SECOND FIVE-YEAR REVIEW REPORT FOR LEY CREEK PCB DREDGINGS SUBSITE ONONDAGA LAKE SUPERFUND SITE ONONDAGA COUNTY, NEW YORK

Prepared by

U.S. Environmental Protection Agency
Region 2
New York, New York

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JAN. 17, 2012
Date

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List of Acronyms Used in this Document	
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIC	Community Involvement Coordinator
cy	Cubic Yards
EPA	United States Environmental Protection Agency
ft/s	Feet per Second
GM	General Motors Corporation
mg/kg	Milligrams per Kilogram
μg/l	Micrograms per Liter
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
OM&M	Operation, Maintenance, and Monitoring
PCBs	Polychlorinated Biphenyls
RACER	Revitalizing Auto Communities Environmental Response
REALM	Remediation and Liability Management Company, Inc.
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

This is the second five-year review for the Ley Creek PCB Dredgings Subsite of the Onondaga Lake Superfund site. The Subsite is located in the Town of Salina, Onondaga County, New York.

This review evaluated the results from monitoring programs established as part of this remedy to ensure that the remedy remains protective of human health and the environment. Based on this review, it has been concluded that the implemented actions at the Subsite are protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Onondaga Lake site (Ley Creek PCB Dredgings Subsite-Operable Unit 10)		
EPA ID: NYD986913580		
Region: 2	**State:** NY	**City/County:** Town of Salina, Onondaga County

SITE STATUS	
NPL Status: Final	
Multiple OUs? Yes	**Has the site achieved construction completion?** No

REVIEW STATUS
Lead agency: State **If "Other Federal Agency" was selected above, enter Agency name:**
Author name (Federal or State Project Manager): Robert Nunes
Author affiliation: EPA
Review period: 1/30/2007 – 01/20/2012
Date of site inspection: 10/5/2011
Type of review: Statutory
Review number: 2
Triggering action date: 1/30/2007
Due date *(five years after triggering action date)*: 1/30/2012

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
The Onondaga Lake site currently includes twelve subsites (subsites are defined as any site that is situated on Onondaga Lake's shores or tributaries that has contributed contamination to or threatens to contribute contamination to Onondaga Lake). Each subsite is an operable unit. The five-year review evaluates the Ley Creek PCB Dredgings subsite (OU10). No issues or recommendations are identified for OU10.

Issues and Recommendations Identified in the Five-Year Review:

OU(s):	**Issue Category**			
	Issue: No issues or recommendations are identified for the Ley Creek PCB Dredgings subsite.			
	Recommendation:			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**

Protectiveness Statement(s)

Operable Unit: 10	*Protectiveness Determination:* Protective.	*Addendum Due Date (if applicable):*
Protectiveness Statement: The implemented actions at the Subsite protect human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the Subsite use does not change and the engineered and access controls that are currently in place continue to be property operated, monitored, and maintained.		

Sitewide Protectiveness Statement (if applicable)

Protectiveness Determination: While the OU10 remedial action has been completed, the Onondaga Lake site has not achieved construction completion.	*Addendum Due Date (if applicable):*
Protectiveness Statement:	

I. Introduction

The Onondaga Lake site currently includes twelve subsites (subsites are defined as any site that is situated on Onondaga Lake's shores or tributaries that has contributed contamination to or threatens to contribute contamination to Onondaga Lake.) Each subsite is an operable unit (OU).[1] The five-year review report evaluates OU10, the Ley Creek PCB dredging Subsite.

This five-year review for the Subsite, located in the Town of Salina, Onondaga County, New York, was conducted by United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Robert Nunes. The review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii) and in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001) (the five-year review guidance). The purpose of five-year reviews is to ensure that implemented remedies protect public health and the environment and that they function as intended by the site decision documents. This report will become part of the site file.

In accordance with the Section 1.3.3 of the five-year review guidance, a subsequent five-year review is triggered by the signature date of the last review. The trigger for this second five-year review is January 30, 2007, the approval date of the last review. This second five-year review provides background information, covers the Subsite history, discusses past

[1] This five-year review focuses only on the Ley Creek PCB Dredgings subsite (Subsite) of the Onondaga Lake Superfund site. Construction has been completed at one other subsite—LCP Bridge Street. A separate five-year review was completed for that subsite in October 2009. Superfund hazardous-waste remediation at the Onondaga Lake site is being performed mostly by potentially responsibility parties (PRPs) under New York State's oversight. The construction of the remedy for the Ley Creek PCB Dredgings subsite (OU 10) was completed in 2001. The remedy for the Semet Residue Ponds subsite (OU 6) was selected in 2002; construction of a groundwater collection system to address contaminated groundwater migrating to Tributary 5A commenced in 2010. The portion of the selected remedy that would address the tar material, however, is currently being re-evaluated. Under an interim remedial measure (IRM), construction of a barrier wall and groundwater collection system in the lakeshore area of the Semet Residue Ponds subsite and the Willis Avenue subsite (OU 3) were completed in 2007 and 2009, respectively. Construction activities for the Lake Bottom subsite (OU 2) commenced in 2010. An amended Record of Decision (ROD) for the Salina Landfill subsite (OU 8) was issued in 2010; remedial construction commenced in 2011. RODs for portions of the Geddes Brook/Ninemile Creek subsite (upper and lower reaches of Lower Ninemile Creek and associated floodplains, OUs 20 and 24) were issued in April and October 2009. Remedial Investigation/Feasibility Studies (RI/FSs) are presently being performed by the PRPs under state orders at four other subsites—General Motors: Inland Fisher Guide/Ley Creek Deferred media (OU 9); Wastebed B/Harbor Brook (OU 18); Wastebeds 1-8 (OU 22) and Willis Avenue (OU 3). It is anticipated that the RI/FSs will be completed at these subsites by 2014. EPA is the lead agency for the conduct of an RI/FS at the Lower Ley Creek subsite (OU 25) which is also currently underway.

data-collection efforts along with information collected in the past five years, re-evaluates risk and remedy protectiveness based on updated assumptions, and makes recommendations for follow-up actions.

II. Site Chronology

Table 1 (attached) summarizes the subsite-related events from discovery to the present.

III. Background

Site Location

The Ley Creek PCB Dredgings subsite (Subsite) is located along the south bank of Ley Creek in the Town of Salina, Onondaga County, New York. A site location map and site plans are included as Figures 1 through 6. The Subsite is bounded by Factory Avenue on the south and Ley Creek to the north. The New York State Thruway is located immediately to the north of Ley Creek. The eastern limit of the Subsite is the General Motors Outfall 003, which is located just west of Townline Road. The western limit is located approximately 4,000 feet downstream near the Town of Salina Highway Department garage. A fence extends along the south side of the study area approximately 10 feet north of Factory Avenue and to the east and west; however, access along the bank of Ley Creek, which forms the northern site boundary, remains unrestricted.

Physical Characteristics

The 18-acre Subsite consists of dredged spoil materials located on the south bank of the creek. These materials have been covered with a one-foot thick soil cover.

In the vicinity of the Subsite, Ley Creek is generally less than 15 feet wide and less than 2 feet deep. Ley Creek drains an area of approximately 30 square miles and is part of the Onondaga County Ley Creek Drainage District. Portions of the cities and towns of Syracuse, North Syracuse, East Syracuse, Cicero, Clay, Dewitt, Manlius, and Salina are located in the Ley Creek drainage basin.

Site Geology/Hydrogeology

The study area geology is characterized by the dredged material at the surface, and native soils consisting of silts, clays and fine-grained sand deposits. These fine-grained fluvial and lacustrine sediments overlie dense glacial till. The depths of fluvial and lacustrine sediments range from 4 feet to 12 feet below grade with a thickness ranging from 5 feet to 25 feet.

The glacial till unit underlying the fluvial and lacustrine deposits consists of dense reddish brown clayey silt with sand and imbedded gravel fragments. On-site, the till layer ranges in depth from approximately 11 feet to approximately 30 feet below grade. Shale bedrock was encountered at between approximately 30 and 35 feet below grade.

Groundwater elevation data were used to conclude that, in general, the direction of shallow groundwater flow is to the north toward Ley Creek. Groundwater elevations indicate an upward flow potential exists between the upper fluvial and lacustrine deposits and the underlying till.

Land and Resource Use

The Subsite is located in an urban area. It is fenced along the Factory Avenue boundary, limiting access by the general public. The Subsite is part of the floodplain for Ley Creek and is used as "open space" and as part of the floodplain drainage area. It is expected to be maintained as "open space" in the future. There is no recreational use of the area for fishing.

History of Contamination

Prior to the early 1970s, the combination of poor channel conditions and large impermeable areas in the Ley Creek watershed resulted in extensive flooding, some of the worst of which was near the General Motors Corporation (GM)-Inland Fisher Guide Facility in 1969. The formation of the Ley Creek Drainage District and clearing and dredging of the creek channel was initiated following the1969 flooding event. Dredging of Ley Creek was performed by the Onondaga County Department of Drainage and Sanitation. In 1970, the section of the creek between Route 11 and Seventh North Street was dredged, and in 1971, additional portions of the creek between Seventh North Street and Onondaga Lake were dredged. Additional dredging of Ley Creek from Townline Road to Onondaga Lake took place in 1975, and in 1983, the section of the creek between Townline Road and Route 11 was dredged. Dredged materials generated during these activities were placed along the south bank of the creek or used for land restoration projects. It was subsequently determined that much of the dredged sediments were contaminated with PCBs, the result of industrial wastewater discharged primarily from the adjacent GM-Inland Fisher Guide Plant.

Initial Response

After investigations related to the deposited dredge materials conducted in 1985, 1987, and 1989, the New York State Department of Environmental Conservation (NYSDEC) determined that GM needed to perform an RI/FS at the Subsite to fully characterize the areal and vertical extent of contamination present. GM and NYSDEC entered into an Administrative Order on Consent for performance of the RI/FS, effective May 23, 1991. In 1993, the RI was completed. Also in 1993, the adjacent GM Inland Fisher Guide site was

listed on the Registry of Inactive Hazardous Waste Disposal Sites, as a Class 2 site. In 1996, the FS report was accepted by NYSDEC.

Basis for Taking Action

The deposited dredge material/soils were determined to represent a threat to the environment as a contributing source of PCBs to the fish, sediments and groundwater in the vicinity of the Subsite. Ecological risk calculations indicated that the unremediated PCB-contaminated dredge material/soils posed an unacceptable risk to terrestrial species and their predators, such as the short-tailed shrew and the red-tailed hawk.

IV. Remedial Actions

Remedy Selection

NYSDEC issued a ROD for the Subsite in March 1997. EPA concurred on the ROD in February 1998. The major components of the remedy include[2]:

- Excavation and disposal of deposited dredge material/soils that contain PCBs at concentrations exceeding 50 milligrams per kilogram (mg/kg) at a permitted hazardous waste landfill;

- Consolidation and covering of the remaining PCB-contaminated dredge materials where concentrations are less than 50 mg/kg but exceed 1 mg/kg at the surface and 10 mg/kg in subsurface areas;

- Removal of deposited dredged materials, at a minimum, from the first 25 feet of the floodway area to restore the area to an appropriate elevation. After the restoration of the floodway elevations, covering of any remaining materials above the remedial level remaining in the floodway with a geomembrane or clay and 12 inches of soil or a gravel roadway. Grading and covering with a vegetated soil cover consisting of 12 inches of soil in areas outside of the floodway;

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[2] Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information, standards, and risk-based levels established in the risk assessment. The following RAOs for the Subsite were identified in the ROD: 1) reduce, control, or eliminate the PCB contamination present within the dredge materials/soils on the Subsite; 2) eliminate the threat to surface waters and sediments by eliminating any future contaminated surface run-off from the contaminated dredge material/soils on site; 3) reduce short-term impacts to surface water and air expected as a result of remedial activities; 4) eliminate a source of PCBs for uptake by fish and other organisms in Ley Creek; 5) eliminate the potential for direct human or animal contact with the contaminated dredge materials/soils on site; and 6) prevent, to the extent possible, migration of contaminants into the groundwater.

- Construction of a gravel access road adjacent to the southern bank of the Creek to allow for future maintenance and/or dredging;

- Grading and covering four drainage swales from Factory Avenue with a vegetated cover. Lining with a half pipe or formed concrete spillway where the swales pass through the area of covered dredge spoils. Provision of access pads and pathways, as well as gates in the fence, to allow access for maintenance of the County sewer line which is also located in the area to be covered;

- Completion during the remedial design of a hydraulic analysis and floodplain assessment to assure compliance with Executive Order 11988 (Floodplain Management) for the consolidated capped materials to ensure that the material to be left in the floodplain and floodway will not result in any significant change in flood elevations and that there will not be any adverse impact to the remedy from a 100- or 500-year flood;

- Installation of a chain-link fence around the area of the vegetative cover to limit access;

- Implementation of deed restrictions to preclude activities that could potentially expose contaminated materials and to ensure that the integrity of the cover is maintained; and

- Implementation of a long-term monitoring program.

Remedy Implementation

During the remedial design, flow velocities in the vicinity of the Subsite were calculated as part of the Design Conditions Model for the 100-year and 500-year floods. The maximum channel velocity in the vicinity of the Subsite during a 500-year flood is calculated to be approximately 5 feet per second (ft/s). Flow velocities outside the channel, particularly on the southern edge of Ley Creek extending across the Subsite to the northern edge of Factory Avenue ranged from approximately less than 1 ft/s to 4 ft/s. General erosion velocity capacity limits published by the New York State Department of Transportation indicate that bare soil, soil with excellent vegetation, and typical synthetic geomat materials with established vegetation can withstand flow velocities of up to 1 ft/s, 5 ft/s, and 14 ft/s, respectively, without erosion. Therefore, a cover consisting of 12 inches of well- maintained vegetative cover would provide adequate erosion protection for even a 500-year flood and could be used in lieu of a cover with geomembrane or clay in the floodway as specified in the ROD. However, as a measure of additional erosion protection (280% of the erosion protection required to address 500-year flood maximum channel velocity in the vicinity of the Subsite), a cover which includes a synthetic geomat from the southern edge of Ley Creek to the northern edge of the access road was included in the remedial design. The synthetic geomat is a lightweight, porous material that strengthens the interface between

soil and vegetation. The cover design also included the placement of a non-woven geotextile between the 6-inch vegetative soil layer and the 6-inch top soil layer from the southern edge of Ley Creek to a few feet south of the start of the slope increase south of the access road. The non-woven geotextile is a lightweight, porous fabric that would serve as an indicator that erosion has occurred and maintenance of the soil cover is required.

Excavation and staging of the deposited dredged material/soil that contained PCBs greater than or equal to 50 mg/kg was conducted between December 1999 and August 2000. Approximately 3,750 cubic yards (cy) of excavated material/soil were loaded into dump trailers and the trailers were transported to the Chemical Waste Management facility in Model City, New York. Approximately 920 cy of deposited dredged material/soil located on the north bank of Ley Creek were excavated from an area of approximately 6,200 square feet to a depth of 4 feet and consolidated on-site. The excavated area on the north bank was backfilled and seeded with Reed Canary Grass *(Phalaris arundinacea)*.

A vegetative cover was installed over the consolidated dredged material/soil to meet the remedial action objectives called for in the ROD. Due to constructability concerns with respect to installation of the non-woven geotextile between the vegetative soil and top soil layers, the design was modified with NYSDEC approval during remedial construction to allow for the geotextile to be placed beneath one 12-inch layer of soil suitable to support vegetation. With the exception of areas identified for wetland mitigation and the excavated area in the northern area of the north bank of Ley Creek, the vegetative cover system was hydroseeded with Lancer Flat Pea *(Lathyrus sylvestris)* and was fertilized to establish vegetation. On-site wetland mitigation consisted of planting Reed Canary Grass *(Phalaris arundinacea)* in approximately 1.5 acres of the Subsite to replace 1.4 acres of wetlands eliminated during remedial construction.

During remedial construction, six groundwater monitoring wells were decommissioned in accordance with NYSDEC-approved modified procedures because they were located in areas designated for excavation. One additional well was decommissioned because it exhibited artesian conditions, with water flowing from the top of the casing. This would likely have eroded the vegetative cover. Three additional monitoring wells were also lost during excavation activities. Six groundwater monitoring wells did not need to be removed to accommodate construction, but were modified to an elevation flush with the final grade of the vegetative cover. Three groundwater monitoring wells were installed in July 2001 to assess groundwater quality in the deep overburden migrating from the GM Former Inland Guide Facility. Two additional shallow monitoring wells and one nested well pair (one shallow well and one deep well) were installed at the Subsite in September 2006.

Institutional Controls Implementation

The selected remedy for the Subsite included the implementation of deed restrictions to preclude activities that could potentially expose contaminated materials and to ensure that the integrity of the cover is maintained. At the time the ROD was issued, four different

entities were property owners of parcels at the Subsite. In order to facilitate the remediation, Remediation and Liability Management Company, Inc. (REALM) acquired title to these parcels. A deed restriction for the properties was recorded in the Onondaga County Clerk's office on July 6, 2007. The deed restrictions require that the vegetative/soil cover be maintained in accordance with the operation, maintenance, and monitoring (OM&M) Plan, that any amendments to the plan be approved by NYSDEC, that no activities that would threaten the integrity of the cover be undertaken or permitted, and that groundwater be prohibited from residential use.

Operation and Maintenance

Since the completion of the remedial action, site inspections have been conducted in accordance with the NYSDEC-approved OM&M Manual for the Subsite. Three OM&M inspections were performed within one year following submittal of the remedial action report and biannual inspections were performed during the period 2003 - 2005. Minor deficiencies, such as localized cover erosion, rutting of the stone access road, debris accumulation around catch basins, and holes made by burrowing animals, were noted during the inspections. Corrective measures were implemented to address the deficiencies. Subsequent to an evaluation performed in 2005 and 2006 regarding routine site inspection frequency, the inspection frequency was modified from biannual to annual. Routine annual inspections have been conducted on the Subsite since 2007.

To assess the mitigated wetland area, annual wetland inspections were conducted during the period following mitigation. In addition to identifying deficiencies such as bare spots, failed seed germination, and eroded areas, randomly chosen vegetative sample plots (each nine square feet in size) were evaluated for vegetation variety and density. A target restoration goal of 90% ground cover within the sample plots of seeded Reed Canary Grass *(Phalaris arundinacea)* and wetlands-dependent species was established for the restored wetlands. In the 2001 and 2002 evaluations, one of the four sample plots met or exceeded the target restoration goal of 90% ground cover for seeded and wetland species. In the 2003 and 2004 evaluations, two of the four sample plots met or exceeded the target restoration goal of 90% ground cover for seeded and wetland species. In the 2005 evaluation, three of the four sample plots met or exceeded the target restoration goal of 90% ground cover for seeded and wetland species. The remaining sample plot, which had not met the restoration goal, was disced, reseeded, and mulched with straw in the spring of 2007. Although improved from prior years, the restoration goal of 90% ground cover was not met in the remaining sample plot. As an offset to this 0.06-acre wetland deficit, and in-lieu of continued wetland monitoring, an additional 0.6-acre area of vegetation buffer was established along the southern boundary of the restored wetland area. The buffer area provides opportunity for wildlife cover and forage in a transitional zone adjacent to the restored wetlands.

Nine on-site groundwater monitoring wells were sampled in August 2011 for volatile organic compounds (VOCs) and PCBs. The results of the VOC sampling are being used to

support the RI/FS for the upgradient former GM Inland Fisher Guide Facility area and are not relevant to the effectiveness of the Ley Creek PCB Dredgings Subsite remedy. As such, the results of the VOC analyses are not discussed in this document.

Groundwater monitoring wells MW-8 and OBG-21D could not be sampled during the groundwater sampling effort because the pumps did not fit into the wells; this was concluded to be due to damaged and possibly bent well casings. In addition, monitoring wells MW-12 and MW-13 could not be located even though the general well locations were marked. The groundwater sampling field team noted evidence of burrowing animals in the area and the wells, which were among those modified to an elevation flush with the vegetative cover, may have been buried.

In addition, silt fences used during the remediation were not removed following implementation of the remedy and appear to be causing stability issues along the bank of Ley Creek. In its May 17, 2011 comments on the 2010 Annual OM&M Report, NYSDEC recommended that an inspection be conducted from the stream-side of the bank as the vegetation prevents a land-based inspection.

V. Progress Since the Last Five-Year Report

The first five-year review for this Subsite, which was approved on January 30, 2007, concluded that the remedy was protective in the short term; however, in order for the Subsite to be protective in the long term, it recommended that institutional controls be put into place to restrict activities that could affect the integrity of the cap. It also recommended specific measures to address minor deficiencies on the Subsite, such as localized cover erosion, rutting of the stone access road, pavement depression, debris accumulation around catch basins, and holes made by burrowing animals. With respect to the institutional controls recommendation, deed restrictions were incorporated into a Quitclaim deed filed with County Clerk's office in 2007. Several corrective measures were taken to address minor deficiencies on the Subsite in 2007. These included the placement of additional crushed stone on the stone access road, repairing pavement depressions with like asphalt, and placing topsoil and seed in eroded areas and holes dug by burrowing animals. In 2009, a wire mesh with an attached cable connected to a post was placed on each of the four active catch basins to aid in debris removal. The wire meshes, however, were causing the catch basins to quickly plug up with grass, litter, and debris. This resulted in raised water levels within the catch basins and erosion of the cover system. The wire meshes, posts, and cables were removed in 2010 and the catch basins were subsequently monitored and cleared of debris more frequently to minimize instances of standing water and surface erosion. In 2010, a tree growing in the security fence was removed. Also in 2010, a licensed trapper set animal traps on the Subsite. The burrows were not active, however, and no animals were trapped. Holes dug by burrowing animals were subsequently filled with topsoil and seeded.

VI. Five-Year Review Process

Administrative Components

The five-year review team consisted of Robert Nunes (EPA RPM), Edward Modica (EPA Hydrogeologist), Mindy Pensak (EPA Ecological Risk Assessor), Amy Roe (United States Fish and Wildlife Service Biologist), Michael Sivak (EPA Human Health Risk Assessor), and Rick Mustico (NYSDEC Project Manager).

Community Involvement

The EPA Community Involvement Coordinator for the Subsite, Larisa Romanowski, published a notice in the *Syracuse Post-Standard*, a local newspaper, on August 18, 2011, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review of the Subsite to ensure that the implemented components of the remedy are protective of public health and the environment and that they are functioning as designed. It also indicated that once the five-year review is completed, the results would be made available in the local site repository. In addition, the notice included the RPM's address and telephone number for questions related to the five-year review process or the Subsite. No questions or comments were received.

Document Review

The documents, data, and information that were reviewed in completing the five-year review are summarized in Table 2 (attached).

Data Review

Groundwater samples collected from the on-Site monitoring wells in August 2011 were analyzed for total PCBs. PCBs were not detected in any of the groundwater samples.

Site Inspection

On October 5, 2011, a five-year review-related site inspection was conducted by EPA RPM Robert Nunes, along with technical-team members, Amy Roe and Rick Mustico. Also present for the inspection were representatives from the Onondaga Nation, the RACER Trust, and O'Brien & Gere, a technical consultant for the Trust. Minor deficiencies at the Subsite were observed. These included small areas of erosion in the Catch Basin # 3 (CB #3) overflow spillway, a plugged culvert crossing Factory Avenue which discharges to Catch Basin #2 (CB #2), a damaged drainage ditch culvert under the eastern most sanitary sewer manhole access pathway, and a damaged section of the chain-link perimeter fence.

Interviews

No interviews were conducted during the review period.

Institutional Controls Verification

Institutional controls in the form of deed restrictions have been put into place that restrict activities which might compromise or threaten the integrity of the Subsite cover and which preclude withdrawal of groundwater for residential use.

O'Brien & Gere has verified that institutional controls required by the decision document are in place by reviewing records maintained by the County Clerk. Annual confirmations that the institutional controls remain in place and that remedy-related OM&M is being performed will be included in future OM&M reports.

Other Comments on Operation, Maintenance, and Institutional Controls

This Subsite has ongoing operation, maintenance, and monitoring activities as part of the remedy. As was anticipated by the decision documents, these activities are subject to routine modification and adjustment. Table 4 (attached) summarizes several observations and offers suggestions with which to address them.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Site inspections indicate that residual PCB contaminated materials remain capped, the vegetative cover is well established, and the Subsite perimeter remains fenced. Institutional controls in the form of deed restrictions were established in 2007 and remain in place. Only minor deficiencies in the remedy have been observed during annual Subsite inspections. With respect to the mitigated wetland area, wetland restoration goals for the project have been met. Based upon the inspections and a review of the documents summarized in Table 2, it has been concluded that the remedy is functioning as intended by the ROD.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

EPA's letter to NYSDEC dated Feb 9, 1998 concurred with the remedy selected by the State. The human health risk assessment and ecological risk assessment performed as part of the RI concluded that PCBs posed an unacceptable risk to ecological receptors; no unacceptable risks to human health were identified under current or future use scenarios.

The remediation levels for PCBs selected in the ROD to meet Subsite remedial goals were 1 mg/kg for surface soils and 10 mg/kg for subsurface soils. These levels conformed with New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 objectives[3] and were consistent with EPA's policy for remediation goals for PCBs at Superfund sites so that the residual risk meets the risk range identified in the National Oil and Hazardous Substances Pollution Contingency Plan. Furthermore, calculation of the ecological risk using the remediation levels for PCBs selected in the ROD indicated that the selected remedy was protective of the environment.

Since the time the ROD was signed, NYSDEC promulgated soil standards for PCBs that can be used as remediation goals. Three standards are relevant to the Subsite: 1) 1 mg/kg and 25 mg/kg for commercial and industrial land use, respectively, for the protection of human health through direct contact exposure; 2) 1 mg/kg for the protection of ecological receptors; and 3) 3.2 mg/kg to restrict the potential for migration to groundwater.

The cleanup goals identified in the ROD remain protective. For the first standard, typical exposures under a commercial or industrial scenario will likely be to the surface soils, and the 1 mg/kg remediation goal is consistent with current standards. Exposure to the subsurface soils at the cleanup goal will still result in risks within the acceptable risk range. Ecological receptors are likely to have contact only with surface soils; therefore, the remediation goal identified in the ROD is consistent with this standard. With respect to the protection of the groundwater, the presence of PCBs in the shallow aquifer will continue to be investigated as part of the Supplemental RI/FS for the GM Former Inland Fisher Guide Facility and Ley Creek Deferred Media Subsite.

The vapor intrusion pathway was not evaluated because the property does not have current development and the potential risk from exposure through inhalation of volatilization of PCBs, the Subsite contaminants, is not significant.

There are no changes in the physical conditions of the Subsite or its usage that would affect the protectiveness of the selected remedy, and there are no significant changes in Subsite use expected over the next five years.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No.

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[3] *Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels*, Division of Hazardous Waste Remediation, January 24, 1994.

Technical Assessment Summary

Based upon the results of the five-year review, it has been concluded that:

- The soil/vegetative cover is intact and in good condition. Topsoil was observed to be partially eroded within one small area in one of the overflow spillways;
- One Factory Avenue culvert was observed to be obstructed with debris and/or soil/sediment within the culvert;
- One drainage ditch culvert was damaged resulting in restricted storm water flow along a segment of the drainage ditch;
- One portion of the security fence in the eastern area of the Subsite is damaged;
- Two monitoring wells were not able to be sampled and may be damaged;
- Two monitoring wells on the western end of the Subsite were not able to be located and may be covered with topsoil; and
- Silt fences used during remediation still remain on the Subsite and appear to be causing stability issues along the bank of Ley Creek.

VIII. Issues, Recommendations and Follow-Up Actions

There are no recommendations or follow-up actions stemming from this five-year review.

IX. Protectiveness Statement

The implemented actions at the Subsite protect human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the Subsite use does not change and the engineered and access controls that are currently in place continue to be property operated, monitored, and maintained.

X. Next Review

Since hazardous substances, pollutants or contaminants remain at the Subsite which do not allow for unlimited use or unrestricted exposure, in accordance with 40 CFR 300.430 (f)

(4) (ii), the remedial action for the site shall be reviewed no less often than every five years. EPA will conduct another five-year review within five years of the date of this review.

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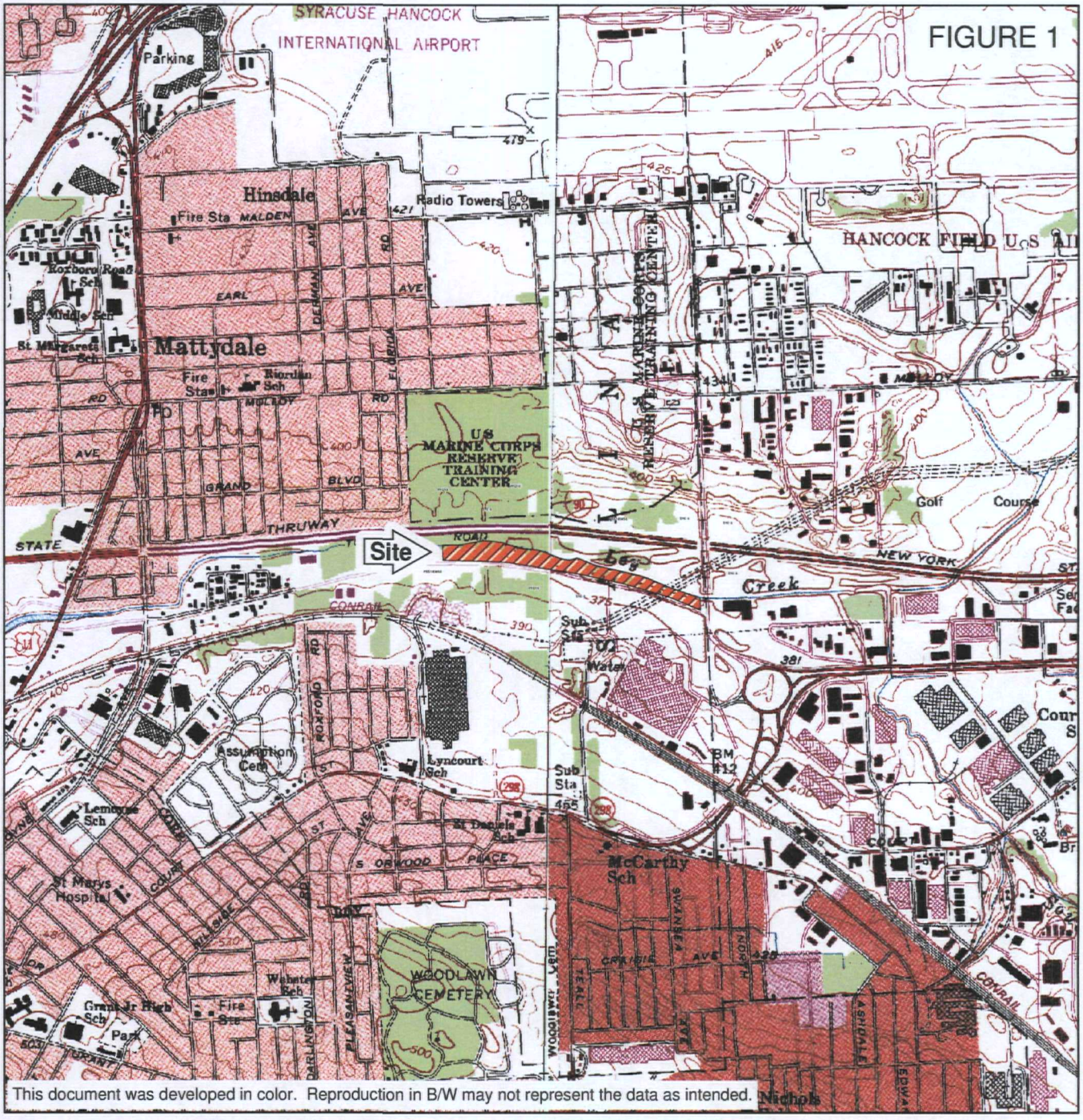
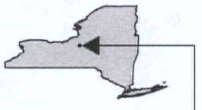
PLOT DATE: 12/19/06 DIV. 732 JPS

FIGURE 1



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

ADAPTED FROM: SYRACUSE EAST AND SYRACUSE WEST, NEW YORK USGS QUADRANGLES



QUADRANGLE LOCATION

LEY CREEK PCB DREDGINGS SITE SYRACUSE, NEW YORK

SITE LOCATION

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

Feet

1:24,000

4966.34124
JANUARY 2007

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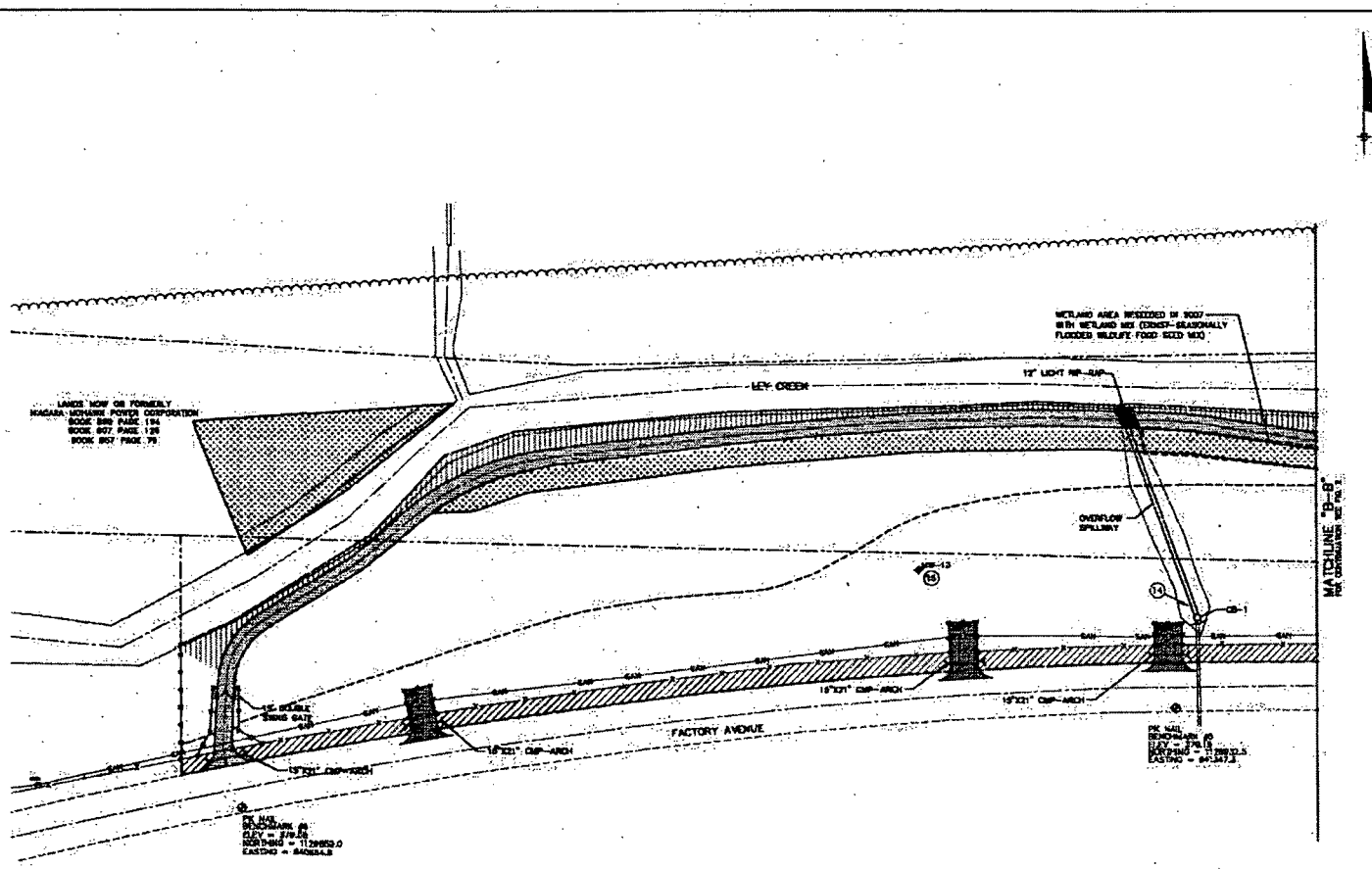
Figure 2



LEGEND

- FENCED WITH CANARY COVER
- OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- UTILITY POLE
- GUY WIRE
- SANITARY SEWER
- SANITARY MANHOLE
- SECURITY FENCE
- PAVEMENT
- GRAVEL ACCESS ROAD
- LIMITS OF SOIL LOCATED ALONG FACTORY AVENUE RELOCATED BENEATH COVER SYSTEM
- CATCH BASIN
- MW-25070 MODIFIED MONITORING WELL
- MONITORING WELL PREVIOUSLY DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
- LIMITS OF COVER SYSTEM
- LIMITS OF NON-WOVEN GEOTEXTILE
- PHOTOGRAPH LOCATION

LEY CREEK PCB DREDGING SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

OCTOBER 2010 OM&M INSPECTION PARTIAL SITE PLAN

1"=40' 40 0 40

FILE NO. 14774.46418.001
DECEMBER 2010

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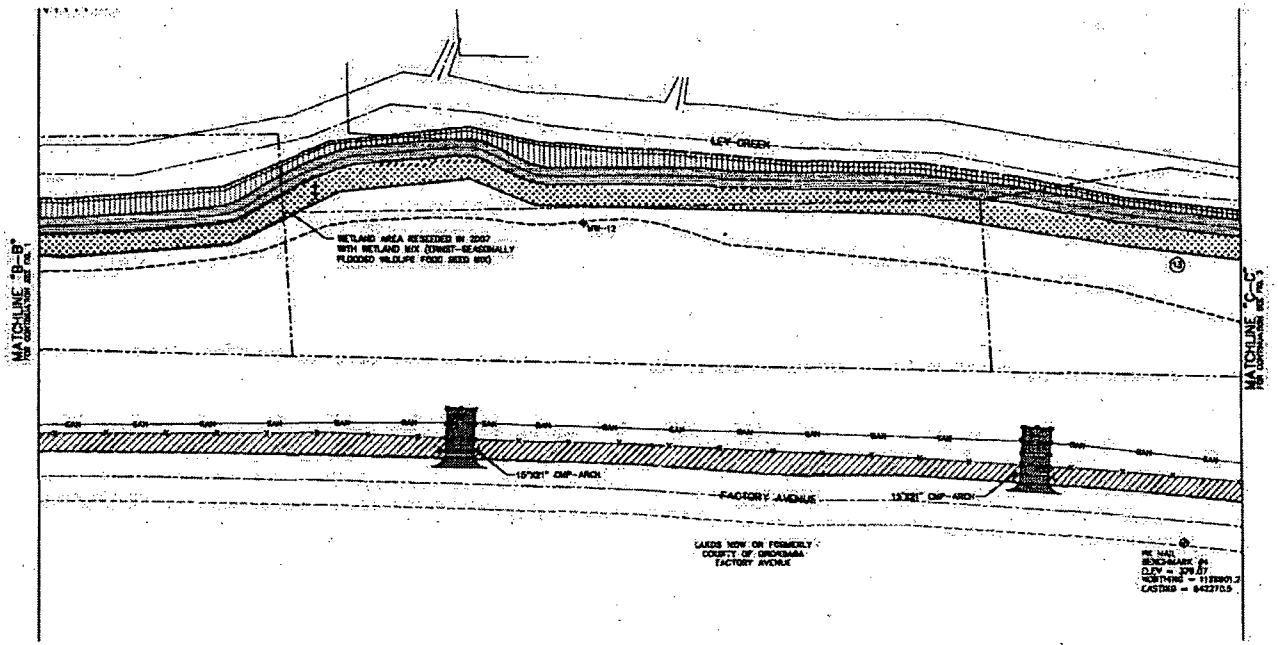
Figure 3



LEGEND

- SURFACE WITH CANARY COVER
- OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- UTILITY POLE
- CITY WIRE
- SANITARY SEWER
- SANITARY MANHOLE
- SECURITY FENCE
- PAVEMENT
- GRAVEL ACCESS ROAD
- LIMITS OF SOIL LOCATED ALONG FACTORY AVENUE RELOCATED BENEATH COVER SYSTEM
- CATCH BASIN
- MODIFIED MONITORING WELL
- MONITORING WELL PREVIOUSLY DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
- LIMITS OF COVER SYSTEM
- LIMITS OF NON-WOVEN GEOTEXTILE
- PHOTOGRAPH LOCATION

LEY CREEK PCB DREDGINGS SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

OCTOBER 2010 OM&M INSPECTION PARTIAL SITE PLAN

1"=40' 40 0 40

FILE NO. 14774.60418.002
DECEMBER 2010

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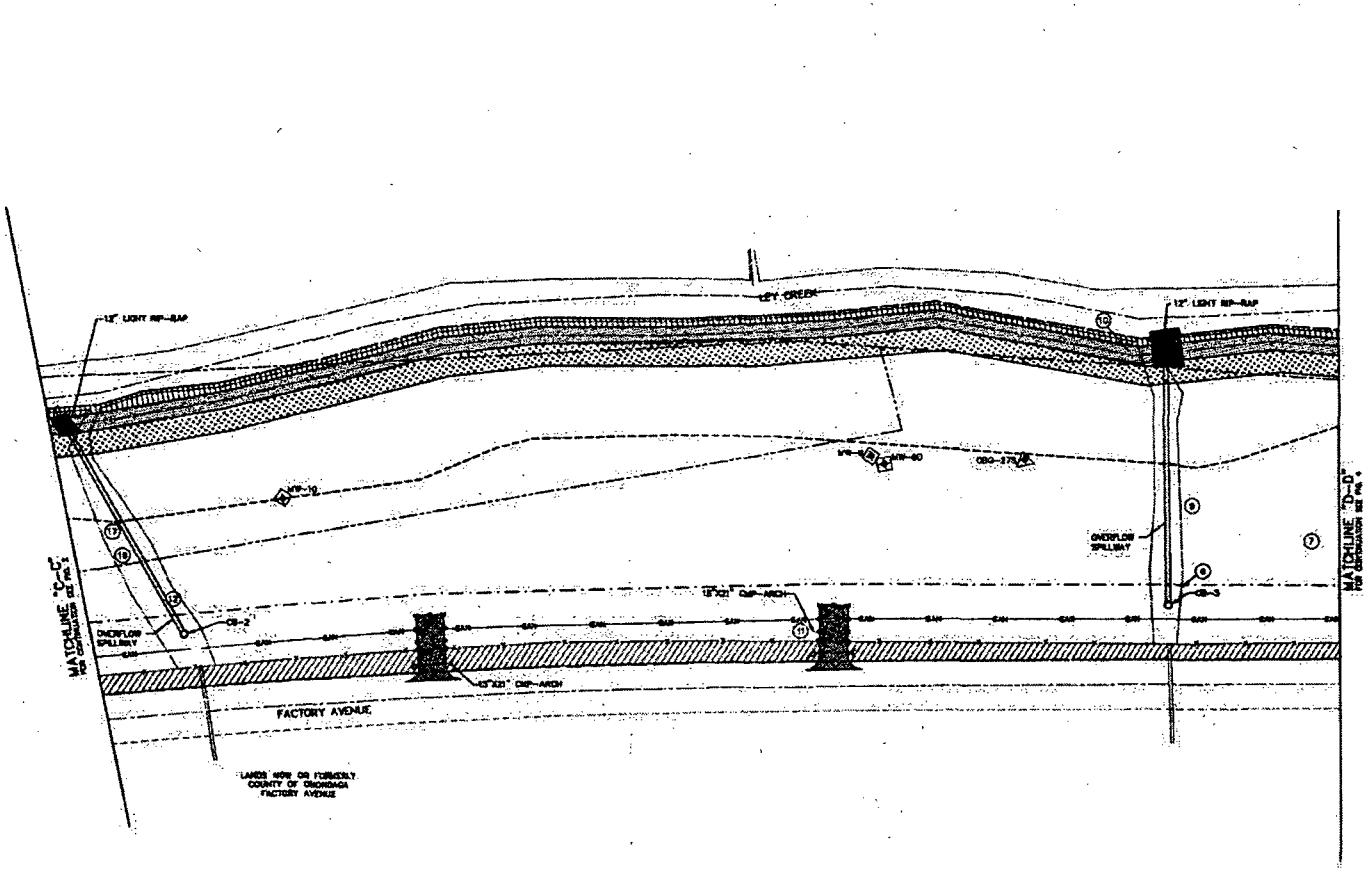
Figure 4



LEGEND

- SECURED WITH CANARY STRAP
- OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- UTILITY POLE
- GUY WIRE
- SANITARY SEWER
- SANITARY MANHOLE
- SECURITY FENCE
- PAVEMENT
- GRAVEL ACCESS ROAD
- LIMITS OF SOIL LOCATED ALONG FACTORY AVENUE RELOCATED BENEATH COVER SYSTEM
- CATCH BASIN
- MW-08S/D MODIFIED MONITORING WELL
- MONITORING WELL PREVIOUSLY DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
- LIMITS OF COVER SYSTEM
- LIMITS OF NON-WOVEN GEOTEXTILE
- PHOTOGRAPH LOCATION

LEY CREEK PCB DREDGING SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

OCTOBER 2010 OM&M INSPECTION PARTIAL SITE PLAN

1"=40' 40 0 40

FILE NO. 14774.46418.003
DECEMBER 2010

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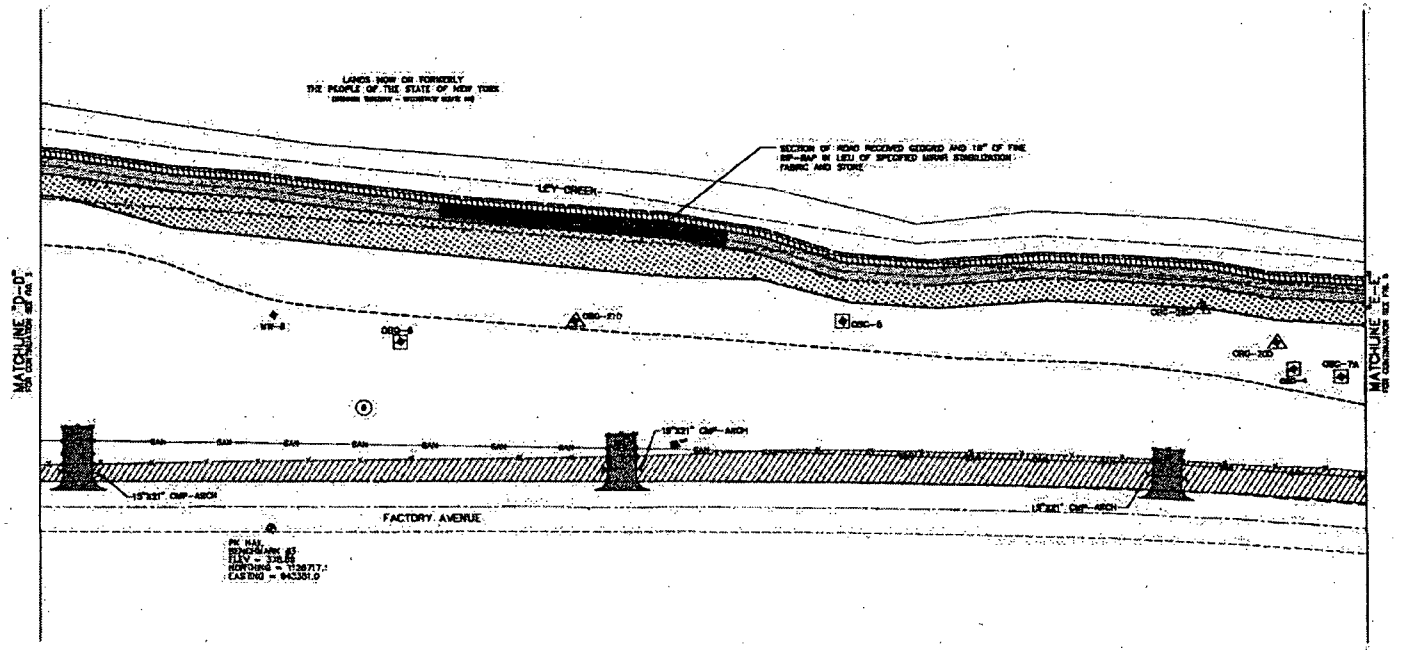
Figure 5



LEGEND

- STONE WITH CANARY DYKE
- OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- UTILITY POLE
- GUY WIRE
- SANITARY SEWER
- SANITARY MANHOLE
- SECURITY FENCE
- PAVEMENT
- GRAVEL ACCESS ROAD
- LIMITS OF SOIL LOCATED ALONG FACTORY AVENUE RELOCATED BENEATH COVER SYSTEM
- CATCH BASIN
- MW-08(D) MODIFIED MONITORING WELL
- MONITORING WELL PREVIOUSLY DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
- LIMITS OF COVER SYSTEM
- LIMITS OF NON-WOVEN GEOTEXTILE
- PHOTOGRAPH LOCATION

LEY CREEK PCB DREDGING SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

OCTOBER 2010 OM&M INSPECTION PARTIAL SITE PLAN

1"=40' 40 0 40

FILE NO. 14774.48418.004
DECEMBER 2010

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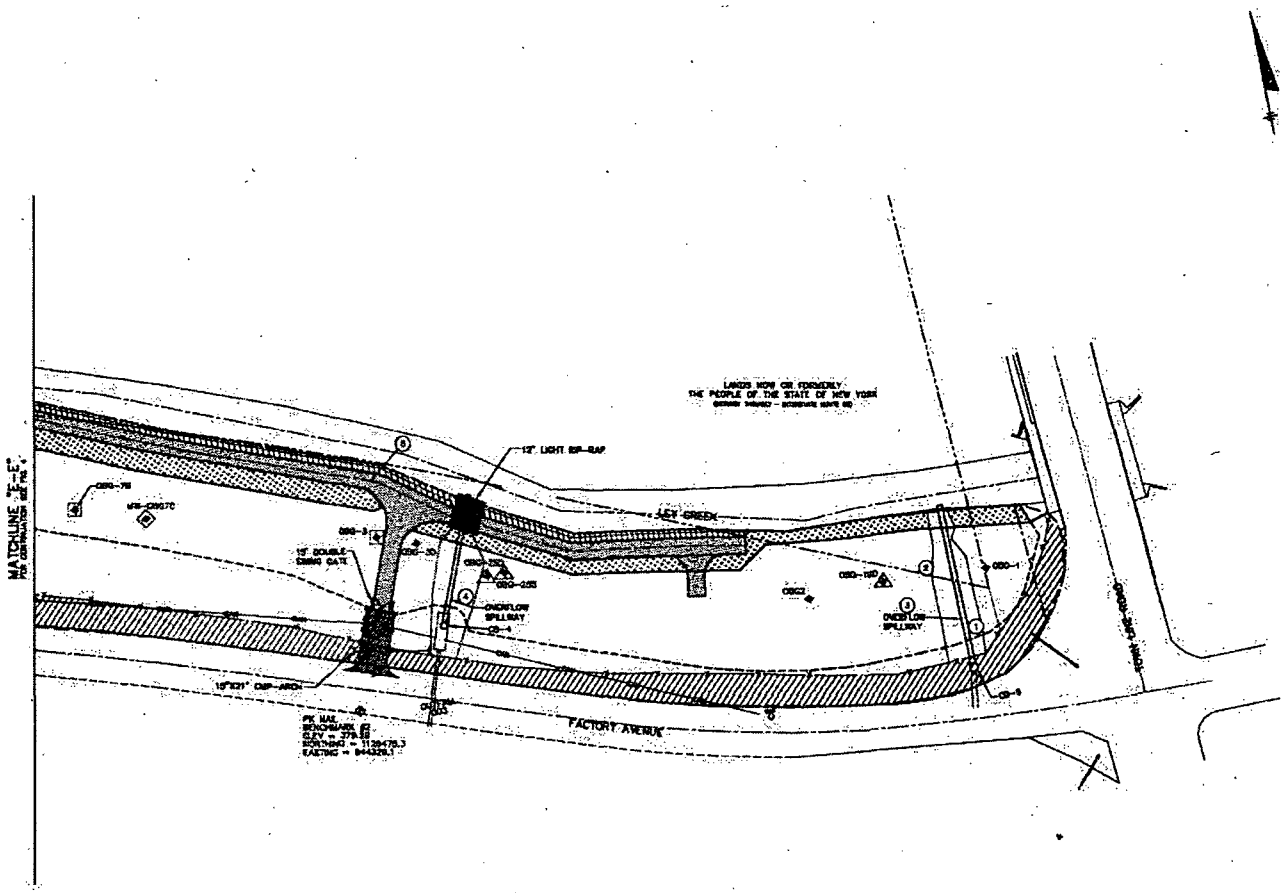
Figure 6



LEGEND

- SOILS WITH CANARY WASTE
- OVERHEAD WIRES
- PROPERTY BOUNDARY
- EDGE OF WOODS
- UTILITY POLE
- GUY WIRE
- SANITARY SEWER
- SANITARY MANHOLE
- SECURITY FENCE
- PAVEMENT
- GRAVEL ACCESS ROAD
- LIMITS OF SOIL LOCATED ALONG FACTORY AVENUE RELOCATED BEHIND COVER SYSTEM
- CATCH BASIN
- MW-09R7C MODIFIED MONITORING WELL
- MONITORING WELL PREVIOUSLY DESTROYED
- ABANDONED MONITORING WELL
- NEW MONITORING WELL
- LIMITS OF EROSION CONTROL MAT
- LIMITS OF COVER SYSTEM
- LIMITS OF NON-WOVEN GEOTEXTILE
- ③ PHOTOGRAPH LOCATION

LEY CREEK PCB DREDGING SITE
SYRACUSE, NEW YORK
SITE REMEDIATION PROJECT

OCTOBER 2010
OM&M INSPECTION
PARTIAL SITE PLAN

1"=40' 40 0 40

FILE NO. 14774.48418.003
DECEMBER 2010

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Table 1: Chronology of Site Events	
Event	**Date(s)**
Onondaga County Department of Drainage and Sanitation implements channel improvement programs for Ley Creek and places dredged sediments on the banks of the Creek	1970-1983
An Administrative Order on Consent between GM and NYSDEC for performance of an RI/FS became effective	May 1991
RI field work commenced	Jul 1992
NYSDEC issues Record of Decision (ROD)	Mar 1997
EPA concurs on ROD	Feb 1998
Remedial Design approved	Jun 1999
REALM and NYSDEC signed Administrative Order on Consent for performance of a Remedial Action	Jul 1999
Remedial Action commenced	Dec 1999
Remedial Action substantially completed	Nov 2001
First Five-Year Review completed	Jan 2007
Motors Liquidation Corporation (MLC) (formerly General Motors Corporation) filed for bankruptcy	Jun 2009
REALM filed for bankruptcy	Oct 2009
EPA, DOJ & the US Attorney for the SDNY along with 14 states and the St. Regis Mohawk Tribe announced that MLC agreed to resolve its liabilities under CERCLA, RCRA and the Clean Air Act at 89 MLC-owned sites, including the Ley Creek PCB Dredgings Subsite. Through the bankruptcy settlement, the RACER Trust is established to conduct, manage, and fund investigation, cleanup, and maintenance activities at the sites.	Oct 2010

Table 2: Documents, Data, and Information Reviewed in Completing the Five-Year Review	
Document Title, Author	**Submittal Date**
Record of Decision for the Ley Creek PCB Dredgings Subsite, Town of Salina, NY, NYSDEC	1997
Operation, Maintenance and Monitoring Manual, Ley Creek PCB Dredgings Subsite, Town of Salina, NY, Remediation and Liability Management Company, Inc., O'Brien & Gere Engineers, Inc.	2001
Remedial Action Engineering Report, Ley Creek PCB Dredgings Subsite, Town of Salina, NY, Remediation and Liability Management Company, Inc., O'Brien & Gere Engineers, Inc.	2001
Five-Year Review Report, Ley Creek PCB Dredgings Subsite	January 2007
Analytical Data Summary Report, GM Inland Fisher Guide Facility and Ley Creek Deferred Media Subsite, Syracuse, NY, September 2006 through January 2007 Sampling Events, Remediation and Liability Management Company, Inc., O'Brien & Gere Engineers, Inc.	April 2007
Letter to James Hartnett, REALM, from Susan Edwards, NYSDEC re: 2006 Annual OM&M Inspection Report.	May 30, 2007
Quitclaim Deed between REALM and REALM	June 25, 2007
Letter to James Hartnett, REALM, from Susan Edwards, NYSDEC re: 2007 Annual OM&M Report.	May 13, 2008
Operation, Maintenance and Monitoring Inspection Reports, Ley Creek PCB Dredgings Subsite, Town of Salina, NY, Remediation and Liability Management Company, Inc.	2007-2011
Revised Remedial Investigation/Feasibility Study – Former Syracuse IFG Facility, Motors Liquidation Company	October 2010
Letter to M. Brendan Mullen, RACER Trust, from Richard Mustico, NYSDEC re: 2010 Annual OM&M Inspection Report.	May 17, 2011
Laboratory Report, EPA Region 2 Laboratory	October 6, 2011
EPA guidance for conducting five-year reviews and other guidance and regulations to determine if any new Applicable or Relevant and Appropriate Requirements relating to the protectiveness of the remedy have been developed since EPA issued the ROD.	

Table 3: Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls	
Comment	**Suggestion**
The Factory Avenue culvert, which discharges to CB-2, was observed to be obstructed with debris and/or soil/sediment within the culvert.	The culvert should be cleaned out. Materials removed should be properly characterized and disposed.
The easternmost drainage ditch culvert was damaged resulting in restricted storm water flow along the drainage ditch.	The culvert should be repaired or replaced, as appropriate.
A portion of the site security fence in the eastern area of the site is damaged.	The fence should be repaired.
Topsoil was eroded within one small area in the CB-3 overflow spillway.	Topsoil should be placed where needed, and seed and fertilizer applied.
Groundwater monitoring wells MW-8 and OBG-21D were not able to be sampled and may be damaged.	The wells should be inspected to ascertain their condition and repaired or replaced as may be needed.
Groundwater monitoring wells MW-12 and MW-13 may be covered with topsoil dug by burrowing animals.	Covered wells should be located and marked prior to future groundwater sampling events. Additional measures to control burrowing animals (*e.g.*, removal of burrowing animals) should be considered.
Silt fences used during remediation are still present on the site and appear to be causing stability issues along the bank of Ley Creek.	An inspection should be conducted from the streamside of the bank as the vegetation prevents a land-based inspection. Corrective measures should be implemented, as appropriate.
New York State requires annual certification that institutional controls are in place and that remedy-related operation, maintenance, and monitoring (OM&M) is being performed.	A technical consultant for the Revitalizing Auto Communities Environmental Response Trust, which is responsible for performing required maintenance and monitoring activities at the Subsite, has verified that institutional controls required by the decision document are in place and that remedy-related OM&M is being performed. Annual confirmations that the institutional controls remain in place and that remedy-related OM&M is being performed need to be included in future OM&M reports.
Although the current maintenance includes twice a year mowing, Flatpea (Lathyrus sylvestris) need not be mowed twice per year. The Site should only be mowed, as needed, to prevent woody vegetation from becoming established.	Mowing of the upland portion of the site should not occur during the bird-nesting season: June 15 - August 31, and should be conducted by May 15 if site conditions allow (*e.g.*, not too wet).