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Phase 1 Remedial Investigation Work Plan

Remedial Investigation and Feasibility Study of
Surface Drainageways
Dewey Loeffel Landfill Superfund Site
Nassau, New York

Originally Submitted January 21, 2014

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1. Introduction

The Administrative Settlement Agreement and Order on Consent for Remedial Investigation and Feasibility Study of Surface Drainageways, Index No. CERCLA-02-2013-2030 (Consent Order), was executed between the United States Environmental Protection Agency (USEPA) and the General Electric Company (GE) for the Dewey Loeffel Landfill Superfund Site (the Site). The Consent Order became effective on November 6, 2013, and includes as Appendix 2 a Statement of Work (SOW) for the Remedial Investigation/Feasibility Study (RI/FS) of the Surface Drainageways at the Site. The Site includes four components: the Landfill (LF); Groundwater (GW); the Western Drainageway (WD); and, the Southern Drainageway (SD). The WD and SD components make up the Surface Drainageways. The Site components are described further in Section 1.3, and a Site Location Map is presented as Figure 1.

The Consent Order requires (among other things) the development of a work plan for the performance of Phase 1 of the RI for the WD and SD components of the Site. This Phase 1 RI Work Plan has been developed by ARCADIS of New York, Inc. (ARCADIS), on behalf of GE, in accordance with the Consent Order and Section II of the SOW, and is accompanied by a Quality Assurance Project Plan (QAPP) and a Health and Safety Plan (HASP).

1.1 Purpose and Objectives

The goals of the Phase 1 RI are to gather additional physical and chemical data on the WD and SD in order to better define and understand the nature and extent of potential constituents of concern in the WD and SD, and focus the subsequent RI activities (i.e., Phase 2). The objective of this Phase 1 RI Work Plan is to define the elements of the work to be completed by GE under the Consent Order for the Phase 1 RI. Specifically, this Phase 1 RI Work Plan includes a detailed description, rationale, and schedule for the first phase of the RI, which generally includes field reconnaissance and site survey, project mapping, the collection and analysis of sediment and soil samples to assess the presence of polychlorinated biphenyls (PCBs) and other potential constituents of concern, and the continuation of the fish and surface water monitoring programs currently being conducted by GE in the WD.

1.2 Site History and Background

As described in the Consent Order, from approximately 1952 to 1968, the LF was owned and operated by several companies, including the Loeffel Waste Oil and Removal Service Company (Loeffel Companies) as a waste disposal facility. During this time, the LF consisted of two waste lagoons located in the western and central portions of the LF, a 6-foot deep oil pit in the east central portion of the LF, four 30,000-gallon aboveground storage tanks, and a drum disposal area located in the southeastern portion of the LF.

Disposal operations at the LF reportedly ceased in 1968 by order of the State of New York. Between 1970 and 1975, remedial actions undertaken by the Loeffel Companies included covering and grading the drum disposal area, oil pit and lagoons, and constructing a system of drainage ditches around the LF. From 1974 to 1980, the Loeffel Companies reportedly also operated a waste oil transfer station utilizing the four 30,000-gallon aboveground storage tanks.

On September 23, 1980, GE entered into an agreement with the New York State Department of Environmental Conservation (NYSDEC) which required GE to perform field investigations, submit an engineering report which discussed the collected data, identify remedial alternatives, and recommend a remedial alternative. A remedy was subsequently selected by NYSDEC and involved the installation of soil-bentonite cutoff wall around the LF, an overlying clay cap, and a leachate collection system below the cap within the cutoff wall. The design of the remedy was performed by GE and approved by NYSDEC. The remedy was subsequently implemented in 1983 and 1984 by NYSDEC using funding provided by GE, Schenectady Chemicals, Inc. (now SI Group, Inc. [SI Group]), and Bendix Corporation (now part of Honeywell International, Inc.). NYSDEC subsequently performed operation, maintenance and monitoring activities at the LF, which, since 1991 (but with the exception of 1994), included the removal of leachate from the LF for off-site treatment.

Beginning in 1983, NYSDEC and/or GE performed a variety of response actions at the Site. Some of this remedial work was performed in accordance with two Records of Decision (RODs) issued by NYSDEC, including the following:

- In January 2001, the NYSDEC issued a ROD that included elements specific to the LF and GW components of the Site based on the results of an RI/FS performed by GE under the oversight of NYSDEC (NYSDEC 2001). Although those components are described in Section 1.3 of this Phase 1 RI Work Plan, the activities described in this Phase 1 RI Work Plan do not pertain to the LF or GW components of the Site; and
- In January 2002, the NYSDEC issued a ROD for the Surface Drainageways based on the results of an RI/FS performed by GE under the oversight of NYSDEC (NYSDEC 2002a). This ROD selected a remedy for the WD, but no further action was selected for the SD.

The ROD issued by NYSDEC for the Surface Drainageways included the following remedial action elements for the WD:

- A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program;

- Complete the NYSDEC approved Interim Remedial Measures (removal of contaminated soils and sediments from Mead Road Pond area, the spoil banks adjacent to Mead Road Pond, the Low-lying Area, and the Northwest Drainage Ditch);

- Removal and proper disposal of PCB contaminated sediments from T11A;

- Removal and proper disposal of PCB-impacted sediment and soil in a former impoundment on the Valatie Kill known as Area 28, which is located just downstream of the Krouner Road/Hoags Corners Road bridge;

- Complete appropriate site restoration activities in the areas disturbed by the removals in T11A and the Valatie Kill;

- Assess the effectiveness of the remedy by implementing a long term monitoring program to determine the trends in the PCB concentrations in various media (biota, sediment, water) which will include:

    - Annual biota sampling in T11A, the Valatie Kill, and Nassau Lake, along with reference locations.

    - Annual surficial sediment sampling in T11A, in the Valatie Kill, and in Nassau Lake.

    - Annual suspended sediment sampling in Nassau Lake.

    - Surface water sampling, especially during high flow events, in the vicinity of the disposal site, in T11A, in the Valatie Kill, and in Nassau Lake.

- Implement institutional controls such as fish consumption advisories against consumption of fish from the impacted portion of the Valatie Kill and Nassau Lake;

- Establish an inspection program to ensure that the dam which impounds Nassau Lake will continue to do so for as long as it is necessary to contain the PCB contaminated sediments in Nassau Lake; and

- Perform remedial review to determine if the remedy is protective of human health and the environment and meets the goals of the remedy.

From 2001 through 2004, GE removed approximately 15,000 tons of sediment and soil from Mead Road Pond area, Tributary T11A, and Area 28 of the Valatie Kill for off-site transportation and disposal. The ROD also included a long-term monitoring program for the WD. Since issuance of the ROD, GE has funded and/or performed many monitoring activities in the WD (e.g., surface water sampling, fish sampling) as discussed in detail in Section 2 of this Phase 1 RI Work Plan.

Beginning in late March 2008, NYSDEC also extracted groundwater from three bedrock extraction wells located to the south of the LF on a seasonal basis, operating during the spring, summer, and fall months. Along with leachate from the LF, the extracted groundwater was transported for off-site treatment and disposal. NYSDEC continued operating the groundwater extraction wells on a seasonal basis through October 2011.

At the request of NYSDEC, USEPA proposed the site for inclusion on the National Priorities List (NPL) on March 4, 2010. The Site was subsequently added to the NPL on March 10, 2011.

USEPA subsequently took over operation of the leachate collection system at the LF and the groundwater extraction wells to the south of the LF on October 31, 2011. USEPA winterized the groundwater extraction system (including erection of a pole barn to enclose the existing and an additional storage tank at the LF), allowing year-round extraction of groundwater for off-site treatment and disposal.

The Administrative Settlement Agreement and Order on Consent for a Removal Action, Index No. CERCLA-02-2012-2005 (Removal Order) was entered into by USEPA, GE and SI Group, and became effective on April 16, 2012 (USEPA 2012). Pursuant to the Removal Order, GE and SI Group assumed responsibility from USEPA for continued operation and maintenance of the leachate collection system at the LF and the groundwater extraction wells south of the LF on August 1, 2012. The leachate and extracted groundwater continued to be transported for off-site treatment and disposal. Under the Removal Order, GE and SI Group also conducted pre-design and design activities for a treatment system that would, once constructed, eliminate the need for continued trucking from the Site. Construction of a treatment system was completed in December 2013 and start-up testing is currently underway.

On October 7, 2013, a separate Administrative Settlement Agreement and Order on Consent for Remedial Investigation and Feasibility Study of the LF and GW, Index No. CERCLA-02-2013-2008 entered into by USEPA, GE and SI Group became effective (USEPA 2013a). That agreement does not cover the RI/FS for the WD and SD, and is not associated with this Phase 1 RI Work Plan.

On November 21, 2013, GE submitted to USEPA a proposal for additional sampling in the Mead Road Pond area and Tributary T11A (portions of the WD) under Paragraph 47.f of the Removal Order (ARCADIS, 2013b). This proposal presented a sampling and analysis plan for additional sediment and soil sampling in the Mead Road Pond area (including the Northwest Drainage Ditch) and Tributary T11A. Responses to USEPA comments were provided on December 5, 2013 and USEPA approved the Paragraph 47.f proposal on December 6, 2013. The samples in the Mead Road Pond area were collected on December 18, 2013 and the samples in Tributary T11A were collected on January 14 and 15, 2014. As such, sediment and soil sampling for those components of the WD are not

addressed in this Phase 1 RI Work Plan, but the results will be included in the Site Characterization Summary Report (SCSR) that will be prepared and submitted after implementation of the Phase 1 RI Work Plan.

1.3 Site Description

The Site is located in the Town of Nassau, Rensselaer County, New York, and includes the following four components, as described in the SOW attached to the Consent Order:

- LF, defined as the Dewey Loeffel Landfill proper, including contaminated soils associated with prior landfill operations and leachate and other areas where contaminants may have migrated, but not including the GW, SD, and WD components of the Site, as defined below.
- GW, defined as all groundwater contamination at the Site and any other areas where contaminants may have migrated, but not including the LF, SD, and WD.
- SD, defined as the Southeast Drainage Ditch, Valley Stream and Smith Pond, but not including the GW, LF, and WD.
- WD, defined as the Northwest Drainage Ditch, former Mead Road Pond, Tributary T11A, Valatie Kill and Nassau Lake, and any other area where contaminants have migrated, but not including the LF, GW, and SD.

Only the WD and SD are the subject of this Phase 1 RI Work Plan, and are described in further detail in the sections that follow. Investigation activities for the LF and GW components of the Site are being addressed under a separate consent order between USEPA, GE and SI Group (USEPA 2013a).

1.3.1 Western Drainageway

The WD begins where the drainage from the LF flows under Mead Road into the Northwest Drainage Ditch, and then continues through a channel in the former Mead Road Pond. The WD continues through Tributary T11A to the confluence with the Valatie Kill. The Valatie Kill then travels about 2.7 miles before entering the northeastern end of Nassau Lake. The four areas of the WD are shown on Figure 1 and described in more detail below.

<u>Mead Road Pond Area</u>

The Mead Road Pond area is located to the northwest and west of the LF. A majority of the surface water runoff from the LF flows under Mead Road through two 30-inch-diameter culvert pipes into the Northwest Drainage Ditch, which travels in a westerly direction about 400 feet before passing the Low Lying Area, a small one-acre bog just northeast of the former Mead Road Pond. The drainage channel extends another 400 feet (through the Mead Road Pond inlet, the former Mead Road Pond and Mead Road Pond outlet) before entering Tributary T11A. Based on qualitative visual observations (as no calibrated flow

measurement device or quantitative flow rate information is available for Tributary T11A), the drainage channel through the Mead Road Pond area has low and intermittent flow rates, although flow is highly variable based on precipitation and snowmelt events. The watershed area is approximately 25 acres as measured at the end of the Mead Road Pond outlet (inlet to Tributary T11A).

Tributary T11A

Tributary T11A is a small stream that flows northwesterly through a steep-sided, wooded ravine from the Mead Road Pond area to the Valatie Kill. The tributary is about 1,900 feet long and slopes at an approximate 7 percent grade. Tributary T11A often has low and, in the upper reach, intermittent flow rates, although the flow is highly variable based on precipitation and snowmelt events. The total watershed area for Tributary T11A is approximately 75 acres as measured at its confluence with the Valatie Kill.

Valatie Kill

Following the confluence with Tributary T11A, the Valatie Kill travels in a southwesterly direction. The watershed area for the Valatie Kill is approximately 6,000 acres at United States Geological Survey (USGS) gaging station 01360640, which is located just upstream from the Krouner Road/Hoags Corners Road bridge, approximately 1.7 miles below the confluence of the Valatie Kill with Tributary T11A and approximately 1.0 miles upstream of the inlet to Nassau Lake. The average annual flow in the Valatie Kill at the gaging station is approximately 14 cubic feet per second (cfs).

Nassau Lake

Nassau Lake is a shallow, 173-acre impoundment. The Valatie Kill accounts for approximately 60% of Nassau Lake's watershed area. Nassau Lake is impounded at the southern end (outlet) by the Nassau Lake Dam. Nassau Lake and the properties surrounding it are privately owned. Nassau Lake has an average water depth of approximately 7 feet with a maximum depth of approximately 11 feet. About 40% of the lake's surface area has water depths less than 5 feet.

Pursuant to the Second Stipulation and Order of Partial Settlement between New York State and GE, dated March 26, 2003, GE designed and constructed a new dam for Nassau Lake. Operation and ownership of the new dam was turned over to the Nassau Lake Park Improvement Association (NLPIA) in May 2009.

1.3.2 Southern Drainageway

The SD begins at the LF in the Southeast Drainage Ditch, which travels approximately 0.4 miles to a confluence with Valley Stream. Valley Stream originates in Mud Pond about 1.3

miles upstream from this confluence and then flows about 1.1 miles downstream from this confluence into Smith Pond, a roughly 35-acre pond. After exiting Smith Pond, Valley Stream travels about 1.6 miles before entering the southeastern end of Nassau Lake. Valley Stream accounts for approximately 35% of the Nassau Lake watershed area. The SD is shown on Figure 1.

2. Summary of Previous Investigations and Remedial Actions

This section presents an overview of the previous investigation and remediation activities conducted for the WD and SD components of the Site.

The flow within the WD and SD is highly variable based on precipitation and snowmelt events, and minor variations in the channel alignment are possible. As such, the distinction between sediment and soil samples is also variable. For previous investigations and remedial actions as well as proposed investigations and remedial actions, the distinction between sediment (i.e., roughly defined as unconsolidated particulate material submerged below water) and soil samples is based on the presence of water at the time of investigation design and/or sampling.

2.1 Western Drainageway

Previous investigations of the WD were conducted between 1979 and 2013, and have consisted of multiple surface water, sediment, soil, and biota (fish and non-fish) sampling events at many locations throughout the WD, by or on behalf of NYSDEC and GE. In addition, USEPA conducted sediment and soil sampling in the WD in 2009. In total, more than 5,000 surface water, sediment, soil, and biota samples have been collected from the WD to date.

The previous soil and sediment investigations and remedial actions for the WD are described in further detail below. In addition to the investigation programs outlined below, From 2009 through 2014, GE conducted annual fish sampling in the WD (along with a background location in the Valatie Kill about 1.1 miles upstream from its confluence with Tributary T11A and a location in the Valatie Kill immediately downstream from the Nassau Lake Dam). From 2002 through 2008, these fish collection efforts were led by NYSDEC, with manpower and equipment assistance by ARCADIS (formerly Blasland, Bouck and Lee, Inc. [BBL]). GE also funded the laboratory analyses for these fish monitoring efforts.

Since 2011, GE has been conducting an annual surface water sampling program in the WD (including Tributary T11A and the Valatie Kill). From 2004 through 2010, GE conducted a surface water and suspended sediment monitoring program in Tributary T11A and the Valatie Kill.

<u>Mead Road Pond Area</u>

A total of 465 sediment and soil samples have been collected in the Mead Road Pond area between 1988 and 2011, and a total of 46 additional sediment and soil samples were collected in 2013. Seven sediment/soil sampling events were performed between 1988 and 1991, while four sediment/soil sampling events were performed during the previous RI between 1992 and 1996. In 2000, several sampling events were performed during pre-

design activities associated with the former Mead Road Pond Interim Remedial Measures (IRM).

Prior to the performance of the IRM in the Mead Road Pond area in 2001, concentrations of total PCBs in sediment and soil samples in the Northwest Drainage Ditch, Low Lying Area, Mead Road Pond spoil banks and Mead Road Pond outlet (all of which had a higher concentration of PCBs than the pond itself) were up to 470 parts per million (ppm), 18 ppm, 410 ppm and 180 ppm, respectively. During the IRM, NYSDEC and/or GE collected a total of 24 confirmation samples to guide additional excavations in select areas and to confirm the limits of excavation. The IRM included the removal of approximately 9,600 tons of PCB-impacted sediment and soil.

In 2009, USEPA collected four additional sediment/soil samples from the drainage channel in the Mead Road Pond area. These results were all well below the pre-IRM levels, with total PCB concentrations at non-detect (ND) in two samples, 0.17 ppm in the third sample, and an estimated concentration of 3.5 ppm in the fourth sample (from the Mead Road Pond inlet).

On June 23, 2011, GE collected 17 sediment samples from the drainage channel in the Mead Road Pond area to further assess the potential for transport of PCBs into Tributary T11A. PCB concentrations in those sediment samples ranged from ND to 12.8 ppm. These results were summarized in a letter report submitted to NYSDEC (ARCADIS 2011).

As discussed above, pursuant to the Paragraph 47.f proposal, GE collected additional samples in the Mead Road Pond area on December 18, 2013. PCB concentrations in those samples ranged from ND to 18.1 ppm.

Tributary T11A

A total of 389 sediment and soil samples were collected from Tributary T11A between 1989 and 2011. Two sediment/soil sampling events were performed in 1989 and additional sediment/soil sampling events were performed during the previous RI in 1993 and 1996. Additionally, sediment/soil sampling was conducted in 2002 during pre-design activities associated with the excavation of fine-grained sediment in Tributary T11A.

The concentrations of total PCBs in sediment samples collected in Tributary T11A prior to the remedial action ranged up to 230 ppm. Approximately 1,200 tons of fine-grained sediment was removed from Tributary T11A from October 2002 through January 2003. During the excavation activities, and as directed by NYSDEC, GE collected four confirmation samples to confirm the limits of the excavations. Additional excavation was completed at three of these locations. Six other confirmation sample locations were targeted at the direction of NYSDEC, but samples could not be collected due to a lack of sediment (i.e., excavation into the native till).

In 2009, NYSDEC collected four additional samples in Tributary T11A. These results included a maximum total PCB concentration of 22 ppm. USEPA also collected seven samples from Tributary T11A in 2009, with a maximum concentration of 1.0 ppm total PCBs.

In April and August 2010, GE collected a total of 51 sediment samples and 115 soil samples to better characterize PCB concentrations in the Tributary T11A ravine. Sediment PCB concentrations ranged from 0.297 to 22.6 ppm, while soil PCB concentrations ranged from 0.0515 to 407 ppm. The results of the April and August sampling events were summarized in letter reports submitted to NYSDEC (ARCADIS, 2010a, 2010b).

As a follow-up to the 2010 sampling, on June 23, 2011, GE collected 50 additional soil samples with PCB concentrations ranging from 0.105 to 1,340 ppm. The results of this sampling event were summarized in a letter report submitted to NYSDEC (ARCADIS 2011).

As discussed above, pursuant to the Paragraph 47.f proposal, GE collected additional samples in the T11A area on January 14 and 15, 2014. PCB concentrations in those samples ranged from ND to 599 ppm.

Valatie Kill

A total of 426 sediment and soil samples have been collected from the Valatie Kill. Six sampling events were performed during the previous RI between 1992 and 1996. Two sampling events were also performed in 1998 and 1999 from low lying areas near the Valatie Kill. Additional soil/sediment sampling was performed during pre-design activities associated with the excavation of sediment and soil in Area 28, which was an impoundment located just downstream from the Krouner Road/Hoags Corners Road bridge.

Prior to the remedial action at Area 28 of the Valatie Kill, concentrations of total PCBs in Area 28 ranged up to 120 ppm. Approximately 4,000 tons of sediment and soil were removed from Area 28 from mid-2003 through mid-2004. During the Area 28 remedial action, 10 confirmation samples were collected at locations and depths specified by NYSDEC to confirm the limits of the excavations. The maximum total PCB concentration in those samples was 0.92 ppm. In other areas of the Valatie Kill, the maximum historic total PCB concentration was 6.4 ppm, in a sample collected near Mead Road downstream from the confluence of Tributary T11A.

In 2009, USEPA collected 10 additional sediment and soil samples, plus two field duplicate samples, in the Valatie Kill between the confluence with Tributary T11A and the inlet to Nassau Lake. Those results also indicated low concentrations of PCBs, with a maximum total PCB concentration of 1.3 ppm.

Nassau Lake

A total of 223 sediment and soil samples have been collected from or immediately adjacent to Nassau Lake. Seven sediment sampling events were performed during the previous RI between 1993 and 1997. NYSDEC and GE also conducted a split sampling event in 1998. The maximum total PCB concentration for all of these sampling events was 9.5 ppm in a sample collected from the northeastern quadrant of the lake.

In 1998 and 2000, 26 soil samples were collected from five parcels immediately adjacent to Nassau Lake. These results indicated low concentrations of PCBs, with a maximum total PCB concentration of 2.2 ppm.

In 2009, USEPA collected 18 additional sediment samples in Nassau Lake during two sampling events. These results indicated low concentrations of PCBs, with a maximum estimated total PCB concentration of 1.7 ppm in a sample collected from the northeastern quadrant of the lake.

2.2 Southern Drainageway

Previous investigations of the SD were conducted between 1979 and 2002, and have consisted of multiple surface water, sediment, and biota (fish and non-fish) sampling events at various locations throughout the SD. Ten sediment sampling events in the SD were performed by NYSDEC and GE between 1988 and 1993. The results showed total PCB concentrations to be ND at all but two locations, one in the Southeast Drainage Ditch, where a concentration of 1.4 ppm was reported, and the other at the confluence of Valley Stream and Nassau Lake (i.e., in Nassau Lake at the Valley Stream Outlet), where an estimated concentration of 0.13 ppm was reported.[1] The ROD stated that the Southern Drainageway "was not significantly impacted by hazardous wastes from the site, based upon the results of sediment and biota sampling." Further, the ROD did not prescribe any further characterization, remediation, or monitoring within the Southern Drainageway.

In 2009, USEPA conducted two sampling events at ten locations within the SD, with a total of 22 sediment samples plus two duplicate samples. Of the 24 samples, all but four sample results were ND for total PCBs. The four samples with low detections of total PCBs were all collected from the Southeast Drainage Ditch, between the LF and Valley Stream. Total PCB concentrations in these four samples were low, ranging from 0.0375 to 0.74 ppm.

[1] Based on the location from which the sample was collected, it is assumed that the estimated concentration of 0.13 ppm is likely representative of the conditions in Nassau Lake and does not necessarily represent the conditions in the stream.

3. Description and Rationale for the Phase 1 RI Activities

This section of the Phase 1 RI Work plan provides a detailed description of, and rationale for, the elements of the work to be completed by GE under the Consent Order for the first phase of the RI. As mentioned previously, a QAPP has been prepared for the activities associated with the Phase 1 RI, consistent with Section II.B.2 of the SOW. Included in the QAPP are Standard Operating Procedures (SOPs) developed to provide procedures for the work to be performed in association with this Phase 1 RI Work Plan. All work performed as part of the Phase 1 RI will also be performed in accordance with the procedures outlined in the site-specific HASP. The QAPP and HASP are separate documents, but are being provided to USEPA with this Phase 1 RI Work Plan.

3.1 Property Access Outreach

As required by the Consent Order and associated SOW, GE will use best efforts to obtain access from the owners of all parcels needed to perform the field reconnaissance and sampling activities described herein. GE will target completion of property access efforts within 45 days after USEPA approval of this Phase 1 RI Work Plan. GE will attempt to obtain access and sampling permission for its representatives and contractors, as well as for USEPA and its contractors and oversight officials.

In efforts to obtain access for field reconnaissance and sampling (where access is not already in place), GE will obtain the most recent tax records from Rensselaer County to identify the appropriate property owners. GE will mail a letter and access agreement form to such property owners within one week of USEPA approval of this work plan.[2] Approximately ten calendar days following this initial mailing, GE will make an attempt to contact (via telephone or in person) property owners that did not respond to the access form mailing. If GE is unsuccessful in initially contacting a targeted property owner, a final attempt via telephone or in person will be made within one week of the initial attempt. GE will document the status of its property outreach efforts in a table for tracking progress and reporting to USEPA. GE will provide updates to USEPA on its outreach efforts and progress.

GE will notify USEPA if, after the outreach efforts described above, it is unable to obtain access agreements with any specific property owners within 45 days following USEPA approval of the Phase 1 RI Work Plan. At its discretion, USEPA may seek access from such property owners. Should owners of properties targeted for sampling refuse to provide

[2] Although not a requirement of the Consent Order, GE may also mail a letter to the owners of properties where access is already in place notifying them of forthcoming field reconnaissance and sampling activities.

access for field reconnaissance or sampling, or are unresponsive to property access outreach efforts by GE and USEPA, GE will remove that property from consideration for access and, instead, seek access from an adjacent property owner, as deemed appropriate.

3.2 Field Reconnaissance

Field reconnaissance of the WD and SD will document, using field notes, photography/video, and position (via Global Positioning System [GPS]), relevant stream features such as riffles, depositional areas (e.g., sand bars, gravel bars), backwater areas, and evidence of bank undercutting or scour. In addition, the reconnaissance will attempt to identify potential depositional areas outside of the current active drainageway channels, such as abandoned channels and oxbows, secondary high flow channels, wetlands, and other topographic depressions within the floodplains. Field reconnaissance will also be performed to assess geomorphology (i.e., width of the stream, bank slope, presence of sand bars/gravel bars, man-made structures affecting stream flow) to aid in understanding transport of sediments (and associated PCBs) in the WD and SD to guide the sampling discussed in Section 3.8 of this Phase 1 RI Work Plan. Proposed modifications to this Phase 1 RI Work Plan to be based on field reconnaissance and/or due to field discoveries during sampling activities will be coordinated for review and approval by USEPA. At a minimum, updated tables and figures will be prepared after the field reconnaissance and provided to USEPA for review. In addition, a meeting or call will be scheduled between USEPA and GE to review and discuss such revised tables and figures.

Field reconnaissance will be completed in the WD, including the area around Nassau Lake, and the SD downstream from the LF. During the reconnaissance, the following will be completed:

- Develop a narrative description of stream characteristics, noting length and location of any dominant or otherwise notable features;
- Estimate the bank full elevation;
- Determine stream and bank characteristics (e.g., width, depth, bank slope, potential entrenchment, substrate);
- Wetlands located in proximity to the drainageways based on information from the Nationwide Wetlands Inventory (NWI) Geographic Information System (GIS) database;
- Review land use (e.g., residential, agricultural, recreational) to confirm/refine information obtained from Rensselaer County Records on tax parcel zoning information and from the aerial photography;
- Identify man-made structures or improvements, such as bank structures, outfall pipes or water intake pipes, levees, retaining walls, rip-rap, or other evidence of land disturbance; and
- Document the presence of features that could detract from human use or minimize access to the stream and floodplain areas (e.g., steep and/or rocky stream banks,

fences/gates, “Posted” or “No Trespassing” signs, very densely vegetated or wetland areas that make physical access difficult, evidence of frequent flood inundation).

The proposed work will be performed once access is granted from the appropriate property owners. GE and/or ARCADIS will notify USEPA at least 14 days in advance of planned field activities. The results of the reconnaissance proposed will be compared, to the extent practicable, to records of the reconnaissance performed by GE in the 1990s under the stipulation agreement with the State of New York.

3.3 Project Base Mapping

Aerial photography will be collected of the WD, including in/around Nassau Lake, and the SD downstream from the LF. The data will be digitized and referenced to North American Datum of 1983 (NAD83) and North American Vertical Datum of 1988 (NGVD88), and topographic mapping will be developed from the aerial photography having a 2-foot contour resolution. Based on unique features identified during the field reconnaissance, select areas may also be designated for topographic mapping at 1-foot contour intervals. The work will be conducted by a New York State-Licensed Land Surveyor and conform to National Map Accuracy Standards. Additionally, available mapping (i.e., the 100-year floodplain as well as the 500-year floodplain [where available]) as developed by the Federal Emergency Management Agency (FEMA) will be reviewed and included in the digitized topographic mapping. Hydraulic modeling will be performed based on project base mapping to supplement the available FEMA maps, as necessary.

3.4 Fish Monitoring

Fish monitoring was performed in 2014 in general accordance with the SOW dated March 20, 2009 (previously approved by NYSDEC on April 23, 2009). This sampling program was implemented in 2009, 2010, 2011, and 2012, as well as in 2013 when it was slightly expanded (i.e., additional target sample sizes for specific species at several sampling locations). As such, the 2014 fish monitoring program was performed as described in the 2013 Biological Monitoring Data Summary Report dated November 26, 2013 (ARCADIS 2013c). The fish monitoring program performed in 2014 is summarized in the remainder of this section. The full description of the 2014 fish collection activities, including a summary of results, temporal trends in PCB concentrations in the fish, and an evaluation of the implications of the recent fish PCB data on the fish consumption advisories for the site waters was submitted to USEPA on April 7, 2015 (ARCADIS 2015b).

The 2014 fish monitoring program targeted collection of up to 215 forage-size fish composite samples and up to 145 edible-size fish samples (as summarized in Table 1). The monitoring included the following 12 sampling stations located within the Mead Road Pond area, Tributary T11A, the Valatie Kill (including both upstream of the Tributary T11A confluence and downstream of the Nassau Lake Dam), and Nassau Lake (see Figure 2):

- 1 – Drainage Channel Above Former Mead Road Pond;
- 2 – Drainage Channel Through Former Mead Road Pond;
- 3 – Upper Third of Tributary T11A;
- 4 – Middle Third of Tributary T11A;
- 5 – Lower Third of Tributary T11A;
- 6 – Valatie Kill, Confluence with T14 (Near China Hill Road);
- 7 – Valatie Kill, Below Confluence with Tributary T11A;
- 8 – Valatie Kill, Above Area 28;
- 9 – Valatie Kill, Area 28;
- 10 – Valatie Kill, Below Area 28;
- 11 – Nassau Lake; and
- 12 – Valatie Kill, Below Nassau Lake (Above County Route 7).

Previous fish sampling in the SD indicated over 92% (86 of 93 samples collected) of fish samples showed PCB concentrations below 1 ppm. In the January 2002 ROD, NYSDEC stated that the SD "was not significantly impacted by hazardous wastes from the site, based upon the results from sediment and biota sampling". As such, no fish sampling was performed in the SD in 2014.

The fish collection was performed during the late spring (i.e., June 18 through 20, 2014) in all sampling stations except Nassau Lake, and during the early summer (i.e., July 8, 2014) for Nassau Lake. These timeframes are consistent with historical fish sample collection activities. In total, the 2014 fish monitoring program included the collection of 126 forage-size fish composite samples and 116 edible-size fish samples.

Samples were analyzed by Pace Analytical Services, Inc. (Pace) in Green Bay, Wisconsin for analysis of PCB Aroclors using USEPA Method SW-846 8082 and percent lipids using gravimetric techniques. Samples were processed by the analytical laboratory as whole-body (typically smaller fish) or edible portion (typically larger fish). Edible portions were prepared following the Procedures for Collection and Preparation of Aquatic Biota for Contaminated Analysis (NYSDEC 2002b), except that per existing and historic tissue monitoring procedures, rib cage bones were not left on the fillet as part of the sample processing. For edible portions this included skin-on, scales-off fillets for bluegill, brook trout, largemouth bass, pumpkinseed, rock bass, white perch, white sucker and yellow perch. Bullhead (yellow or brown) were processed as skin-off fillets. American eels were processed as a skin-off with head and viscera removal. For smaller edible-size fish that were too small to fillet, preparation followed modified procedures and the whole fish minus the head and viscera was analyzed.

Details regarding the collection timeframe, collection methods, and targeted sample sizes and species are described separately below for sampling station numbers 1 through 10 and 12 and for sampling station number 11 (Nassau Lake).

Sampling Stations 1 through 10 and 12

Fish collection at sampling stations 1 through 10 and 12 was performed June 18 through 20, 2014. At each monitoring station, fish were collected using backpack electrofishing units.

The specific species for the forage-size and edible-size fish samples at each sampling station were based on species occurrence and availability of historic data (Table 1). Potential forage-size (typically 6 inches or less) fish species included creek chub, blacknose dace, longnose dace, common shiner, cutlips minnow, juvenile brook trout, and juvenile white suckers. Potential edible-size fish species included larger brook trout, white sucker and, additionally at sampling station number 12, bullhead (combined brown and yellow bullhead) and rock bass. As specified in Table 1, up to five samples for each species were targeted, except up to seven blacknose dace samples were targeted. Thus, a total of up to 275 samples were targeted for collection from these 11 sampling stations.

The forage-size fish were targeted to be composite samples of up to ten individuals per sample and were analyzed as whole-body samples. With respect to edible-size fish, where a legal size limit exists, that size or above was preferred. The edible-size fish were individual fish samples and processed (by the laboratory) as edible portion. Edible portions include skin-on, scales-off fillets for most fish (e.g., brook trout, white sucker and rock bass); however, bullhead (yellow or brown) were targeted to be processed as skin-off fillets. Smaller edible-size fish that were too small to fillet were targeted to be prepared as whole body minus head and viscera to meet laboratory tissue mass requirements. As in past years, special care was taken to focus on the target species and not overfish these waterways, particularly Tributary T11A.

In total, the 2014 fish monitoring program included the collection of 126 forage-size fish composite samples and 50 edible-size fish samples from sampling stations 1 through 10 and 12.

Sampling Station 11

Fish collection at sampling station 11 (Nassau Lake) was performed on July 8, 2014, after the aquatic vegetation in the lake died off. Fish were collected using boat-mounted electrofishing techniques.

The sampling targeted up to 10 each of edible-size bluegill, American eel, pumpkinseed, and white perch, and up to 15 each of edible-size yellow perch, bullhead (combined brown and yellow bullhead), and largemouth bass. Thus, a total of up to 85 samples of edible-size fish species were targeted to be collected. With respect to edible-size fish, where a legal size limit exists, that size or above was preferred.

The edible-size fish were individual fish samples and processed (by the laboratory) as an edible portion (excluding ribs). Edible portions included skin-on, scales-off fillets for bluegill, pumpkinseed, yellow perch, white perch, and largemouth bass. Bullhead (yellow or brown) were targeted to be processed as skin-off fillets. American eels were targeted to be processed as a skin-off with head and viscera removal.

In total, the 2014 fish monitoring program included the collection of 66 edible-size fish samples from sampling station 11.

3.5 Surface Water Monitoring

Surface water monitoring will continue to be conducted in 2015 at locations within Tributary T11A and the Valatie Kill, and the resulting data will be used to further assess the presence of PCB Aroclors within those areas. The surface water monitoring program will be performed in general accordance with the SOW dated December 22, 2010 (previously approved by NYSDEC on June 9, 2011), which was implemented in 2011, 2012, 2013 and 2014, with the addition of one location (5U) in 2012 and two locations (7UU and 7D) in 2013. As such, the surface water monitoring program will be performed as described in the 2013 Surface Water Sampling in Tributary T11A and the Valatie Kill Report dated November 14, 2013 (ARCADIS 2013a). For reference, the current surface water monitoring program is summarized in the remainder of this section. A summary of the 2014 surface water monitoring results was submitted to the USEPA on March 16, 2015 (ARCADIS 2015a).

Surface water samples will be collected in 2015 during three events from the following 14 monitoring locations in Tributary T11A and the Valatie Kill (including upstream of the Tributary T11A confluence) (see Figure 3):

- 3U – Above Tributary T11A Upper Third;
- 3 – Upper Third of Tributary T11A;
- 4 – Middle Third of Tributary T11A;
- 5U – Between Middle and Lower Thirds of Tributary T11A;
- 5 – Lower Third of Tributary T11A;
- 6 – Valatie Kill, Confluence with Tributary T14 (China Hill Road);
- 7UU – Valatie Kill, Above Sample Location 7U (new location added in 2013);
- 7U – Valatie Kill, Above Confluence with Tributary T11A;
- 7 – Valatie Kill, Below Confluence with Tributary T11A;
- 7D – Valatie Kill, Below Sample Location 7 (new location added in 2013);
- 8 – Valatie Kill, Above Area 28;
- 9 – Valatie Kill, Area 28;
- 10 – Valatie Kill, Below Area 28; and
- 11U – Valatie Kill, Above Confluence with Nassau Lake.

The surface water sampling events are targeted to be performed in the late spring, summer, and early fall under normal flow conditions associated with those months (i.e., high flow events are not targeted). During each sampling event, the flow rate for the Valatie Kill will be determined from USGS gaging station 01360640 located near Area 28 (Figure 3). GE will notify USEPA at least 14 days in advance of planned field activities.

Surface water grab samples will be collected and analyzed in accordance with the QAPP. Approximately two liters of surface water will be collected per sample location. To assess the precision and accuracy of the field sampling and analytical methods, quality assurance/quality control (QA/QC) samples will also be collected, as specified in the QAPP.

Samples will be analyzed by Pace for PCBs using low-level USEPA Method 8082. A method detection limit (MDL) study was performed by Pace in 2011 to support and then use lower detection and reporting limits for PCB Aroclors 1221, 1248, 1254 and 1260. Use of lower detection and reporting limits for PCB Aroclors 1016, 1232, and 1248 were also based on the results of the MDL study. The MDL study results were summarized in the 2013 Surface Water Sampling in Tributary T11A and the Valatie Kill Report (ARCADIS 2013a), and support a reporting limit of approximately 0.005 micrograms per liter (µg/L) per Aroclor and a MDL of approximately 0.001 µg/L per Aroclor. A copy of the MDL study is included as Appendix A to this Phase 1 RI Work Plan. Surface water samples will also be analyzed for total suspended solids in accordance with Standard Method (SM) 2540D.

As described above, flow is currently monitored in the Valatie Kill using the USGS gaging station located upstream from the Krouner Road/Hoags Corners Road bridge. To support the surface water sampling program, GE proposes to install a flow measurement structure near the downstream end of Tributary T11A, upstream of the confluence with the Valatie Kill. The flow measurement structure will consist of a removable weir plate and associated support structure. The design details are included in Appendix B to this Phase 1 RI Work Plan. It is anticipated that during each surface water sampling event the flow will be measured at this structure (once installed) to estimate the flow from Tributary T11A into the Valatie Kill, and will also be measured at the USGS gaging station in the Valatie Kill.

3.6 Bathymetric Data Collection

Water depth measurements and soft sediment probing will be performed at locations throughout the lake to update sediment thickness and surface data for Nassau Lake. Historic information on sediment thickness and related investigations is provided in the 1995 Loeffel Site Environs Remedial Investigation Phase I Report. Specifically, water depth measurements and soft sediment probing will be conducted from a boat across the entire lake at a rate of approximately one location per two acres, resulting in a total of about 82 locations in Nassau Lake. The locations of these measurements will be based on a gridded pattern as shown on Figure 4; however, locations may be adjusted and/or added during field efforts in areas where topography appears to change rapidly. In addition, grab

samples of sediment will be visually characterized during sediment probing efforts. Locations will be navigated to with a boat using GPS survey coordinates.

Depth measurements and soft sediment probing will be performed in accordance with the QAPP. The proposed work will be performed once access is granted from the necessary property owners. GE will notify USEPA at least 14 days in advance of planned field activities.

3.7 PCB Volatilization Evaluation

Ambient air sampling for PCBs was previously conducted near the shoreline of Nassau Lake in September 1997. The purpose of the sampling was to assess the PCB concentrations in ambient air around Nassau Lake and obtain correlated meteorological data to assess whether Nassau Lake is a source of PCBs to ambient air. Ambient air sampling was also performed along the shoreline of Burden Lake as a reference. The sampling activities, results, and conclusions were presented in a report titled, "Ambient Air Sampling for PCBs near Nassau Lake" (BBL 1997). The conclusion presented in that report was that despite the presence of favorable weather conditions, PCBs were non-detectable at a concentration of 0.004 micrograms per cubic meter in ambient air along the shoreline downwind of Nassau Lake.

Nonetheless, as required by the Consent Order and associated SOW, the data collected in 1997 will be re-evaluated as part of the Phase 1 RI activities. The results of this re-evaluation will be presented in the SCSR and will be used to determine if further air sampling for PCBs is warranted during Phase 2.

3.8 Sediment and Soil Sampling and Analyses

This section describes the specific sediment and soil sampling activities to be conducted within the WD and SD as part of the Phase 1 RI activities. A summary of the program, including the target number of samples and the analyses to be performed, is provided in Tables 2 and 3. The proposed work will be performed once access is granted from the necessary property owners. GE will notify USEPA at least 14 days in advance of planned field activities.

Prior to implementing the sampling as described below, associated figures and tables will be updated, as necessary, to reflect adjustments made to sampling locations based on the field reconnaissance activities. These revised figures and tables will be submitted for USEPA review and approval prior to initiating the sampling activities.

3.8.1 Western Drainageway

3.8.1.1 Valatie Kill

Ten sample transects will be established across the Valatie Kill to the approximate extent of the floodplain (as defined by the extent of the 100-year flood elevation, which will be determined during the initial project base mapping [see Section 3.3]), to better define the extent of constituents along the Valatie Kill and its floodplain and thereby focus the scope and extent of the Phase 2 RI activities. The number of transects is based on approximate equidistant spacing along the Valatie Kill, with bias based on available historical sample results and/or apparent depositional areas. Despite the large amount of sampling previously performed in Area 28, including post-remediation samples, one of the ten transects is located in this area. The locations of, and other details related to, these transects are described herein; however, the proposed sample locations are subject to modification based on the results of the field reconnaissance described above.

Seven sample transects will be located between the confluence of Tributary T11A and the USGS gaging station just upstream of the Krouner Road/Hoags Corners Road bridge. The remaining three sample transects will be located downstream from the Krouner Road/Hoags Corners Road bridge and upstream from the inlet to Nassau Lake. The locations of these transects are illustrated on Figure 5. At each transect, sediment samples will be collected from one location within the channel. In addition, soil samples will be collected on each side of the bank full channel from five locations (for 10 total soil locations per transect): one location immediately outside the top of bank, and four additional locations extending outward away from the stream to the approximate lateral extent of the floodplain, as determined by topography, results of the field reconnaissance and review of FEMA/topographic mapping. The specific locations of the samples will be selected in the field using professional judgment based on field observations at the time of sample collection. In some cases, the topography may dictate more sample locations on one side of the stream than on the other.

Sediment and soil samples will be collected at depth intervals of 0 to 6 inches, 6 to 12 inches, and 12 to 24 inches (or until refusal, if shallower). The samples in the Valatie Kill were limited to a 24-inch depth based on historical data and the general shallow depth of refusal observed in this area. This will result in the targeted collection of a total of 30 sediment and 300 soil samples. Further, up to 25 additional sediment or soil samples, which will target specific geomorphic features (i.e., width of the stream, bank slope, presence of sand bars/gravel bars, man-made structures affecting stream flow) noted during the field reconnaissance, will be collected using professional judgment based on field observations made during field reconnaissance (see Section 3.2). Some of the 25 additional samples will be collected between transects and biased toward apparent depositional areas.

All of the samples collected from the Valatie Kill will be submitted for PCB Aroclor and total organic carbon (TOC) analyses, with analysis of a subset of the samples for other Target Compounds List (TCL) and Target Analyte List (TAL) constituents, 1,4-Dioxane, PCB congeners, and dioxins/furans. The specific subset of samples will be selected based on field observations and professional judgment but will be biased toward locations in and near the bank full channel.

A subset of samples will also be analyzed for grain size and bulk density. The specific samples for these physical analyses will be selected to represent the range of sediment and soil types observed in the field during the reconnaissance and sampling activities. In addition, sediment and soil samples will be visually classified in the field during sampling activities. The target number of samples for each analysis to be performed is summarized in Table 3.

3.8.1.2 Nassau Lake

Sediment samples will be collected from a total of 30 locations within Nassau Lake using a gridded approach to obtain an unbiased representation for nature and extent. Twenty of the locations will generally be distributed to represent the conditions present across the entire lake bottom, and six locations are proposed for the inlets from the WD and SD and the outlet above the dam (Figure 4). Further, four additional sediment samples will be collected using professional judgment based on field observations made during field reconnaissance and/or during the sampling efforts. The proposed sample locations are subject to modification based on the results of field reconnaissance and sediment probing. Sediment samples will be collected at depth intervals of 0 to 6 inches, 6 to 12 inches and 12 to 18 inches (or refusal, if shallower). In addition, samples will be collected, to the extent practicable, from the 18 to 24 inch interval and archived for potential analysis. This will result in the targeted collection of a total of 90 sediment samples plus 30 archived sediment samples from Nassau Lake.

In addition, sediment and soil samples will be collected along the shoreline of Nassau Lake. Sample transects will be established at 15 locations generally evenly spaced around the perimeter of Nassau Lake (Figure 4). At each transect, sediment samples will be collected at one location between the summer high water level (413.0 feet above mean sea level [amsl]) and winter low water level (411.5 feet amsl). In addition, soil samples are proposed to be collected at two locations on each transect: one between the summer high water level and the 10-year flood elevation (but closer to the 10-year flood elevation), and the other from between the 10-year flood elevation and the 25-year flood elevation (but closer to the 25-year flood elevation). The 10-year and 25-year flood elevations in Nassau Lake are estimated at 415.8 feet amsl and 416.0 feet amsl, respectively. As necessary, these elevations will be confirmed based on project base mapping and hydraulic modeling (see Section 3.3). If appropriate based on field reconnaissance, the 100-year floodplain elevation of about 416.5 feet amsl may also be considered to define the lateral extent of the

sample transects. The proposed transect and sample locations are subject to modification based on the results of the field reconnaissance described above, as approved by USEPA.

Shoreline sediment and soil samples will be collected at approximate depth intervals of 0 to 6 inches and 6 to 12 inches (or refusal, if shallower). This will result in the targeted collection of a total of 30 sediment and 60 soil samples.

Finally, four additional sediment samples will be collected downstream of the dam at the southern end of Nassau Lake. Samples will be collected from either two locations at approximate depth intervals of 0 to 6 inches and 6 to 12 inches (or refusal, if shallower) or from four locations at an approximate depth interval of 0 to 6 inches. The proposed sample number and locations are subject to modification based on the results of the field reconnaissance described above.

Therefore, a total of 94 sediment and 60 soil samples are targeted to be collected in or adjacent to Nassau Lake during the Phase 1 RI activities. All of the sediment and soil samples collected from Nassau Lake will be submitted for PCB Aroclor and TOC analyses. In addition, a subset of the samples will be submitted for analysis for other TCL and TAL constituents, 1,4-Dioxane, PCB congeners, and dioxins/furans. The specific subset of samples will be selected based on field observations and professional judgment but will be biased toward the northeast quadrant of the lake (where the Valatie Kill enters the Nassau Lake) and/or in apparent depositional areas along or near the thalweg of the lake (based on the lake bathymetry).

A subset of samples will also be analyzed for grain size and bulk density. The specific samples for these physical analyses will be selected to represent the range of sediment and soil types observed in the field during sampling. In addition, sediment and soil samples will be visually classified in the field during sampling activities. The target number of samples for each analysis to be performed is summarized in Table 3.

3.8.2 Southern Drainageway

Sampling will be performed in the SD at 28 to 32 locations to better define the nature and extent of PCBs in the Southeast Drainage Ditch, Valley Stream, and Smith Pond, and also to evaluate other constituents, thereby focusing the scope and extent of the Phase 2 RI activities. Given the narrow width and shallow depth of the SD and consistent with previous sampling by USEPA, single-point samples have been determined to be more appropriate than transects. Additionally, of 40 historical sample results for the SD, 24 were non-detect for PCBs and the highest concentration was 1.4 ppm (from a sample located in the Southeast Drainage Ditch). Note that in the January 2002 ROD, NYSDEC stated that the SD “was not significantly impacted by hazardous wastes from the site, based upon the results from sediment and biota sampling”. The proposed sample locations are illustrated on Figure 6.

3.8.2.1 Southeast Drainage Ditch

For the Southeast Drainage Ditch, sediment or soil samples will be collected from approximately 10 to 12 locations spaced approximately every 200 feet along the Southeast Drainage Ditch and selected to represent the current stream channel up to the approximate bank full elevation, and, if present, potential former and/or high level stream channels. In addition, samples will be collected at three additional locations selected to represent the area just above the approximate bank full elevation. The collection of up to 24 samples from as many as 12 locations will supplement the data available from the eight samples collected from four locations by USEPA in 2009. The specific sample locations will be determined using professional judgment based on the results of the field reconnaissance and mapping described previously.

Sediment and soil samples will be collected at approximate depth intervals of 0 to 6 inches and 6 to 12 inches (or refusal, if shallower). This will result in the targeted collection of a total of 26 to 30 sediment or soil samples.

All samples collected from the Southeast Drainage Ditch will be submitted for PCB Aroclors and TOC analyses. In addition, a subset of the samples will be submitted for analysis for other TCL/TAL constituents, 1,4-Dioxane, PCB congeners, and dioxins/furans. The specific subset of samples will be selected based on field observations and professional judgment, but will be biased toward depositional areas of the stream channel, as determined during the field reconnaissance (see Section 3.2).

A subset of samples will also be analyzed for grain size and bulk density. The specific samples for these physical analyses will be selected to represent the range of sediment and soil types observed in the field during sampling. In addition, sediment and soil samples will be visually classified in the field during sampling activities. The target number of samples for each analysis to be performed is summarized in Table 3.

3.8.2.2 Valley Stream (including Smith Pond)

For the section of Valley Stream between the confluence with the Southeast Drainage Ditch and Smith Pond, sediment or soil samples will be collected from approximately five to seven locations spaced approximately every 1,000 feet along the Valley Stream. In addition, samples will be collected at two locations to represent the area just above the approximate bank full elevation. The collection of up to 14 samples from as many as seven locations will supplement the data available from the four samples collected from two locations by USEPA in 2009 (results from 2009 were all non-detect for PCBs). Sample locations will be selected to represent the current stream channel up to the approximate bank full elevation, and, if present, potential former and/or high level stream channels.

For the section of Valley Stream between Smith Pond and the inlet to Nassau Lake sediment or soil samples will be collected from three locations spaced to provide about one sample location every 2,000 feet. Sample locations will be selected to represent the current stream channel up to the approximate bank full elevation. The collection of six samples from the three locations will supplement the data available from the eight samples collected from four locations by USEPA in 2009 (results from 2009 were all non-detect for PCBs). Samples will also be collected from five locations in Smith Pond. The specific sample locations will be determined using professional judgment and are subject to modification based on the results of the field reconnaissance and mapping described above.

Sediment and soil samples will be collected at approximate depth intervals of 0 to 6 inches and 6 to 12 inches (or refusal, if shallower). This will result in the targeted collection of a total of 30 to 34 sediment or soil samples.

All samples collected from Valley Stream and Smith Pond will be submitted for PCB Aroclors and TOC analyses. In addition, a subset of the samples will be submitted for analysis for other TCL/TAL constituents, 1,4-Dioxane, PCB congeners, and dioxins/furans. The specific subset of samples will be selected based on field observations and professional judgment, but will be biased toward depositional areas of the channel in Valley Stream and the inlet portion of Smith Pond.

A subset of samples will also be analyzed for grain size and bulk density. The specific samples for these physical analyses will be selected to represent the range of sediment and soil types observed in the field during sampling. In addition, sediment and soil samples will be visually classified in the field during sampling activities. The target number of samples for each analysis to be performed is summarized in Table 3.

3.8.3 Sample Collection and Laboratory Analytical Methods

Sediment samples will be collected from the selected locations using Lexan or aluminum tubes, and soil samples will be collected using a Macro-Core® sampling device, hand auger, or other appropriate sampling method. Soil and sediment samples will be collected and processed in accordance with the QAPP. To assess the precision and accuracy of the field sampling and analytical methods, QA/QC samples will also be collected, as specified in the QAPP.

Sediment and soil samples will be analyzed by Pace for PCB Aroclors by USEPA Method 8082B and TOC by the Lloyd Kahn Method. In addition, the analysis for other TCL/TAL constituents, 1,4-Dioxane, PCB congeners, dioxins/furans, grain size, and bulk density will be by the following methods:

- USEPA Methods 6010B and 7471A for metals (including mercury);
- USEPA Method 8081A for pesticides;
- USEPA Method 8260C for volatile organic compounds (VOCs);
- USEPA Method 8270C for semi-volatile organic compounds (SVOCs);
- USEPA Method 8270D for 1,4-Dioxane;
- Modified Green Bay Mass Balance Method for PCB congeners;
- USEPA Method 8290 for dioxins/furans;
- American Society for Testing and Materials (ASTM) Method D422-63 for grain size; and
- ASTM Method D4531-86 for bulk density.

Except for grain size and bulk density, Level 4, Contract Laboratory Program (CLP) equivalent data packages will be provided by the laboratory. The analytical data will be returned on a standard turnaround time and the complete data package will be delivered within 30 calendar days.

Except for grain size and bulk density, sediment and soil analytical results will undergo full data validation to evaluate data quality and usability. Data validation will be conducted in accordance with USEPA's October 1999 National Functional Guidance for Data Validation and USEPA's October 2006 Region II Guidelines for Organic Data Validation, SOP HW-45 Revision 1 (USEPA 1999, 2006).

3.9 Management of Investigation-Derived Materials

Investigation-derived materials (IDM) that will be generated during sediment and soil sampling may include excess sample material, decontamination fluids, used personal protective equipment (PPE), and disposable equipment. The management of these materials is discussed below.

Any excess sediment and soil sample material will be containerized and placed in 55-gallon drums and temporarily stored in the treatment building or pole barn at the LF. All drums will be labeled with the appropriate sample locations and the dates on which the material was generated. These materials will be characterized as necessary for profile approval, and then transported off-site for disposal at a permitted facility in accordance with the Transportation and Disposal Plan (T&D Plan) conditionally approved by USEPA under the Removal Order.

Any decontamination fluids containing non-indigenous materials (e.g., alconox solution[3]) generated during performance of the sediment and soil sampling will be containerized in 55-

[3] Note that alconox may have been associated with the identification of 1,4-Dioxane in certain environmental samples.

gallon drums. These drums will be either stored in the treatment building or pole barn at the LF. Depending on the content of the decontamination fluids, this material may be treated on-site using the treatment system. Alternatively, these materials may be characterized as necessary for profile approval, and then transported off-site for disposal at a permitted facility in accordance with the T&D Plan conditionally approved by USEPA under the Removal Order.

Used PPE, disposable equipment, and other debris (e.g., plastic, tubes, etc.) will be containerized in 55-gallon drums. These drums will be either stored in the treatment building or pole barn at the LF. These materials will be characterized as necessary for profile approval, and then transported off-site for disposal at a permitted facility in accordance with the T&D Plan conditionally approved by USEPA under the Removal Order.

4. Data Management and Reporting

This section of the Phase 1 RI Work plan provides a summary of the data management and reporting to be completed by GE under the Consent Order for the first phase of the RI.

4.1 Submittal of Analytical Data to USEPA

USEPA will be provided with validated analytical data summary packages, including any Data Usability Summary Reports from data validation, within 75 days after each sampling event. If requested by USEPA, data will also be submitted upon receipt from the lab (prior to validation). All data submitted to USEPA will be in a useable database format or spreadsheet consistent with the Region 2 Electronic Data Deliverable format, and will show the location, medium, and results for each sample.

In addition, pursuant to paragraph 50 of the Consent Order, all results of sampling, tests, modeling, and all other data (including raw data) received or generated during a month will be included in the associated Monthly Progress Reports that are submitted to USEPA.

4.2 Database Development

A Microsoft Access™ database, supplemented by GIS mapping, will be developed for the project as part of the Phase 1 RI activities. This database will include the following:

- Property ownership and zoning, as provided by Rensselaer County and adjusted as appropriate via field reconnaissance (i.e., separate GIS layer for refined land use information);
- Floodplain mapping up to and including the 10-year, 25-year, 100-year floodplain, as currently mapped by the FEMA and the 500-year floodplain (if available from FEMA);
- GIS layers presenting the results of geomorphologic survey and other field reconnaissance of the drainageways, as well as the aerial photography and base mapping developed (see Section 3.3);
- Flow data from USGS gaging station 01360640 and the new flow measurement structure proposed for installation in Tributary T11A (see Section 3.5);
- Wetland areas, based on National Wetlands Inventory Mapping, New York State Freshwater Wetlands Mapping, and site-specific wetlands delineation data;
- Soil types, as currently mapped by Rensselaer County Soil Conservation District; and
- Sample data including: sample locations (horizontal coordinates and elevation data), sample collection dates (and times for surface water data), sample descriptions (including soil or fish types), and laboratory analytical results.

The database will also include available information from relevant investigations previously conducted at the Site that is already in a format sufficient for inclusion in the electronic database (GE does not intend to convert and/or compile the information if it is not already in

a sufficient format). Per the SOW, the electronic database summarizing the Phase 1 RI sampling data and an associated GIS map set will be provided to USEPA in the SCSR. However, if the database is available prior to development of the SCSR, it will be provided to the USEPA ahead of submittal of that report.

4.3 Site Characterization Summary Report

Within 60 days after submittal to USEPA of the final set of validated data from Phase 1 of the RI, or such longer time as specified or agreed to by USEPA, a SCSR will be submitted to USEPA for the Surface Drainageways. The SCSR will provide a preliminary conceptual site model (CSM) for the WD and SD, including: an overview of the Site's physiography, geology, and hydrology; characterization of the nature and extent of contamination; and an evaluation of potential contaminant degradation processes. Based on the CSM, contaminant fate and transport will also be discussed.

To support the development of the SCSR, available data for the WD and SD components of the Site will be compiled, reviewed, and summarized. These data include the results from the Phase 1 RI, the results of previous investigations as they relate to the WD and SD, and historical information about the Site as it relates to the WD and SD, including aerial photographs and other available information.[4]

The SCSR will also include a compilation of stream flow data and a summary, as well as an electronic database, of all available sampling data from the WD and SD (with coordinates and sampling dates, as discussed above) for sediment, soil, fish (and other biota), and surface water. The SCSR will also include the following information for the WD and SD:

- Introduction and background information, including a summary of historical investigations and remediation actions;
- Results of field reconnaissance, including mapped geomorphologic features;
- Summary of sampling activities conducted as part of Phase 1 of the RI;
- Figures developed from the mapping, including the surveyed sampling locations and GIS layers;
- Tables summarizing the sample descriptions and analytical results from the Phase 1 RI samples;
- Copies of field notes;

[4] Any data that cannot be obtained from NYSDEC or other governmental agencies in time to be included in the SCSR will be submitted to USEPA upon receipt and, depending on when the data are received, incorporated into the SCSR Addendum or the RI Report. GE will also provide USEPA with a description of the efforts made to obtain the relevant data from NYSDEC and other governmental agencies.

- Representative photographs from the field reconnaissance efforts;
- Updated results from the fish and surface water sampling programs; and
- Copies of Data Usability Summary Reports presenting the results of data validation.

The SCSR will also identify the additional data necessary to complete the RI (during Phase 2) and support the development of the FS for the Surface Drainageways.

5. Phase 1 RI Schedule

The anticipated schedule for implementation of the overall RI/FS, as outlined in the Consent Order and associated SOW, is presented in Appendix C and generally assumes 60 days for initial USEPA review of documents and 21 days for USEPA review and approval of revised documents. Implementation of the Phase 1 RI activities described herein are assumed to require 180 days (including receipt of final validated data packages) and the timeframes for key activities are presented below. USEPA may specify a longer timeframe for a particular activity.

Activity	Timeframe/Comments
Complete property access outreach efforts	Within 45 days following USEPA approval of the Phase 1 RI Work Plan
Initiate Phase 1 RI field activities	Following receipt of required property access agreements (weather permitting)
Perform PCB volatilization evaluation for Nassau Lake	Concurrent with Phase 1 RI field activities
Develop database	Concurrent with Phase 1 RI field activities
Submit validated analytical data	Within 60 days following completion of each sampling event
Submit SCSR	Within 60 days following submittal to USEPA of the final set of validated data from the Phase 1 RI activities
Present SCSR findings to USEPA and NYSDEC	Within 30 days after submittal of the SCSR to USEPA

6. References

ARCADIS. 2010a. Supplemental Investigation of Tributary T11A – Phase 2. October 14.

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Tables

TABLE 1
SUMMARY OF TARGETED FISH SPECIES AND SAMPLE SIZES PER SAMPLE STATION

PHASE 1 REMEDIAL INVESTIGATION WORK PLAN
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

Species	Station 1 - Drainage Channel Above Former Mead Road Pond	Station 2 - Drainage Channel Through Former Mead Road Pond	Station 3 - T11A Upper Third	Station 4 - T11A Middle Third	Station 5 - T11A Lower Third	Station 6 - Valatie Kill, Confluence With T-14 (China Hill Road)	Station 7 - Valatie Kill, Below Confluence With T11A	Station 8 - Valatie Kill, Above Area 28	Station 9 - Valatie Kill, Area 28	Station 10 - Valatie Kill, Below Area 28	Station 11 - Nassau Lake	Station 12 - Valatie Kill, Below Nassau Lake (Above County Rt. 7)
Forage-Size Fish												
Creek chub	5	5	5	5	5	5	5	5	5	5		
Blacknose dace	7	7	7	7	7	7	7	7	7	7		
Brook trout			5	5	5		5			5		
White sucker						5	5	5	5	5		5
Common shiner						5	5					
Longnose dace							5	5	5	5		5
Cutlips minnow												5
Edible-Size Fish												
Brook trout						5	5	5		5		
White sucker						5	5	5	5	5		5
Bluegill											10	
American eel											10	
Pumpkinseed											10	
Yellow perch											15	
White perch											10	
Bullhead (Yellow and Brown)											15	5
Rock bass												5
Largemouth bass											15	

Notes:

1. Forage-size fish will be analyzed as whole-body composite samples, with up to ten individuals per sample.

2. Edible-size fish will be analyzed as individual fish. Sample processing includes skin-on scales-off fillets for most fish such as brook trout, white sucker, bluegill, pumpkinseed, rock bass, yellow perch, white perch, and largemouth bass. American eel and bullhead (yellow or brown) will be processed as skin-off fillets. Smaller edible-size fish that are too small to fillet may be analyzed as whole body minus head and viscera to meet laboratory tissue mass requirements.

3. Fillet samples collected under this fish monitoring program have not historically included ribs and will not include ribs going forward.

4. The numbers presented in this table represent both the target and the maximum number of samples per species. The minimum number of samples (either composites or individuals) will be a target of three samples for each specified species at each location for the Valatie Kill and T11A. For Nassau Lake, the target/maximum number of samples also represents the target/minimum number of samples for most species. The exception is American eel and white perch since they are occasionally not available, are considered targets of opportunity, and will only be collected in Nassau lake as they appear while sampling for the other five species.

5. A reasonable level of effort will be expended to collect the target number of samples and will be determined in the field but generally is assumed to include two complete passes through the sampling reach. Additionally, field work (including boat launching and docking) at Nassau Lake is generally expected to take up to one 8-hour day.

TABLE 2
SUMMARY OF TARGETED NUMBER OF SEDIMENT AND SOIL SAMPLES

PHASE 1 REMEDIAL INVESTIGATION WORK PLAN
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

Sample Location	Target Sample Intervals (inches)[2]	Target Number of Samples[3]			
		Sediment	Soil	Sediment/Soil	Total
Western Drainageway					
Valatie Kill					
Transect Samples	0-6, 6-12, 12-24	30	300	0	330
Judgmental Samples	0-6, 6-12 and/or 12-24	0	0	25	25
Subtotal Valatie Kill	--	**30**	**300**	**25**	**355**
Nassau Lake					
Lake Samples	0-6, 6-12, 12-18	90	0	0	90
Lake Samples to be Archived	18-24	30	0	0	30
Downstream of Dam	0-6 and/or 6-12	4	0	0	4
Shoreline Samples (Below Summer/High Water Level)	0-6, 6-12	30	0	0	30
Shoreline Samples (Above Summer/High Water Level)	0-6, 6-12	0	60	0	60
Subtotal Nassau Lake	--	**154**	**60**	**0**	**214**
Subtotal Western Drainageway	--	**184**	**360**	**25**	**569**
Southern Drainageway					
Southeast Drainage Ditch	0-6, 6-12	0	0	20 - 24	20 - 24
Southeast Drainage Ditch (above bank full elevation)	0-6, 6-12	0	6	0	6
Valley Stream Between Southeast Drainage Ditch and Smith Pond	0-6, 6-12	0	0	10 - 14	10 - 14
Valley Stream Between Southeast Drainage Ditch and Smith Pond (above bank full elevation)	0-6, 6-12	0	4	0	4
Smith Pond	0-6, 6-12	0	0	10	10
Valley Stream Between Smith Pond and Nassau Lake	0-6, 6-12	0	0	6	6
Subtotal Southern Drainageway	--	**0**	**10**	**46 - 54**	**56 - 64**
Subtotal Western and Southern Drainageways	--	**184**	**370**	**71 - 79**	**625 - 633**
QA/QC[1]	--	**-**	**-**	**-**	**32**
Total	--	**184**	**370**	**71 - 79**	**657 - 665**

Notes:

1. Quality assurance/quality control (QA/QC) samples (i.e., blind field duplicates and matrix spike/matrix spike duplicate [MS/MSD] sample pairs) will each be collected at a rate of one per twenty samples per sampling event. Blind duplicate samples are included in the total sample count while MS/MSD sample pairs are not Included in the total sample count.

2. Samples will be collected from the depth increments listed or to refusal if shallower.

3. The WD also includes Mead Road Pond area (including the Northwest Drainage Ditch) and Tributary T11A. Sediment and soil sampling in Mead Road Pond area and Tributary T11A are being performed pursuant to a Paragraph 47.f Proposal approved by the United States Environmental Protection Agency under the April 2012 Removal Order and, therefore, are not addressed in this Phase 1 RI Work Plan.

4. See Table 3 for details on the total number of samples per analysis.

TABLE 3
SUMMARY OF TYPE AND NUMBER OF LABORATORY ANALYSES FOR SEDIMENT AND SOIL SAMPLES

PHASE 1 REMEDIAL INVESTIGATION WORK PLAN
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

Sample Location	Target Number of Total Samples	Number of Samples per Analysis[2,3]					
		PCB	TOC	TCL/TAL / 1,4-Dioxane	PCB (mGBM)	Dioxin/Furan	Grain Size/ Bulk Density
Western Drainageway							
Valatie Kill							
Transect Samples	330	330	330	20	10	5	33
Judgmental Samples	25	25	25	0	0	0	0
Subtotal Valatie Kill	**355**	**355**	**355**	**20**	**10**	**5**	**33**
Nassau Lake							
Lake Samples (including archived)	90 - 120	90 - 120	90 - 120	5	5	3	9
Downstream of Dam	4	4	4	0	0	0	0
Shoreline Samples (Below Summer/High Water Level)	30	30	30	0	0	0	0
Shoreline Samples (Above Summer/High Water Level)	60	60	60	0	0	0	0
Subtotal Nassau Lake	**184 - 214**	**184 - 214**	**184 - 214**	**5**	**5**	**3**	**9**
Subtotal Western Drainageway	**539 - 569**	**539 - 569**	**539 - 569**	**25**	**15**	**8**	**42**
Southern Drainageway							
Southeast Drainage Ditch	20 - 24	20 - 24	20 - 24	3	2	1	3
Southeast Drainage Ditch (above bank full elevation)	6	6	6	0	0	0	0
Valley Stream Between Southeast Drainage Ditch and Smith Pond	10 - 14	10 - 14	10 - 14	2	1	0	2
Valley Stream Between Southeast Drainage Ditch and Smith Pond (above bank full elevation)	4	4	4	0	0	0	0
Smith Pond	10	10	10	1	0	0	0
Valley Stream Between Smith Pond and Nassau Lake	6	6	6	0	0	0	0
Subtotal Southern Drainageway	**56 - 64**	**56 - 64**	**56 - 64**	**6**	**3**	**1**	**5**
Subtotal Western and Southern Drainageways	**625 - 633**	**595 - 633**	**595 - 633**	**31**	**18**	**9**	**47**
QA/QC[1]	**32**	**32**	**32**	**2**	**1**	**1**	**0**
Total	**657 - 665**	**627 - 665**	**627 - 665**	**33**	**19**	**10**	**47**

Notes:

1. Quality assurance/quality control (QA/QC) samples (i.e., blind field duplicates and matrix spike/matrix spike duplicate [MS/MSD] sample pairs) will each be collected at a rate of one per 20 samples per sampling event. Blind duplicate samples are included in the total sample count while MS/MSD sample pairs are not Included in the total sample count.

2. All samples will be analyzed for total organic carbon (TOC) by Lloyd Kahn method and polychlorinated biphenyl (PCB) by SW-846 method 8082. Additionally, a subset of samples in the Western Drainageway (WD) and Southern Drainageway (SD) will also be analyzed for other Target Compound List (TCL) and Target Analyte List (TAL) constituents, including volatile organic compounds (VOCs) by SW-846 method 8260, semi-volatile organic compounds (SVOCs) by SW-846 method 8270, 1,4-dioxane by SW-846 method 8270D (subject to Note 3), pesticides by method SW-846 8082, metals including mercury by SW-846 methods 6010B and 7471A. Additionally, a subset of samples will be analyzed for PCB congeners by modified Green Bay Mass Balance (mGBM) method, dioxins/furans by SW-846 method 8290, grain size by American Society for Testing and Materials (ASTM) method D422-63 and bulk density by ASTM D4531-86.

3. The WD also includes Mead Road Pond area (including the Northwest Drainage Ditch) and Tributary T11A. Sediment and soil sampling in Mead Road Pond area and Tributary T11A are being performed pursuant to a Paragraph 47.f Proposal approved by the United States Environmental Protection Agency under the April 2012 Removal Order and, therefore, are not addressed in this Phase 1 RI Work Plan. The analyses of sediment/soil being conducted pursuant to the Paragraph 47.f Proposal includes 1,4-Dioxane. In addition, a subset of sediment or soil samples will be collected for 1,4-Dioxane analysis under this Phase 1 RI Work Plan. The collection frequency and locations will be coincident with the samples collected for analysis of TCL/TAL constituents.

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Figures

VALATIE KILL

TRIBUTARY T14

CHINA HILL ROAD

UNNAMED PONDS

UNNAMED POND

TRIBUTARY T11A

FORMER MEAD ROAD POND

UNNAMED TRIBUTARIES

UNNAMED POND AT NASSAU SPORTSMAN CLUB

NORTHWEST DRAINAGE DITCH

WD

DEWEY LOEFFEL LANDFILL

MEAD ROAD

SOUTHEAST DRAINAGE DITCH

MEAD ROAD

TRIBUTARY T8A

HOAGS CORNERS ROAD

VALATIE KILL

AREA 28

TRIBUTARY T8

NASSAU-AVERILL PARK ROAD

VALLEY STREAM

SD

USGS GAGING STATION

CENTRAL NASSAU ROAD

VALLEY STREAM

SMITH POND

NASSAU LAKE

VALLEY STREAM

VALATIE KILL

LEGEND:

DRAINAGEWAY (EXAGGERATED)

WD = WESTERN DRAINAGEWAY

SD = SOUTHERN DRAINAGEWAY

2000' 0 2000'

Approximate Scale: 1" = 2000'

REFERENCE: BASE MAP SOURCE USGS 7.5 MINUTE QUADS NASSAU, NEW YORK, 1953, PHOTOINSPECTED 1978.

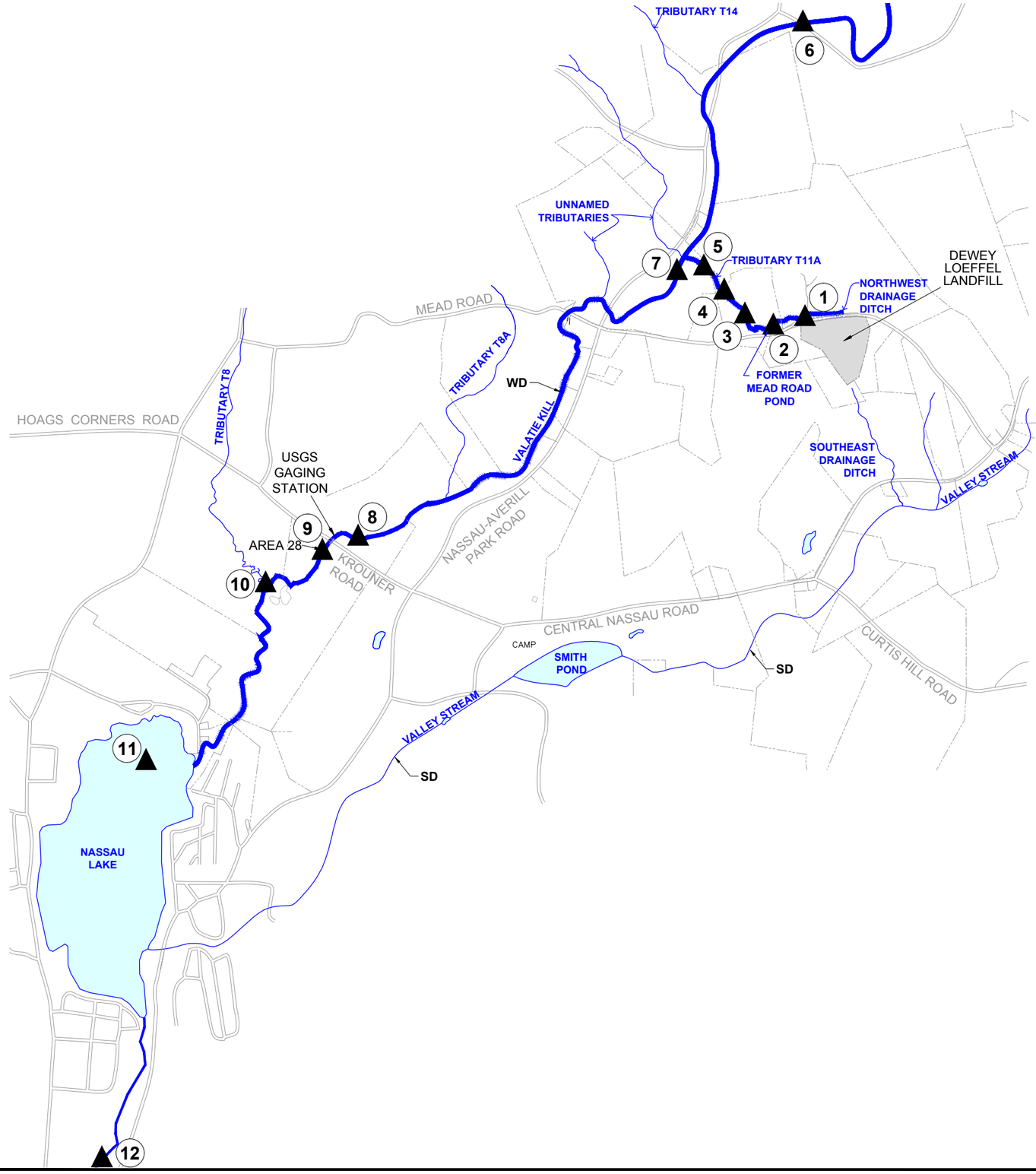
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
PHASE 1 REMEDIAL INVESTIGATION WORK PLAN

SITE LOCATION MAP

ARCADIS

FIGURE
1

01/15/2013 SYRACUSE, NY-ENV/CAD-DJHOWES
B0010073/2013/00004/CDR/P1RIWP/10073G01.CDR



LEGEND:

PROPERTY LINE

FISH SAMPLING LOCATION

STATION NUMBER	LOCATION
1	DRAINAGE CHANNEL ABOVE FORMER MEAD ROAD POND
2	DRAINAGE CHANNEL THROUGH FORMER MEAD ROAD POND
3	UPPER THIRD OF TRIBUTARY T11A
4	MIDDLE THIRD OF TRIBUTARY T11A
5	LOWER THIRD OF TRIBUTARY T11A
6	VALATIE KILL, CONFLUENCE WITH T14 (NEAR CHINA HILL ROAD)
7	VALATIE KILL, BELOW CONFLUENCE WITH T11A
8	VALATIE KILL, ABOVE AREA 28
9	VALATIE KILL, AREA 28
10	VALATIE KILL, BELOW AREA 28
11	NASSAU LAKE
12	VALATIE KILL, BELOW NASSAU LAKE (ABOVE COUNTY ROUTE 7)

NOTES:

1. THE BASE MAP FEATURES ON THIS FIGURE ARE BASED ON AERIAL PHOTOGRAPHS DATED MARCH 31, 1988. PROPERTY LINES ARE AS INDICATED IN THE MARCH 1, 2012 RENSSELAER COUNTY RECORDS
2. ALL LOCATIONS ARE APPROXIMATE.
3. WD = WESTERN DRAINAGEWAY; SD = SOUTHERN DRAINAGEWAY

0 1800' 3600'

GRAPHIC SCALE

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
PHASE 1 REMEDIAL INVESTIGATION WORK PLAN

FISH SAMPLING LOCATIONS - WESTERN DRAINAGEWAY

ARCADIS

FIGURE 2

CITY: SYRACUSE, NY DIV/GROUP: ENV/REM-WIM-DV DB: P. LISTER, K.SARTORI PM/TM: D. SAUDA LYR:(Opt)ON=*;OFF=*REF*
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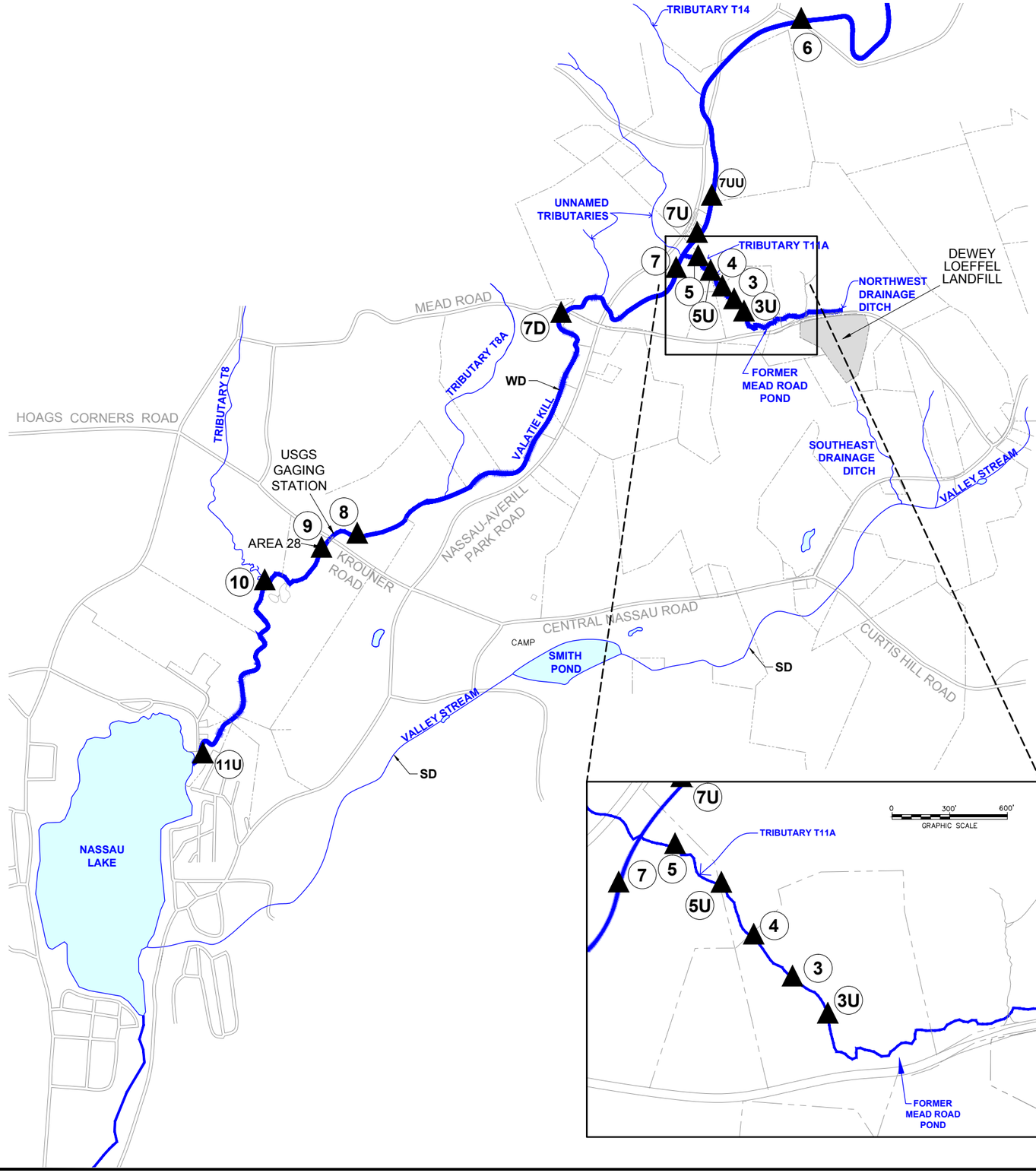

LEGEND:

PROPERTY LINE

SURFACE WATER SAMPLING LOCATION

SAMPLING LOCATION	LOCATION
3U	ABOVE UPPER THIRD OF TRIBUTARY T11A
3	UPPER THIRD OF TRIBUTARY T11A
4	MIDDLE THIRD OF TRIBUTARY T11A
5U	BETWEEN MIDDLE AND LOWER THIRD OF TRIBUTARY T11A
5	LOWER THIRD OF TRIBUTARY T11A
6	VALATIE KILL, CONFLUENCE WITH T14 (NEAR CHINA HILL ROAD)
7UU	ABOVE SAMPLE LOCATION 7U
7U	VALATIE KILL, ABOVE CONFLUENCE WITH T11A
7	VALATIE KILL, BELOW CONFLUENCE WITH T11A
7D	BELOW SAMPLE LOCATION 7
8	VALATIE KILL, ABOVE AREA 28
9	VALATIE KILL, AREA 28
10	VALATIE KILL, BELOW AREA 28
11U	VALATIE KILL, ABOVE CONFLUENCE WITH NASSAU LAKE

NOTES:

1. THE BASE MAP FEATURES ON THIS FIGURE ARE BASED ON AERIAL PHOTOGRAPHS DATED MARCH 31, 1988. PROPERTY LINES ARE AS INDICATED IN THE MARCH 1, 2012 RENSSELAER COUNTY RECORDS
2. ALL LOCATIONS ARE APPROXIMATE.
3. WD = WESTERN DRAINAGEWAY; SD = SOUTHERN DRAINAGEWAY

0 1800' 3600'

GRAPHIC SCALE

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
PHASE 1 REMEDIAL INVESTIGATION WORK PLAN

SURFACE WATER SAMPLING LOCATIONS - WESTERN DRAINAGEWAY

ARCADIS

FIGURE 3

CITY: SYRACUSE, NY DIV/GROUP: ENV/REM-WIM-DIV DB: P. LISTER K.SARTORI PM/TM: D. SAUDA LYR:(Opt)ON=*;OFF=*REF*
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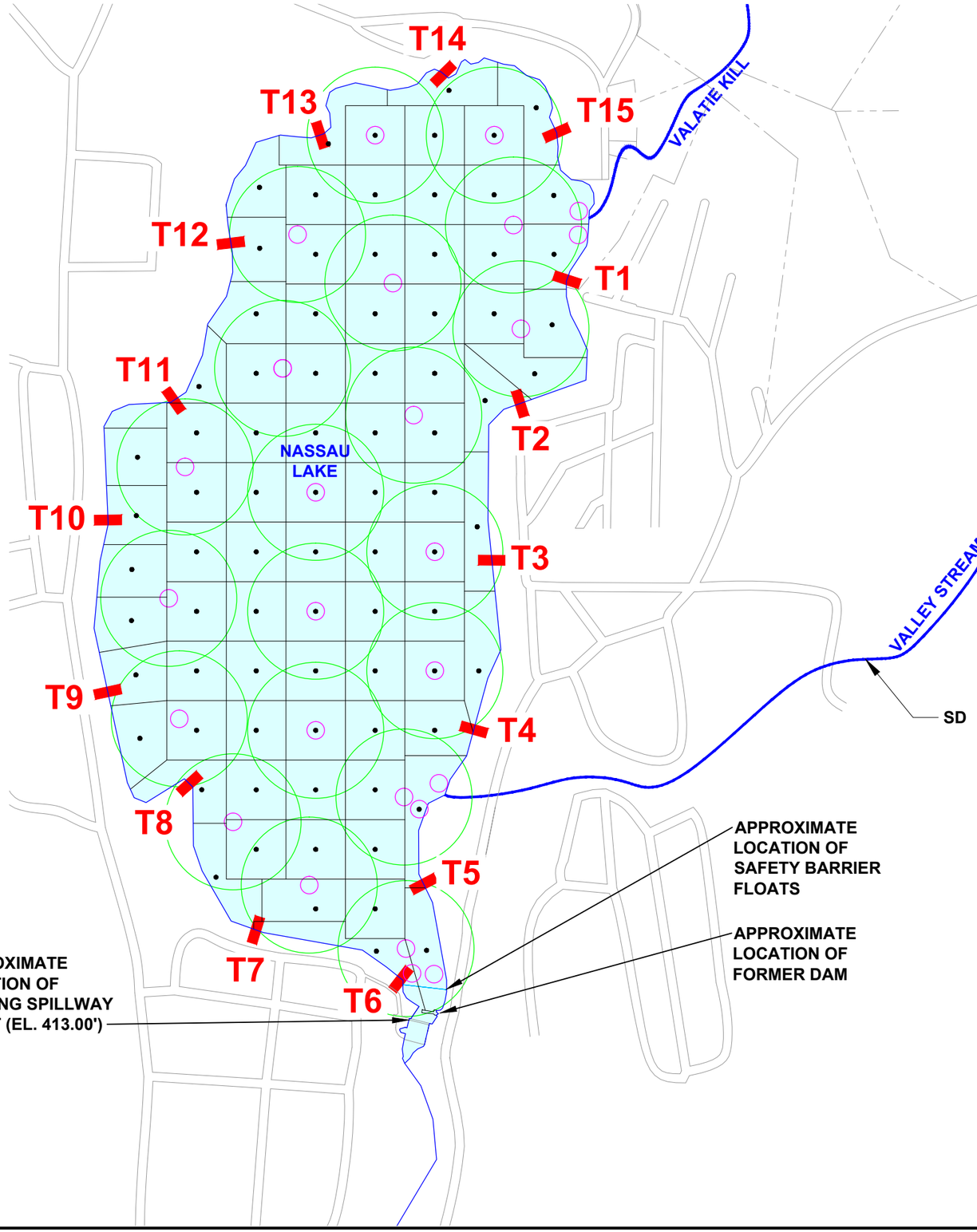


LEGEND:

- PROPERTY LINE
- IN–LAKE SEDIMENT SAMPLING LOCATION
- WATER DEPTH MEASUREMENT AND SOFT SEDIMENT PROBING LOCATION
- SAMPLING TRANSECT LOCATION (T)

NOTES:

1. THE BASE MAP FEATURES ON THIS FIGURE ARE BASED ON AERIAL PHOTOGRAPHS DATED MARCH 31, 1988. PROPERTY LINES AREA AS INDICATED IN THE MARCH 1, 2012 RENSSELAER COUNTY RECORDS.
2. ALL LOCATIONS ARE APPROXIMATE.
3. WD = WESTERN DRAINAGEWAY; SD = SOUTHERN DRAINAGEWAY
4. IN–LAKE SEDIMENT SAMPLES WILL BE COLLECTED FROM 20 LOCATIONS IN NASSAU LAKE, AS WELL AS TWO LOCATIONS EACH NEAR THE INLETS FROM VALATIE KILL AND VALLEY STREAM, RESPECTIVELY, AND TWO LOCATIONS NEAR THE SAFETY BARRIER FLOATS. FOUR OTHER LOCATIONS (NOT SHOWN) WILL BE SELECTED BASED ON PROFESSIONAL JUDGEMENT IN THE FIELD DURING SAMPLING. THE PROPOSED SAMPLING LOCATIONS ILLUSTRATED ARE INTENDED TO PROVIDE REPRESENTATIVE SPATIAL COVERAGE OF THE LAKE AND ARE SUBJECT TO MODIFICATION BASED ON THE RESULTS OF IN THE FIELD RECONNAISSANCE, THE RESULTS OF SEDIMENT PROBING, AND PROPERTY OWNER APPROVAL(S).
5. SAMPLING TRANSECTS WILL BE ESTABLISHED AT 15 LOCATIONS AROUND THE PERIMETER OF NASSAU LAKE. AT EACH TRANSECT, SEDIMENT SAMPLES ARE PROPOSED TO BE COLLECTED AT ONE LOCATION BETWEEN THE SUMMER HIGH WATER LEVEL AND THE WINTER LOW WATER LEVEL AND SOIL SAMPLES ARE PROPOSED TO BE COLLECTED FROM ONE LOCATION BETWEEN THE SUMMER HIGH WATER LEVEL AND THE 10–YEAR FLOOD ELEVATION (BUT CLOSER TO THE 10–YEAR FLOOD ELEVATION) AND FROM ONE LOCATION BETWEEN THE 10–YEAR FLOOD ELEVATION AND THE 25–YEAR FLOOD ELEVATION (BUT CLOSER TO THE 25–YEAR FLOOD ELEVATION). THE PROPOSED SAMPLING TRANSECT LOCATIONS ILLUSTRATED ARE SUBJECT TO MODIFICATION BASED ON THE RESULTS OF IN THE FIELD RECONNAISSANCE AND MAPPING.
6. FOUR ADDITIONAL SEDIMENT SAMPLES WILL BE COLLECTED FROM TWO TO FOUR LOCATIONS DOWNSTREAM OF THE DAM (NOT SHOWN).

0 300' 600'

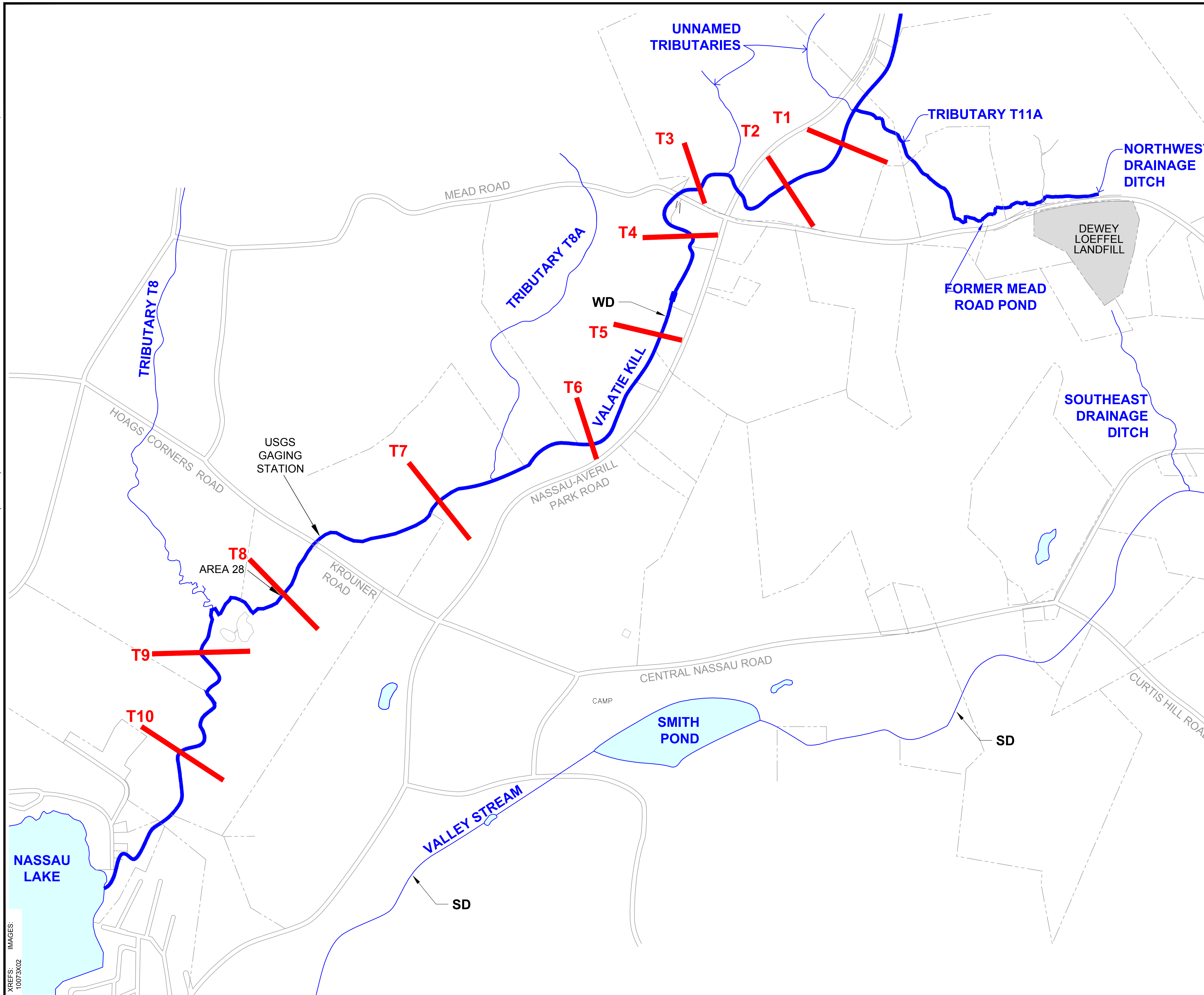
GRAPHIC SCALE

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
PHASE 1 REMEDIAL INVESTIGATION WORK PLAN

PROPOSED PROBING AND SOIL / SEDIMENT SAMPLING LOCATIONS - NASSAU LAKE

ARCADIS

FIGURE
4



LEGEND:

PROPERTY LINE

SAMPLING TRANSECT LOCATION (T)

NOTES:

1. THE BASE MAP FEATURES ON THIS FIGURE ARE BASED ON AERIAL PHOTOGRAPHS DATED MARCH 31, 1988. PROPERTY LINES ARE AS INDICATED IN THE MARCH 1, 2012 RENSSELAER COUNTY RECORDS.
2. ALL LOCATIONS ARE APPROXIMATE.
3. WD = WESTERN DRAINAGEWAY; SD = SOUTHERN DRAINAGEWAY
4. THE PROPOSED SAMPLING TRANSECT LOCATIONS AND LENGTHS ILLUSTRATED ARE INTENDED TO SHOW GENERAL LOCATION AND ORIENTATION. THE LOCATIONS ARE SUBJECT TO MODIFICATION BASED ON THE RESULTS OF THE FIELD RECONNAISSANCE, TOPOGRAPHIC MAPPING, AND PROPERTY OWNER APPROVAL(S). SAMPLING TRANSECTS WILL TERMINATE AT THE BOUNDARY OF THE 100-YEAR FLOODPLAIN.
5. AT EACH SAMPLING TRANSECT, SEDIMENT SAMPLES WILL BE COLLECTED FROM ONE LOCATION WITHIN THE CHANNEL AND SOIL SAMPLES WILL BE COLLECTED FROM FIVE LOCATIONS ON EACH SIDE OF THE CHANNEL (FOR 10 TOTAL SOIL SAMPLE LOCATIONS PER TRANSECT). ONE SOIL SAMPLE LOCATION WILL BE IMMEDIATELY OUTSIDE THE TOP OF BANK, AND FOUR ADDITIONAL SOIL SAMPLE LOCATIONS WILL EXTEND OUTWARD AWAY FROM THE TOP OF THE STREAM BANK TO THE APPROXIMATE LATERAL EXTENT OF THE FLOODPLAIN AS DETERMINED BY RESULTS OF THE FIELD RECONNAISSANCE AND MAPPING. THE SPECIFIC LOCATIONS OF THE SOIL SAMPLES WILL BE SELECTED IN THE FIELD USING PROFESSIONAL JUDGMENT BASED ON FIELD OBSERVATIONS AT THE TIME OF SAMPLE COLLECTION. IN SOME CASES, THE TOPOGRAPHY MAY DICTATE MORE SOIL SAMPLE LOCATIONS ON ONE SIDE OF THE STREAM BANK THAN ON THE OTHER. UP TO 25 ADDITIONAL SEDIMENT OR SOIL SAMPLES WILL ALSO BE COLLECTED TO TARGET SPECIFIC GEOMORPHIC FEATURES NOTED DURING THE FIELD RECONNAISSANCE.

0 1000' 2000'

GRAPHIC SCALE

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
PHASE 1 REMEDIAL INVESTIGATION WORK PLAN

PROPOSED SOIL / SEDIMENT SAMPLING TRANSECT LOCATIONS - VALATIE KILL

ARCADIS

FIGURE
5

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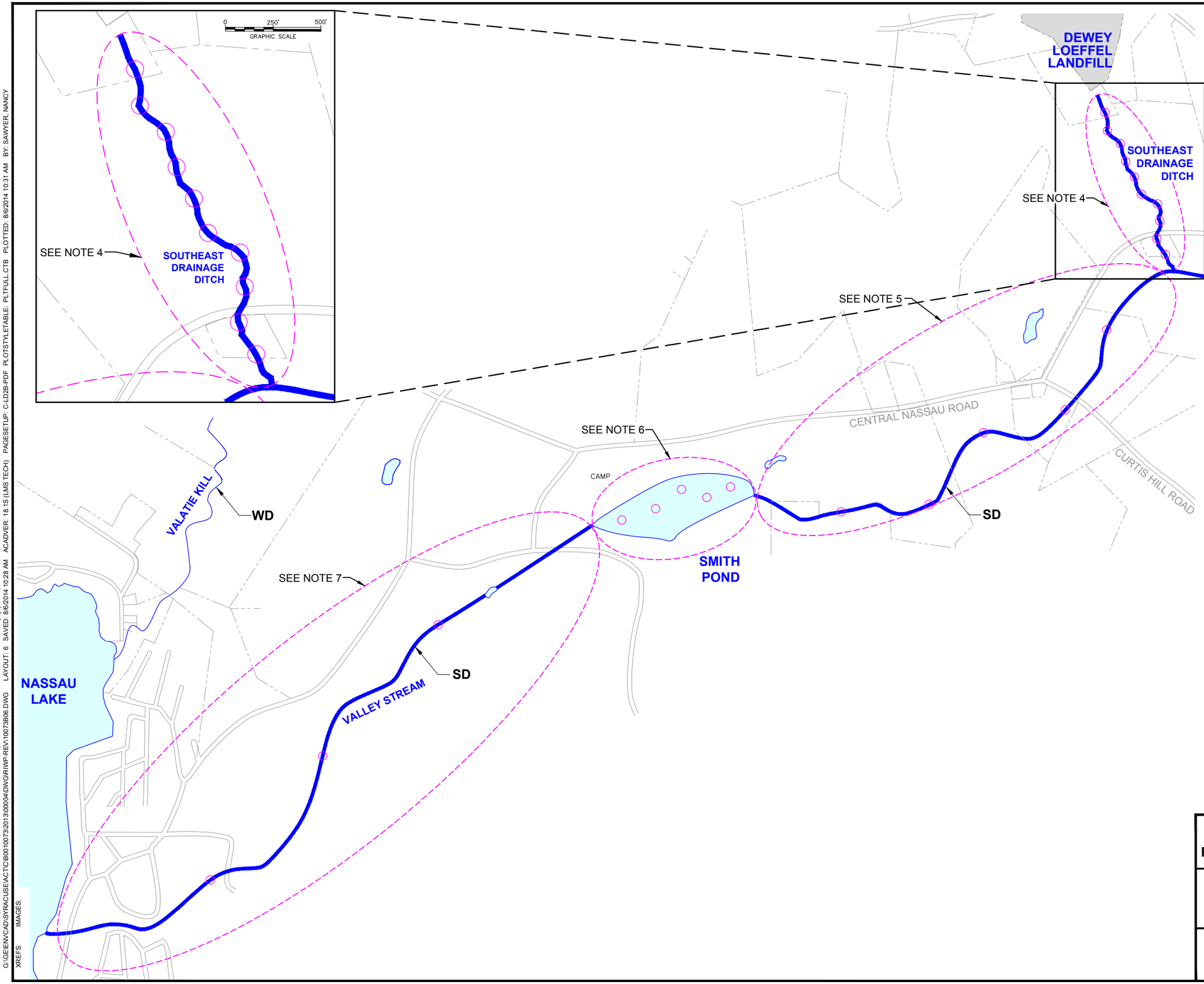

LEGEND:

- PROPERTY LINE
- SOIL/SEDIMENT SAMPLING AREA
- SOIL/SEDIMENT SAMPLING LOCATION

NOTES:

1. THE BASE MAP FEATURES ON THIS FIGURE ARE BASED ON AERIAL PHOTOGRAPHS DATED MARCH 31, 1988. PROPERTY LINES AREA AS INDICATED IN THE MARCH 1, 2012 RENSSELAER COUNTY RECORDS.
2. ALL LOCATIONS ARE APPROXIMATE.
3. WD = WESTERN DRAINAGEWAY; SD = SOUTHERN DRAINAGEWAY
4. SEDIMENT/SOIL SAMPLES ARE PROPOSED TO BE COLLECTED FROM 10 TO 12 LOCATIONS IN THE SOUTHEAST DRAINAGE DITCH. LOCATIONS WILL BE SELECTED TO REPRESENT THE CURRENT STREAM CHANNEL UP TO THE APPROXIMATE BANK FULL ELEVATION, AND, IF PRESENT, POTENTIAL FORMER STREAM CHANNELS. THREE ADDITIONAL SAMPLING LOCATIONS WILL BE SELECTED TO REPRESENT THE AREA JUST ABOVE THE APPROXIMATE BANK FULL ELEVATION. THE SPECIFIC SAMPLING LOCATIONS ARE SUBJECT TO MODIFICATION BASED ON THE RESULTS OF IN THE FIELD RECONNAISSANCE, MAPPING, AND PROPERTY OWNER APPROVAL(S).
5. SEDIMENT/SOIL SAMPLES ARE PROPOSED TO BE COLLECTED FROM FIVE TO SEVEN LOCATIONS IN VALLEY STREAM IN THE AREA BETWEEN THE CONFLUENCE WITH THE SOUTHEAST DRAINAGE DITCH AND SMITH POND. LOCATIONS WILL BE SELECTED TO REPRESENT THE CURRENT STREAM CHANNEL UP TO THE APPROXIMATE BANK FULL ELEVATION, AND, IF PRESENT, POTENTIAL FORMER STREAM CHANNELS. TWO ADDITIONAL SAMPLING LOCATIONS WILL BE SELECTED TO REPRESENT THE AREA JUST ABOVE THE APPROXIMATE BANK FULL ELEVATION. THE SPECIFIC SAMPLING LOCATIONS ARE SUBJECT TO MODIFICATION BASED ON THE RESULTS OF IN THE FIELD RECONNAISSANCE, MAPPING, AND PROPERTY OWNER APPROVAL(S).
6. FIVE SAMPLING LOCATIONS ARE PROPOSED TO BE LOCATED IN SMITH POND. THE SPECIFIC SAMPLING LOCATIONS ARE SUBJECT TO MODIFICATION BASED ON THE RESULTS OF IN THE FIELD RECONNAISSANCE AND MAPPING.
7. SEDIMENT/SOIL SAMPLES ARE PROPOSED TO BE COLLECTED FROM THREE LOCATIONS IN VALLEY STREAM IN THE AREA BETWEEN SMITH POND AND THE INLET TO NASSAU LAKE. LOCATIONS WILL BE SELECTED TO REPRESENT THE CURRENT STREAM CHANNEL UP TO THE APPROXIMATE BANK FULL ELEVATION. THE SPECIFIC SAMPLING LOCATIONS ARE SUBJECT TO MODIFICATION BASED ON THE RESULTS OF IN THE FIELD RECONNAISSANCE, MAPPING, AND PROPERTY OWNER APPROVAL(S).

0 1000' 2000'
GRAPHIC SCALE

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
PHASE 1 REMEDIAL INVESTIGATION WORK PLAN

PROPOSED SOIL / SEDIMENT SAMPLING LOCATIONS - SOUTHERN DRAINAGEWAY

ARCADIS

FIGURE
6

CITY: SYRACUSE, NY DIV/GROUP: ENV/REM-W/IM-DV DB: P. LISTER, K.SARTORI PM/TM: D. SAUDA LYR:(Opt)ON=*;OFF=*REF*
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XREFS:
IMAGES:

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Appendices

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Appendix A

Northeast Analytical, Inc.

Date: 11-Aug-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1221		Analysis:	SW-846 8082
Matrix:	Liquid		Instrument:	GC-23F
Extraction:	Solid Phase	SW-846 3535	Column:	ZB-1
Spike conc:	0.0050	ug/L	Detector:	ECD
			LRF:	11070453

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO13976	07/28/11	1221 #1 SPE (2L)	07/29/11	0.00505	101%
2	AO13977	07/28/11	1221 #2 SPE (2L)	07/29/11	0.00595	119%
3	AO13978	07/28/11	1221 #3 SPE (2L)	07/29/11	0.00551	110.2%
4	AO13979	07/28/11	1221 #4 SPE (2L)	07/29/11	0.00553	111%
5	AO13980	07/28/11	1221 #5 SPE (2L)	07/29/11	0.00570	114.0%
6	AO13981	07/28/11	1221 #6 SPE (2L)	07/29/11	0.00575	115%
7	AO13982	07/28/11	1221 #7 SPE (2L)	07/29/11	0.00588	117.6%
8	AO13983	07/28/11	1221 #8 SPE (2L)	07/29/11	0.00571	114.2%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0056	ug/L
STD (s):	0.00028	ug/L
%RSD:	4.98%	
MDL:	0.00084	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	SMS	Date:	8/11/2011
Gas Chromatography Analyst:	Anthony J Maiello	Date:	8/11/2011
QA/QC Officer:	Christine K. Brinkman	Date:	8/11/2011
Lab Director:	Robert E. Waymouth	Date:	8/11/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

Northeast Analytical, Inc.

Date: 11-Aug-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1221	Analysis:	SW-846 8082
Matrix:	Liquid	Instrument:	GC-23B
Extraction:	Solid Phase	Column:	ZB-5
Spike conc:	0.0050 ug/L	Detector:	ECD
		LRF:	11070453

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO13976	07/28/11	1221 #1 SPE (2L)	07/29/11	0.00527	105%
2	AO13977	07/28/11	1221 #2 SPE (2L)	07/29/11	0.00568	114%
3	AO13978	07/28/11	1221 #3 SPE (2L)	07/29/11	0.00521	104.2%
4	AO13979	07/28/11	1221 #4 SPE (2L)	07/29/11	0.00542	108%
5	AO13980	07/28/11	1221 #5 SPE (2L)	07/29/11	0.00614	122.8%
6	AO13981	07/28/11	1221 #6 SPE (2L)	07/29/11	0.00563	113%
7	AO13982	07/28/11	1221 #7 SPE (2L)	07/29/11	0.00588	117.6%
8	AO13983	07/28/11	1221 #8 SPE (2L)	07/29/11	0.00562	112.4%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0056	ug/L
STD (s):	0.00031	ug/L
%RSD:	5.52%	
MDL:	0.00093	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	SMS	Date:	8/11/2011
Gas Chromatography Analyst:	Anthony J Maiello	Date:	8/11/2011
QA/QC Officer:	Christine K. Brinkman	Date:	8/11/2011
Lab Director:	Robert E. Waymouth	Date:	8/11/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

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Northeast Analytical, Inc.

Date: 14-Jul-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1248		Analysis:	SW-846 8082
Matrix:	Liquid		Instrument:	GC-23F
Extraction:	Solid Phase	SW-846 3535	Column:	ZB-1
Spike conc:	0.0050	ug/L	Detector:	ECD
			LRF:	11060457

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO10451	07/01/11	1248 #1 SPE (2L)	07/01/11	0.00565	113%
2	AO10452	07/01/11	1248 #2 SPE (2L)	07/01/11	0.00490	98%
3	AO10453	07/01/11	1248 #3 SPE (2L)	07/01/11	0.00448	89.6%
4	AO10454	07/01/11	1248 #4 SPE (2L)	07/01/11	0.00553	111%
5	AO10455	07/01/11	1248 #5 SPE (2L)	07/01/11	0.00542	108.4%
6	AO10456	07/01/11	1248 #6 SPE (2L)	07/01/11	0.00536	107%
7	AO10457	07/01/11	1248 #7 SPE (2L)	07/01/11	0.00508	101.6%
8	AO10458	07/01/11	1248 #8 SPE (2L)	07/01/11	0.00519	103.8%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0052	ug/L
STD (s):	0.00038	ug/L
%RSD:	7.30%	
MDL:	0.00114	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	LMB	Date:	7/14/2011
Gas Chromatography Analyst:	Anthony J Maiello	Date:	7/14/2011
QA/QC Officer:	Christine K. Brinkman	Date:	7/14/2011
Lab Director:	Robert E. Waymouth	Date:	7/14/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

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Northeast Analytical, Inc.

Date: 14-Jul-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1248	Analysis:	SW-846 8082
Matrix:	Liquid	Instrument:	GC-23B
Extraction:	Solid Phase	Column:	ZB-5
Spike conc:	0.0050 ug/L	Detector:	ECD
		LRF:	11060457

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO10451	07/01/11	1248 #1 SPE (2L)	07/01/11	0.00589	118%
2	AO10452	07/01/11	1248 #2 SPE (2L)	07/01/11	0.00497	99%
3	AO10453	07/01/11	1248 #3 SPE (2L)	07/01/11	0.00508	101.6%
4	AO10454	07/01/11	1248 #4 SPE (2L)	07/01/11	0.00553	111%
5	AO10455	07/01/11	1248 #5 SPE (2L)	07/01/11	0.00512	102.4%
6	AO10456	07/01/11	1248 #6 SPE (2L)	07/01/11	0.00527	105%
7	AO10457	07/01/11	1248 #7 SPE (2L)	07/01/11	0.00520	104.0%
8	AO10458	07/01/11	1248 #8 SPE (2L)	07/01/11	0.00490	98.0%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0052	ug/L
STD (s):	0.00032	ug/L
%RSD:	6.19%	
MDL:	0.00097	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	LMB	Date:	7/14/2011
Gas Chromatography Analyst:	Anthony J Maiello	Date:	7/14/2011
QA/QC Officer:	Christine K. Brinkman	Date:	7/14/2011
Lab Director:	Robert E. Waymouth	Date:	7/14/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

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Northeast Analytical, Inc.

Date: 14-Jul-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1254		Analysis:	SW-846 8082
Matrix:	Liquid		Instrument:	GC-23F
Extraction:	Solid Phase	EPA 3545	Column:	ZB-1
Spike conc:	0.0050	ug/L	Detector:	ECD
			LRF:	11060462

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO10471	07/02/11	1254 #1 SPE (2Liter)	07/04/11	0.00525	105.0%
2	AO10472	07/02/11	1254 #2 SPE (2Liter)	07/04/11	0.00511	102.2%
3	AO10473	07/02/11	1254 #3 SPE (2Liter)	07/04/11	0.00531	106.2%
4	AO10474	07/02/11	1254 #4 SPE (2Liter)	07/04/11	0.00522	104.4%
5	AO10475	07/02/11	1254 #5 SPE (2Liter)	07/04/11	0.00538	107.6%
6	AO10476	07/02/11	1254 #6 SPE (2Liter)	07/04/11	0.00525	105%
7	AO10477	07/02/11	1254 #7 SPE (2Liter)	07/04/11	0.00551	110.2%
8	AO10478	07/02/11	1254 #8 SPE (2Liter)	07/04/11	0.00481	96.2%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0052	ug/L
STD (s):	0.00021	ug/L
%RSD:	3.95%	
MDL:	0.00062	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	KMS	Date:	7/14/2011
Gas Chromatography Analyst:	Anthony J. Maiello	Date:	7/14/2011
QA/QC Officer:	Christopher L. Bradbury	Date:	7/14/2011
Lab Director:	Robert E. Waymouth	Date:	7/14/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

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Northeast Analytical, Inc.

Date: 14-Jul-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1254		Analysis:	SW-846 8082
Matrix:	Liquid		Instrument:	GC-23B
Extraction:	Solid Phase	EPA 3545	Column:	ZB-5
Spike conc:	0.0050	ug/L	Detector:	ECD
			LRF:	11060462

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO10471	07/02/11	1254 #1 SPE (2Liter)	07/04/11	0.00537	107.4%
2	AO10472	07/02/11	1254 #2 SPE (2Liter)	07/04/11	0.00462	92.4%
3	AO10473	07/02/11	1254 #3 SPE (2Liter)	07/04/11	0.00495	99.0%
4	AO10474	07/02/11	1254 #4 SPE (2Liter)	07/04/11	0.00425	85.0%
5	AO10475	07/02/11	1254 #5 SPE (2Liter)	07/04/11	0.00520	104.0%
6	AO10476	07/02/11	1254 #6 SPE (2Liter)	07/04/11	0.00486	97%
7	AO10477	07/02/11	1254 #7 SPE (2Liter)	07/04/11	0.00536	107.2%
8	AO10478	07/02/11	1254 #8 SPE (2Liter)	07/04/11	0.00444	88.8%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0049	ug/L
STD (s):	0.00042	ug/L
%RSD:	8.61%	
MDL:	0.00126	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	SMS	Date:	7/14/2011
Gas Chromatography Analyst:	Anthony J. Maiello	Date:	7/14/2011
QA/QC Officer:	Christopher L. Bradbury	Date:	7/14/2011
Lab Director:	Robert E. Waymouth	Date:	7/14/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

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Northeast Analytical, Inc.

Date: 14-Jul-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1260		Analysis:	SW-846 8082
Matrix:	Liquid		Instrument:	GC-23F
Extraction:	Solid Phase	EPA 3545	Column:	ZB-1
Spike conc:	0.0050	ug/L	Detector:	ECD
			LRF:	11060461

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO10463	07/01/11	1260 #1 SPE (2Liter)	07/05/11	0.00416	83.2%
2	AO10464	07/01/11	1260 #2 SPE (2Liter)	07/05/11	0.00584	116.8%
3	AO10465	07/01/11	1260 #3 SPE (2Liter)	07/05/11	0.00454	90.8%
4	AO10466	07/01/11	1260 #4 SPE (2Liter)	07/05/11	0.00499	99.8%
5	AO10467	07/01/11	1260 #5 SPE (2Liter)	07/05/11	0.00466	93.2%
6	AO10468	07/01/11	1260 #6 SPE (2Liter)	07/05/11	0.00525	105%
7	AO10469	07/01/11	1260 #7 SPE (2Liter)	07/05/11	0.00544	108.8%
8	AO10470	07/01/11	1260 #8 SPE (2Liter)	07/05/11	0.00510	102.0%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0050	ug/L
STD (s):	0.00054	ug/L
%RSD:	10.71%	
MDL:	0.00160	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	KMS	Date:	7/14/2011
Gas Chromatography Analyst:	Anthony J. Maiello	Date:	7/14/2011
QA/QC Officer:	Christopher L. Brinkerhoff	Date:	7/14/2011
Lab Director:	Robert E. Waymouth	Date:	7/14/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

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Northeast Analytical, Inc.

Date: 14-Jul-11

Method Detection Limits

METHOD DETECTION LIMIT STUDY

Method Detection Limit (MDL) calculations as based on procedures outlined in 40 CFR, part 136, App B; 1-July-85.

Compound:	Aroclor 1260		Analysis:	SW-846 8082
Matrix:	Liquid		Instrument:	GC-23B
Extraction:	Solid Phase	EPA 3545	Column:	ZB-5
Spike conc:	0.0050	ug/L	Detector:	ECD
			LRF:	11060461

	NEA Sample ID	Extraction Date	File Name	Analysis Date	Measured Concentration ug/L	Percent Recovery (%)
1	AO10463	07/01/11	1260 #1 SPE (2Liter)	07/05/11	0.00382	76.4%
2	AO10464	07/01/11	1260 #2 SPE (2Liter)	07/05/11	0.00529	105.8%
3	AO10465	07/01/11	1260 #3 SPE (2Liter)	07/05/11	0.00478	95.6%
4	AO10466	07/01/11	1260 #4 SPE (2Liter)	07/05/11	0.00439	87.8%
5	AO10467	07/01/11	1260 #5 SPE (2Liter)	07/05/11	0.00431	86.2%
6	AO10468	07/01/11	1260 #6 SPE (2Liter)	07/05/11	0.00502	100%
7	AO10469	07/01/11	1260 #7 SPE (2Liter)	07/05/11	0.00551	110.2%
8	AO10470	07/01/11	1260 #8 SPE (2Liter)	07/05/11	0.00469	93.8%

One sided Student's t values (t) at the 99% confidence level.

Number (n)	(t) value
7	3.143
8	2.998

Number (n):	8	
AVG:	0.0047	ug/L
STD (s):	0.00055	ug/L
%RSD:	11.67%	
MDL:	0.00165	ug/L
VALID:	valid	

MDL calculations:

MDL = t * s

Where:

t = one sided Student's t value for the number of replicates at the 99% level

s = standard deviation of the population

PQL calculations:

PQL = MDL * 5

Sample Preparation Chemist:	KMS	Date:	7/14/2011
Gas Chromatography Analyst:	Anthony J. Maiello	Date:	7/14/2011
QA/QC Officer:	Christopher L. Bradbury	Date:	7/14/2011
Lab Director:	Robert E. Waymouth	Date:	7/14/2011

Document Control#: QA_MDL_FULLReport_012308_REV0_01

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ARCADIS

Appendix B

CITY:SYRACUSE DIV/GROUP:ENV/CADD DB:GMS K.SARTORI PIC:P.KEANEY PM:D.SAUDA TM:□ROBERTSON LYR:(Opt)ON=*;OFF=*REF*
V:\ENVCAD\SYRACUSE\ACT\C\B0010073\2013\00004\DWG\LOEFFEL\10073P01.d□□ LAYOUT: 1 SAVED: 1/17/2014 11:51 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/17/2014 11:52 AM BY: SARTORI, KATHERINE
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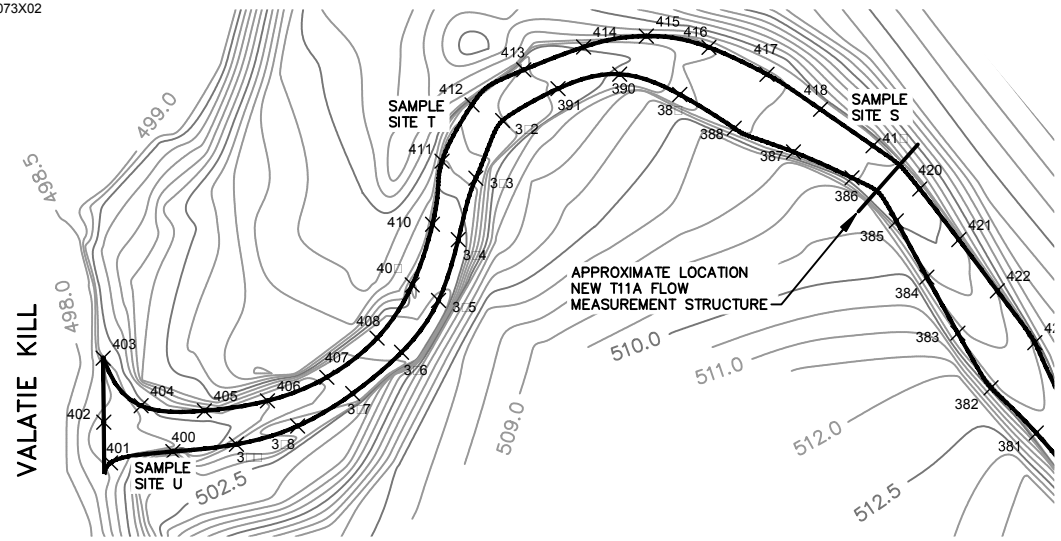
10073X02



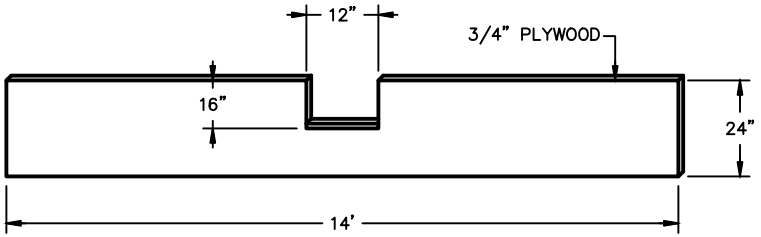
LOCATION OF FLOW MEASUREMENT STRUCTURE

0 30' 60'

GRAPHIC SCALE

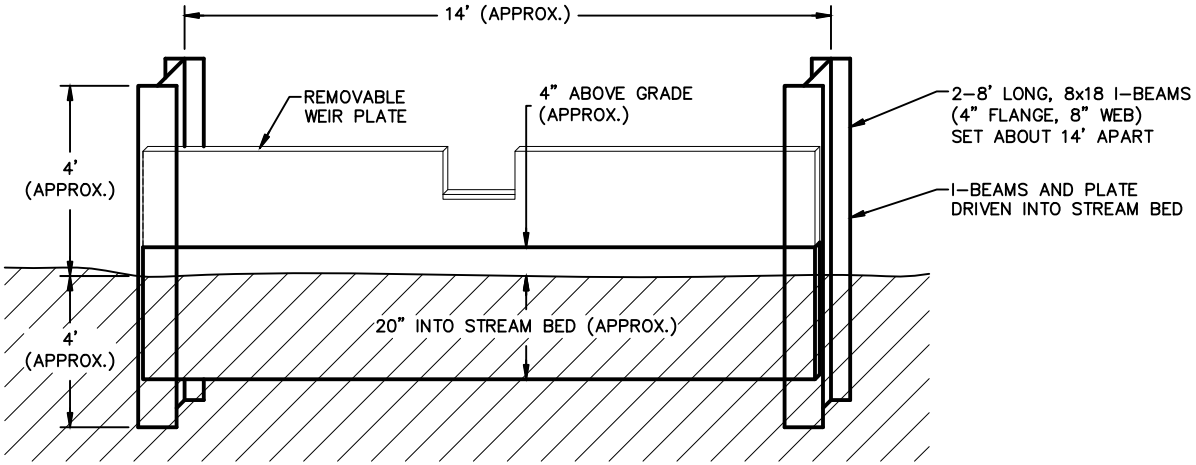
LEGEND:

3□5 PREVIOUS EXCAVATION BOUNDARY AND COORDINATE



REMOVABLE WEIR PLATE DETAIL

NOT TO SCALE



REMOVABLE WEIR PLATE SUPPORT STRUCTURE

NOT TO SCALE

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

TRIBUTARY T11A FLOW MEASUREMENT STRUCTURE

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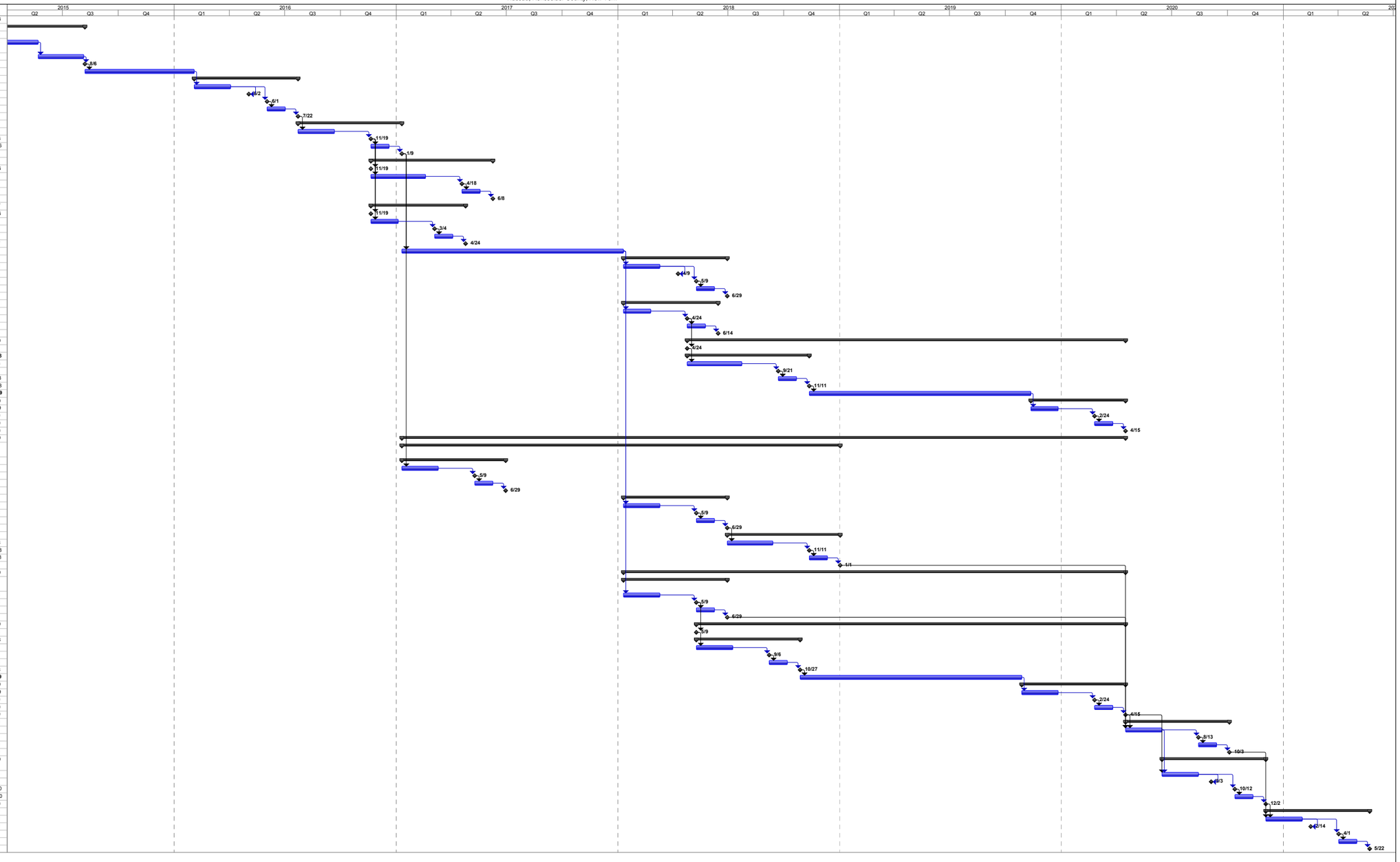
FIGURE 1

ARCADIS

Appendix C

Surface Drainageways
Remedial Investigation/Feasibility Study (RI/FS) Schedule
Dewey Loeffel Landfill Superfund Site
Nassau, Rensselaer County, New York

ID	Task Name	Duration	Start	Finish
1	**Effective Date of Order**	**0 days**	**Wed 11/6/13**	**Wed 11/6/13**
2	**Task 1 - Phase 1 RI Work Plan (inc. QAPP and HASP)**	**622 days**	**Fri 11/22/13**	**Thu 8/6/15**
3	Preparation/submittal	60 edays	Fri 11/22/13	Tue 1/21/14
4	Receipt of USEPA draft comments / Submittal of GE responses / Receipt of USEPA comments	485 edays	Tue 1/21/14	Thu 5/21/15
5	Modification/re-submittal	75 edays	Thu 5/21/15	Tue 8/4/15
6	Approval	0 edays	Thu 8/6/15	Thu 8/6/15
7	**Task 3 - Phase 1 RI Implementation**	**180 edays**	**Thu 8/6/15**	**Tue 2/2/16**
8	**Task 4 - Site Characterization Summary Report (SCSR)**	**171 days**	**Tue 2/2/16**	**Fri 7/22/16**
9	Preparation/submittal	60 edays	Tue 2/2/16	Sat 4/2/16
10	Meeting to present SCSR findings	0 edays	Mon 5/2/16	Mon 5/2/16
11	Receipt of USEPA comments	60 edays	Sat 4/2/16	Wed 6/1/16
12	Modification/re-submittal	30 edays	Wed 6/1/16	Fri 7/1/16
13	Approval or approval with modifications	21 edays	Fri 7/1/16	Fri 7/22/16
14	**Task 5 - Phase 2 RI/FS Work Plan (inc. QAPP and HASP)**	**171 days**	**Fri 7/22/16**	**Mon 1/9/17**
15	Preparation/submittal	60 edays	Fri 7/22/16	Tue 9/20/16
16	Receipt of USEPA comments	60 edays	Tue 9/20/16	Sat 11/19/16
17	Modification/re-submittal	30 edays	Sat 11/19/16	Mon 12/19/16
18	Approval or approval with modifications	21 edays	Mon 12/19/16	Mon 1/9/17
19	**Fate & Transport Model Memorandum**	**201 days**	**Sat 11/19/16**	**Thu 6/8/17**
20	**USEPA Determination**	**0 days**	**Sat 11/19/16**	**Sat 11/19/16**
21	Preparation/submittal	90 edays	Sat 11/19/16	Fri 2/17/17
22	Receipt of USEPA comments	60 edays	Fri 2/17/17	Tue 4/18/17
23	Modification/re-submittal	30 edays	Tue 4/18/17	Thu 5/18/17
24	Approval or approval with modifications	21 edays	Thu 5/18/17	Thu 6/8/17
25	**Re-Use Assessment**	**156 days**	**Sat 11/19/16**	**Mon 4/24/17**
26	**USEPA Determination**	**0 days**	**Sat 11/19/16**	**Sat 11/19/16**
27	Preparation/submittal	45 edays	Sat 11/19/16	Tue 1/3/17
28	Receipt of USEPA comments	60 edays	Tue 1/3/17	Sat 3/4/17
29	Modification/re-submittal	30 edays	Sat 3/4/17	Mon 4/3/17
30	Approval or approval with modifications	21 edays	Mon 4/3/17	Mon 4/24/17
31	**Task 6 - Phase 2 RI/FS Implementation**	**365 edays**	**Mon 1/9/17**	**Tue 1/9/18**
32	**SCSR Addendum**	**171 days**	**Tue 1/9/18**	**Fri 6/29/18**
33	Preparation/submittal	60 edays	Tue 1/9/18	Sat 3/10/18
34	Meeting to present SCSR Addendum findings	0 edays	Mon 4/9/18	Mon 4/9/18
35	Receipt of USEPA comments	60 edays	Sat 3/10/18	Wed 5/9/18
36	Modification/re-submittal	30 edays	Wed 5/9/18	Fri 6/8/18
37	Approval or approval with modifications	21 edays	Fri 6/8/18	Fri 6/29/18
38	**Task 7 - Identification of Candidate Technologies Memo**	**156 days**	**Tue 1/9/18**	**Thu 6/14/18**
39	Preparation/submittal	45 edays	Tue 1/9/18	Fri 2/23/18
40	Receipt of USEPA comments	60 edays	Fri 2/23/18	Tue 4/24/18
41	Modification/re-submittal	30 edays	Tue 4/24/18	Thu 5/24/18
42	Approval or approval with modifications	21 edays	Thu 5/24/18	Thu 6/14/18
43	**Task 8 - Treatability Studies**	**722 days**	**Tue 4/24/18**	**Wed 4/15/20**
44	**USEPA Determination**	**0 days**	**Tue 4/24/18**	**Tue 4/24/18**
45	**Treatability Testing Work Plan (inc. QAPP and HASP)**	**201 days**	**Tue 4/24/18**	**Sun 11/11/18**
46	Preparation/submittal	90 edays	Tue 4/24/18	Mon 7/23/18
47	Receipt of USEPA comment	60 edays	Mon 7/23/18	Fri 9/21/18
48	Modification/re-submittal	30 edays	Fri 9/21/18	Sun 10/21/18
49	Approval or approval with modifications	21 edays	Sun 10/21/18	Sun 11/11/18
50	**Treatability Testing Implementation**	**365 edays**	**Sun 11/11/18**	**Mon 11/11/19**
51	**Treatability Testing Evaluation Report**	**156 days**	**Mon 11/11/19**	**Wed 4/15/20**
52	Preparation/submittal	45 edays	Mon 11/11/19	Thu 12/26/19
53	Receipt of USEPA comments	60 edays	Thu 12/26/19	Mon 2/24/20
54	Modification/re-submittal	30 edays	Mon 2/24/20	Wed 3/25/20
55	Approval or approval with modifications	21 edays	Wed 3/25/20	Wed 4/15/20
56	**Task 9 - Risk Assessment**	**1192 days**	**Mon 1/9/17**	**Wed 4/15/20**
57	**Task 9A - Baseline Human Health Risk Assessment (BHHRA)**	**722 days**	**Mon 1/9/17**	**Tue 1/1/19**
58	**Memo on Exposure Scenarios & Assumption**	**171 days**	**Mon 1/9/17**	**Thu 6/29/17**
59	Preparation/submittal	60 edays	Mon 1/9/17	Fri 3/10/17
60	Receipt of USEPA comments	60 edays	Fri 3/10/17	Tue 5/9/17
61	Modification/re-submittal	30 edays	Tue 5/9/17	Thu 6/8/17
62	Approval or approval with modifications	21 edays	Thu 6/8/17	Thu 6/29/17
63	**Pathway Analysis Report (PAR)**	**171 days**	**Tue 1/9/18**	**Fri 6/29/18**
64	Preparation/submittal	60 edays	Tue 1/9/18	Sat 3/10/18
65	Receipt of USEPA comments	60 edays	Sat 3/10/18	Wed 5/9/18
66	Modification/re-submittal	30 edays	Wed 5/9/18	Fri 6/8/18
67	Approval or approval with modifications	21 edays	Fri 6/8/18	Fri 6/29/18
68	**BHHRA Report**	**186 days**	**Fri 6/29/18**	**Tue 1/1/19**
69	Preparation/submittal	75 edays	Fri 6/29/18	Wed 9/12/18
70	Receipt of USEPA comments	60 edays	Wed 9/12/18	Sun 11/11/18
71	Modification/re-submittal	30 edays	Sun 11/11/18	Tue 12/11/18
72	Approval or approval with modifications	21 edays	Tue 12/11/18	Tue 1/1/19
73	**Task 9B - Ecological Risk Assessment**	**827 days**	**Tue 1/9/18**	**Wed 4/15/20**
74	**Screening Level Ecological Risk Assessment (SLERA) Report**	**171 days**	**Tue 1/9/18**	**Fri 6/29/18**
75	Preparation/submittal	60 edays	Tue 1/9/18	Sat 3/10/18
76	Receipt of USEPA comments	60 edays	Sat 3/10/18	Wed 5/9/18
77	Modification/re-submittal	30 edays	Wed 5/9/18	Fri 6/8/18
78	Approval or approval with modifications	21 edays	Fri 6/8/18	Fri 6/29/18
79	**Baseline Ecological Risk Assessment (BERA)**	**707 days**	**Wed 5/9/18**	**Wed 4/15/20**
80	**USEPA Determination**	**0 days**	**Wed 5/9/18**	**Wed 5/9/18**
81	**BERA Scope of Work (inc. QAPP and HASP)**	**171 days**	**Wed 5/9/18**	**Sat 10/27/18**
82	Preparation/submittal	60 edays	Wed 5/9/18	Sun 7/8/18
83	Receipt of USEPA comments	60 edays	Sun 7/8/18	Thu 9/6/18
84	Modification/re-submittal	30 edays	Thu 9/6/18	Sat 10/6/18
85	Approval or approval with modifications	21 edays	Sat 10/6/18	Sat 10/27/18
86	**BERA Implementation**	**365 edays**	**Sat 10/27/18**	**Sun 10/27/19**
87	**BERA Report**	**171 days**	**Sun 10/27/19**	**Wed 4/15/20**
88	Preparation/submittal	60 edays	Sun 10/27/19	Thu 12/26/19
89	Receipt of USEPA comments	60 edays	Thu 12/26/19	Mon 2/24/20
90	Modification/re-submittal	30 edays	Mon 2/24/20	Wed 3/25/20
91	Approval or approval with modifications	21 edays	Wed 3/25/20	Wed 4/15/20
92	**Task 10 - RI Report**	**171 days**	**Wed 4/15/20**	**Sat 10/3/20**
93	Preparation/submittal	60 edays	Wed 4/15/20	Sun 6/14/20
94	Receipt of USEPA comments	60 edays	Sun 6/14/20	Thu 8/13/20
95	Modification/re-submittal	30 edays	Thu 8/13/20	Sat 9/12/20
96	Approval or approval with modifications	21 edays	Sat 9/12/20	Sat 10/3/20
97	**Task 11 - FS Development & Screening of Remedial Alternatives Technical Memo**	**171 days**	**Sun 6/14/20**	**Wed 12/2/20**
98	Preparation/submittal	60 edays	Sun 6/14/20	Thu 8/13/20
99	Meeting to present remedial action objectives	0 edays	Thu 9/3/20	Thu 9/3/20
100	Receipt of USEPA comments	60 edays	Thu 8/13/20	Mon 10/12/20
101	Modification/re-submittal	30 edays	Mon 10/12/20	Wed 11/11/20
102	Approval or approval with modifications	21 edays	Wed 11/11/20	Wed 12/2/20
103	**Task 12 - FS Report**	**171 days**	**Wed 12/2/20**	**Sat 5/22/21**
104	Preparation/submittal	60 edays	Wed 12/2/20	Sun 1/31/21
105	Meeting to present FS findings	0 edays	Sun 2/14/21	Sun 2/14/21
106	Receipt of USEPA comments	60 edays	Sun 1/31/21	Thu 4/1/21
107	Modification/re-submittal	30 edays	Thu 4/1/21	Sat 5/1/21
108	Approval or approval with modifications	21 edays	Sat 5/1/21	Sat 5/22/21



Project: Dewey Drainageways RIFS
Date: Thu 8/6/15

Task | Milestone | Project Summary | External Milestone | Inactive Milestone | Manual Task | Manual Summary Rollup | Start-only | Progress
Split | Summary | External Tasks | Inactive Task | Inactive Summary | Duration-only | Manual Summary | Finish-only | Deadline