankruptcy, the current balance of the allocated funds, the source of funding and any difference between the GM settlement amount and that specified in the Proposed Plan, and the source of funds should the actual costs exceed the Proposed Plan estimate.

18. These comments are submitted solely on behalf of National Grid. Additional comments on the EPA Proposed Plan and supporting documents are being submitted on behalf of a PRP Group for Lower Ley Creek, of which National Grid is a member.

Exhibit A

Engineering Document, Conditions for Proposed Activities Within Transmission

Line Rights-of-Way

Conditions for Proposed Activities Within Transmission Line Rights-of-Way

Table of Contents

1.0 Scope

1.1 This document presents minimum conditions for work within National Grid electric transmission line rights-of-way, whether owned in fee or by easement. Activities that are not fully in conformance with this document may sometimes be allowed provided they are specifically shown on plans or described in specifications or other documents that have been reviewed and approved by National Grid.

1.2 "Requestor" as used in this document refers to any person, organization, corporation or other entity requesting permission to conduct activities within a transmission line right-of-way or anyone acting on the Requestor's behalf.

2.0 Compliance/Safety

2.1 All activities conducted by the Requestor shall comply with all applicable Federal, state, and local laws, statutes, rules, regulations, and codes. In particular, the requirements of the following statutes, regulations, and safety codes and guidelines, appropriate for the voltage(s) of the transmission line(s) within the right-of-way, must be met:

2.1.1 National Electrical Safety Code

2.1.2 In Massachusetts:

a 220 CMR 125.00, "Installation and Maintenance of Electric Transmission Lines,"

b MGL Chapter 166 Section 21A "Coming into Close Proximity to High Voltage Lines" except that the required clearance of six feet is insufficient. The minimum clearance allowed by OSHA shall be maintained.

2.1.3 In New York, Part 57 of the New York State Industrial Codes Rules (also known as the "High-Voltage Proximity Act") (http://www.labor.ny.gov/workerprotection/safetyhealth/sh57.shtm)

2.1.4 All OSHA regulations governing working clearances to electric distribution and transmission lines shall be followed. Although regulations 29 CFR 1926 Subpart CC and 29 CFR 1926.1501 may be specific to equipment that can hoist, lower, and horizontally move a suspended load, all equipment operating within a right-of-way shall maintain the clearances specified in these regulations, including but not limited to cranes, backhoes, excavators, forklifts, pile drivers, and drill-rigs.

a In accordance with 1926.1408, if the Requestor asks to encroach upon the 20 foot clearance requirement and requests voltages of electric lines near the proposed work or activity, the Requestor shall provide an aerial photograph or detailed survey plan delineating the area of work or activity in proximity to electric lines and structures. Requests may be emailed to TransmissionEngineering@NationalGrid.com or mailed to

National Grid c/o Transmission Engineering, 40 Sylvan Road, Waltham, MA 02451.

2.2 The Requestor shall not place or store any items within the right-of-way, including construction materials or debris, excavated soil, trailers, or storage containers.

2.3 The Requestor shall not unload or load vehicles or equipment within the right-of-way.

2.4 The Requestor shall adequately ground vehicles, equipment, fences and gates, at all times and in accordance with applicable Federal, state, and local laws, statutes, rules, regulations, and design codes, including, but not limited to, those listed in paragraph A above and IEEE Standard 80.

3.0 Protection of Transmission Line Facilities

3.1 The Requestor shall, at all times, protect transmission line facilities from damage. In addition to compliance with safety codes as described in paragraph 1 above, protection of transmission facilities shall, as a minimum, include the following:

3.1.1 The Requestor shall operate equipment and vehicles at least 50 feet horizontally away from any transmission line pole, tower, guy wire, or guy anchor.

3.1.2 When making a rough cut during excavation, the Requestor shall disturb no earth within an area bounded by a line drawn 25 feet plus 2.5 times the depth of the cut from the nearest transmission line pole, tower leg, guy wire, or guy anchor, but not less than 50 feet. Upon completion of the rough cut, the slopes of the bank shall be graded on a slope no steeper than one vertical to five horizontal and stabilized with vegetation or rip-rap. The top of the slope shall be at least 50 feet from the nearest pole, tower leg, guy wire, or guy anchor.

3.1.3 The Requestor shall not store or use explosives within the right-of-way.

3.1.4 The Requestor shall locate all ground wires buried in areas to be excavated and shall protect them against damage. If a buried ground wire is broken, the Requestor shall prevent anyone from touching it and shall notify National Grid.

4.0 Access to Right-of-way

4.1 The Requestor shall not at any time block or impede access to or along the right-of-way.

4.2 The Requestor shall not damage roads or trails used to gain access to or along the right-of-way.

4.3 All underground utilities and all proposed bituminous and/or concrete drive surfaces and underground utilities shall be designed to withstand and meet AASHTO *Standard Specifications for Bridges and Highways* H-20 highway class design criteria for vehicular loading.

5.0 Preservation of Rights and Future Use

5.1 National Grid retains all rights granted in the original right-of-way deed. Specifically, National Grid reserves the right to place future structures or relocate existing structures anywhere within the right-of-way, and reserve the right to control any vegetation within the right-of-way.

5.2 The Requestor shall place no above or below ground structures within the right-of-way, including streetlights, signs, sheds, fences, septic systems, and swimming pools.

5.3 Improvements shall not continuously occupy more than 100 feet along any line drawn longitudinally along the right-of-way.

5.4 Improvements shall not occupy expected future locations of transmission structures. This includes the bisector of angles in the right-of-way and generally includes areas adjacent to existing structures.

6.0 Protection of Interests

6.1 National Grid shall not be held liable for any damage to the Requestor's activities within the right-of-way when such damage is the result of construction, maintenance, or operation or other use of existing or future transmission line facilities.

6.1.1 For any proposed underground pipe or conduit the Requestor shall provide warning tape in the trench for all and tracer cable for non-metallic pipes or conduits when located within a transmission corridor. Plans provided for review shall identify such warning tape and tracer cable.

6.1.2 All newly installed pipes and conduits shall be marked in the field using three sided markers. A specification will be provided the Requestor as needed.

6.2 The Requestor shall pay all costs associated with modifications or repairs made necessary to National Grid's facilities as a result of activities by the Requestor, including the cost of repairs or modifications to buried ground wires. Repairs and/or modifications shall be performed by National Grid. The Requestor shall notify National Grid's Manager of Transmission Engineering Services when a buried wire is damaged.

6.3 The Requestor shall notify National Grid in writing at least 24 hours before the start of the work. In New York the notification shall also be made in accordance with the requirements of the High Voltage Proximity Act (Section 57.7).

6.4 Electrostatic currents may occur in proximity to electric transmission lines under certain circumstances. Although people may experience annoying shocks due to these currents when touching conductive objects, National Grid is not able to eliminate the currents. The steady-state current due to these electrostatic effects is within the limits established by the National Electrical Safety Code.

7.0 Deliverables

7.1 Full-sized paper copies of plans prepared to an appropriate scale shall be provided by the Requestor. Plans shall be certified by an appropriate professional licensed in the state in which the project is located. Digital signatures of a licensed professional will not be accepted. If plans are acceptable and an agreement can be achieved, the Requestor shall provide final plans in both paper and pdf versions.

7.2 Upon completion of any development located within a transmission corridor, Requestor shall provide upon request by Transmission Engineering, a certified As-Built Plan. Plan shall be certified by a licensed professional.

Appendix A

Procedure for Determining Wire Heights

- Elevations of conductors (wires) should be taken* at the point of attachments at bottom insulator on transmission structure.
- Elevations should be taken* at mid-span and quarter-span.
- Elevations should be taken* at any obvious low points (other than mid-point) which may occur due to grade changes below.
- Elevations should be taken directly above any proposed improvements or areas of proposed activity(s) as applicable.
- Existing grade elevations corresponding to aerial shots cited above should also be recorded. Any proposed finish grades different from existing grades, should also be recorded.
- As measurements are recorded, the following information must be recorded: date, time, ambient air temperature, wind direction and velocity, and weather conditions (e.g.: sunny, rain, snow, etc).

* <u>WARNING</u>: Conductors are electrically energized and are to be considered dangerous to approach. All measurements to conductors shall be made by remote measurement techniques which shall in no case cause measuring devices or personnel to come within safety parameters established by OSHA 1926.550 or New York State's High Voltage Proximity Act.

c = clearance from grade

H = measured horizontal offset distance (perpendicular to conductor at point of crossing)

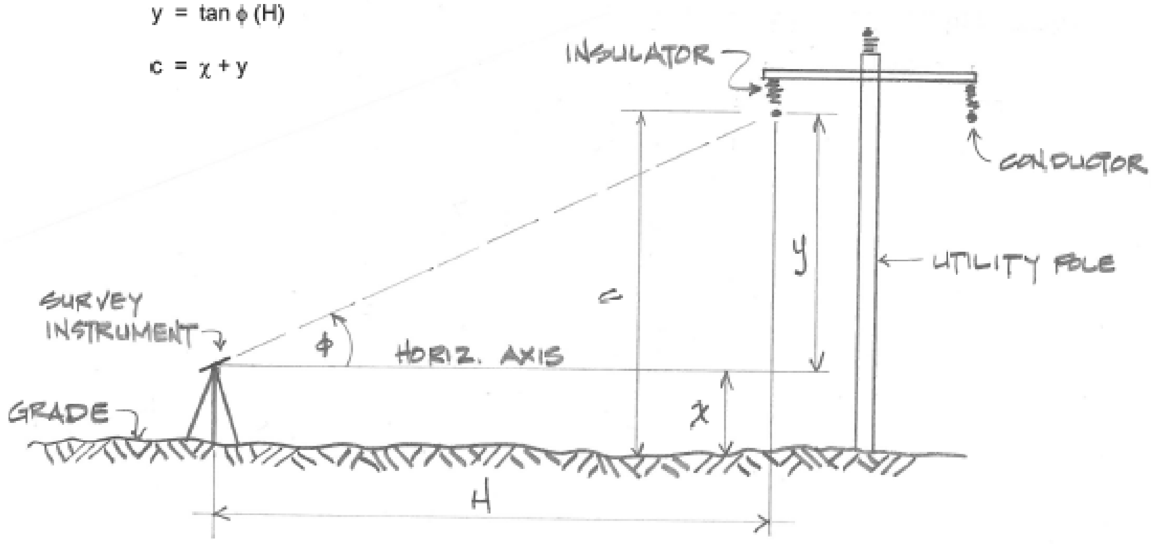
χ = measured vertical distance from horizontal axis of instrument eye piece to grade at a point

ϕ = measured vertical angle from horizontal axis of instrument eye piece to conductor

y = calculated vertical distance from horizontal axis to conductor

$y = \tan\phi\,(H)$

$c = \chi + y$



Revision History

Version	Date	Revision	Author	Reviewer	Approver
1.2	07/12/2007	Revised wording relative to electrostatic currents in paragraph 6.D.to clarify the issue. Previous wording: "Mild shocks due to electrostatic currents may be felt when touching conductive objects, such as vehicles, located within the right-of-way. Although these shocks may be annoying, National Grid will not be able to eliminate them."	Mark Browne		Mark Browne
1.3	11/29/2010	Clarify that guideline applies to electric transmission rights of way Clarify that activities must comply with requirements for the voltages of lines within the right of way Add requirement to comply with MGL Chapter 166 Section 21A	Mark Browne		Mark Browne
1.4	07/11/2012	Added AASHTO H-20 load criteria requirement for proposed drive surfaces and u/g utilities.	Keith Tornifoglio		Mark Browne
1.5	03/17/2014	Added Appendix A, full-sized hardcopies to-scale, and warning tape and tracer cable for buried utilities	Keith Tornifoglio		Mark Browne
1.6	07/18/2014	OSHA clearances	Keith Tornifoglio		Mark Browne

Kevin C. Murphy, Esq.
kmurphy@wladislawfirm.com

December 17, 2014

Via E-Mail (Richard.Mustico@dec.ny.gov)

Richard Mustico
NYS Department of Environmental Conservation
Division of Environmental remediation
625 Broadway
Albany, NY 12233-7013

RE: November, 2014 Proposed Plan for the General Motors – Inland Fisher Guide Site, Operable Unit 2, Sub-Site of the Onondaga Lake Superfund Site, Town of Salina, Onondaga County, New York

Onondaga County, NY Comments on the Proposed Plan

Dear Mr. Mustico:

Onondaga County, New York welcomes the opportunity to comment on the Proposed Plan for the General Motors – Inland Fisher Guide Site, Operable Unit 2, Lower Ley Creek Sub-Site of the Onondaga Lake Superfund Site, Town of Salina, Onondaga County, New York.

To do so, the County submits it is necessary to place the County's comments in the full context of the history of the subsite, as designated, and the site as a whole.

I. Overall Site History

It is known and recognized by NYSDEC and the United States Environmental Protection Agency (USEPA) that General Motors Corporation (GM) was unquestionably the largest source of contaminants found in Ley Creek.

On August 12, 1985 GM executed a consent order with NYSDEC (Case #7-0383) to (a) address the on-going discharge to Ley Creek of waste waters from its Salina facility contaminated with, among other pollutants, two types of PCB, Aroclor 1242 and Aroclor 1248, and (b) limit any such future discharges.

An evaluation of the extent of the resulting PCB contamination in and about Ley Creek was inexplicably delayed until 1997 when a subsequent order was entered between NYSDEC and GM. In 1997, NYSDEC alleged that the PCB contamination of Ley Creek dredge spoils was "the result of discharges of contaminated wastewater primarily from operations of" GM's Salina, NY facility and determined it was necessary to "undertake additional investigation in Ley Creek sediments and surface water" downstream of the GM facility.

After 10 additional years passed, in 2007, NYSDEC stated it had "confirmed" GM's discharge of PCBs to Ley Creek. As a result, NYSDEC determined the GM facility was a subsite of the Onondaga Lake NPL site."

Ultimately, NYSDEC and USEPA jointly notified GM of their determination that the General Motors Corporation's Salina Facility was a subsite of the Onondaga Lake NPL site and the resulting investigations of Ley Creek confirmed the presence of PCB-contaminated surface water and sediment in Ley Creek downstream of the GM facility.

Thereafter, the United States arbitrarily divided Ley Creek into two sites: upper Ley Creek, upstream of the Route 11 bridge, and lower Ley Creek, downstream of the Route 11 bridge. It did so despite having determined that the GM site was a subsite of the Onondaga Lake superfund site located at the terminus of Ley Creek, the absence of any physical barrier at the Route 11 bridge that would preclude the transport of GM waste beyond the Route 11 bridge, and an existing NYSDEC Order that, the County submits, required GM to investigate the length of Ley Creek. Unfortunately, that decision artificially limited GM's legal and financial responsibility to pay its proportionate share of the cost of remediation for the entirety of Ley Creek, including "Old Ley Creek."

It is critical that if the entirety of the Creek is not going to be subject to primary oversight by a single government regulator, whether that be USEPA or NYSDEC, that the regulators work cooperatively and in harmony to secure an overall result that is protective of human health and the environment without actual or perceived differences in the remedy and in a manner that is cost-effective and efficient for all parties concerned, especially given the impact of the General Motors Corporation bankruptcy.

II. <u>The Proposed Plan</u>

Onondaga County submits the Proposed Plan raises the following issues:

- A lack of consistency between the remedy proposed for upper Ley Creek and the remedy selected by USEPA and agreed to by NYSDEC with respect to lower Ley Creek;

- A failure in the Plan as proposed to adequately address both the need for coordination with response efforts related to lower Ley Creek and potential impacts of the Plan as proposed on flooding and flood control issues with respect to the entirety of the Creek; and

- The proposed timing of the implementation of the Plan given that the source areas are subject to continuing investigation and have not yet been remediated while at the same time the now-RACER Trust facility continues to discharge PCBs to Ley Creek. Given the above deficiencies, the projected cost options are based on poorly defined remedial endpoints and insufficient field data and thus, the Proposed Plan comparison of remedies is of limited utility.

III. Consistency in Remedy Selection

The remedy selected by USEPA for that portion of the Creek downstream of the Route 11 bridge and proposed by NYSDEC for that portion of the Creek upstream of the bridge respectively, both require or propose the removal of sediment and soils in or abutting the Creek. Both require or propose the removal of soils and sediment that contain concentrations of PCB ≥ 1 mg/kg.

1. Soil Removal

Concerning the soil removal remedy, the USEPA Record of Decision states, at 23-24, as follows:

> Any contaminated soil located on the northern bank of the Creek that cannot be safely excavated because of the presence of the two large buried natural gas and oil pipelines which run parallel to a portion of the northern bank of the Creek would be covered with one foot of soil. Prior to placing the soil cover, soil samples would be collected to document the contaminant concentrations and a readily-visible and permeable subsurface demarcation layer delineating the interface between the contaminated soils and the clean soil cover would be installed.
>
> * * *
>
> The excavated areas would be backfilled with at least two feet of soil that would meet NYSDEC Program Policy Division of Environmental Remediation (DER)-10, Appendix 5. The excavated wetland area would be backfilled with soil that meets unrestricted SCOs since this area is considered ecologically sensitive. In excavated areas where there is underlying municipal refuse, a readily-visible and permeable subsurface demarcation layer delineating the interface between the refuse and the clean soil cover would be required.

The NYSDEC Proposed Plan for the Creek upstream of the Route 11 bridge states, at 15, as follows with respect to the proposed soil removal component of the remedy:

> There are limited areas where underground utilities are present at the Site. Due to the potential health and safety threat of excavating around and beneath underground utilities, soil may remain at concentrations above restricted SCOs in some areas following excavation. This would be

> addressed by a soil cover, institutional controls and as part of a Site Management Plan.
>
> * * *
>
> Clean fill meeting the requirements of the NYSDEC Technical guidance for Site Investigation and Remediation (DER-10), Appendix 5, would be brought in to replace excavated soil or complete the backfilling of the excavation and establish the designated grades at the Site. With the exception of Factory Avenue Area and Factory Avenue/LeMoyne Avenue Intersection Area excavations, excavated areas would be restored with clean substrate and vegetation as per an approved habitat restoration plan developed as part of the design. Excavated areas along Factory Avenue would be restored with a cover which would consist of an indicator fabric layer, as needed (e.g., for soil in the vicinity of underground utilities), overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, gravel, as appropriate for the area being restored.

2. Sediment Removal

Concerning sediment removal, the USEPA Record of Decision states, at 27 and 28, as follows:

> At least one-foot of clean fill would be placed over the excavated areas to stabilize the sediment bed and support habitat replacement/reconstruction.
>
> While long-term monitoring of the sediment would not be required because all the contaminated sediment above cleanup levels would be excavated, fish monitoring would be conducted to determine the remaining levels of contamination in the fish and the rate of decline.

The NYSDEC Proposed Plan with respect to upstream sediment removal states, at 14, as follows:

> Habitat restoration of Ley Creek would consist of placement of at least 0.5 feet of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The specific thickness and substrate material to be used for the backfill in these areas would be determined during the remedial design as part of the habitat restoration plan.
>
> This alternative would result in contaminants remaining on site.

3. Remedy Consistency

A. Fill Placement after Removal

In sum, absent further explanation, the post-excavation soil or sediment cover requirements materially vary depending on whether the location of the remedy is downstream or upstream of the Route 11 bridge. As compared to the NYSDEC proposal, the USEPA Record of Decision is either more conservative or unnecessarily over-protective. Given that the Record of Decision and the Proposed Plan are both subject review and acceptance by NYSDEC or USEAP, the discrepancy in post-excavation fill placement requirements should be eliminated and the post-removal fill obligations should be uniform on either side of the bridge.

B. Remediation Standard and Contaminant Removal

More concerning is that the USEPA Record of Decision states that for locations downstream of the bridge "all the contaminated sediment above cleanup levels would be excavated." Despite that decision by USEPA, NYSDEC has not proposed the implementation of Sediment Alternative 4, which "would remove ... all of the contaminants in on-Site sediment." Rather, at a present-worth cost savings of $2,390,000, NYSDEC has proposed to implement select Sediment Alternative 3, which "would result in contaminants remaining on-Site above levels that allow for unlimited exposure." There appears to be a discrepancy in the remedy selected downstream of the bridge and the remedy proposed for upstream of the bridge. Absent an explanation that resolves the apparent discrepancy, the County submits that NYSDEC should give additional consideration to selecting Sediment Alternative 4, especially given the Record of Decision for sediment downstream of the bridge and the downstream reach of the Creek having previously been determined by USEPA and NYSDEC to be a receptor of upstream contaminants.

4. Flood Control and Infrastructure

Ley Creek and its branches have a history of flooding, including major floods in March, 1950, 1960 and 1964; May, 1969; June, 1972; July, 1974; and September, 1976. *See e.g.* attached Plate 1 from *Flood of June 1972: Onondaga Lake and Ley Creek at Syracuse, New York 1972*, Shindel, H. L. USGS Open-File Report: 72-346. http://pubs.er.usgs.gov/publication/ofr72346

More recently, the town of DeWitt, which is upstream of the Town of Salina, has been beset with flooding from Ley Creek. Before the year 2000, DeWitt reportedly never received more than four inches of rain in a 24-hour period. Since 2000, the town has had rainfalls totaling more than four inches five or six times in a 24-hour period. The Creek flows through the northern neighborhoods of the town, and as explained by the Town Supervisor, "Ley Creek is very flat – it's not your typical watershed ... because it's very flat, a lot of water tends to flood." http://www.eaglebulletin.com/news/2014/may/07/dewitt-encouraging-residents-save-rain-rain-barrel/

The flooding risk that Ley Creek presents and the need to manage the Creek are both further highlighted in the FEMA Flood Insurance Study for Onondaga County. In addition, the Town of Salina Hazard Mitigation Plan highlights the need for on-going channel inspection, debris removal and maintenance. Attachment A contains excerpts from the Flood Insurance Study and a copy of the Hazard Mitigation Plan [can be reviewed at http://www.ongov.net/planning/haz/documents/Section9.28-TownofSalina.pdf/is enclosed].

In addition to the above, the Onondaga County Ley Creek trunk sewer crosses the Creek in the area of study and potentially is located in an area of proposed soil or sediment excavation.

Given the above, the County has the following concerns and questions.

- The maintenance of existing utilities and the future need to inspect, maintain and improve existing utility infrastructure is significantly impacted by the existence of remaining contaminants. The Proposed Plan provides limited information or data when it comes to defining the actual or potential impact on existing infrastructure.

- As the remedial development process proceeds, how will the Proposed Plan address the potential impacts on the Bear Trap-Ley Creek Drainage District and the Ley Creek trunk sewer?

  The final design needs to confirm whether the remedy will impact this sewer, and if so, incorporate provisions to allow for future utility maintenance.

- The Ley Creek channel is very flat and has little fall from the upper drainage areas to the mouth of Onondaga Lake and is impacted significantly by the elevation of Onondaga Lake. How will the Proposed Plan assure that the flood district residents are protected from flooding and the environment is protected from the mobilization of pollutants during implementation of the remedy, especially given the proposal to dredge in the wet?

- Did the Feasibility Study of the Proposed Plan investigate the cost to divert or channel the Creek to eliminate the need to dredge in the wet? If not, why not? If yes, what were the estimated costs and why was that option not included in the Feasibility Study of the Proposed Plan?

- As the design and implementation of the proposed and/or selected remedies proceed what effort will the Agency make to assure that future flood mitigation meets or exceeds the current channel capacity? What steps will be taken to coordinate the design and plan with FEMA, local municipalities, utilities, residents, etc.?

- What opportunities does NYSDEC envision to expand the floodway to offer greater flood protection as either a necessary aspect of the proposed remedy or an added/modified design feature (e.g., less capping material)?

- How will proposed institutional controls impact the Ley Creek Drainage District? What restrictions or limitations will be placed on the properties that are incorporated into the District by virtue of their proximity to Ley Creek? For example, will the institutional restrictions preclude further upgrades to, or installation of additional drainage and/or wastewater facilities?

5. <u>Coordination and Timing of the OU2 Remedy</u>

- The County submits the issues identified above support further collaboration if not a single, joint NYSDEC/USEPA effort to address the PCB contamination of Ley Creek by GM-IFG. Both cost savings and unity of remedy selection demand greater and better coordinated efforts to address the Creek, especially given the limited resources that were extracted in the bankruptcy process from GM-IFG, the overwhelming, if not sole, contributor of the PCB issues being addressed by two independent and less than efficiently coordinated efforts by NYSDEC and USEPA.

  What steps are and will be taken to coordinate the implementation of the upper and lower Ley Creek remedies?

  What steps will be taken to insure that the upper Ley Creek remedy does not increase the cost of implementing the lower Ley Creek remedy?

  What cost saving or efficiency opportunities had NYSDEC identified in an effort to minimize the inefficiency of the current process?

- Perhaps of greater import, a review of NYSDEC records indicates that as recently as November, 2012, the RACER Trust discharged to Ley Creek from its stormwater treatment system concentrations of PCBs in violation of its existing SPDES permit and the system itself has a history of overflowing and discharging untreated waters to Ley Creek.

  What actions are being taken to permanently cease any and all on-going or future PCB discharges by the RACER Trust?

  What is the impact of these on-going RACER Trust PCB discharges on Ley Creek and its environs, including Onondaga Lake?

  Is PCB-contaminated groundwater discharging from the GM-IFG facility to Ley Creek? If yes, the proposed remedy should be delayed until such time that all groundwater discharges are eliminated.

- Given the above concerns, the County submits the selection of a remedy for upper Ley Creek should await the outcome of the GM-IFG facility OU 1 investigation and remedy selection and implementation process.

6. Sedient Dewatering

- As NYSDEC may be aware, the Onondaga County Sanitary District generally will not accept leachate from a Class 2 New York hazardous waste site absent a compelling public need, and only if the resulting discharges meet all applicable legal requirements.

  With this in mind, assuming that the contemplated remedy includes the discharge of wastewaters from sediment dewatering to the METRO WWTP:

  a. What is the potential volume of wastewater that for which the RACER Trust may seek disposal at METRO?

  b. Will pretreatment of these wastewaters be necessary?

  c. What provisions will be made to cease pumping during periods of wet weather and/or peak periods of I&I?

Should you or the Department have any questions or comments or require further clarification or information regarding the above comments please do not hesitate to contact David Coburn, the Director of the Onondaga County Office of Environment at 315/435-2647 or the undersigned.

Very truly yours
THE WLADIS LAW FIRM, P.C.

Kevin C. Murphy

KCM/cm

Enclosure

Cc: Luis A. Mendez, Esq. (via email)
David Coburn (via email)

ATTACHMENT A

Flood Insurance Study, vol. 1 of 2, ONONDAGA COUNTY, NEW YORK (ALL JURISDICTIONS), Federal Emergency Management Agency FLOOD INSURANCE STUDY NUMBER 36067CV001A

At page 14, Town of Dewitt:
In the Town of DeWitt, problems on the two major flooding sources, Ley Creek and Butternut Creek, occur primarily in the Erie-Ontario lowland portion of the town.

The channels of the North Branch Ley Creek and South Branch Ley Creek convey runoff to their confluence. At this point, the creek slope is generally insufficient to carry the flow within its channels, and the nearby area becomes flooded. The situation occurs during the annual spring snow-melt runoff, and on frequent occasions following long-duration rainstorms.

At page 19, Town of Salina:
In the Town of Salina, flooding problems occur along the floodplains of Bloody Brook, Ley Creek and Bear Trap Creek. Low-lying areas adjacent to Onondaga Lake are flooded whenever a rise in the water level of the lake occurs. Flooding in the lower portion of Ley Creek occurs due to a reduction in the channel slope downstream of the confluence of the north and south branches. Flooding is the most common in the spring when snowmelt runoff occurs, following long duration rainstorms, and is further aggravated by frozen or previously saturated soil. During the spring snowmelt, widespread flooding and damages occurred in March 1950, March 1960 and March 1964. Flooding, which was the result of a rainstorm in May 1966 had an estimated 6-year recurrence interval and resulted in over $90,000 in damages. The flood of record occurred in June 1972 during Tropical Storm Agnes and resulted in widespread damages. The flood had a recorded discharge of 17,200 cfs at *gaging* (sic) station No. 4-22375, in Baldwinsville. The flood had an estimated recurrence interval of 20 years on the Seneca River.

At pages 20-2, City of Syracuse:
The principal flooding sources in the city are Harbor Brook, Meadow Brook, Ley Creek and Onondaga Lake. Heavy rains, especially those occurring in the spring which combined with snowmelt, have frequently caused high water and local flooding. Some of the more frequent flooding occurs in the area north of Rowland Street and west of Geddes Street, caused by Harbor Brook, and the areas west of MacArthur Stadium and southwest of the Seventh Street bridge, both caused by Ley Creek.

LAW OFFICE OF JOSEPH J. HEATH
GENERAL COUNSEL FOR THE ONONDAGA NATION
512 JAMESVILLE AVENUE
SYRACUSE, NEW YORK 13210-1502
315-475-2559
Facsimile
315-475-2465

December 17, 2014

VIA ELECTRONIC MAIL

Richard Mustico
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233
Richard.Mustico@dec.ny.gov

Re: Public Comments on Draft Proposed Remedial Action Plan for General Motors-Inland Fisher Guide Operable Unit 2

Dear Mr. Mustico:

I am submitting the following comments on the Draft Proposed Remedial Action Plan (PRAP) for the General Motors Inland Fisher Guide Operable Unit 2 (GM-IFG OU2) subsite on behalf of the Onondaga Nation, a federally recognized Indian Nation occupying the currently recognized Onondaga Nation Territory within Onondaga County, New York. The Nation has already provided the Department of Environmental Conservation (DEC) with comments regarding this draft PRAP in a government-to-government capacity pursuant to the DEC's consultation obligations with Indian Nations. Having discussed those comments with DEC staff, I am reiterating our continuing concerns as part of the public comment process.

As noted in many prior comments and during consultation on this project, the Nation strongly prefers remedial alternatives that directly remove contaminants from the areas on or around Onondaga Lake and ensure the greatest degree of public safety. The Onondaga Nation is the Firekeeper or central council fire of the Haudenosaunee, which is composed of the Mohawk, Oneida, Onondaga, Cayuga, Seneca, and Tuscarora Nations. Onondaga Lake is sacred to the Onondaga and Haudenosaunee people and the Lake and its tributaries were central to the Nation's way of life, providing material goods such as fish, food and medicinal plants, and salt. The Nation has an obligation to care for the lands on which we all live, to ensure that wildlife and natural areas are protected, and to work toward providing clean air and water for future generations. We are concerned that the PRAP for this site, as with other remediation plans for the area, relegates Ley Creek to a permanently contaminated state.

In particular, we are concerned with the DEC's apparent reliance on the continued applicability of the current restrictive fish advisory to limit human exposure to PCBs from fish consumption to acceptable levels. Traditionally, the Nation relied heavily on fish caught in Onondaga Lake and its tributaries. The continued contamination of these resources significantly damages or altogether precludes such traditional uses. Any PRAP adopted by DEC should allow for the lifting of fish consumption restrictions – if not immediately, then at some identifiable point in the future. Similarly, we support relying on unrestricted use standards for soil remediation, which provide for the broadest possible future uses at these sites. Unrestricted use soil standard also provide greater assurance that these contaminated areas will not discharge PCBs or other hazardous substances to Ley Creek and Onondaga Lake in the future.

Because there are no DEC or EPA cleanup standards for PCB-contaminated sediment, the PRAP relies on a "risk-based" remediation goal of 1 ppm PCBs in sediment. The derivation of this value is unexplained in the PRAP, which simply note that the standard has been adopted in other New York State hazardous waste sites and is "protective of human health and the environment for this site." In addition, the supporting documents fail to provide a valid reason to discard other "risk-based clean-up levels" considered during the Feasibility Study stage. Sediment Alternative 4, for example, would set a remediation goal of 0.28 ppm for PCBs, which is described as the average upstream sediment concentration for PCBs, and is economically and technically viable. Other remediation alternatives that would have set a PRG of 0.2 ppm for PCBs were apparently eliminated from consideration as infeasible, because they also incorporated remediation goals for trivalent chromium, copper, and nickel lower than the levels that could be documented in clean fill. (GM IFG OU2 FS Addendum, June 2014.) However, this explanation fails to recognize that the PCB-remediation goals incorporated in the rejected alternative were apparently achievable. In addition, the PRAP acknowledges that PCB levels in fish tissue and invertebrates are significantly higher within the OU2-related areas of Ley Creek than in upstream regions, meaning that this subsite is contributing to the on-going contamination of Onondaga Lake, its tributaries and its natural resources. Rather than eliminating this contribution by remediating to a level as clean as or cleaner than upstream sources, DEC appears to have selected a remediation goal which simply reduces contamination to more acceptable levels.

Given that PCBs are the key threat for this site and one of the primary reasons for the continuing fish advisories in Onondaga Lake and its tributaries, more protective alternatives surely deserved greater consideration. Under either standard, DEC should assess whether, at some point in the future, any risk-based standard chosen will ensure that PCB levels in fish are sufficiently low to allow unrestricted consumption – which should surely be the goal of the PRAP. Instead, as currently drafted, the PRAP acknowledges that PCB-contamination in Ley Creek will not be reduced to levels that meet this goal and essentially relies on the continued applicability of fish consumption advisories to protect public health.

Even the most restrictive sediment alternative (Alternative 4) allows PCBs to remain in the Creek sediments at "background levels." Given that PCBs are entirely man-made substances, this "background level" is related to the universally contaminated state of the Onondaga Lake watershed, not natural or safe levels. Again, the Nation is concerned that even the most protective clean-up level considered presumes that Ley Creek will remain contaminated by man-made pollutants in perpetuity. While we recognize that there may be limited value in setting downstream PCB remediation goals lower than existing upstream levels, we believe that there is value in moving toward the lowest sustainable contaminant level. The "background" level of 0.28 ppm or the rejected risk-based level of 0.2 ppm at least approaches that level.

For all these reasons, the Nation supports a more protective remediation goal, such as Sediment Alternative 4 and Soil Alternative 3m rather than the proposed Sediment Alternative 3 and Soil Alternative 2. While the Nation's preferred alternatives may be slightly more expensive, we believe these costs are more than justified by their potential to support a fully restored Ley Creek and the permanent removal of potential contaminants to Ley Creek and Onondaga Lake.

Thank you for your attention to these comments. Please let me know if you have any questions.

Sincerely,

Alma Lowry

Alma Lowry
Of Counsel

cc: Onondaga Nation Council of Chiefs

Mustico, Richard (DEC)

From: Steve Apelman <GFRestorations@optimum.net>
Sent: Tuesday, January 20, 2015 3:25 PM
To: Mustico, Richard (DEC)
Subject: GM– Inland Fisher Guide; Onondaga Lake Superfund site.

Mr. Richard Mustico,
Project Manager, N.Y.S. Department of Environmental Conservation,
Division of Environmental Remediation,
625 Broadway, Albany, NY 12233-7013

BioTech and Greenfield Restorations Inc. would like to introduce your office to the same technology that has previously been introduced and recognized by Bill Ottoway of your organization.

The Inland Fisher project, with more than 25,000 cubic yards of PCB contamination will cost quite a large sum to dig and haul, which has always been the remediation method of choice.

As the DEC's Bill Ottoway can attest to , as well as the office of the California EPA that has selected our technology as the *preferred method of remediation for contamination in that State*, we can eliminate all the cost of digging and hauling, as well as the cost of locating large amounts of clean fill and the associated costs of bringing that fill back to the excavation site.

Our methods are purely biological, non-toxic, safe to use and handle. and have more than a *decade of field proven effectiveness*. Our technology has never failed to meet clean up goals.

I would appreciate the opportunity to show how our technology can save huge amounts of money and time in this remediation project. Once you become familiar with the technology and its proven track record, you will recognize its capacity to save the State of New York vast amounts of money, allowing for more sites to be cleaned with the same budget.

Steve Apelman, President

Tim Cook, V.P of Operations

Greenfield Restorations

gfrestorations@optimum.net

Office: 631-698-3357

Mobile: 631-332-6877

Dear Mr. Hesler,

Thank you for the Appendix 5 document, DER-10. I forwarded this document to Mr. John Burns, of Nobel Metals Extraction, LLC. He replied, reaffirming that the configuration which he proposed (see attached) is capable of accomplishing the goals defined in the DER-10 document. For removal of metals from the sand, which has been heated and dried, the Noble Metals system employs "Air Classification and Separation" technology. He states that the technology is in widespread use. I have attached the "Introduction to Air Classification" document to which he referred for an introduction.

This document led me to additional references to this technology. The Sturtevant, Inc. brochure is attached, as an example, from a firm that provides several models of air classifiers. Another firm which offers a variety of air classifier models is RSG, Inc., which supplies a web-site at: www.airclassify.com. Moreover, an Air Classifier overview is provided at: http://en.wikipedia.org/wiki/Air_classifier.

There are dozens of suppliers of Thermal Desorption systems. Many of them are experienced in removing metals from sand and soil using Air Classification technologies.
A lengthy list of them is available at: http://www.environmental-expert.com/companies/keyword-soil-remediation-1020/page26. Certainly, these technologies are mature and reliable, and available nation-wide.

Mr. Burns stated to me that none of his technology is patented and, therefore, he is wary of exposing the details, at a distance, of his use of the metal air classification and separation process. I have attached his original letter in which he described his thermal system. He described it to me as an iterative process, in which the various metals are sequentially removed based on differential particle sizes. A grinding process reduces the particles to nearly uniform, small sizes. Then differential specific gravities are iteratively employed to remove small, uniform particles. I recommended to Mr. Burns that he make a detailed presentation to the N.Y.S. D.E.C., in the headquarters, at Albany. Therefore, I am urging that an opportunity be extended for him to do so, in the near future.

For comparison, I have also attached the "Cost and Performance Summary Report" for the use of thermal desorption technology at the Sand Creek site in Colorado, during the 1990's. Note, especially, that no air classifier technology was incorporated in that project.

A Thermal Desorption with Air Classifier system would make it possible to achieve the D.E.C. Policy objective which is defined in the Final Commissioner Policy, CP-51. The policy declaration is: "D.E.C.'s preference is that remedial programs, including the selection of soil cleanup levels, be designed such that the performance standard results in the implementation of a permanent remedy resulting in no future land use restrictions". I have not learned of any other technology or process which will accomplish this objective. We should favor deployment of these available technologies to remediate our inherited environmental problems, and recover the unrestricted use of our landscape.

Economic development, property values, and the social, recreational and cultural life of our community all improve when toxic landfills are avoided in our townships. And, we can achieve this beneficial outcome within our existing budgets.

Thank you for your kind attention.

Robert Papworth
Syracuse, N.Y
(315) 471-0914
rppwrth@verizon.net

Buell
Division of
Fisher-Klosterman, Inc.

Introduction to Air Classification

I. Definition of Air Classification

Air classification is a process of *approximate* sizing of dry mixtures of different particle sizes into groups or grades at cutpoints ranging from 10 mesh to sub-mesh sizes. Air classifiers complement screens in applications requiring cutpoints below commercial screen sizes and supplement sieves and screens for coarser cuts where the special advantages of air classification warrant it. *Air sizing is the counterpart of water classification.*

2. Primary Applications

The applications of air classification are many and varied. Some of the more important uses are:

a. Scalping off of the coarse end from a pulverized product, usually for further milling. This prevents overgrinding and saves power.

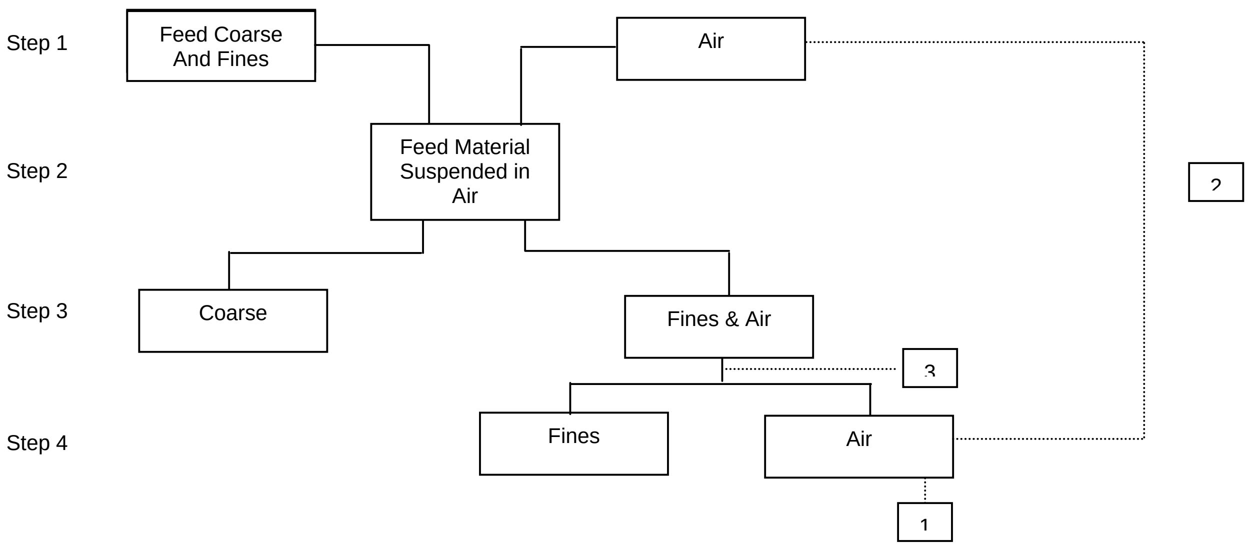
b. The "tailoring" of several size fractions from a heterogeneous mixture of particulate matter. In this application, each fraction has a different particle size distribution meeting commercial specifications or requirements of a dry beneficiation process.

c. The scalping off of the fine end of the product for "de-dusting," "de-fuming" or changing the flow, apparent density or other physical characteristics of the coarse fraction.

d. Beneficiation of a mixture by the removal of impurities contained in a narrow particle size range of the mixture or the separation of mixed products having substantial difference in settling velocities in an air stream.

3. Principles of Operation

All air classifying devices employ the process steps shown in Figure 1.below:



Step I - Suspension of the feed material to be classified in an air stream. Step I is sometimes completely separated from the classification process as when the classifier is handling an air-solids stream from an air-swept mill.

Step II - Introduction of the air-solids stream in the classification zone.

Step III - Separation of the coarse fraction from the fine fraction and air stream by opposing the drag force created by the air with gravitational, inertial or centrifugal force or a combination of them. The drag force is proportional to the first power of a particle's diameter. Inertial or centrifugal force is proportional to the cube of the particle's diameter. If the particle is small enough, it will move with the air stream. If the forces are equal, the particle will be held in equilibrium. This equilibrium determines the cutpoint of an ideal classifier. *The cutpoint therefore is equal to the particle size that has a 50-50 chance of ending in the fine fraction or coarse fraction.* In some applications, it is necessary to remove part of the air stream with the coarse fraction to facilitate the removal of the coarse particles.

Step IV - Separation and collection of the fine fraction from the air stream. The air is either released to atmosphere (1) to form an "open air system" or recirculated (2) to form a "closed air system." Step IV is sometimes eliminated with the fines and air mixture going to another process (3) such as another classifier or a direct-fired, pulverized coal burner, etc.

A theoretically perfect air classifier would combine the above four steps in such a way as to assure that all particles are perfectly diffused in the air stream as discreet particles. Each particle must then be subjected to the same air velocities to induce a drag force proportional to their size. This drag force, in turn, must be opposed by a gravitational, inertial or centrifugal force or combination thereof, acting equally on each particle so that they must be only proportional to the particle's mass. Means must then be found to collect the coarse particles without their colliding with the fine particles which are traveling in the opposite direction. The fine fraction must then be 100% collected from the air stream. In addition, the classifier must not be subject to abrasion, have surfaces on which material can build up to spoil the classification nor subject particles to too violent action which might cause attrition. Above all, the classifier must be inexpensive and economical to operate. It is therefore no wonder that hundreds of classifying devices have been invented over the past 100 years, none of them achieving perfection. Some devices are more successful than others. Since the design of a classifier entails compromises, it is natural that the classifier must be designed around the job it is to perform if maximum efficiency is to be achieved.

3.1 Basic Classifier Details

Classifiers employing gravitational forces only are limited to the coarsest cuts. Their range is normally 10 mesh to 65 mesh, although the range can be extended to 200 mesh. A 200 mesh spherical particle with a specific gravity of 2 has a terminal velocity in standard air of 1 foot per second. The air volume required to effect the classification is proportional to the amount of material to be classified. This air volume must move at 1 foot per second. To classify even relatively small amounts of material necessitates very large, cumbersome equipment. Imparting an inertial force on the particulate material to be classified proportionally increases the drag force required to counteract the inertial force on the cutpoint particle. Air velocities can therefore be increased and the classification equipment required to handle a particular tonnage correspondingly decreases. Classifiers employing inertial force are usually employed for cutpoints from 40 mesh to 270 mesh.

Centrifugal force is employed in classification for the same reasons that inertial forces are employed. Centrifuging is a practical method of imparting a force on a particle 500 to 2,000 times greater than is feasible by the gravitational method. Classifiers employing centrifugal principles have a range of 150 mesh to five microns.

Particle size is normally expressed in mesh or sieve size for particles 40 microns and larger, i.e., the particle that would just pass through an opening formed between the strands of woven wire cloth. For example, a 10 mesh particle is a particle that would barely pass through the spaces formed between wire cloth with 10 openings to the inch. The particle would have a diameter approximately 0.08 inches or 2,000 microns. A 100 mesh particle would barely pass through the spaces between a wire cloth with

100 openings to the inch. The particle would have a diameter of approximately 0.006 inches or 150 microns.

4. Factors Affecting Efficiency

The fractionalization results obtained by air classifying devices on pulverized materials are controlled by the physical characteristics of the material to be classified.

4.1 Cutpoint and Particle Size Distribution

By far, the most important factor is the particle size distribution of the product to be classified with respect to the cutpoint required. A good understanding of this subject matter is essential to grasping the fundamentals of air classification.

First, we must elaborate on the term "cutpoint" briefly described for Step III in Figure 1. At that time, we stated that the cutpoint is established by equilibrium condition of the drag force acting against the gravitational, inertial or centrifugal force which can only hold true for a particular size particle. This is the particle that has a 50-50 chance of being found in the fines or in the coarse. As it will be seen shortly, this is the only acceptable definition of the term; however, it is of no commercial interest. *The user of classifier equipment is only interested in a top size or minimum size value for which there are no commercially-recognized definitions.* A 200 mesh cutpoint might mean anything from a product 100.00% passing through a calibrated mesh sieve to 99%, 98% and 80%, even 70% minus 200 mesh. This also holds true when the user is thinking in terms of coarse fraction devoid of fine material. At that time, a 200 mesh cutpoint would signify a coarse product of 98% plus 200 mesh, etc.

Some materials have very homogeneous particle size distributions. For example, synthetic catalyst for cat crackers where all particles are between 150 and 30 microns with 80% of all particles between 80 and 40 microns. Other products, like crushed limestone, have unlimited extremes with large quantities of coarse particles and very fine minus 10 micron particles.

There are few particles in between. The particle size distribution of the feed is all important in all classifying devices having less than 100% efficiency (none of them does). The less efficient the classifying device, the more effect the feed distribution will have on classifier performance.

Every air classifying device operating at a set stable condition will separate the particles of a mixture into sized fractions according to a probability curve based on the size of the particle. The coarser the particle, the greater the probability of that particle to be found in the coarse fraction and vice versa. For example, a typical MET classifier operated at a 100 micron cutpoint, i.e., all particles exactly 100 microns in diameter in the material feed to the classifier are split evenly between the coarse and fine fraction, will distribute 200 micron particles twice the cutpoint in the following percentages: 90% in the coarse fraction, 10% in the fines fraction.

At 50 microns (half the cutpoint), the reverse holds true: 10% of the 50 micron particles will be found in the coarse fraction and 90% will be found in the fines fraction. When a heterogeneous material such as limestone is passed through a classifier with the above operating characteristic, the efficiency of the classification is very high as little feed material is found between 200 and 50 microns. With a homogeneous mixture, the efficiency will decrease proportionately to the increase of material between 200 and 50 microns. The above only holds true when efficiency is related to the theoretical cutpoint. From a practical standpoint, classifier efficiency usually is related to the product required by the customer instead of the theoretical cutpoint.

This "actual" efficiency is influenced also by the percentage of the product available in the classifier feed. Example, the following tabulation of "actual" efficiencies for a classifier having the characteristics mentioned above (90% of particles twice the cutpoint are found in the coarse; 90% of particles half the cutpoint are found in the fines) set to produce a fine fraction 98% minus 100 mesh from a heterogeneous mixture 20%, 50% and 80% minus 100 mesh and a homogeneous mixture 20%, 50% and 80% minus 100 mesh would produce the results in Table 1 below.

Table 1

	Heterogeneous Mixture			Homogeneous Mixture		
	20% - 100M	50% - 100M	80% - 100M	20% - 100M	50% - 100M	80% - 100M
Actual Efficiency	37.5%	75%	94%	Not Feasible	2.65%	2.34%
Theoretical Efficiency	96%	90%	90%	Not Feasible	98.0%	82.88%
Theoretical Cutpoint	270 mesh	200 mesh	150 mesh		28 mesh	270 mesh

4.2 Particle Behavior in an Air Stream

A classifier sizes particles according to their settling velocities in the air. The results of a classification test are evaluated; however, against screens which size particles according to the screen's smallest cross-sectional area. The following factors affect particle settling velocities independently of its smallest cross-sectional area.

a. Specific Gravity which affects the particle's mass and, therefore, its settling velocity in air. For example, a 74 micron particle (200 mesh) with a specific gravity of 2 grs/cc will behave in the same manner as a 53 micron particle (270) mesh with a specific gravity of 4 grs/cc.

b. Apparent specific gravity of porous or hollow particles such as diatomaceous earth and flyash will have the same affect on their settling velocities as the actual specific gravity of solid particles.

c. Particle shapes affect the classifier performance when deviating from spherical forms due to their particle changing surface area as the particle tumbles in an air stream producing a variable drag force on it. Particles differing widely from spherical shape are difficult to define size and to measure reliably. For example, a mica flake can have a length and width six times its thickness. If the mean diameter and mass of a particular flake are of a magnitude to have it normally classified as coarse, the particle can still be swept with the fines if the plane in which the flake shows the largest area is perpendicular to the air stream at the moment of its classification.

4.3 Surface Moisture

Free water content of pulverized material when present on the surface of the particles changes the apparent particle size distribution of the classifier feed by forming agglomerates. The free water content tolerated by air classifying devices depends entirely on the nature of the material being classified. Flour, for example, normally contains approximately 18% free water; there is no affect on the classification. However, one percent water in fine limestone will seriously affect the efficiency of the classification.

4.4 Viscosity of Gas Stream

Air classifiers may be operated with heated or refrigerated air or other gases such as nitrogen, having different viscosities from that of standard air. As the drag force acting on particles is directly related to the viscosity of the gas stream, the gravitational, inertial or centrifugal force acting on the particle must be changed proportionally to retain a set cutpoint.

4.5 Electrostatically Charged Particles

These particles will repel each other when they have the same polarity, as is usually the case. The material disperses more readily in an air stream and becomes more difficult to collect by mechanical means. This results in higher classifier cutpoints and lower efficiencies.

4.6 Flow Characteristics

Free flowing materials disperse readily in an air stream and can be distributed evenly without difficulty. Both factors are important prerequisites to good classification. The opposite is true for materials with poor flow characteristics. In addition, materials that have tendencies to build up on classifier surfaces will create flow disturbances or plug the classifier.

4.7 Surface Area

The number of particles per unit volume is an important factor in determining the capacity of any classifying device. The finer the material, the more particles will be held by a given volume unit and the lower the capacity of the classifying device. Due to the heterogeneous mixture of pulverized materials and other technical reasons, particle counts are rarely used and the fineness of a product is expressed in terms of developed surface area, expressed in CM.sq./gr., measured usually by Blaine or Wagner tests. Surface area is sometimes expressed in terms of average particle size. This is an inaccurate method as a slight change in the extremities of the particle size distribution can have a tremendous effect on the surface area developed by a particular sample.

4.8 Particle Hardness

Hard particles besides being abrasive have a tendency to bounce and ricochet inside the classifier chamber when handled at medium to high velocities. This results in abnormal amounts of stray coarse particles in the fine product.

5. Efficiency Formulate

5.1 Actual or Conventional Classifier Efficiency

Actual or conventional classifier efficiency is expressed as the percentage of desired product found in the fines in terms of available product in the classifier feed. For example, 90% efficiency means that 90% of the material considered fines in the classifier feed was classified as fines with the balance, 10%, going into the coarse fraction. As no attention is paid to the particle size distribution of the classifier feed, the formula is valueless when comparing various classifying devices unless they are operated with identical material. The definition of the term "fines" also greatly affects conventional or actual efficiency as the percentage of coarse material is not taken into consideration in the formula. For example, if the term "fines" is defined as 98% minus 200 mesh, the classifier may have an efficiency of 85% on a particular material. If the standard for the fine product is relaxed and a product 95% minus 200 mesh becomes acceptable, the actual efficiency may become 95% even though the classifier characteristics have not changed. The theoretical cutpoint was raised and more minus 200 mesh material in the classifier feed was found in the desired product. If the standards are increased and the desired product must now be 100% minus 200 mesh, the cutpoint must be decreased, perhaps to 35%.

5.2 Theoretical or Absolute Efficiency

Theoretical or Absolute Efficiency is based on the theoretical cutpoint and is the percentage of material properly classified as coarse and fine. Coarse material is defined as any particle larger than the cutpoint. Since the formula does not take into consideration the particle size distribution of the classifier feed, it is not an effective tool to compare various classifying devices unless operated on identical material. It does, however, eliminate the effects of product requirements on efficiency.

5.3 Fractional Efficiency

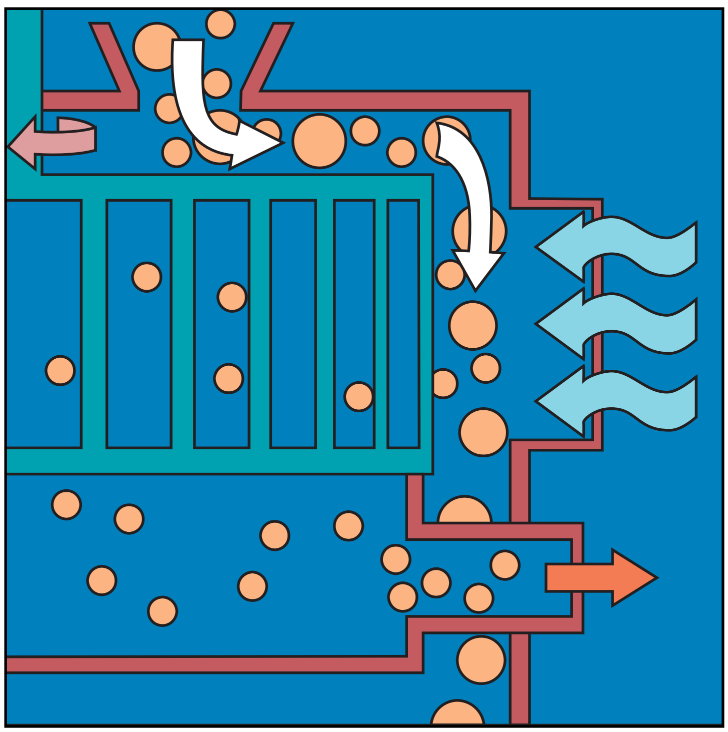
Fractional Efficiency, as demonstrated above in the conventional formula, cannot give a satisfactory overall picture of the classification efficiency of a particular classifying device as it is influenced by extraneous factors due to particle size distribution of the material being classified and the selection of the cutpoint. The fractional efficiency method is a piecemeal efficiency. The feed material is divided into several size fractions, usually in the screens selected for the analysis, and in 10 micron increments for the submesh fraction. The percentage of each fraction going into the fine product or coarse product is then calculated. Each percentage thus obtained is actually the efficiency of the classifying device on the corresponding size fractions. Besides being a quantitative measurement, fractional efficiency is also a qualitative measuring device as it shows, as an example, if the 5% plus 200 mesh fraction allowed in a desired fine product is made up of material close to 200 mesh or whether it contains undesirable, very coarse particles.

5.4 Fractional Efficiency Curve

Fractional efficiency is best expressed graphically as it summarizes a whole series of percentages, each one of which must be properly identified, into one simple line. The line is plotted with one axis indicating the percent of material available in the feed that was found in either the fine fraction or coarse fraction for each size fraction. The other axis indicates the average particle size in microns or mesh for each size fraction into which the feed was originally divided.

AIR CLASSIFIERS

Whirlwind©, SuperFine® and Side Draft™ (SD™)



STURTEVANT Inc.®

POWDER PROCESSING TECHNOLOGY: THE STURTEVANT SOLUTION.

THE SUPERFINE CLASSIFIER

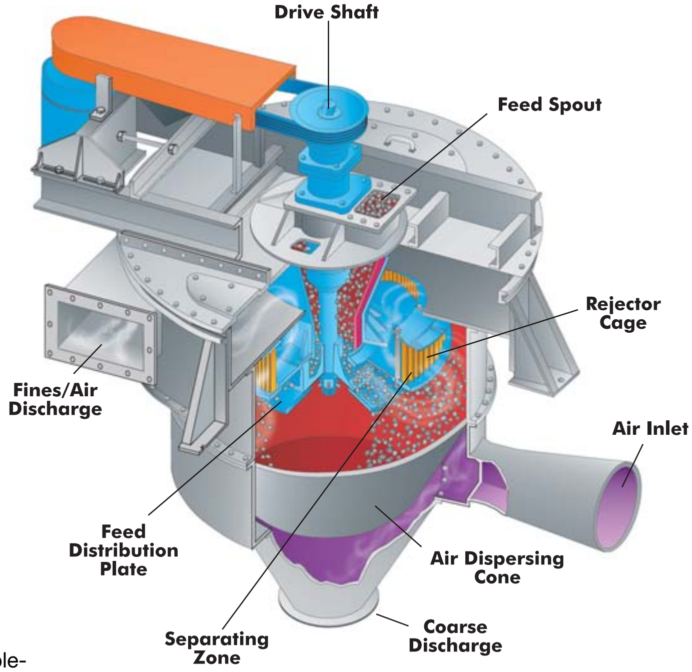
The **SuperFine Classifier** achieves the high degree of accuracy demanded in the separation of particles 44 microns and smaller while delivering benefits including:

- Ideal for separation of high-value materials, 44-5 microns
- Tight particle size control
- Compact design allows easy retrofit into existing facilities
- Consistent, high-quality product, despite variations in feed material, through easy-to-make changes in air flow and variable-speed rejector cage
- Processes abrasive materials; ceramic liners and/or inexpensive, steel replaceable liners available
- Effective product cooling
- Fines collected in cyclone or process collector

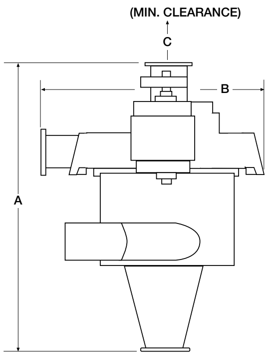
36" SuperFine, fully assembled for shipment

APPLICATIONS

- Ceramics
- Chemicals
- Diatomaceous earth
- Food products
- Minerals
- Plastics
- Shredded fibers
- Tobacco



Material entering through the feed spout is subjected to centrifugal force, causing uniform distribution of the material into the upward-moving air stream. The unique design of the SuperFine's variable-speed, multi-blade rejector cage allows only the selected particles to pass into the fines chamber and exhaust into the system collector. Oversized particles settle into the coarse discharge. The SuperFine system delivers maximum selection efficiency and productivity.

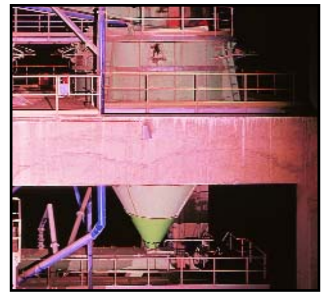


SUPERFINE AIR CLASSIFIERS							
SIZE	A	B	C	WEIGHT (lbs.)	H.P.	AIR FLOW (CFM)	FEED RATE (lbs./hr.)
36"	5' 6"	3' 9"	3' 6"	2,100	10-20	3,000	1,000-10,000
72"	9' 6"	7' 4"	4' 8"	4,800	25-50	9,000	10,000-30,000

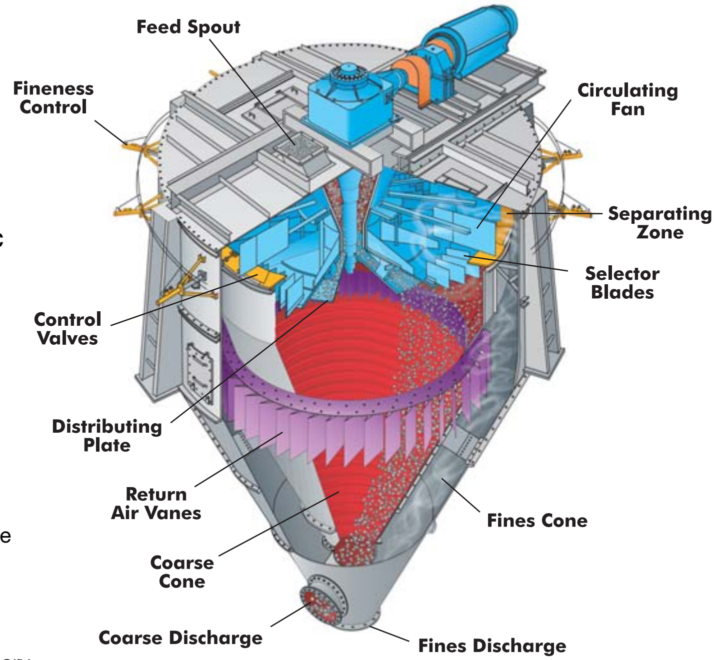
THE WHIRLWIND CLASSIFIER

The **Whirlwind Classifier** offers an exceptional ability to achieve a wide range of separations. Its features allow precise definition and delivery of the desired size product while delivering the following benefits:

- Fine classification of 100 to 400 mesh materials
- Lowest capital cost: no auxiliary equipment, such as cyclones, process dust collectors, air locks, and system fans, are needed
- Consistent, high-quality product: external adjustment for variation in feed material
- Saves on operating expenses:
  - Low energy consumption
  - Reduced maintenance; durable, wear-resistant liners
- Processes abrasive materials; long-wearing, ceramic liners and inexpensive, steel replaceable liners



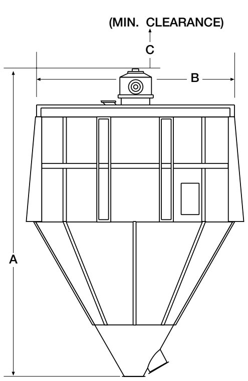
Whirlwind installation requires no process dust collector



APPLICATIONS

- Aggregates, crushed stone
- Cement
- Ceramics
- Chemicals
- Coal
- Diatomaceous earth
- Fly ash
- Food products
- Gypsum
- Hydrated lime
- Minerals
- Plastics
- Silica sand
- Soda ash, bicarbonate

Material entering through the feed spout is subjected to centrifugal force, throwing coarse particles away from the distributing plate and into the air flow. Due to gravity, large particles settle into the coarse cone. Finer particles are swept upward where selector blades generate further classification. During this secondary separation, oversized particles are spun out of the air flow and drop down into the coarse cone. The selected fines continue through the circulating fan and into the fines cone. Fines drop out of the recirculated air flow at the fixed return air vanes.



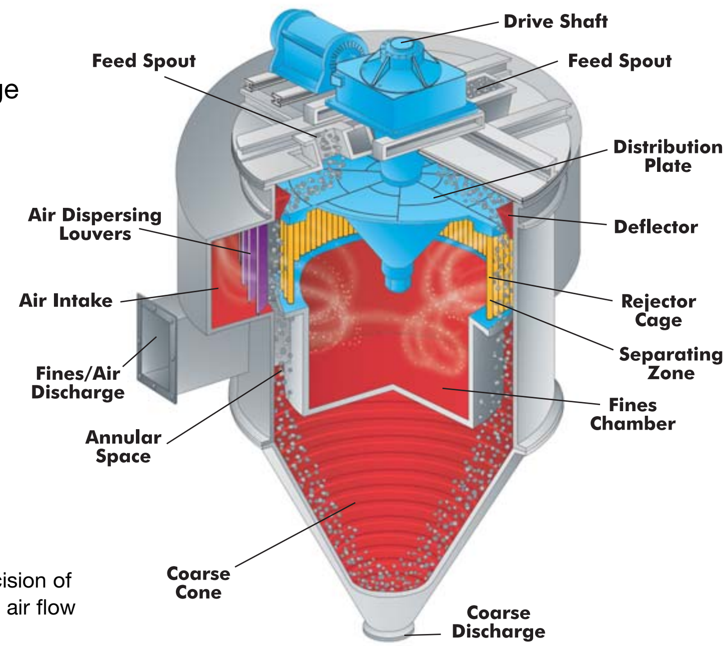
WHIRLWIND AIR CLASSIFIERS							
SIZE	A	B	C	WEIGHT (lbs.)	H.P.	AIR FLOW Vent (CFM)	FEED RATE (tons/hr.)
20"	3' 9"	2' 5"	1' 9"	650	5-7.5	25-50	1
3'	6' 7"	3' 3"	3' 0"	1,500	7.5-10	65-125	3
4.5'	8' 8"	4' 10"	3' 0"	2,400	10-15	75-150	8
6'	10' 9"	6' 4"	3' 8"	6,800	15-25	90-175	14
8'	13' 0"	8' 4"	4' 8"	9,500	20-30	150-300	25
10'	15' 8"	10' 4"	4' 8"	13,000	30-40	190-375	40
12'	19' 1"	12' 4"	5' 6"	18,500	40-50	275-550	56
14'	21' 1"	14' 5"	5' 6"	21,500	50-75	400-800	77
16'	24' 5"	16' 5"	6' 3"	31,000	100-150	675-1,350	125
18'	27' 7"	18' 5"	8' 9"	50,000	250-300	1,000-2,000	200
20'	30' 9"	20' 5"	9' 0"	68,000	350-400	1,500-3,000	300
22'	33' 0"	22' 5"	9' 0"	87,000	450-500	2,000-4,000	450
24'	35' 10"	24' 5"	10' 9"	117,000	600-700	2,500-5,000	600
26'	38' 9"	26' 5"	10' 9"	125,000	600-800	3,000-6,000	800

THE SIDE DRAFT CLASSIFIER

Illustrates ceramic lining in fully-assembled SD

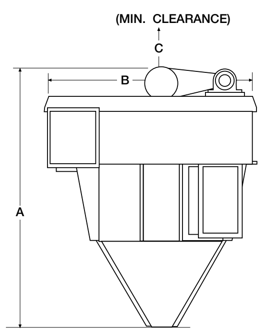
The **SD Classifier** represents a highly versatile, energy-efficient system for the consistent separation of particles in the 100 to 400 mesh range.

- Compact design allows easy retrofit into existing facilities
- Saves on operating expenses:
  - Low energy consumption
  - Durable, wear-resistant design minimizes maintenance
- Effective product cooling
- Consistent, high-quality product, regardless of variations in feed material, through easy-to-make changes in air flow and variable-speed rejector cage
- Processes abrasive materials: ceramic liners and/or inexpensive, wear area replaceable liners available
- Fines collected in cyclone or process collector



APPLICATIONS

- Aggregates, crushed stone
- Cement
- Ceramics
- Chemicals
- Coal
- Diatomaceous earth
- Fly ash
- Food products
- Gypsum
- Hydrated lime
- Minerals
- Plastics
- Shredded fibers
- Silica sand
- Soda ash, bicarbonate



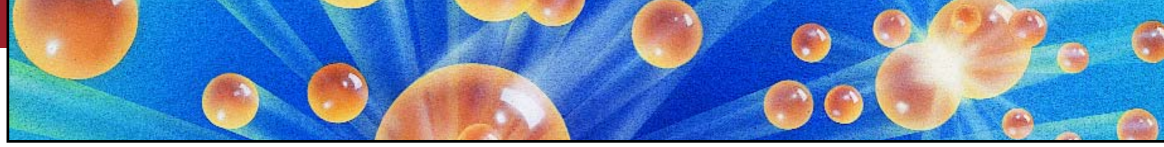
Material enters through the feed spout, is evenly conveyed across the top of the distribution plate and drops into the separating zone, creating a uniformly dispersed curtain of material. Forces generated by the rejector cage and process air subject the curtain of material to particle size classification.

High separation efficiencies and precision of classification are obtained by controlling air flow and rejector cage speed.

The multi-pin, variable-speed rejector cage allows only the selected fines to pass into the fines chamber and exhaust into the system collector. The coarse particles, after passing through the separating zone, fall into the coarse outlet.

SD AIR CLASSIFIERS

SIZE	A	B	C	WEIGHT (lbs.)	H.P. (min.-max.)	AIR FLOW (CFM)	FEED RATE (tons/hr:min.-max.)
20	7' 2"	3' 5"	2' 6"	2,100	5-7.5	3,000	4-12
30	13' 3"	5' 2"	3' 4"	2,800	7.5-10	9,400	10-40
40	14' 0"	6' 1"	3' 4"	3,500	20-30	15,300	20-65
50	15' 6"	8' 1"	3' 4"	7,000	30-40	23,500	30-100
60	16' 0"	9' 6"	4' 3"	14,000	40-50	35,300	45-150
70	17' 0"	13' 5"	4' 3"	14,600	50-60	38,000	60-190
80	22' 1"	13' 6"	4' 3"	15,000	60-75	56,000	75-240
90	24' 0"	14' 3"	4' 11"	29,000	75-100	64,000	95-300
100	24' 7"	17' 3"	4' 11"	30,500	100-125	88,300	110-370
110	28' 3"	18' 0"	5' 2"	36,300	125-150	94,200	140-450
120	25' 11"	15' 6"	5' 2"	37,300	150	117,700	160-500
130	31' 2"	19' 3"	5' 2"	45,400	150-200	141,200	190-600
140	34' 0"	21' 10"	8' 4"	62,500	200-250	159,000	220-670
150	29' 7"	20' 10"	8' 4"	63,000	250-300	165,000	250-770
160	31' 8"	23' 1"	9' 11"	87,300	300-400	180,400	280-900
170	35' 2"	23' 6"	9' 11"	109,000	400-500	212,000	320-1,020
180	35' 0"	23' 4"	9' 11"	88,500	500-600	242,000	360-1,150



STURTEVANT: QUALITY FOR GENERATIONS.

For over a century, Sturtevant has been a leader in the powder processing industry. In the 1920s we pioneered much of the air classification technology that is still in use. Today, with more than 3,100 installations and over 70 years of proven performance in separating dry powders into fine and coarse fractions, our experience is unsurpassed.

In response to the variety of applications requiring particle classification through air separation, Sturtevant now offers three separators, providing high-performance equipment that delivers efficiency, accuracy and dependability all over the world in the food, chemical and minerals industries:

- **The Whirlwind**© - Completely self-contained, requires no process dust collection equipment.
- **The SuperFine**® - Ideal for separations at 44-5 microns.
- **The Side Draft**™ **(SD**™**)** - High-efficiency separations. Versatile, variable-speed control to change fineness online.

Each provides unique benefits, backed by maximum performance and Sturtevant durability, to deliver customized solutions for your most exacting needs.

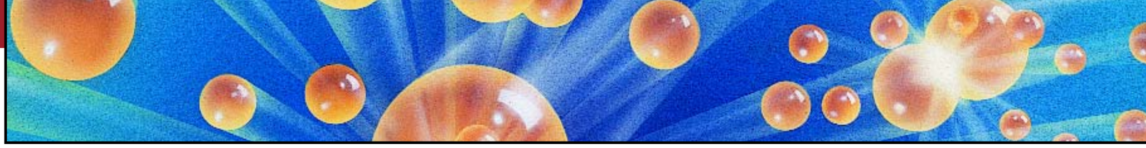
SD fit being checked prior to shipment

16-foot Whirlwind installed in grinding circuit producing 325 mesh product

SUPERIOR PERFORMANCE FROM STURTEVANT.

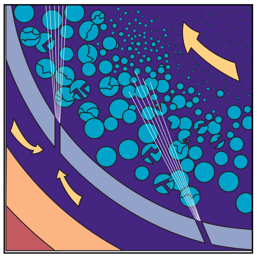
Sturtevant air separators balance the physical principles of centrifugal force, drag force and gravity to generate a high-precision method of classifying particles according to size or density. For dry materials of 100 mesh and smaller, air classification provides the most effective and efficient means for separating a product from a feed stream, for dedusting, or, when used in conjunction with grinding equipment, for increasing productivity. All three Sturtevant air classifiers offer durable construction and other time- and energy-saving advantages, including:

- Capability to process an extensive range of dry materials
- Higher capacity and finer separations than screeners
- Simple construction, low maintenance, easy-to-use controls
- Dial-in, external fineness controls; no system shutdown to change products
- Maximized wear-resistance for abrasive materials in special applications
- Easily modified for water cooling, air cooling or drying of product
- Safe classification for heat-sensitive materials

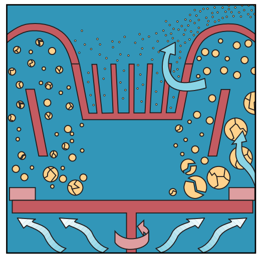


PROVEN PERFORMERS

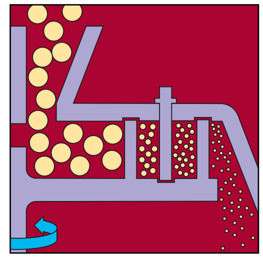
For most dry material size reduction or separation needs, Sturtevant's extensive line of products can meet your requirements.



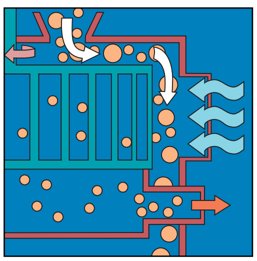
Micronizer®: Jet mills dry particles to sub-micron size; some models USDA-accepted.



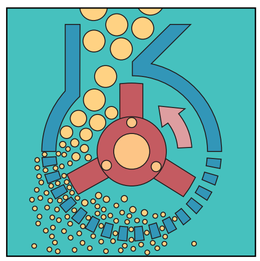
Powderizer®: Air-swept impact mill with integral classifier; grinds to low-micron range with tightest particle size distribution.



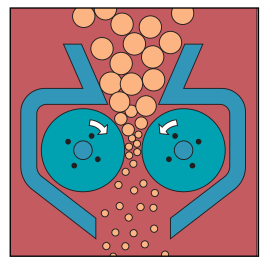
Simpactor®: Centrifugal, pin-type impact mill; reduces low- to medium-density materials to 50-200 mesh.



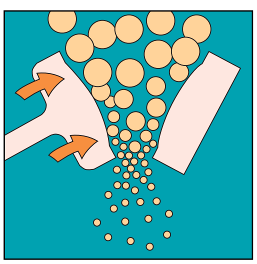
Air Classifiers: Air streams separate fine and coarse particles with mechanical rejector for product quality assurance.



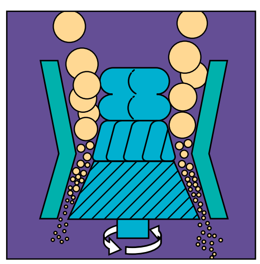
Hammermill: Versatile, perfect for friable materials; easy access for maintenance or inspection.



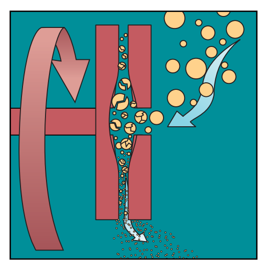
Roll Crusher: Best-suited for controlled reduction of friable materials; minimal fines.



Jaw Crusher: Ideal for coarse and intermediate crushing; minimal fines production.



Screening Machines: Separates powders into several fractions for multiple products or eliminating dust and oversized particles.



Sample Grinders: Disk type grinder for very fine work at small throughput rates.

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CP-51 / Soil Cleanup Guidance

New York State Department of Environmental Conservation

DEC Policy

Issuing Authority: Alexander B. Grannis, Commissioner	
Date Issued: October 21, 2010	**Latest Date Revised:**

I. Summary

This policy provides the framework and procedures for the selection of soil cleanup levels appropriate for each of the remedial programs in the New York State Department of Environmental Conservation (DEC) Division of Environmental Remediation (DER). This policy applies to the Inactive Hazardous Waste Disposal Site Remedial Program, known as the State Superfund Program (SSF); Brownfield Cleanup Program (BCP); Voluntary Cleanup Program (VCP); Environmental Restoration Program (ERP); Spill Response Program - Navigation Law (NL) section 176 (SRP); and the Resource Conservation and Recovery Act (RCRA) Corrective Action Program. It replaces *Technical and Administrative Guidance Memorandum (TAGM) 4046: Determination of Soil Cleanup Objectives and Cleanup Levels* (January 24, 1994); the *Petroleum Site Inactivation and Closure Memorandum* (February 23, 1998); and Sections III and IV of *Spill Technology and Remediation Series (STARS) #1* (August 1992).

This document is used in conjunction with the applicable statutes, regulations and guidance. Site-specific soil cleanup levels, determined in accordance with this guidance, are only applied after:

- the site, or area of concern, is fully investigated to determine the nature and extent of contamination;
- all sources of contamination are addressed consistent with the hierarchy provided in 6 NYCRR 375-1.8(c) or consistent with the RCRA Corrective Action Program (as appropriate);
- groundwater, if contaminated, has been evaluated for appropriate remedial actions consistent with 6 NYCRR 375-1.8(d) or consistent with the RCRA Corrective Action Program (as appropriate); and
- impacts on adjacent residential properties, surface water, aquatic ecological resources are evaluated, as well as indoor air, soil vapor, vapor intrusion and other appropriate media.

II. Policy

It is DEC's policy, consistent with applicable statutes and regulations, that all remedies will be protective of public health and the environment. DEC's preference is that remedial programs, including the selection of soil cleanup levels, be designed such that the performance standard results in the implementation of a permanent remedy resulting in no future land use restrictions. However, some of

DEC's remedial programs are predicated on future site use. Further, it is not always feasible to return to a condition where no restrictions are required.

The procedures set forth herein are intended for the use and guidance of both DEC and remedial parties to provide a uniform and consistent process for the determination of soil cleanup levels. This guidance is not intended to create any substantive or procedural rights, enforceable by any party in administrative or judicial litigation with DEC. DEC reserves the right to act at variance with these procedures to address site-specific circumstances and to change the procedures in this guidance at any time.

Please note that this guidance focuses only on soil cleanup levels. All remedies must be fully protective of public health and the environment and must prevent further off-site migration to the extent feasible, with special emphasis on preventing or minimizing migration onto adjacent residential properties. A remedial party is required to evaluate and investigate, if necessary, all environmental media including soil, groundwater, surface water, sediments, soil vapor, ambient air, and biota. [See 6 NYCRR 375-1.8(a)(6) or RCRA Corrective Action Program (as appropriate)]. This investigation will determine if any of the referenced media are, or may be, impacted by site contamination. Applicable guidance should be consulted for media other than soil.

Nothing contained in this guidance, in itself, forms the basis for changes to previously selected remedies. However, a change in the site remedy may be considered consistent with *DER-2: Making Changes to Selected Remedies* (April 1, 2008). [See Section VI, Related References.] To the extent that a change to a selected remedy at a site in one of DER's remedial programs is necessary as provided in DER-2, as applicable, the Soil Cleanup Objectives (SCOs) may be considered in the evaluation of appropriate changes to the selected remedy. For sites in other programs, applicable regulations and guidance must be used.

III. Purpose and Background

DEC has a number of different remedial programs that were developed over time based on separate and distinct authorities. These programs use different procedures to determine the extent of soil cleanup necessary to satisfy the remedial program goals. The purpose of this document is to set forth how soil cleanup levels are selected for the different programs.

Legislation establishing New York State's Brownfield Cleanup Program (Article 27, Title 14 of the Environmental Conservation Law [ECL]) required DEC, in consultation with the New York State Department of Health (NYSDOH), to develop an approach for the remediation of contamination at brownfield sites. The resulting regulation includes seven sets of SCOs. Four sets provide for the protection of public health for different land uses (residential, restricted residential, commercial, and industrial); two sets provide for the protection of other resources (groundwater and ecological resources); and one set includes SCOs for protection of public health and the environment for all uses (unrestricted use).

With the promulgation of the SCOs, it is necessary to discuss how the SCOs, and soil cleanup levels generally, are arrived at for a specific site. Some key definitions in understanding how cleanup levels for soil are arrived at follow.

Feasible, which means suitable to site conditions, capable of being successfully carried out with available technology, implementable and cost effective [see 6 NYCRR 375-1.2(s)].

Presumptive remedy, which means a technology or technique where experience has shown the remedy to be a proven solution for specific types of sites and/or contaminant classes [See *DER-15: Presumptive/Proven Remedial Technologies* February 27, 2007. Refer to Section VI, Related References.]

Soil cleanup level, which means the concentration of a given contaminant for a specific site that must be achieved under a remedial program for soil. Depending on the regulatory program, a soil cleanup level may be based on the regulation [6 NYCRR 375-6.8(a) or (b)], modified from the regulatory value based on site-specific differences, or based on other information, including background levels or feasibility. Soil cleanup levels may include:

- SCOs promulgated at 6 NYCRR 375-6;
- Supplemental Soil Cleanup Objectives (SSCOs);
- a "totals" approach for a family of contaminants known as Polycyclic Aromatic Hydrocarbons (PAHs);
- Presumptive remedy for Polychlorinated Biphenyls (PCBs); and
- Nuisance Condition.

Soil Cleanup Objective (SCO), which means the chemical concentrations for soil cleanup of individual chemicals contained in 6 NYCRR 375-6.8(a) or (b). The SCOs were developed using the process outlined in the Technical Support Document (TSD). The SCOs and the SSCOs defined below are applicable statewide and do not account for many site-specific considerations which could potentially result in higher levels. Soil concentrations that are higher than the SCOs and SSCOs are not necessarily a health or environmental concern. When an SCO (or SSCO) is exceeded, the degree of public health or environmental concern depends on several factors, including the magnitude of the exceedance, the accuracy of the exposure estimates, other sources of exposure to the contaminant, and the strength and quality of the available toxicological information on the contaminant.

Supplemental Soil Cleanup Objective (SSCO), which means a) an existing soil cleanup level for a contaminant which had been included in former TAGM 4046 and was not included in 6 NYCRR 375-6; b) has been developed using the same process used for development of the SCOs; and c) new cleanup levels for soil developed by the remedial party following the approach detailed in Appendix E of the TSD. The TSD provides information relative to the development of cleanup objectives for soil that are not set forth in 6 NYCRR 375-6. Cleanup objectives that have been established at the direction of DEC or the election of remedial parties are included in Table 1.

Technical Support Document (TSD), which refers to the document dated December 2006 detailing the development of the SCOs that were promulgated in 6 NYCRR 375-6. It provides the technical background and provides a detailed discussion of the considerations for development of the SCOs for the different land uses and exposure pathways. The TSD is available on DEC's website [see Section VI, Related References].

The purpose of this guidance is NOT to focus on media other than soil. Accordingly, the remedial program may require remedial activities to address media other than soil (e.g., groundwater, surface water, sediment, and vapor). Applicable guidance should be consulted for media other than soil. This guidance is to be used in conjunction with the applicable statutes, regulations and guidance. Site-specific soil cleanup levels, determined in accordance with this guidance, are only applied after:

- the site, or area of concern, is fully investigated to determine the nature and extent of contamination;
- all sources of contamination are addressed consistent with the hierarchy provided in 6 NYCRR 375-1.8(c) or consistent with the RCRA Corrective Action Program (as appropriate);
- groundwater, if contaminated, has been evaluated for appropriate remedial actions consistent with 6 NYCRR 375-1.8(d) or consistent with the RCRA Corrective Action Program (as appropriate); and
- an evaluation of impacts on adjacent residential properties, surface water, aquatic ecological resources, as well as indoor air, soil vapor, vapor intrusion and other appropriate media.

IV. Responsibility

The responsibility for maintaining and updating this policy lies with DER. DEC staff are responsible for implementing this policy, with input (as applicable) from NYSDOH.

V. Procedures

A. General Approaches to the Selection of Soil Cleanup Levels

The determination of soil cleanup levels for a site is dependent on:

1. The regulatory program pursuant to which the site is being addressed;
2. Whether the groundwater beneath or down gradient of the site is, or may become contaminated with site-related contaminants;
3. Whether ecological resources constitute an important component of the environment at or adjacent to a site, and which are, or may be, impacted by site-related contaminants; and
4. Other impacted environmental media such as surface water, sediment, and soil vapor.

After fully evaluating the nature and extent of soil contamination associated with a site, the soil cleanup levels will be based on one, or a combination of, the following four approaches.

Approach 1: **Utilize the Unrestricted Use Soil Cleanup Objectives** [see 6 NYCRR Table 375-6.8(a)]. Under this approach, the soil cleanup levels will be established consistent with the SCOs set forth in 6 NYCRR Table 375-6.8(a). For contaminants of concern which are not included in the rule, DEC may direct development of a soil cleanup level which is protective of public health and the environment without restrictions following the procedure outlined in Appendix E of the TSD. Under this approach, the unrestricted SCOs are applied throughout the soil matrix to the top of bedrock (including the saturated zone).

Approach 2: **Utilize the Restricted Use Soil Cleanup Objectives** [see 6 NYCRR Table 375-6.8(b)]. Under this approach, soil cleanup levels will be established consistent with the SCOs set forth in 6 NYCRR Table 375-6.8(b) selecting the lowest SCO in the categories described in A through C below. Generally, after source removal, the soil cleanup levels do not need to be achieved to more than 15 feet below ground surface or to the top of bedrock, whichever is shallower.

A. Select the applicable land use category for the protection of public health (residential, restricted residential, commercial or industrial);

B. Determine if the SCOs for the protection of groundwater are applicable (see Section V.D); and

C. Determine if the SCOs for the protection of ecological resources are applicable (see Section V.C).

Approach 3: **Limited Site-Specific Modifications to Soil Cleanup Objectives.** This approach allows for consideration of site-specific information to modify the SCOs promulgated in 6 NYCRR Tables 375-6.8 (a) and (b) following the approach detailed in Appendix E of the TSD. The equations and basic methodology specified for calculating the 6 NYCRR 375-6.8 (a) and (b) values may not be modified under this approach. However, in instances where site-specific parameters were used in the calculation of the SCOs, site data different from the assumptions used to calculate the SCOs may be used to modify the soil cleanup levels for a specific site. These instances are very limited and occur only in certain pathways that are listed below.

- Protection of groundwater pathway
- Particulate inhalation pathway
- Volatile inhalation pathway
- Protection of ecological resources pathway

It should be noted that even if site-specific data modifies these pathways, it may not result in modifying the SCOs because the lowest value from all applicable pathways is used to determine each SCO. The inhalation pathway is very seldom the controlling pathway in the determination of the protection of public health. The specific parameters that can be modified are identified in Appendix E of the TSD (e.g., inhalation dispersion terms, fraction of organic carbon in soil, etc.).

The remedial party should consider the cost of collecting the data necessary to support a request to modify the SCOs with the potential for deriving a higher SCO that provides an appropriate level of protection. The remedial party may be required to submit additional data to support the use of modified SCOs. Once DEC approves one or more modified SCOs, they are applied in the manner described under Approach 2.

Approach 4: **Site-Specific Soil Cleanup Objectives.** Under this approach, the remedial party may propose site-specific cleanup levels or approaches for soil which are protective of public health and the environment based on other information. This approach sets forth a flexible framework to develop soil cleanup levels by allowing the remedial party to conduct a more detailed evaluation of site information in an effort to calculate protective soil cleanup levels or approaches unique to a site. Under this approach, the remedial party may propose a remedy that does not include specific soil cleanup levels (e.g., excavate the top 6 feet in an area extending 75 feet in all directions from boring B12); modify the input parameters used in the SCO calculations; use site data to improve or confirm predictions of exposures to receptors to contaminants of concern; analyze site-specific risks using risk assessments; use toxicological information available from alternate sources; or consider site background and historic fill. Data supporting these site-specific adjustments or use of alternate methodologies must also be provided to DEC for review and approval to ensure that the resulting soil cleanup levels are protective.

The Approach 4 framework leaves DEC with discretion to determine whether a different approach is appropriate for the site and, if a different approach is to be used, the proper method of implementation. The remedial party should consider the cost of collecting the data necessary to develop site-specific soil cleanup levels (or approaches) with the potential for deriving a soil cleanup level which is higher than a particular SCO and which provides an appropriate level of protection. The remedial party may also be required to submit additional data to support the use of methodologies in the calculation of site-specific soil cleanup levels or to support the proposed approach.

B. Application of Soil Cleanup Levels for the Specific Remedial Programs: Soil cleanup levels are determined on a site-specific basis depending on the program under which the site is being remediated. In some cases (e.g., BCP Track 1 or Track 2), the soil cleanup levels are the SCOs taken directly from 6 NYCRR 375-6. In other cases, soil cleanup levels may be derived from the Part 375 SCOs but modified based on other information. In yet other cases, the soil cleanup levels may have no relationship or connection to the SCOs, but rather be developed in accordance with DEC-approved methodologies or approaches.

1. <u>Inactive Hazardous Waste Disposal Site Remedial Program (State Superfund Program)</u>: The goal of the remedial program for a specific site is to restore that site to pre-disposal conditions, to the extent feasible. The unrestricted use SCOs are considered to be representative of pre-disposal conditions unless an impact to ecological resources has been identified (see 6 NYCRR 375-2.8(b)(2)). However, it must be recognized that achievement of this goal may not be feasible in every case. At a minimum, all remedies must be protective of public health and the environment. The following procedure is used to determine the most feasible remedy.

(a) The remedial party shall evaluate, and if feasible, implement a cleanup utilizing Approach 1 (application of unrestricted SCOs).

(b) Where DEC determines that achieving unrestricted SCOs is not feasible as documented in a feasibility study, the remedial party may evaluate alternatives to remediate the site to the greatest extent feasible (see *DER-10: Technical Guidance for Site Investigation and Remediation*, Chapter 4.3). [See Section VI, Related References.] In this event, the remedial party may propose soil cleanup levels in accordance with any of the general approaches. However, when considering restricted use soil cleanup levels, the remedial party should apply the least restrictive use category feasible. For purposes of this discussion, residential use is the least restrictive use and industrial use is the most restrictive category. This process starts with consideration of residential use, followed by restricted residential use, commercial use, and then industrial use. The evaluation proceeds through the different land uses until a feasible remedy is found. This evaluation is not bound to the SCOs in regulation or SSCOs set forth in this guidance but may result in a site-specific soil cleanup level that is between the SCOs or soil cleanup level for two different land uses (e.g., above the restricted residential SCO and below the commercial SCO).

2. <u>Brownfield Cleanup Program</u> The remedy shall be fully protective of public health and the environment, including, but not limited to, groundwater according to its classification pursuant to ECL 17-0301, drinking water, surface water, air (including indoor air), sensitive populations (including children), and ecological resources (including fish and wildlife). Soil cleanup levels corresponding to the cleanup track under which the site is being remediated are required to be met. The four cleanup tracks are:

> **<u>Track 1</u>**: Cleanups pursuant to this track must achieve unrestricted use of the site. This track requires that the remedial party implement a cleanup utilizing Approach 1. Institutional and engineering controls are allowed only for periods of less than five years (defined as short-term controls) except in the limited instance where a volunteer has conducted remedial activities resulting in a bulk reduction in groundwater contamination to asymptotic levels.
>
> **<u>Track 2</u>** : Cleanups pursuant to this track may consider the current, intended, or reasonably anticipated future use in determining the appropriate cleanup levels for soil. This track requires that the remedial party implement a cleanup that achieves the SCOs in the tables in 6 NYCRR 375-6.7(b) for the top 15 feet of soil (or bedrock if less than 15 feet). This track follows approach 2. Institutional and engineering controls are allowed for soil (for the top 15 feet of soil or bedrock if less than 15 feet) for less than five years (defined as short-term controls). Institutional and engineering controls which limit site use and the use of onsite groundwater can be used without regard to duration. Track 2 cleanups at restricted residential, commercial or industrial use sites require site management plans to ensure that material removed from the site (post remedial action) is managed appropriately and to ensure that any buffer zone protecting adjacent residential use sites or ecological resources is maintained.
>
> **<u>Track 3</u>**: Cleanups pursuant to this track may consider the current, intended, or reasonably anticipated use in determining the appropriate cleanup levels for soil. This track requires that the remedial party implement a cleanup utilizing Approach 3 for those SCOs which the remedial party seeks to modify an established SCO. Institutional and engineering controls are allowed for soil (for the top 15 feet of soil or bedrock if less than 15 feet) for less than 5 years (defined as short-term controls). Institutional and engineering controls which limit site use and the use of on-site groundwater can be used without regard to duration. Track 3 cleanups at restricted residential, commercial or industrial use sites require site management plans to ensure that material removed from the site (post remedial action)is managed appropriately and to ensure that any buffer zone protecting adjacent residential use sites or ecological resources is maintained.
>
> **<u>Track 4</u>**: Cleanups pursuant to this track may consider the current, intended, or reasonably anticipated use in determining the appropriate cleanup levels for soil. This track allows for the development of site-specific soil cleanup levels below the cover system in accordance with Approach 4. Track 4 remedies must address all sources as a component of the remedy. Short- and long-term institutional and engineering controls are allowed to achieve protection of public health and the environment. The remedy under Track 4 must provide a cover system over exposed residual soil contamination. Soils which are not otherwise covered by structures such as buildings, sidewalks or pavement (i.e., exposed surface soils) must be covered with soil that complies with the use-based SCOs in 6 NYCRR Table 375-6.8(b) levels for the top one foot (non-residential uses) or top two feet (restricted residential use).

3. Environmental Restoration Program: The goal of the program for a specific site is to select a remedy that is protective of public health and the environment, including, but not limited to, groundwater according to its classification pursuant to ECL 17-0301, drinking water, surface water and air (including indoor air), sensitive populations (including children) and ecological resources (including fish and wildlife). At a minimum, the remedy selected shall eliminate or mitigate all significant threats to public health and to the environment presented by contaminants disposed at the site through the proper application of scientific and engineering principles. Soil cleanup levels may be developed in accordance with Approaches 1 – 4 without restriction.

4. Voluntary Cleanup Program: The goal of the program for a specific site is to select a remedy that is protective of public health and the environment for the contemplated use. The soil cleanup levels may be developed in accordance with Approaches 1 – 4 without restriction.

5. Petroleum Spill Response Program: The goal of the Petroleum Spill Response Program is to achieve pre-spill conditions [6 NYCRR 611.6(a)(4)]. Remedial activities under this program shall be undertaken relative to the petroleum contamination that was released along with any co-mingled contamination from other sources. The remedial party shall achieve, to the extent feasible, the unrestricted SCOs for petroleum-related contaminants listed in 6 NYCRR Table 375-6.8(a). For petroleum contaminants not included in 6 NYCRR Table 375-6.8(a) (discussed in Section E below), the remedial party shall apply, to the extent feasible, the soil cleanup levels provided in Table 1. For ease of implementation, two lists of petroleum contaminants (Gasoline and Fuel Oil, Tables 2 and 3) are attached. The tables combine the applicable petroleum-related SCOs from 6 NYCRR 375-6.8(a) and the applicable petroleum related SSCOs from Table 1. Where DEC determines that it is not feasible to achieve the soil cleanup levels as set forth in this paragraph, the remedial party may propose soil cleanup levels in accordance with any of the general approaches. However, when considering restricted use soil cleanup levels, the remedial party should apply the least restrictive use category feasible.

For purposes of this discussion, residential use is the least restrictive use, and industrial use is the most restrictive category. This process starts with consideration of residential use, followed by restricted residential use, commercial use, and then industrial use. The evaluation proceeds through the different land uses until a feasible remedy is found. If the protection of groundwater or ecological SCOs apply, the lower of the applicable protection of the public health SCO or the applicable protection of groundwater or ecological SCO should be achieved to the extent feasible. This evaluation is not bound to the SCOs in regulation or the SSCOs set forth in this guidance but may result in a site-specific soil cleanup level that is between the SCOs or soil cleanup level for two different land uses (e.g., above the restricted residential SCO and below the commercial SCO).

6. RCRA Corrective Action Program: The RCRA program was promulgated to regulate facilities that actively manage hazardous waste. DER administers the RCRA Corrective Action Program, with a goal of achieving soil cleanup levels at Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) that eliminate risks to public health and the environment (i.e., clean the site to unrestricted use) or control said risks (i.e., clean the site or unit(s) to the lowest possible soil cleanup objective, regardless of site use), to the extent feasible. This goal takes into account that certain units at the facility may be permitted to manage hazardous waste under New York State's Hazardous Waste Management (HWM) regulations (6 NYCRR Part 373). The requirements of active HWM facilities, as well as the site's history, will be considered when soil cleanup levels are determined. Selected remedies must be protective of public health and the environment. Soil cleanup levels will be selected using the following procedure.

(a) The remedial party shall evaluate, and if feasible, implement a cleanup utilizing Approach 1. Under this approach, the unrestricted SCOs apply to the entire soil matrix to the top of bedrock. For contaminants not listed in 6 NYCRR 375-6, a new or existing SSCO may be used.

(b) If DEC determines that achieving unrestricted SCOs is not feasible, the remedial party may evaluate other alternatives to remediate the site. In this event, the remedial party may propose soil cleanup levels in accordance with any of the general approaches. However, when considering restricted use soil cleanup levels, the remedial party shall apply the use category which is both feasible and least restricted. For purposes of this discussion, residential use is the least restricted category and industrial use is the most restricted category. A soil cleanup level between two different land uses (e.g., residential and restricted residential) may be determined to be feasible, and if selected, must be achieved.

Any soil cleanup levels specified in regulation (i.e., 6 NYCRR 373-2.6(b)-(k) for “regulated units” as defined in 6 NYCRR 373-2.6 (a)(1)(ii)) or in a DEC enforceable document (Part 373 permits, Consent Orders, etc.) shall take precedence over the soil cleanup levels which could be established through use of this document.

C. Determination of Whether Ecological Resources SCOs Apply to a Site: SCOs developed to protect ecological resources (ESCOs) are incorporated in the Unrestricted Use SCO in 6 NYCRR Table 375-6.8(a) and are included as a separate category in 6 NYCRR Table 375-6.8(b). For contaminants of concern which do not have a calculated ESCO in regulation, DEC may direct the remedial party to develop a soil cleanup level which is protective of ecological resources where appropriate, based on the process outlined in Appendix E of the TSD.

The presence of ecological resources and any impact to those resources will be assessed during the remedial investigation. For sites where there is the potential for an ecological resource impact to be present, or where it is likely to be present, an assessment of fish and wildlife resource impacts will be performed. For sites in DER’s SSF, BCP, VCP and ERP, the assessment will be performed in accordance with DEC’s guidance, *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites*, October, 1994, as described in DER-10, Section 3.10. For sites in the RCRA Corrective Action Program, the assessment will be performed using the above referenced fish and wildlife impact analysis document as guidance, and by consulting with appropriate personnel in DEC’s Division of Fish, Wildlife and Marine Resources.

Soil cleanup levels which are protective of ecological resources must be considered and applied, as appropriate, for the upland soils (not sediment) at sites where DEC determines, based on the foregoing analysis, that:

- ecological resources are present, or will be present, under the reasonably anticipated future use of the site, and such resources constitute an important component of the environment at, or adjacent to, the site;
- an impact or threat of impact to the ecological resource has been identified; and
- contaminant concentrations in soil exceed the ESCOs as set forth in 6 NYCRR 375-6.8(b) or the Protection of Ecological Resources SSCOs contained in this document.

Sites or portions thereof that will be covered by buildings, structures or pavement are not subject to the ESCOs. Further, ecological resources do not include pets, livestock, agricultural or horticultural crops, or landscaping in developed areas. (See 6 NYCRR 375-6.6 for more detail.)

D. Determination of Whether Protection of Groundwater SCOs Apply: SCOs developed to protect groundwater are incorporated in the Unrestricted Use SCOs in 6 NYCRR Table 375-6.8(a) and are included as a separate category in 6 NYCRR Table 375-6.8(b). For contaminants of concern which do not have a protection of groundwater SCO, DEC may direct the remedial party to develop a soil cleanup level which is protective of groundwater using the process in Appendix E of the TSD.

1. Except as provided for in (2) below, the protection of groundwater SCOs will be applicable where:

   (i) contamination has been identified in on-site soil by the remedial investigation; and
   (ii) groundwater standards are, or are threatened to be, contravened by the presence of soil contamination at concentrations above the protection of groundwater SCOs.

2. DEC may provide an exception to the applicability of the protection of groundwater SCOs, as set forth in 6 NYCRR 375-6.5(a)(1), when (i), (ii), and (iii) exist and either (iv) or (v) also apply, as described below.

   (i) The groundwater standard contravention is the result of an on-site source which is addressed by the remedial program.
   (ii) An environmental easement or other institutional control will be put in place which provides for a groundwater use restriction.
   (iii) DEC determines that contaminated groundwater at the site:
      (a) is not migrating, nor is likely to migrate, off-site; or
      (b) is migrating, or is likely to migrate, off-site; however, the remedy includes active groundwater management to address off-site migration.
   (iv) DEC determines the groundwater quality will improve over time.
   (v) The groundwater contamination migrating from the site is the result of an off-site source of contamination, and site contaminants are not contributing consequential amounts to the groundwater contamination.

3. In determining whether to provide the exemption set forth in subparagraph 2 above, DEC will consider:

   (i) all of the remedy selection criteria at 6 NYCRR 375-1.8(h) or in the RCRA Corrective Action program;
   (ii) the amount of time that the groundwater will need to be actively managed for the protection of public health and the environment; and
   (iii) the potential impact that groundwater contamination may have on media not specifically addressed by the SCOs (e.g., vapor intrusion, protection of surface water, and protection of aquatic ecological resources).

E. Supplemental Soil Cleanup Objectives: SSCOs are either existing cleanup levels in Table 1 or are new soil cleanup levels developed by the remedial party as part of its remedial program. These SSCOs are in addition to the SCOs that are included in Part 375.

Existing SSCOs: The Table 1 list of SSCOs includes contaminants from former TAGM 4046 that were not included in 6 NYCRR 375-6.8 and soil cleanup levels developed using the process detailed in Appendix E of the TSD but not promulgated. For those contaminants which were part of the former TAGM 4046, soil cleanup levels exist for the protection of public health (based on ingestion) and for the protection of groundwater. In some cases, to be determined on a site-by-site basis, evaluation of other factors is likely needed for the protection of public health, especially when the use of a site includes residential use.

These other factors include other exposure pathways (e.g., homegrown vegetable ingestion, inhalation and dermal contact), potential non-site exposures to the contaminant and current toxicological data on the contaminant. In these instances, DEC (in consultation with NYSDOH) will determine if the additional factors have been adequately addressed. The SSCOs identified in Table 1 (subject to the limitation described above) may be used as if they were included in Part 375. A remedial party is not required to use the SSCOs set forth in Table 1. In lieu of applying an SSCO, the remedial party may elect to develop a soil cleanup level (using the process described in Appendix E of the TSD and discussed below.) Table 1 also includes SSCOs that were developed for some pathways using the same process detailed in the TSD. A remedial party may elect to use those SSCOs directly or confirm that the calculated value for that pathway is correct.

New SSCOs: The remedial party may elect to, or DEC may direct a remedial party to, develop a contaminant-specific SCO for any contaminant not included in 6 NYCRR Tables 375-6.8(a) or (b). Generally, DEC will request that an SCO be developed only where the contaminant is a predominant contaminant of concern (COC) at the site and is not otherwise being addressed to DEC's satisfaction as part of the proposed remedy. This could happen, for example, when a remedial party is seeking a Track 1 cleanup and non-SCO/SSCO contaminants are present and may not be satisfactorily addressed by the remedial activities addressing the SCOs or SSCOs. Guidance on the process for developing new SCOs is provided in Appendix E of the TSD. DEC will include all newly developed soil cleanup levels, developed and approved pursuant to this paragraph in a revised Table 1. The developed SSCO must:

1. be developed utilizing the same methodologies that were used by DEC to develop SCOs that are set forth in Part 375; and

2. apply the maximum acceptable soil concentrations (caps), as set forth in section 9.3 of the TSD.

F. Use of SCOs and SSCOs as a Screening Tool: The SCOs and SSCOs may be used to identify areas of soil contamination and to determine the extent of soil contamination. As noted in Section V.K, consideration of other media is required to determine if remedial action is needed.

1. At sites or areas of concern where contaminant concentrations are equal to or below the unrestricted SCOs in 6 NYCRR Table 375-6.8(a), no action or study is warranted because of soil contamination.

2. The exceedance of one or more applicable SCOs or SSCOs, (which is the lower of protection of public health, protection of groundwater, or protection of ecological resources soil cleanup objectives as described in Section III below), alone does not trigger the need for remedial action, define “unacceptable” levels of contaminants in soil, or indicates that a site qualifies for any DEC remedial program (e.g., BCP, SSF). As noted in the definition of SCO above, SCOs and SSCOs are applicable statewide and do not account for many site-specific considerations which could potentially result in higher levels. Therefore, soil concentrations that are higher than the applicable SCOs or SSCOs are not necessarily health or environmental concerns.

3. When an applicable SCO or SSCO is exceeded, the degree of public health or environmental concern depends on several factors, including:

   - magnitude of the exceedance;
   - accuracy of the exposure estimates;
   - other sources of exposure to the contaminant; and
   - strength and quality of the available toxicological information on the contaminant.

G. Soil Cleanup Levels for Nuisance Conditions: Experience has shown that contaminants in soil that meets the DEC-approved soil cleanup levels can exhibit a distinct odor or other type of nuisance (e.g., staining). This is true even though the contaminants will not leach from the soil (e.g., certain soils with more insoluble substances at higher concentrations). When DEC determines that soil remaining after the remedial action will result in the continuation of a nuisance (e.g., odors, staining, etc), DEC will require that additional remedial measures be evaluated, and may require additional remedial actions be taken to address the nuisance condition.

H. Subsurface Soil Cleanup for Total Polycyclic Aromatic Hydrocarbons: For non-residential use sites (i.e., commercial or industrial use sites) where the ESCOs are not applicable, DEC may approve a remedial program which achieves a soil cleanup level of 500 parts per million (ppm) for total PAHs for all subsurface soil. The 500 ppm soil cleanup level is in lieu of achieving all of the PAH-specific SCOs in 6 NYCRR 375-6. For purposes of this provision, subsurface soil shall mean the soil beneath permanent structures, pavement, or similar cover systems; or at least one foot of soil cover (which must meet the applicable SCOs). Institutional controls (e.g., an environmental easement) along with a site management plan will be required when this soil cleanup level is employed at a site. This cleanup level is determined to be feasible and protective based on DEC’s experience in its various remedial programs. This approach has existed in TAGM 4046 since it was first issued in 1992.

I. Soil Cleanup for PCBs: DEC may approve a remedial program which achieves a soil cleanup level for PCBs as set forth herein:

1. **For Non-BCP sites:** An acceptable presumptive remedy for soil where neither the unrestricted SCOs nor the ESCOs are applied in the remedial program may include a soil cleanup level for PCBs of 1 ppm in the surface soils and 10 ppm in subsurface soils.

2. **For BCP sites:** An acceptable presumptive remedy for soil may include a soil cleanup level for PCBs of 1 ppm (the applicable SCO) in the surface soils and 10 ppm in subsurface in limited circumstances as follows:

- cleanup track is Track 4;
- site use will be restricted residential, commercial or industrial; and
- ESCOs do not apply.

3. **At industrial use sites,** a level of 25 ppm for PCBs provided that access is limited and individual occupancy is restricted to less than an average of 6.7 hours per week.

For purposes of this provision, subsurface soil shall mean:

- soil beneath permanent structures, pavement, or similar cover systems;
- soil beneath 1 foot of soil cover for commercial and industrial uses; or
- soil beneath 2 feet of soil cover for residential and restricted residential uses.

Institutional controls (i.e., an environmental easement), along with a site management plan, will be required when this soil cleanup level is employed at a site. As with all presumptive remedies, just because a remedy is presumptive does not mean that it will work at every site. For example, this presumptive remedy for PCBs in soil is not applicable at most landfills. This cleanup level is determined to be feasible and protective based on DEC's experience in its various remedial programs. Further, this approach has existed in TAGM 4046 since it was first issued in 1992.

J. Sampling and Compliance with Soil Cleanup Levels: The number of samples to determine if the SCOs have been achieved should be sufficient to be representative of the area being sampled. See attached Table 4 for suggested sampling frequency and subdivision 5.4(e) of DER-10 for details. This frequency can be used for confirmatory samples or for backfill. It is DEC's goal that all confirmatory samples demonstrate that the remedy has achieved the DEC-approved soil cleanup levels. However, recognizing the heterogeneity of contaminated sites and the uncertainty of sampling and analysis, DEC project manager has limited discretion to determine that remediation is complete where some discrete samples do not meet the soil cleanup levels established for a site. See DER-10 for more information regarding the determination that remediation is complete.

K. Other Considerations: All remedies must be fully protective of public health and the environment and prevent off-site migration to the extent feasible with special emphasis for the prevention or minimization of migration onto adjacent residential properties or into ecological resources. A remedial party is required to investigate all environmental media including soil, groundwater, surface water, sediments, soil vapor, indoor air, and biota. (See 6 NYCRR 375-1.8(a)(6) or RCRA Corrective Action Program). This investigation will determine if any of the referenced media are, or may be, impacted by site contamination. However, the SCOs do not directly address these other media. DEC may require remedial actions to address such media and impacts, including but not limited to the application of lower soil cleanup levels or buffer zones where it determines, based on the investigation, that any of these media are, or may be, impacted by site contamination.

VI. Related References:

- ♦ Environmental Conservation Law, Article 27 Titles 3, 5, 9, 13 and 14.
- ♦ Article 12 of the Navigation Law, Section 178.

- 6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.
- 6 NYCRR Subparts 373-1, 373-2 and 373-3, Requirements for Hazardous Waste Management Facilities. September 6, 2006.
- 6 NYCRR Part 611, Environmental Priorities and Procedures in Petroleum Cleanup and Removal. November 5, 1984 (amended).
- Development of Soil Cleanup Objectives: Technical Support Document. New York State Department of Environmental Conservation. December 14, 2006.
- Supplemental Guidance to RAGS: Calculating the Concentration Term. United States Environmental Protection Agency. Publication 9285.7-081. May 1992.
- New York State Guidelines for Urban Erosion and Sediment Control. 1997.
- Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites. New York State Department of Environmental Conservation. October 1994.
- Program Policy DER-2, *Making Changes to Selected Remedies*. New York State Department of Environmental Conservation. April 1, 2008.
- Program Policy DER-10, *Technical Guidance for Site Investigation and Remediation*. New York State Department of Environmental Conservation. May 3, 2010.
- Program Policy DER-15, *Presumptive/Proven Remedial Technologies*. New York State Department of Environmental Conservation. February 27, 2007.

TABLES

1 - Supplemental Soil Cleanup Objectives
2 - Soil Cleanup Levels for Gasoline Contaminated Soils
3 - Soil Cleanup Levels for Fuel Oil Contaminated Soils
4 - Recommended Number of Soil Samples for Soil Imported to or Exported From a Site

Table 1

Supplemental Soil Cleanup Objectives
(ppm)

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
METALS							
Aluminum	7429-90-5					10,000 [a,b]	
Antimony	7440–36-0					12[c]	
Boron	7440-42-8					0.5	
Calcium	7440-70-2					10,000 [a,b]	
Cobalt	7440-48-4	30				20	
Iron	7439-89-6	2,000					
Lithium	7439-93-2					2	
Molybdenum	7439-98-7					2	
Technetium	7440-26-8					0.2	
Thallium	7440-28-0					5 [c]	
Tin	7440-31-5					50	
Uranium	7440-61-1					5	
Vanadium	7440-62-2	100 [a]				39[b]	
PESTICIDES							
Biphenyl	92-52-4					60	
Chlordecone (Kepone)	143-50-0					0.06	
Dibenzofuran	132-64-9						6.2
2,4-D (2,4-Dichloro-phenoxyacetic acid)	94-75-7	100 [a]					0.5
Furan	110-00-9					600	
Gamma Chlordane	5103-74-2	0.54					14
Heptachlor Epoxide	1024-57-3	0.077					0.02
Methoxychlor	72-43-5	100 [a]				1.2	900

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
Parathion	56-38-2	100 [a]					1.2
2,4,5-T	93-76-5	100 [a]					1.9
2,3,7,8-TCDD	1746-01-6					0.000001	
2,3,7,8-TCDF	51207-31-9					0.000001	
SEMIVOLATILE ORGANIC COMPOUNDS							
Aniline	62-53-3	48	100[a]	500[a]	1000[a]		0.33[b]
Bis(2-ethylhexyl) phthalate	117-81-7	50				239	435
Benzoic Acid	65-85-0	100[a]					2.7
Butylbenzyl-phthalate	85-68-7	100 [a]					122
4-Chloroaniline	106-47-8	100 [a]					0.22
Chloroethane	75-00-3						1.9
2-Chlorophenol	95-57-8	100 [a]				0.8	
3-Chloroaniline	108-42-9					20	
3-Chlorophenol	108-43-0					7	
Di-n-butyl-phthalate	84-74-2	100 [a]				0.014	8.1
2,4-Dichlorophenol	120-83-2	100 [a]				20	0.40
3,4-Dichlorophenol	95-77-2					20	
Diethylphthalate	84-66-2	100 [a]				100	7.1
Di-*n*-hexyl-phthalate	84-75-3					0.91	
2,4-Dinitrophenol	51-28-5	100 [a]				20	0.2
Dimethylphthlate	131-11-3	100 [a]				200	27
Di-n-octylphthlate	117-84-0	100 [a]					120
1,2,3,6,7,8-HCDF	57117-44-9					0.00021	
Hexachloro-benzene	118-74-1	0.41					1.4
2,6-Dinitrotoluene	606-20-2	1.03					1.0
Isophorone	78-59-1	100 [a]					4.4

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
4-methyl-2-pentanone	108-10-1						1.0
2-methyl-naphthalene	91-57-6	0.41					36.4
2-Nitroaniline	88-74-4						0.4
3-Nitroaniline	99-09-2						0.5
Nitrobenzene	98-95-3	3.7	15	69	140	40	0.17[b]
2-Nitrophenol	88-75-5					7	0.3
4-Nitrophenol	100-02-7					7	0.1
Pentachloroaniline	527-20-8					100	
2,3,5,6-Tetrachloroaniline	3481-20-7					20	
2,3,4,5-Tetrachlorophenol	4901-51-3					20	
2,4,5-Trichloroaniline	636-30-6					20	
2,4,5-Trichlorophenol	95-95-4	100 [a]				4	0.1
2,4,6-Trichlorophenol	88-06-2					10	
VOLATILE ORGANIC COMPOUNDS							
2-Butanone	78-93-3	100 [a]					0.3
Carbon Disulfide	75-15-0	100 [a]					2.7
Chloroacetamide	79-07-2					2	
Dibromochloro-methane	124-48-1					10	
2,4-Dichloro aniline	554-00-7					100	
3,4-Dichloroaniline	95-76-1					20	
1,2-Dichloropropane	78-87-5					700	
1,3-Dichloropropane	142-28-9						0.3
2,6-Dinitrotoluene	606-20-2	1.03					0.17[b]
Ethylacetate	141-78-6					48	

Contaminant	CAS Number	Residential	Restricted Residential	Commercial	Industrial	Protection of Ecological Resources	Protection of Ground-water
4-methyl-2-pentanone	108-10-1						1.0
113 Freon (1,1,2- TFE)	76-13-1	100 [a]					6
isopropylbenzene	98-82-8	100 [a]					2.3
p-isopropyltoluene	99-87-6						10
Hexachlorocyclo-pentadiene	77-47-4					10	
Methanol	67-56-1					6.5	
N-nitrosodiphenyl-amine	86-30-6					20	
Pentachloro-benzene	608-93-5					20	
Pentachloronitro-benzene	82-68-8					10	
Styrene	100-42-5					300	
1,2,3,4-Tetrachlorobenzene	634-66-2					10	
1,1,2,2-Tetrachloroethane	79-34-5	35					0.6
1,1,2,2-Tetrachloroethylene	127-18-4					2	
1,2,3-Trichlorobenzene	87-61-6					20	
1,2,4-Trichlorobenzene	120-82-1					20	3.4
1,2,3-Trichloropropane	96-18-4	80					0.34

[a] SCOs for organic contaminants (volatile organic compounds, semivolatile organic compounds, and pesticides) are capped at 100 ppm for residential use, 500 ppm for commercial use, 1000 ppm for industrial use. SCOs for metals are capped at 10,000 ppm.

[b] Based on rural background study

[c] SCO limited by contract required quantitation limit.

Table 2

Soil Cleanup Levels for Gasoline Contaminated Soils

Contaminant	CAS Registry Number	Soil Cleanup Level (ppm)
Benzene	71-43-2	0.06
n-Butylbenzene	104-51-8	12.0
sec-Butylbenzene	135-98-8	11.0
Ethylbenzene	100-41-4	1.0
Isopropylbenzene	98-82-8	2.3
p-Isopropyltoluene	99-87-6	10.0
Methyl-Tert-Butyl-Ether	1634-04-4	0.93
Naphthalene	91-20-3	12.0
n-Propylbenzene	103-65-1	3.9
Tert-Butylbenzene	98-06-6	5.9
Toluene	108-88-3	0.7
1,2,4-Trimethylbenzene	95-63-6	3.6
1,3,5-Trimethylbenzene	108-67-8	8.4
Xylene (Mixed)	1330-20-7	0.26

Table 3

Soil Cleanup Levels for Fuel Oil Contaminated Soil

Contaminant	CAS Registry Number	Soil Cleanup Level (ppm)
Acenaphthene	83-32-9	20
Acenaphthylene	208-96-8	100
Anthracene	120-12-7	100
Benz(a)Anthracene	56-55-3	1.0
Dibenzo(a,h)Anthracene	53-70-3	0.33
Benzene	71-43-2	0.06
n-Butylbenzene	104-51-8	12.0
sec-Butylbenzene	135-98-8	11.0
Tert-Butylbenzene	98-06-6	5.9
Chrysene	218-01-9	1.0
Ethylbenzene	100-41-4	1.0
Fluoranthene	206-44-0	100
Benzo(b)Fluoranthene	205-99-2	1.0
Benzo(k)Fluoranthene	207-08-9	0.8
Fluorene	86-73-7	30
Isopropylbenzene	98-82-8	2.3
p-Isopropyltoluene	99-87-6	10.0
Naphthalene	91-20-3	12.0
n-Propylbenzene	103-65-1	3.9
Benzo(g,h,i)Perylene	191-24-2	100
Phenanthrene	85-01-8	100
Pyrene	129-00-0	100
Benzo(a)Pyrene	50-32-8	1.0
Indeno(1,2,3-cd)Pyrene	193-39-5	0.5
1,2,4-Trimethylbenzene	95-63-6	3.6
1,3,5-Trimethylbenzene	108-67-8	8.4
Toluene	108-88-3	0.7
Xylene (Mixed)	1330-20-7	0.26

Table 4

Recommended Number of Soil Samples for Soil Imported To or Exported From a Site

Contaminant	**VOCs**[a]	**SVOCs, Inorganics & PCBs/Pesticides**	
Soil Quantity (cubic yards)	**Discrete Samples**	**Composite**	**Discrete Samples/Composite**
0-50	1	1	Each composite sample for analysis is created from 3-5 discrete samples from representative locations in the fill.
50-100	2	1	
100-200	3	1	
200-300	4	1	
300-400	4	2	
400-500	5	2	
500-800	6	2	
800-1000	7	2	
➢ 1000	Add an additional 2 VOC and 1 composite for each additional 1000 Cubic yards or consult with DER.[b]		

[a] VOC samples cannot be composited. Discrete samples must be taken to maximize the representativeness of the results.

[b] For example, a 3,000 cubic yard soil pile to be sampled and analyzed for VOCs would require 11 discrete representative samples. The same pile to be sampled for SVOCs would require 4 composite samples with each composite sample consisting of 3-5 discrete samples.

533 E. Sherman Street
Marion, Indiana 46952
765-251-9015 Office
888-448-7649 Fax
www.noblemetalses.com
admin@noblemetalses.com

Noble Metals Extraction Systems, LLC

Dear Mr. Papworth:

As per our conversation in early August and as referenced in your letter of August 12, 2014 I have prepared a brief Statement Of Work (SOW) for the Lower Ley Creek Subsite of the Onondaga Lake Superfund Site, Syracuse, NY.

Materials identified for this SOW were obtained from the Final Feasibility Study Report Lower Ley Creek Subsite Of The Onondaga Lake Superfund Site, Syracuse NY. EPA Contract No: EP-W-10-007 and data obtained from the New York State Department Of Environmental Conservation.

Attached you will find a copy of any pages referenced form the Feasibility Study for your convenience.

Respectfully,

John Burns

John Burns
Noble Metals Extraction Systems, LLC
775-846-9588 Cell

Noble Metals Statement of Work
For Lower Ley Creek Sub Site and Wastbeds 9-15
At the Onondaga Lake Superfund Sites, Syracuse New York

August 21, 2014

1. PURPOSE

This Statement of Work (SOW) sets forth an alternative approach to remediate soils and sediments containing hazardous substances, pollutants or contaminants as defined in Appendix B of the FINAL FEASIBILITY REPORT LOWER LEY CREEK SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE, SYRACUSE NY. EPA Contract No:EP-w-10-007 (See Attachment). This SOW contains the following:

a. A brief description of the equipment required.
b. A description of its function.
c. An estimate of the total volume of material to be processed on a per weekly basis.
d. An estimate of operating cost per cubic yard.
e. A cost estimate to manufacture and assemble a complete remediation system with all site specific requirements in place.
f. A list of potential environmental and economic advantages and a time line of engineering, construction and on site assembly.

1.1 REMEDIAL ALTERNATIVE

While thermal treatment of soils or sediments to remove hazardous substances, pollutants or contaminants has been an accepted remedial alternative for organic analytes, it is typically not used where metals are the source of contamination. However, the metals extraction industry has had to deal with more complex ores over the past thirty years. As a result, thermal treatment of soils and sediments has become the method of choice in the industry. We combine the equipment and methodology used in thermal treatment of soils with highly efficient metal extraction equipment and methodology. As a result, we have an efficient system that can effectively deal with a variety of soil conditions.

1.2 SYSTEM OPERATION

Noble Metals remediation of soils or sediment containing hazardous substances, pollutants or contaminants is to first heat them (to a temperature typically used in mining applications to deal with sulfides) to approximately 800 degrees F. The organic analytes along with several of the metal analytes such as Mercury, Lead and Cadmium will be volatized and drawn off entering an oxidizer. The oxidizer operating at approximately 2000 degrees F breaks down the volatized analytes into toxicants and carcinogens which are then captured and stabilized. The soil or sediment then passes thru a heat exchanger which cools the material to a temperature of approximately 150 degrees F. The remaining metals are them removed using standard mining methods appropriate to the metal analytes.

1.2.1 DESCRIPTION OF DISCHARGED MATERIALS

There are three categories of material discharged from the integrated system
.

a. Stabilized Toxicants and Carcinogens.
b. Base Metal Concentrates
c. Sterile Soil Matrix

The stabilized toxicants and carcinogens are easily disposed, typically in land fills. The base metal concentrates and the soil matrix both have economic value and can be sold to offset a portion of the costs.
The generation of electricity using the heat exchanger as a power source is also available. This is often used in remote locations to augment valuable consumables such as fuel for generators and could provide an additional income stream to help offset project costs.

1.3 PRODUCTION RATE

System design is based on a production capacity of 1000 tons per 24 hour day. Maintenance, weather conditions and other typical operating challenges may reduce the actual rate somewhat.

1.4 OPERATING COST

Direct operating costs of integrated systems used in the mining industry range from $90.00.00 to $135.00.00 per cubic yard. Considering the analytes listed in Appendix B (See Attachment) operational cost should trend toward the lower side of this range.

1.5 ENGINEERING, SITE SPECIFIC MODIFICATIONS, CONSTRUCTION AND ON SITE ASSEMBLY

A commercial operation history of more than 20 years world wide has created a vast data base covering many different soil and sediment conditions. The list of analytes from Appendix B (See Attachment) would not indicate the need for extensive research and development. It should require little engineering other than that required for integration of site specific modifications to existing designs. The construction of specific equipment not commercially available will be done at our facility in Marion Indiana. While no specific site has yet been determined, several locations currently exist which will be good candidates.

1.6 ENGINEERING, SITE SPECIFIC MODIFICATIONS, CONSTRUCTION AND ON SITE ASSEMBLY COSTS

Total cost will be greatly affected by the availability of key components required to assemble a complete integrated system. Based on current availability of key components cost should fall in a range of $7,000,000.00 to $10,000,000.00 USD.

A site evaluation fee of $750,000 will be required to facilitate an on-site evaluation. The site evaluation will include laboratory testing of bulk samples(to establish the site specific engineering criteria), overall engineering for site specific modifications. Noble Metals will reserve key components where available, and establish a representative model. We will also provide support and attendance at all public comment hearings if required. This fee will be applied to the cost of the integrated system and applied as a partial prepaid deposit amount. Should no further actions beyond the scope described above be required Noble Metals shall retain the fee as payment in full for services rendered.

1.7 ENVIRONMENTAL AND ECONOMIC ADVANTAGES

An environmental advantage is obtained by the elimination of and or reduction of analyte levels to meet Human Health Risk Assessment as obtained from Table 2,C. of the FINAL FEASIBILITY STUDY REPORT (See Attachment). This will reduce or eliminate any potential for contamination in the future.

There will be positive economic advantages for the local economy by the creation of well-paid long term jobs, the supply of commercially viable by-products, and the potential to supply electricity to the power grid. This equipment has a production life regularly exceeding 20 years and could be used for remediating waste beds 9-15. This could provide an ongoing economic benefit for the community.

1.8 TIME LINE OF ACTION

a. Present to October 1, 2014. Site evaluation, sample acquisition

b. October 1, 2014 to November 30, 2014. Laboratory testing of bulk samples to establish minimum engineering criteria, engineering, reservation of available key components, and a model construction.

c. December 1, 2014 to December 15 2014. Provide a new SOW and scope of effort based upon tests results along with a follow-on contract.

d. December 16, 2014 to April 30, 2015. Acquisition, construction and site specific modifications competed and ready for shipment to site.

NOBLE METALS EXTRACTION SYSTEMS, LLC

e. May 1, 2015 to May 31, 2015. On site assembly.

f. June 1, 2015. Integrated system available to accept soils and sediments.

John Burns, General Manager
Noble Metals Extraction Systems, LLC

765-25`-9007 Main Office
888-448-7649 Fax
775-846-9588 Cell

APPENDIX B

DEVELOPMENT OF SOIL AND SEDIMENT PRELIMINARY REMEDIATION GOALS

LOWER LEY CREEK SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE, SYRACUSE, NY

1.0 PRG CALCULATION SUMMARY

This appendix presents the information and rationale used in the identification of PRGs for the FS. PRGs were calculated following the assumptions and information (e.g., exposure assumptions, ingestion rates, etc.) presented in the HHRA and BERA. The Human Health and Ecological PRGs are presented in Table 1 and Table 2, respectively. The Human Health and Ecological PRG calculations are detailed in Tables 1.A through 1.J and Tables 2.A through 2.F, respectively.

1.1 HUMAN HEALTH PRGS

PRGs were calculated for exposure to all identified site COCs in site soil, sediment, and fish tissue. Site COCs were identified as contaminants contributing a cancer risk exceeding 1E-05 to a cumulative cancer risk greater than 1E-04, or a contaminant that contributed substantially to a non-cancer target organ hazard index (HI) greater than 1. Identification was based on the reasonable maximum exposure (RME) scenarios. To be consistent with the baseline HHRA, the inhalation exposure route was not considered in the PRG calculations. Because inhalation generally contributes negligibly to overall risk, this approach is appropriate.

1.1.1 Soil

The following COCs were identified for the site soil: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-c,d)pyrene, chromium, PCB-1248, and PCB-1260. The majority of the COCs were identified because of excessive contributions to cumulative cancer risks. PCB-1260 was identified solely because of contributions to non-cancer hazards.

For each of these COCs, PRGs were calculated for the following receptors: Adult Recreational Visitor, Older Child Recreational Visitor (6 to 16 years old), Younger Child Recreational Visitor (less than 6 years old), and Construction Worker. Calculated soil PRGs for these receptors are presented in Table 1, along with the New York Remedial Program Soil Cleanup Objectives. These values were compared to the calculated PRGs to identify the most conservative proposed cleanup level for each COC (most conservative PRG is shaded).

1.1.2 Sediment

The following COCs were identified in site sediment for at least one site receptor: 3-methylcholanthrene, benzo(a)pyrene, dibenzo(a,h)anthracene, PCB-1260, and vanadium. For each of these COCs (where applicable), PRGs were calculated for the following receptors: Adult Recreational Visitor, Older Child Recreational Visitor (6 to 16 years old), and Younger Child Recreational Visitor (less than 6 years old). PRGs were not calculated for the Construction Worker because no COCs were identified for this receptor. Calculated sediment PRGs for these receptors are presented in Table 1. New York sediment screening values (for sediment direct contact) are not available. Accordingly, the most conservative calculated PRG is identified as the proposed PRG for each COC (most conservative PRG is shaded).

1.1.3 Fish Tissue

The following COCs were identified for exposure to fish tissue: PCB-1254, PCB-1260, total PCBs, total dioxins/furans (as TEQ), dieldrin, arsenic, chromium, and mercury. For these COCs, PRGs were calculated for the Adult Recreational Visitor, Older Child Recreational Visitor (6 to 16 years old), and Younger Child Recreational Visitor (less than 6 years old). PRGs were not calculated for the Construction Worker because this exposure pathway was identified as incomplete.

After the calculation of fish tissue PRGs (mg/kg fish tissue), an associated sediment PRG concentration (mg/kg sediment) was calculated using site-specific biota-sediment accumulation factors (BSAFs). This sediment PRG concentration is protective of the fish ingestion pathway. Site-specific BSAFs were calculated by dividing the fish tissue exposure point concentration (EPC) for each contaminant by the sediment EPC. These EPCs (95% UCLs) were obtained from the Lower Ley Creek BERA. The calculation of fish tissue PRGs is detailed in Tables 1.H through 1.J.

Calculated fish tissue PRGs (in both mg/kg of fish tissue and mg/kg of sediment) are presented in Table 1. Also presented in Table 1 are the New York Sediment Screening Criteria for Human Health Bioaccumulation (mg/kg of sediment). These values were compared to the calculated PRGs to identify the most conservative proposed cleanup level for each COC (most conservative PRG is shaded).

1.2 ECOLOGICAL PRGS

Ecological PRGs were calculated or identified for the ecological receptors and sediment COCs identified in the BERA. These PRGs are summarized in Table 2. In addition, soil at Lower Ley Creek was evaluated with respect to ecological receptors to determine the extent of potential risk associated with exposure of ecological receptors to site surface soil. These evaluations are discussed below.

1.2.1 Sediment

Ecological receptors identified within the BERA as having potential risk from exposure to site sediment include upper level trophic receptors (piscivorous mammals and birds) and benthic invertebrates. For upper trophic level receptors, PRGs were calculated (using a food web) to be protective of the mink (piscivorous mammal) and belted kingfisher (piscivorous bird). These two receptors were the most conservative of the four evaluated in the BERA. The food web calculations (presented in Table 2.A) incorporated direct contact with sediment (ingestion of sediment), bioaccumulation of sediment in fish tissue (ingestion of fish tissue), and direct contact with surface water (ingestion of surface water). All exposure parameters for the food web calculations (e.g., sediment ingestion rates, diet composition, body weight, etc.) were obtained from the BERA. To provide risk management information, two PRGs were calculated for each COC: one based on the LOAEL and one based on the NOAEL. The BSAFs were calculated from the sediment and fish tissue concentrations presented in the BERA.

Several inorganics and total PAHs were identified within the BERA (benchmark screening) as posing a potential threat to benthic invertebrates via exposure to site sediment. These COCs include arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc, and total PAHs. Within the BERA, "no effect" concentrations were identified via toxicity testing for each of the identified COCs. These concentrations are presented in detail in Table 2.B and are identified as the proposed PRGs for the benthic invertebrate receptor.

The food web and benthic invertebrate PRGs are summarized in Table 2. Also presented in Table 2 are the New York Sediment Screening Criteria for Metals, for Benthic Aquatic Life (Chronic Toxicity), and for Wildlife Bioaccumulation. These values were compared to the calculated PRGs to identify the most conservative proposed cleanup level for each COC (most conservative PRG is shaded).

1.2.2 Soil

Because soil was not evaluated in the BERA, this PRG evaluation also evaluated potential risk to ecological receptors from exposure to site soil. For this evaluation, maximum surface soil concentrations of all detected analytes (obtained from the Human Health Risk Assessment, Table 2s) were compared to benchmark values protective of ecological receptors. This evaluation is presented in Table 2.C. Benchmark values were obtained from U.S. EPA Eco-SSLs, New York Soil Cleanup Objectives for Protection of Ecological Resources, and U.S. EPA Region 5 Ecological Soil Screening Levels. Precedence was given to the Eco-SSLs in the screening process.

As shown in Table 2.C, the maximum detected soil concentration of the following analytes exceeded the associated benchmark screening level:

Metals

- Antimony
- Barium
- Cadmium
- Chromium
- Copper
- Lead
- Manganese
- Mercury

Organics

- Butylbenzylphthalate
- Di-n-butylphthalate
- Endrin
- DDT and Metabolites
- PCB-1248
- PCB-1260
- High molecular weight PAHs
- Low molecular weight PAHs

Metals

- Nickel
- Selenium
- Silver
- Vanadium
- Zinc

Organics

The vanadium and manganese results may reflect natural soil conditions. In addition, maximum barium, selenium, and dibutyl phthalate concentrations only slightly exceeded their screening values. It is unlikely these analytes would pose a significant ecological threat.

6.0 GENERAL RESPONSE ACTIONS AND APPLICABLE SCREENING TECHNOLOGIES

This section includes identification and review of GRAs and potentially applicable remedial technologies and process options for the contaminated media of concern (sediment and soil). GRAs are initial broad response actions considered to address the preliminary RAOs for the contaminated media identified as a concern at the site. GRAs include several remedial categories, such as containment, removal, disposal, and treatment of contamination for each medium of concern. Site-specific GRAs are first developed to satisfy the preliminary RAOs for the contaminated media and then are evaluated as part of the identification and screening of remedial technologies and process options for the contaminated media.

6.1 GENERAL RESPONSE ACTIONS

The GRAs considered for remediation of the media of concern (sediment and soil) are listed below:

- No Action;
- Institutional Controls;
- Monitored Natural Restoration;
- Containment and Engineering Controls;
- Removal (dredging/excavating) and Disposal;
- In Situ Treatment; and
- Ex Situ Treatment.

These GRAs and their associated remedial technologies are presented in Table 6.1 and discussed below from the generally least active (e.g., no action) to the most active.

6.1.1 No Action

Under the no action alternative, no remedial action would be implemented. The no action alternative reflects Site conditions as described in the baseline risk assessments (SERAS, 2012). No action was retained as a GRA to serve as a baseline for comparison with other methods, technologies, and process options.

6.1.2 Institutional Controls

Institutional controls are activities that do not involve active remediation. In most cases, these are activities, documents, informational devices, or legal restrictions that minimize, limit, or prevent human exposures to COPCs. This GRA can include physical site activities such as installation of warning signs, fencing, and surveillance. It can also include purely legal documents and methods of public communication such as deed restrictions, new regulations, and fishing advisories.

Institutional controls are widely recognized as a potential remedial technology for sediment sites (EPA, 2002). However, these controls are often only suitable when used in combination with other, more active remedial technologies. Further, the NCP preamble states that institutional controls are not intended to be a substitute for active response measures unless such measures are not practicable. Thus, institutional controls should be viewed as a means to further reduce risks where other technologies are infeasible, partially effective, or require some period of time before they become effective.

EPA has placed institutional controls into four broad categories:

- Governmental Controls;
- Property Controls;
- Enforcement Tools; and
- Informational Devices.

The specific technologies or activities recognized by EPA as most applicable to sediment sites (EPA, 2002) are:

- Fish consumption advisories and commercial fishing bans;
- Waterway use restrictions; and
- Land use restriction/structure maintenance.

Based on these categories and general information on the creek, institutional controls that may be applicable to Lower Ley Creek include use restrictions preventing exposure to or disturbance of sediments or other impacted media, such as:

- Health advisories regarding specific activities; and
- Bans on, or permit requirements for, dredging and/or certain waterfront improvements or alterations.

As a tributary of Onondaga Lake, Lower Ley Creek is currently under a New York State Department of Health (NYSDOH) fish advisory. This advisory recommends that women under age 50 and children under the age of 15 eat no fish of any species. For older women and adult males, the advisory recommends the following:

- Eat no largemouth and smallmouth bass over 15 inches, carp, channel catfish, white perch, and walleye;
- Eat up to four meals per month of brown bullhead and pumpkinseed; and
- Eat up to one meal per month of all other fish.

6.1.3 Monitored Natural Recovery

Natural restoration involves allowing natural processes to decrease the concentration, mobility, bioavailability, toxicity, and/or exposure of chemicals. Generally, it is allowed to occur over a given time frame and is expected to achieve specified goals within that time frame. Natural restoration always includes a monitoring component to confirm that decreases in chemical concentrations or exposures are actually taking place as expected. It also includes contingency planning procedures if sufficient natural recovery is not observed. Such contingency planning might involve a range of activities from additional monitoring to implementing more active remedial technologies.

MNR can occur through a variety of physical, chemical, and biological processes that act alone or in combination to reduce chemical concentrations, exposure, and/or mobility in sediments. MNR usually includes the following primary mechanisms that affect the surface of the sediment bed:

- Mixing of incoming clean sediments from the water column with creek sediment chemicals, causing dilution of the chemical concentrations (often the first step before burial);
- Burial of creek sediments containing chemicals by incoming clean sediments from the water column;
- Degradation of organic compounds within sediments;
- Reduction of chemical mobility and/or toxicity by conversion to less toxic forms and/or forms that are more highly adsorbed to creek sediments;
- Diffusion/advection of chemicals to the water column (i.e., loss to the water column); and
- Transport of sediments containing chemicals and dispersion over wider areas at lower concentrations.

It is important to note that these processes are interrelated and do not always work synergistically. For example, if sediments from the water column containing high chemical concentrations are settling onto creek sediments, these chemical inputs may offset any decreases in sediment chemical concentrations caused by burial, diffusion/advection, and/or degradation. This is why source control is a necessary first step in any MNR scenario. The last two of these MNR mechanisms may not always be desirable. Clearly, dispersion of chemicals over wider adjacent areas or to other media that increases toxicity in those areas and media cannot be considered natural recovery. Thus, it is important that natural recovery evaluations considering these processes evaluate the potential impact of substantial reduction in one area or medium to toxicity and risks elsewhere in the system.

Reduction of chemical mobility and/or toxicity by conversion as well as degradation is highly dependent on a number of factors, including the type of chemicals present, concentrations of those chemicals, and the rates of any conversion or degradation processes. Consequently, MNR may not degrade or reduce the toxicity of contaminated sediments in many circumstances. In some cases (such as heavy metals), the primary mechanism of MNR is isolation by burial over time.

6.1.4 Containment and Engineering Controls

Sediment containment technologies can reduce potential exposure to human and ecological receptors by preventing direct contact with contaminated sediments/soils and reducing the flux of chemicals into the water column. The most common containment technology is capping. Variations of capping technology can include:

- Engineered sediment cap with erosion controls;
- Engineered capping with reactive materials; and
- Thin-layer capping (for sediments and soils).

6.1.4.1 Granular Material Sediment Cap

A granular material sediment cap includes the installation of a granular material (sand) sediment cap over contaminated sediments. In areas of high erosion potential, granular material sediment caps consist of an armor stone layer overlying a sand isolation layer. Finally, a 2 ft habitat layer is placed on top of the cap to facilitate the re-colonization of the stream bottom by native species. Before the placement of any capping material, excavation of sediment is usually conducted to maintain the current bathymetry of the water body.

6.1.4.2 Engineered Bentonite Cap

An engineered bentonite cap is designed to hydrate and form a continuous and highly impermeable isolation layer over contaminated sediments. Engineered bentonite caps are typically produced for application in relatively shallow, freshwater to brackish, generally nearshore environments and is comprised of bentonite clay with polymer additives covering a small aggregate core. The bentonite clay is comprised principally of montmorillonite, and the proprietary polymer is added to further promote the adhesion and coalescing of clay particles to the aggregate core. The aggregate core is used essentially for weighting to promote the sinking of the material to the sediment surface. An engineered bentonite cap functions by hydrating, swelling, and forming a continuous and highly impermeable isolation layer above contaminated sediments. After the placement of the bentonite, a 2 ft habitat layer is placed on top of the cap to facilitate the re-colonization of the stream bottom by native species. Before the placement of any capping material, excavation of sediment is usually conducted to maintain the current bathymetry of the water body.

6.1.5 Removal and Disposal

Removal includes dredging/excavating contaminated sediments/soils from their existing location and consolidating/disposing the sediments/soils in a new location that minimizes the mobility, exposure, or impacts to human health and the environment. It is one of the most commonly evaluated and implemented contaminated sediment remediation technologies (EPA, 2002). Removal and on-site consolidation or off-site disposal are presented in Table 6.1 as separate GRAs, but in reality, they can only occur in combination.

6.1.5.1 Dredging (Sediments)

Sediment may be removed from a water body using various dredging techniques (Herbich, 2000). Dredging involves mechanically penetrating, grabbing, raking, cutting, and/or hydraulically scouring the bottom of a water body to dislodge and remove sediment. After the sediment has been dislodged, it is lifted out of the water body either mechanically, as with a clamshell bucket, or hydraulically through a pipeline. Dredging at a site can also be based on a combination of mechanical and hydraulic methods. Hybrid dredges can remove sediments by either mechanical or hydraulic means, depending on site conditions. Pneumatic dredges, a subset of hydraulic dredges, use compressed air systems to remove sediments. Hybrid and pneumatic dredges are generally less available than purely mechanical or hydraulic systems. In addition, their historical use at contaminated sediment projects is relatively limited.

6.1.5.2 Excavation (Sediments and Soils)

Dry excavation of sediments involves isolating an area using a temporary dam, removing the enclosed surface water, and excavating the contaminated sediment with conventional earthwork equipment. Wet excavation of sediments can also be conducted by excavating the contaminated sediment while it is submerged in the water using conventional earthwork equipment. The equipment may need to be placed on support mats to avoid sinking in the soft sediments during construction. This technique allows a visual verification that the appropriate sediment is being removed. It also significantly reduces the amount of sediment dewatering required and eliminates the short-term problem of sediment resuspension in the water column during removal.

Impacted soil along the shores of Lower Ley Creek can also be removed by excavating soil with conventional earthwork equipment.

6.1.6 In Situ Treatment

In situ treatment can include a number of methods that alter sediments and soils in their existing environment to reduce chemical concentration, mobility, bioavailability, and/or toxicity. Table 6.1 lists the primary treatment categories. Agents added to the sediment can include energy, chemicals, microorganisms, or plants. In some cases, the treatment may involve physical mixing or other manipulation of the media. Some forms of in situ treatment require isolation (via berms or dams) of the area to be treated to prevent loss of chemicals or other agents to surrounding areas. In addition, as with any invasive remediation technology, any existing habitats or biological communities would be impacted in the short-term during in situ treatment implementation.

6.1.7 Ex Situ Treatment

Table 6.1 reviews the various ex situ treatment technologies in detail; this detailed review is only summarized in the following text. This technology is often considered separately from removal, but in reality, ex situ treatment and removal must occur in combination. Once removed and treated, the sediments/soils must be managed by placement in a suitable location. If the media have been rendered non-toxic, some form of beneficial reuse can also be considered. Because removal and placement technologies have been previously described, this subsection focuses on the treatment phase of such an application.

There is a vast array of different treatment types, and as with in situ treatment, they reduce the concentration, mobility, bioavailability, and/or toxicity of the chemicals present in the media of concern. Depending on the physical and chemical characteristics of the media after the treatment process, sediments and soils might have a variety of end uses or placement options.

6.2 INFORMATION SOURCES USED TO IDENTIFY REMEDIAL TECHNOLOGIES

Various databases, technical reports, and publications, were used to identify and evaluate remedial technologies for use at the Lower Ley Creek site including:

- Superfund Innovative Technology Evaluation (SITE) Program (EPA, 1999);
- Selecting Remediation Techniques for Contaminated Sediment (EPA, 1993);
- Assessment and Remediation of Contaminated Sediments (ARCS) Program Remediation Guidance Document (EPA, 1994);
- EPA Hazardous Waste Clean-up Information (CLU-IN) web site (EPA, 2000a);
- EPA Remediation and Characterization Innovative Technologies (EPA REACH IT) database (EPA, 2000b);
- Federal Remediation Technologies Roundtable (FRTR, 1999) web site; and
- Remediation Technologies Network (RTN) Remediation Information Management System (RIMS) (RIMS, 2000) Database.

The SITE Program was created by EPA to encourage the development and use of innovative treatment and monitoring technologies. Under the program, EPA works with and supports technology developers who research, refine, and demonstrate innovative technologies at hazardous waste sites. SITE demonstration project information is compiled and can be used as a reference guide on innovative treatment technologies.

The ARCS Program was initiated in 1987 by EPA's Great Lakes National Program Office (GLNPO) to address sediment contamination in the Great Lakes. The ARCS program consisted of a 5-year study and demonstration projects relating to the treatment of contaminated sediments. The ARCS remediation guidance document is a product of the ARCS Program, and was prepared by the Engineering/Technology Work Group (ETWG), a working committee under the ARCS Program. The guidance document provides information on the selection, design, and implementation of sediment remediation technologies, including feasibility evaluation, testing technologies, and effectiveness at past site projects.

The EPA CLU-IN web site provides information about innovative treatment technologies and includes descriptions of and contact information for relevant programs and organizations. It also provides access to publications (e.g., Tech Trends) and other tools useful in technology review and evaluation.

The EPA REACH IT database combines information from three established EPA databases, the Vendor Information System for Innovative Treatment Technologies (VISITT) database, the Vendor Field Analytical and Characterization Technologies System (Vendor FACTS) database, and the Innovative Treatment Technologies (ITT) database. This database combines vendor-supplied information with information from the EPA, the U.S. Department of Defense (DOD), the U.S. Department of Energy (DOE), and state project managers regarding sites at which innovative technologies have been implemented, and provides information on over 1,400 remediation technologies and 750 vendors.

The FRTR describes itself as an interagency group seeking to improve the collaborative atmosphere among federal agencies involved in hazardous waste site remediation. Member agencies include the DOD, DOE, U.S. Department of the Interior (DOI), U.S. Department of Commerce (DOC), U.S. Department of Agriculture (DOA), and the EPA. Its web site contains such information as cost and performance of remedial technologies, results of technology development and demonstration, and technology optimization and evaluation.

The RIMS 2000 database, owned and operated by the Research Technologies Network, L.L.C., contains remedial technology information on nearly 900 technologies. It includes technical paper abstracts, summaries, and components of remediation efforts undertaken since the inception of CERCLA in 1980. This information is verified and updated by RTN on a monthly basis to provide current and objective information on the status of innovative technologies.

These and other resources were used to identify a number of potentially applicable remedial technologies or process options for dealing with contaminated soils and sediments.

6.3 IDENTIFATION AND SCREENING OF APPLICABLE REMEDIAL TECHNOLOGIES

During this identification of remedial technologies, a wide range of potential remedial technologies and process options were reviewed. Based on this review, potential remedies unable to remediate the contaminated media due to site conditions or the lack of compatibility with the contaminated media were eliminated from further consideration. The initial identification and screening of remedial technologies for Lower Ley Creek is presented in Table 6.1. These technologies were developed based on the GRAs discussed above. These technologies were screened to ensure that only those technologies applicable to the contaminants present, the physical matrix, and other site characteristics were considered.

As an initial screening, each of the potentially applicable remedial technologies was evaluated in terms of effectiveness, implementability, and cost.

6.3.1 Effectiveness

Effectiveness focuses on the degree to which a remediation technology or alternative reduces the toxicity, mobility, or volume of hazardous substances through treatment and achieves long-term protection. The effectiveness criterion also considers the degree to which the option complies with the ARARs, minimizes short-term impacts, and also how quickly it achieves protection.

6.3.2 Implementability

Implementability includes both the technical and administrative feasibility of implementing a technology process or a remedial alternative. Consideration of implementability with respect to a remedial technology or a remedial alternative focuses on the administrative implementability of an option, including necessary permits for off-site actions; the availability of treatment, storage, and disposal facilities; and the availability of necessary equipment and skilled workers to implement a remedial technology or a remedial alternative.

6.3.3 Cost

Cost plays a limited role in the screening stage; only order-of-magnitude costs are developed. For remediation technologies, processing costs were assumed to include all the costs associated with the treatment other than capital and mobilization costs. Technologies or remediation alternatives that may be significantly more costly without any offsetting benefit over comparable options may be screened out.

Table 6.1 (continued)
Identification and Screening of Remedial Technologies for Lower Ley Creek

General Response Action (GRA)	Remedial Technology	Variations	Effectiveness	Implementability	Costs	Overall Screening Conclusion*
Ex Situ Treatment	Thermal Desorption (including thermal retort).		Effective for removal/volatilization of organic constituents and mercury. Not effective for removal of most inorganic compounds, but it has been used to remove mercury. Potential short-term impacts with rehandling steps.	Implementable for some chemicals, but mercury vapor control is complex. USEPA recommends against thermal treatment of mercury due to difficulties in controlling off gas. Requires numerous rehandling steps.	High	Not retained. Numerous handling and logistical steps. Limited chemical applicability.
	Incineration/ Vitrification		Effective for destruction and/or removal of organic constituents. Not effective for destruction of inorganic compounds. Potential short-term impacts with rehandling steps.	Potentially implementable. On-site incineration typically meets significant public resistance. Control of mercury vapors is a severe problem.	High	Not retained. Numerous handling and logistical steps. Limited chemical applicability.
	Dechlorination		Potentially effective in detoxifying specific types of aromatic organics, in particular dioxins and PCBs. Not effective for the heavy metal COCs. Potential short-term impacts with rehandling steps.	Very difficult to implement due to excessive amounts of reagent required for chlorinated compounds, lack of full-scale applications to date, and lack of commercial availability. Past applications have been in conjunction with thermal treatment.	High	Not retained. Numerous implementation issues and limited chemical applicability.
	Chemical Extraction		Potentially effective for extracting organics and metals, including chlorobenzenes and mercury. The extraction solution is then treated to remove and recover contaminants. Potential short-term impacts from chemicals and rehandling steps.	Can be difficult to implement due to complex treatment requirements for extraction fluid, lack of full-scale applications to date, and lack of commercial availability.	High	Not retained. Numerous implementation issues and limited chemical applicability.
	Sediment/Soil Washing		Potentially effective physical separation process for removing organics and metals through separation of fine fraction, where this fraction contains the majority of the contamination. Potential short-term impacts from rehandling steps.	Very difficult to implement due to complex treatment requirements for extraction fluid, lack of full-scale applications to date, and lack of commercial availability.	High	Not retained. Numerous implementation issues.
	Solidification/ Stabilization		Effective for improving material handling and for immobilizing and stabilizing heavy metals in a non-leachable matrix. Stabilizing mercury in soils and sediments, for example, has been tested based on sulfide precipitation. Potential short-term impacts from rehandling steps.	Difficult to implement. Addition of solidifying or stabilizing reagents may increase both volume and weight for disposal or containment.	High	Not retained. Too many implementation issues as compared to more proven technologies.
	Biological (includes land farming and slurry phase bioremediation)		Effective at biodegradation of simple organic chemicals. Not effective with transformation of mercury. May release large volumes of volatile chemicals. Potential short-term impacts from rehandling steps.	Difficult to implement on large scale.	High	Not retained. Too many implementation issues as compared to more proven technologies.

Notes:
Highlighted cells indicate remedial technologies that were not retained.
* The overall screening conclusion considers whether the remedial technology should be "retained" for use in developing remedial alternatives in Section 7 (the next step of the evaluation process) or "not retained" for further evaluation.

Table 5.5

Estimated Area and Volumes for All Chemicals Above Cleanup Goals in Soil

Southern Swale Soils (Old Ley Creek)

Depth of Contamination (ft bgs)	Thickness of Contaminated Interval (ft)	Areal Extent (ft^2)	Volume of Contaminated Soil in Depth Interval (CY)
0-2	2	81,894	6,066
0-6	6	25,977	5,773
2-8	6	12,755	2,834
2-14	12	4,333	1,926

Maximum Areal Extent (ft^2) **107,871**

Total Volume (CY) **16,599**

Southern Swale Soils (Lower Ley Creek)

Depth of Contamination (ft bgs)	Thickness of Contaminated Interval (ft)	Areal Extent (ft^2)	Volume of Contaminated Soil in Depth Interval (CY)
0-0.5	0.5	50,920	943
0-2	2	157,270	11,650
0-3	1	7,648	283
2-5	3	14,462	1,607

Maximum Areal Extent (ft^2) **208,190**

Total Volume (CY) **14,483**

Northwest Soils (Lower Ley Creek)

Depth of Contamination (ft bgs)	Thickness of Contaminated Interval (ft)	Areal Extent (ft^2)	Volume of Contaminated Soil in Depth Interval (CY)
0-2	2	642,044	47,559
2-8	6	6,702	1,489

Maximum Areal Extent (ft^2) **642,044**

Total Volume (CY) **49,048**

TOTAL AREAL EXTENT OF SOILS ABOVE CLEANUP GOALS (ft^2) **958,105**

TOTAL VOLUME OF SOILS ABOVE CLEANUP GOALS (CY) **80,130**

Notes:

Cleanup Goals for Soil are shown on Table 5.4

ft - feet

bgs - below ground surface

CY - cubic yards

Table 5.6

Estimated Area and Volumes for All Chemicals Above Cleanup Goals in Sediment

Upstream Section

Depth of Contamination (ft bwsi)	Thickness of Contaminated Interval (ft)	Areal Extent (ft^2)	Volume of Contaminated Sediment (CY)
0-2	2	93,066	6,894
0-4	4	33,973	5,033
0-8	8	119,482	35,402
		Total Areal Extent (ft^2)	**246,521**
		Total Volume (CY)	**47,329**

Middle Section

Depth of Contamination (ft bwsi)	Thickness of Contaminated Interval (ft)	Areal Extent (ft^2)	Volume of Contaminated Sediment (CY)
0-2	2	119,978	8,887
0-3	3	16,959	1,884
0-5	5	65,029	12,042
		Total Areal Extent (ft^2)	**201,966**
		Total Volume (CY)	**22,814**

Downstream Section

Depth of Contamination (ft bwsi)	Thickness of Contaminated Interval (ft)	Areal Extent (ft^2)	Volume of Contaminated Sediment (CY)
0-1	1	69,697	2,581
		Total Areal Extent (ft^2)	**69,697**
		Total Volume (CY)	**2,581**

TOTAL AREAL EXTENT OF SEDIMENTS ABOVE CLEANUP GOALS (ft^2) **518,184**

TOTAL VOLUME OF SEDIMENTS ABOVE CLEANUP GOALS (CY) **72,724**

Notes:

Cleanup Goals for Sediments were based on a 1 milligram per kilogram (mg/kg) PCB concentration

ft - feet

bwsi - below the water-sediment interface

CY - cubic yards

Table 2.C
Ecological Risk Benchmark Screening
Lower Ley Creek Soil
Benthic Invertebrates

Analyte	EPA Eco-SSL				New York Soil Cleanup Objectives-Protection of Ecological Resources	EPA Region 5 Ecological Soil Screening Levels	Maximum Detected Value[a] (mg/kg)
	Plants	Terrestrial Invertebrates	Birds	Mammals			
2-Methylnaphthalene	Based on sum of low molecular weight PAHs				--	--	2.51
Acenaphthene					--	--	2.25
Acenaphthylene					--	--	7.84
Anthracene					--	--	14.9
Fluoranthene					--	--	61.4
Fluorene					--	--	3.76
Naphthalene					--	--	3.08
Phenanthrene					--	--	28.2
Sum Low Molecular Weight PAHs	NSV	29	NSV	100	--	--	124.54
Benzo(a)anthracene	Based on sum of high molecular weight PAHs				--	--	36.2
Benzo(a)pyrene					--	--	27.4
Benzo(b)fluoranthene					--	--	29.1
Benzo(g,h,i)perylene					--	--	16
Benzo(k)fluoranthene					--	--	20.9
Chrysene					--	--	36.7
Dibenzo(a,h)anthracene					--	--	6.4
Indeno(1,2,3-cd)pyrene					--	--	14.3
Pyrene					--	--	62.7
Sum High Molecular Weight PAHs	NSV	18	NSV	1.1	--	--	249.7
1,4-Dichlorobenzene	--	--	--	--	20	--	0.14
2-Butanone	--	--	--	--	100	--	0.38
4-Methylphenol	--	--	--	--	--	163	0.05
4-Nitroaniline	--	--	--	--	--	21.9	0.06
Acetone	--	--	--	--	2.2	2.5	2.03
Alpha-Chlordane	--	--	--	--	1.3	0.324	0.0493
Aluminum	--	--	--	--	--	--	15300
Antimony	NSV	78	NSV	0.27	--	--	19.6
Arsenic	18	NSV	43	46	--	--	17.4
Barium	NSV	330	NSV	2000	--	--	431
Benzene	--	--	--	--	70	0.255	0.06
Beryllium	NSV	40	NSV	21	--	--	3.61
Bis-(2-ethylhexyl)phthalate	--	--	--	--	--	0.925	0.71
Bromomethane	--	--	--	--	--	0.235	0.002
Butylbenzylphthalate	--	--	--	--	--	0.239	1.1
Cadmium	32	140	0.77	0.36	--	--	337
Carbazole	--	--	--	--	--	--	3.23
Carbon Disulfide	--	--	--	--	--	0.0941	0.05
Chromium	NSV	NSV	26	34	--	--	1320
cis-1,2-Dichloroethene	--	--	--	--	--	--	0.003
Cobalt	13	NSV	120	230	--	--	17.2
Copper	70	80	28	49	--	--	731
Cyanide	--	--	--	--	--	1.33	0.6
Dibenzofuran	--	--	--	--	--	--	2.24
Di-n-butylphthalate	--	--	--	--	--	0.15	0.157
Endrin	--	--	--	--	0.014	0.01	0.084
Gamma-Chlordane	--	--	--	--	--	0.224	0.035
Iron	--	--	--	--	--	--	31100
Isophorone	--	--	--	--	--	139	0.05
Lead	120	1700	11	56	--	--	375
Manganese	220	450	4300	4000	--	--	554
Mercury	--	--	--	--	--	0.1	4.11
Methoxychlor	--	--	--	--	--	0.0199	0.0085
Methylene chloride	--	--	--	--	12	--	0.004
Nickel	38	280	210	130	--	--	434
p,m Xylene	--	--	--	--	0.26	--	0.003
p,p'-DDD	DDT and metabolites				--	--	0.008
p,p'-DDE					--	--	0.492
p,p'-DDT						--	0.216
DDT and metabolites	NSV	NSV	0.093	0.021	--	--	0.736
PCB-1248	--	--	--	--	1	--	86.1
PCB-1260	--	--	--	--	1	--	2.94
Phenol	--	--	--	--	30	--	0.0476
Selenium	0.52	4.1	1.2	0.63	--	--	5.2
Silver	560	NSV	4.2	14	--	--	136
Tetrachloroethene	--	--	--	--	2	9.92	0.00384
Toluene	--	--	--	--	36	3.45	0.0183
Trichloroethene	--	--	--	--	2	12.4	0.00918
Vanadium	NSV	NSV	7.8	280	--	--	34.9
Zinc	160	120	46	79	--	--	2180

Notes

[a] = Maximum detected surface soil (0-2 feet) concentration obtained from the Lower Ley Creek Human Health Risk Assessment, Table 2s.

-- = not available or not applicable

[shaded] Indicates screening level is lower than the Maximum Detected Value.

NMES Page 16

OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE
SUBSITE OF THE ONONDAGA LAKE SUPERFUND SITE
RECORD OF DECISION

APPENDIX VI

STATEMENT OF FINDINGS: FLOODPLAINS AND WETLANDS

**STATEMENT OF FINDINGS: FLOODPLAINS AND WETLANDS
FOR THE RECORD OF DECISION
OPERABLE UNIT 2 OF THE GENERAL MOTORS – INLAND FISHER GUIDE SUBSITE
ONONDAGA LAKE SUPERFUND SITE
TOWN OF SALINA, ONONDAGA COUNTY, NEW YORK**

Need to Affect Floodplains and Wetlands

The General Motors – Inland Fisher Guide (GM-IFG) Subsite (Subsite) of the Onondaga Lake Superfund Site consists of the former plant, located south of Ley Creek on Townline Road in the Town of Salina, and approximately 9,200 linear feet Ley Creek and the adjacent floodplains between Townline Road and the Route 11 Bridge (aka Brewerton Road). Also included in the Subsite is a 10-acre wetland (referred to as the "National Grid Wetland") located on the northern portion of the National Grid property directly west of the former GM-IFG facility, soil in the approximately 1.8-acre area located directly between the former GM-IFG facility's northern property boundary and Factory Avenue (referred to as the "Factory Avenue Area") and soil in the area located along the northern shoulder of Factory Avenue in the vicinity of LeMoyne Avenue (referred to as the "Factory Avenue/LeMoyne Avenue Intersection Area").

Ley Creek, which drains an area of approximately 30 square miles, flows due west, approximately two and a half miles downstream from the facility, where it discharges into Onondaga Lake. The Ley Creek drainage basin can, generally, be described as a highly urbanized area. Portions of the city of Syracuse and the towns of Cicero, Clay, DeWitt, Manlius and Salina are located in the Ley Creek drainage basin. Also located in the Ley Creek watershed are interstate highways, a National Grid electrical transfer station, Syracuse International Airport and the Air National Guard's Hancock Field. Large areas of impermeable surfaces in the Ley Creek watershed cause rapid runoff during storms and corresponding rapid rising of flow and water levels.

The National Grid Wetland is part of the New York State-regulated wetland known as "SYE-6." A drainage ditch is located along the northern edge of the National Grid property along Factory Avenue. Upland drainage flows into this wetland from the south and is discharged north to the ditch and through culverts under Factory Avenue towards Ley Creek. Wetland vegetation, trees and shrubs comprise the dominant vegetation of the wetland. The National Grid property is currently zoned for industrial use.

The Factory Avenue Area extends from the northwestern corner of the facility property to Townline Road. The Factory Avenue Area is characterized by maintained grass and is a corridor for overhead and underground utilities. This area is currently zoned for industrial use.

The Factory Avenue/LeMoyne Avenue Intersection Area is located north of Factory Avenue in the vicinity of LeMoyne Avenue down to the Route 11 Bridge. This area is currently zoned for commercial use.

Much of the area adjacent to Ley Creek is located within the 100-year floodplain. In the 1970s, Ley Creek was restructured and dredged to aid in storm water drainage. Dredged materials were spread along the banks of the Creek.

The wetland and floodplain soil is contaminated with PCBs and heavy metals, in particular arsenic, total chromium, copper, lead, nickel and zinc. The sediment is contaminated with PCBs, polyaromatic hydrocarbons, arsenic, chromium, copper, lead, nickel and zinc.

The results of the human health risk assessment indicate that the contaminated sediment and soil present an unacceptable human exposure risk and the ecological risk assessment indicates that the contaminated soils and sediments pose an unacceptable ecological exposure risk. Accordingly, remedial alternatives were developed in the feasibility study (FS) report to remediate the Creek sediment and wetland and floodplain soil. The selected remedy includes the excavation of an estimated 9,600 cubic yards (CY) of sediment in Ley Creek and an estimated 15,000 CY of surface and subsurface floodplain and wetland soil. In limited areas where underground utilities are present, soil may remain at concentrations above restricted soil cleanup objectives following excavation. This is due to the potential health and safety threat of excavating around and beneath the utilities. These areas will be addressed with a cover consisting of an indicator fabric layer overlain by 12 inches of clean soil (minimum) and a top layer consisting of vegetation, asphalt, or gravel, as appropriate, for the area being restored.

In addition to the selected remedy, the FS also considered no-action soil and sediment alternatives that do not entail excavation of contaminated floodplain soils or creek and wetland sediments. Under the no-action alternatives, the contaminated soils/sediments would remain in place, posing unacceptable human and ecological exposure risks and would remain as a potential source for contaminating downstream areas. Thus, the no-action alternatives would not be protective of ecological or human receptors. The implementation of any of the action alternatives developed in FS would be more protective of human health and the environment than the no-action alternative because they would meet the remedial action objectives and remediation goals for the site and would result in residual risks less than the no-action alternative.

The Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation have determined that there is no practicable alternative that is sufficiently protective of human health and the environment that will not result in the excavation of the soil/sediment. Consequently, since remedial action is necessary, any remedial action that might be taken will necessarily affect floodplains and wetlands.

Effects of Proposed Action on the Natural and Beneficial Values of Floodplains and Wetlands

Excavation of soil/sediment will result in temporary, localized disturbance to the wetland, floodplains and creek bed. The total construction period is estimated at 24 months. The areas affected by the temporary clearing of flora and fauna will include 5.1 acres of wetlands and 3.4 acres of floodplains. It is not anticipated that implementation of the selected remedy will result in any significant alteration of the existing site hydrology, which is critical for wetland restoration. Removing the contaminated sediment in the wetland and Creek, especially if they are excavated in the dry, will likely cause short-term adverse ecological impacts. Removing the contaminated sediment in the wetland and Creek in the wet may result in short-term localized exceedances of surface water standards because of suspension of impacted sediment during excavation.

The principal benefit of the selected remedy will be the removal of considerable sediment-bound contaminant mass from the wetland and Creek sediment and soil-bound contaminant mass in floodplain soil. The contaminated sediment that will be removed will no longer function as a source of contamination for the downstream areas or pose risk to ecological receptors. The removal of the contaminated soil on the banks of Ley Creek will eliminate a potential source of contamination to the wetland and Creek through erosion. In this context, the selected remedy will have a substantial positive impact on both the natural and beneficial values of the floodplain soil and wetland and Creek sediment.

The primary location-specific ARARs applicable to the remediation are ECL Article 24 Freshwater Wetlands, ECL Article 15 Use and Protection of Waters, and Clean Water Act (CWA) Section 404. For freshwater wetlands, 6 NYCRR Part 663 regulates activities conducted in or adjacent to regulated wetlands. Article 15 is implemented by 6 NYCRR Part 608 which regulates alterations to beds and banks of streams such as excavation and filling.

The primary New York State standard for protection of freshwater wetlands applicable to the remediation is Environmental Conservation Law (ECL), Article 24, and Title 7. For freshwater wetlands, 6 NYCRR Parts 662 through 665 regulates activities conducted in or adjacent to regulated wetlands. The selected remedy will comply with this standard.

Although not applicable or relevant and appropriate requirements, the selected remedy will also comply with Executive Order 11988: Floodplain Management; Executive Order 11990: Protection of Wetlands, and EPA's Statement of Procedures on Floodplains Management & Wetlands Protection. Accordingly, floodplain and wetland assessments will need to be developed during the remedial design process.

Measures to Mitigate Potential Harm to the Floodplains and Wetlands

Implementation of the selected remedy will entail excavation resulting in temporary physical disturbances to the Creek, wetland and floodplains. Measures to minimize potential adverse impacts that cannot be avoided will be evaluated as part of and incorporated into the remedial design. Common practices include field demarcation of wetland/floodplain areas and implementation of soil/sediment erosion and/or resuspension control measures (*e.g.*, installation of silt fencing, hay bales, hay/straw mulch, jute matting) to minimize impacts from construction activities.

Measures will also be employed during excavation activities to prevent sediment that is resuspended from being transported to downstream areas during flooding events (100-year and 500-year storms). For example, energy barriers such as sheet piles and/or silt curtains could be used during excavation activities to minimize the transport of resuspended sediment from the areas being excavated to downstream areas. Monitoring of surface water in the vicinity of the work zones will be conducted to measure potential exceedances of ambient water quality criteria due to resuspension as a result of excavation operations. Should this monitoring indicate that elevated levels of suspended sediment are being generated by excavation activities, operations will be modified to reduce those levels. Possible actions that could be taken in this regard include slowing down the rate of sediment removal, modifications to movement of the excavation equipment and cessation of excavation activities.

Habitat restoration of Ley Creek will consist of placement of at least six inches of substrate similar to the existing sediments over disturbed areas and restoration of vegetation. The negative ecological effects will be limited and temporary (it is expected that benthic recolonization will take less than three years), and will be offset by the positive long-term effects of clean materials for benthic habitat.