

MODULE III SUPPLEMENT CORRECTIVE ACTION REQUIREMENTS
POMPTON LAKE STUDY AREA INCLUDING ACID BROOK DELTA SEDIMENTS
AND UPLAND SOIL AREAS

A. Introduction

1. This Module III Supplement contains the selected corrective action measures for the Pompton Lake Study Area (“PLSA”) sediments including the Acid Brook Delta (“ABD”) sediments, areas of concern identified in Pompton Lake and the ABD Upland Soil Areas. The PLSA begins at the Lakeside Avenue Bridge and terminates at the Pompton Dam. The Acid Brook is identified as Solid Waste Management Unit (“SWMU”) Number 118 in the permit. Acid Brook discharges into the delta in Pompton Lake.
2. The provisions of Module III of the permit remain in effect. This Supplement carries out the provisions of Module III. E. 7, 8 and 9 of the permit concerning the basis and nature of corrective measures.
3. The United States Environmental Protection Agency (“EPA”) issued a Module III Supplement for corrective action measures in the Pompton Lake ABD and ABD Upland Soil Areas as a permit modification in December 2012. The Module III Supplement was appealed by DuPont (the Permittee) and the Passaic River Coalition in a permit appeal to EPA’s Environmental Appeals Board (“EAB”), and was subsequently withdrawn by EPA in April 2014.

B. Corrective Action Measures Selection Factors

The criteria for selection of corrective action measures pursuant to the permit are set forth in detail in Module III.E.7. These criteria are utilized by EPA to ensure that the corrective action measures are protective of human health and the environment by meeting protective standards or concentration levels for hazardous constituents in each medium, and by controlling sources of releases so as to reduce or eliminate, to the maximum extent practicable, any further releases of hazardous constituents that might pose a threat.

Long term reliability and effectiveness are key factors, and are evaluated in terms of the magnitude of residual risks associated with corrective measures, the type of long term management required, and potential exposure. A potential corrective action measure is also evaluated in terms of the reduction of toxicity, mobility or volume of hazardous material.

The ease or difficulty of implementing potential corrective action measure(s) is assessed, and factors including difficulty of technology, operational requirements, costs, and the availability of any necessary storage or disposal services are considered in the assessment.

The corrective action measures for the PLSA that are contained in this Module III Supplement set forth the requirements that the Permittee must meet to achieve compliance with the requirements of this Permit Modification.

C. Relevant Documents Submitted by Permittee

The Permittee submitted the Revised ABD Remedial Investigation Report (“RIR”), dated January 30, 2008, and the ABD Area Remedial Action Selection Report/Corrective Measures Study (“RASR/CMS”), dated September 18, 2009. These documents provide information to support the corrective action measures evaluated as well as a description of the process of evaluating corrective measures. The Permittee submitted a Hazardous and Solid Waste Amendments (HSWA) Permit Modification Application, dated April 1, 2011, which included the corrective action measures proposed in the RASR/CMS.

In September 2011, the Permittee submitted a revised Corrective Measures Implementation Work Plan (“CMI WP”) containing information on the proposed implementation of the final remedies for the ABD, which were excavation of the ABD Upland Soil Areas and dredging of the sediments in the ABD. The CMI WP includes a Project Operations Plan (in Appendix F of the CMI WP), which outlines issues to be addressed during implementation, such as staging, treatment of the excavated and dredged soil and sediments, transportation and disposition of the contaminated material, restoration and monitoring, and a proposed implementation schedule.

During the period of the permit appeal and in conjunction with the discussions with EPA, the Permittee performed sediment and lake investigation fieldwork including bathymetry surveys and side scan sonar, sediment sampling and biota sampling as well as hydrodynamic modeling. The scope of work and results from these investigations are contained in the following documents submitted to EPA by the Permittee:

- 2013 Sediment Sampling Plan dated July 2013;
- Technical Memorandum: Updated Conceptual Site Model dated March 2014 – (i.e. Sediment Sampling Results);
- Technical Support for the Selection of Additional Sediment Removal Areas, Pompton Lake Corrective Action Implementation, Pompton Lakes, New Jersey dated October 2014; and,
- Technical Support for Acid Brook Delta Upland Soil Areas Corrective Action Implementation, Pompton Lakes, New Jersey dated October 2014.

The CMI WP dated September 2011, including its Project Operations Plan, will be updated as set forth below prior to the implementation of the required work described in this Permit Modification.

D. Updated CMI WP and Schedule

1. Within 90 days of the permit modification effective date, or by such other date as is approved by EPA, the Permittee shall submit to EPA and NJDEP for their review and approval by EPA, an updated CMI WP, including an updated Project Operations Plan, Health & Safety Plan (HASP) and Quality Assurance Project Plan (QAPP) with respect

to the dredging/removal operation, based on the conditions set forth in condition III.E of this Permit Modification. The EPA approved, updated CMI WP will incorporate any modifications resulting from EPA and NJDEP reviews.

2. As part of the updated CMI WP, the Permittee shall also describe how its operations, where appropriate, comport with principles and practices of “Green Remediation” as outlined the EPA Region 2 “Clean and Green Policy.”
3. Upon EPA approval of the updated CMI WP, the Permittee shall implement the approved work plan in accordance with its schedule, and the provisions of this Permit Modification.

E. Specific Corrective Action Measures for the ABD Sediments/Areas in Pompton Lake

1. ABD Sediments and Pompton Lake

a. Qualitative Remedial Action Objectives (RAOs)

There are no promulgated applicable remediation standards for sediment to use as quantitative RAOs. However, narrative qualitative RAOs have been developed to set goals for protecting human health and the environment in the PLSA.

Based on the September 18, 2009 RASR/CMS prepared by DuPont, the following qualitative RAOs for sediment shall apply in order to be protective of ecological receptors:

- Remove sediments with the potential to methylate mercury and reduce the potential for further mercury methylation in near-shore sediment in the ABD (within approximately 200 feet of the shoreline); and,
- Reduce the area of exposure of ecological receptors to elevated mercury concentrations in sediment.
- Reduce the potential for ecological receptor exposure by removing sediment which has the potential to methylate mercury which reduces the mass of mercury in the surficial sediment (i.e. the sediment found at 0 to 0.5 feet) in the ABD and areas of concern identified in Pompton Lake (Area A and the Island Area); and,
- Reduce the potential for ecological receptor exposure by removing sediment which has the potential to methylate mercury which reduces the mercury mass in the deep sediment (i.e. the sediment found at > 0.5 feet) in the ABD and areas of concern identified in Pompton Lake (Area A and the Island Area as defined in E.1.b.).

Figure 1 depicts the Corrective Measures Implementation Areas subject to dredging/removal.

b. Selected Remedial Alternative #4 from the RASR/CMS, as Revised by EPA Dredging ABD Sediments and Removal in Areas in Pompton Lake

The ABD removal area consists of the area depicted in Figure 1 of this Permit Modification. This area is comprised of approximately 36 acres. The sediment removal, which will take place as part of the dredging operation, shall focus on the mercury-impacted sediments and shall include sediments and select areas of the peat layer which have elevated mercury concentrations located within the area depicted in Figure 1.

There are two additional areas of concern identified for removal that are outside of the ABD. Area A is comprised of approximately 0.5 acres and is depicted on Figure 1 of this Permit Modification. The second identified area of concern is the Island Area which is also depicted on Figure 1 of this Permit Modification. The Island Area is comprised of approximately 2.5 acres and includes the northern, eastern and southern areas around the extent of the island as well as the backwater areas to the west of the island.

Selection of the identified areas of concern in Pompton Lake was based on biotic (e.g. insect larvae) and abiotic samples (e.g. sediment pore water) which show that sediment in these areas have the potential to methylate in a near shore environment. The RAOs established for the ABD as described in E.1.a, above are applicable. The removal is intended to:

- Remove mercury impacted sediment from the near shore environment in the ABD where there is the highest potential for methylation of mercury;
- Reduce the potential for ecological receptor exposure by removing sediment which has the potential to methylate mercury which reduces the mass of mercury in the surficial sediment (i.e. sediment found at 0 to 0.5 feet) in the ABD and areas of concern identified in Pompton Lake (Area A and the Island Area); and,
- Reduce the potential for ecological receptor exposure by removing sediment which has the potential to methylate mercury which reduces the mercury mass in the deep sediment (i.e. sediment found at > 0.5 feet) in the ABD and areas of concern identified in Pompton Lake (Area A and the Island Area).

The sediment removal within these identified areas of concern shall focus on the mercury-impacted sediments including sediments down to the native cobble or gravel layer within the delineated areas. The updated CMI WP, including the Project

Operations Plan, shall incorporate procedures for implementing the work in the two identified areas of concern.

c. Confirmation of Implementation of the Corrective Action for the ABD Sediments and Areas in Pompton Lake

Confirmation of sediment dredging/removal completion shall be conducted. Both traditional and dredge mounted survey techniques shall be used to verify that dredging down to the peat layer has been achieved in the appropriate areas including the ABD, and that the horizontal and vertical limits of all targeted sediment removal contained in the updated CMI WP have been achieved. Upon satisfactory evidence that excavation has been completed in compliance with this Permit Modification and the approved, updated CMI WP, the Permittee shall cover the dredged area with a minimum of 6 inches of granular material which shall serve to manage any residual mercury contamination as well as provide a restorative layer within which the benthic community will re-establish.

d. PLSA Long-Term Monitoring Program

Within 45 days of the approval of the CMI WP, or by such other date as is approved by EPA, the Permittee shall design and submit to EPA and NJDEP, for EPA approval, a Long-Term Monitoring Program Work Plan ("LTMP WP") designed to establish baseline conditions and conduct long-term monitoring of the PLSA. The LTMP WP will be designed to measure key indicators of the overall condition of the PLSA over an initial five year monitoring period. The LTMP will be used to evaluate the PLSA ecosystem as a result of the post removal of mercury sediments with the greatest potential for methylation. The results of the initial five year monitoring period will be utilized to determine the scope of further remedial action (if required) and/or any changes to the monitoring.

The LTMP WP shall include documentation of baseline conditions. Historical data and sampling data collected from sediment and biota in 2013/2014 shall be used to establish baseline conditions prior to remedy implementation that will be documented in the LTMP WP. Any data gaps identified that need to be addressed to establish post-remedy baseline conditions shall be collected in the PLSA and steps to address such data gaps shall be proposed in the LTMP WP.

Existing data and any new data collected in order to address identified data gaps will be utilized to (1) develop baseline conditions of mercury in surface water so that significant increases in mercury exposure can be identified, and (2) develop baseline conditions of mercury bioaccumulation in fish tissue such significant increases in mercury exposure to fish or piscivorous wildlife can be identified.

The LTMP WP shall include clearly defined data quality objectives consistent with EPA quality management guidelines as part of its QAPP, a HASP and shall include a field sampling plan that, at a minimum, contains the following monitoring elements:

surface water, sediment, sediment pore water, young of year fish tissue, adult fish tissue, larval insect tissue, emergent insect tissue. The conceptual framework and details for the study design/sampling approach, types of chemical analyses and biological samples, frequency and location of samples will be provided in the LTMP WP.

Information and data gathered during the implementation of the LTMP WP is expected to be sufficient to allow EPA to determine if an Ecological Risk Assessment is necessary as outlined in Section E.1.e., below.

The LTMP WP shall include a schedule for data collection, analysis, reporting, and record-keeping. The PLSA shall be monitored for a minimum of five (5) years following completion of all required dredging/removal and corrective action activities. Results of the LTMP shall guide EPA on the elements of subsequent monitoring and/or remedial activities, should EPA determine their necessity.

If EPA determines that additional remedial work may be necessary, such work shall be incorporated into an additional permit modification that is subject to a public comment period and public hearing.

e. Ecological Risk Assessment (ERA)

During year 5 of the LTMP or earlier if determined to be appropriate by EPA, EPA will determine whether there is a need to perform an ERA of the PLSA utilizing the data collected as part of the LTMP. The LTMP contains a significant portion of the ecological elements needed to perform the ERA. If determined to be required to further inform a decision about the need for additional remedial action, an ERA of the PLSA may be conducted.

2. Remediation and Restoration Plan for the ABD Upland Soil Areas

The ABD Upland Soil Areas encompass approximately 1.74 acres south of Lakeside Avenue. Of those 1.74 acres, approximately 0.9 acres is a relatively flat area situated approximately 8 feet above the lake, 0.7 acres is a wooded slope, and 0.14 acre is relatively flat wetlands along the lake's shore.

As part of the CMI WP to be submitted in D.1., above, the Permittee shall design and submit to EPA and NJDEP for their review and EPA approval, an updated Remediation and Restoration Plan ("Plan"). The updated Plan shall address the corrective action as described in 2(b), below in conjunction with Figure U-1, and include a post-remedial monitoring program for the restoration of the ABD Upland Soil Areas and an implementation schedule. The updated Plan shall be designed to ensure that the potential pathways for ecological receptors to mercury-contaminated soil will be addressed. The Plan that needs to be updated was previously submitted by the Permittee as part of the CMI WP.

Prior to submittal of the updated Plan, EPA shall make arrangements for consultation (in a meeting and/or teleconference) with the Permittee, NJDEP, and United States Fish & Wildlife Service (USFWS) to discuss its provisions.

Upon EPA approval of the updated Plan, including any modifications, the Permittee shall implement the Plan according to its approved schedule.

a. RAOs for ABD Upland Soil Areas

(1) Quantitative RAO for ABD Upland Soil Areas Outside of the Wetlands Transition Zone and Wetlands

Both human health and ecological criteria have been selected as RAOs for the Upland Soil Areas located outside the Wetlands Transition Zone and Wetlands as depicted in Figure 2. The updated Plan shall incorporate excavation so that post-excavation levels of contaminants are below the surface and subsurface soil criteria set out in the RAOs in the Table below.

Analyte	Surface Soil Criteria (mg/kg)	Subsurface Soil Criteria (mg/kg)
Copper (Cu)	1,100*	3100**
Mercury (Hg)	20.5*	23**
Lead (Pb)	400 **	400**
Zinc (Zn)	1,507*	23,000**

Note: * represents ecological soil delineation criteria derived and presented in Appendix C of the ABD Uplands RIWP prepared by Permittee

Note: ** represents New Jersey Residential Direct Contact Soil Remediation Standards (NJRDCSRS)

(2) RAO for ABD Upland Soil Areas within the Wetlands Transition Zone and Wetlands

The RAO for soils within the wetland and wetland transition zones (Removal Areas A, B, B1, C, D1, D2, lower portions of E4, E5, E6, and F – Figure U-1) will be:

- to eliminate or minimize the potential exposure to ecological receptors within the wetland and wetland transition zone to surface and subsurface soils in these areas by limiting the potential for mercury methylation, bioaccumulation, and translocation.

To accomplish this RAO, areas landward within the wetland and wetland transition zone will be excavated to a depth of three feet below the final restoration elevation (as will be defined in the updated CMI WP or one foot below the assumed water table elevation of

200.5 (i.e., 1 foot below full pool lake level), whichever is encountered first. The resulting excavation will be backfilled with soil meeting NJDEP requirements for such material.

b. Selected Remedial Alternative #4 from the RASR/CMS, as revised by EPA – Excavation/Removal of the ABD Upland Soil Areas

The selected remedy is Alternative #4 from the RASR/CMS as revised by EPA, which is excavation of the soil for off-site disposal to be followed with restoration of the excavated areas with the following additional specific requirements and clarifications:

- (1) For surface and subsurface soils outside of the Wetlands Transition Zone and Wetlands (as depicted in Figure U-1 of this Permit Modification):

The Permittee shall excavate in accordance with Alternative #4 of the RASR/ CMS and the *Technical Memo – Upland Soil Areas Removal, Pompton Lake – Acid Brook Delta Project, Pompton Lakes, New Jersey dated October 2014*, with the RAOs being the lower of the NJRDCSRS and the “Ecological Soil Delineation Criteria” developed in the RIR (which is the Table in E.2.a(1) above);

- (2) For the ABD Upland Soil Areas within the Wetlands Transition Zone and the Wetlands (as depicted in Figure U-1 of this Permit Modification):

The Permittee shall adhere to the EPA approved Remediation and Restoration Plan as required by permit condition E.2.a(2) above, to address the potential ecological exposure pathways to contaminants specific to the wetlands transition zone and wetlands.

Corrective Action shall include removal of soils to the depth defined for the Wetland Transition Zone/Wetlands depicted on Figure U-1. The excavation will be backfilled with certified clean fill material (base material and a planting medium) to establish a supportive medium of clean fill material at optimal surface elevations to provide a primary rooting zone for restoration plantings.

c. Confirmation of Implementation of the Corrective Action for the Upland Soil Areas

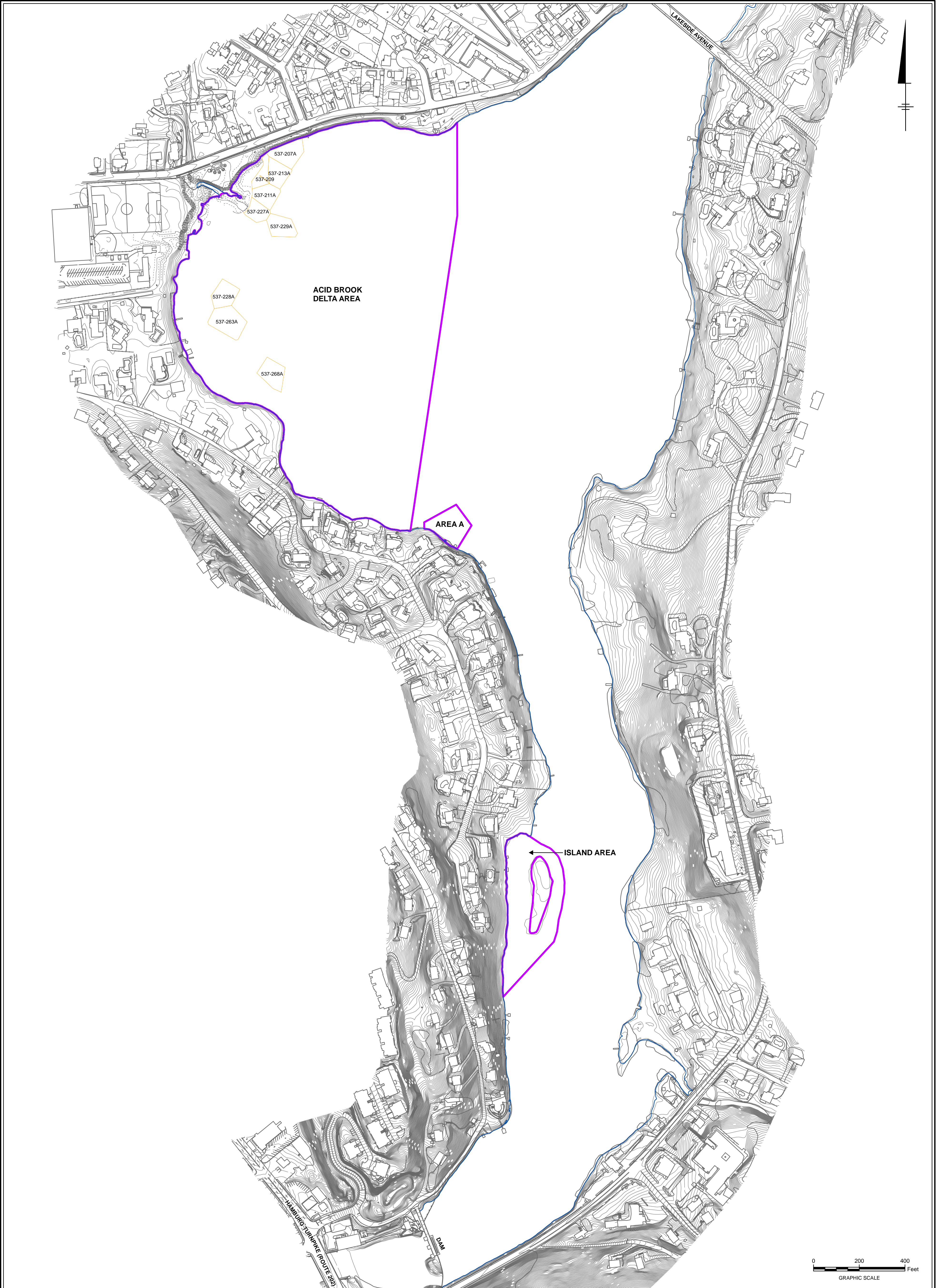
The Permittee shall confirm that the ABD Upland Soil Areas are remediated and restored in accordance with the EPA approved Plan. Surveying shall be used to verify that the horizontal and vertical levels of removal and or re-contouring (placement of fill) that are specified in the approved Plan have been achieved.

Figures

Figure 1: Corrective Measures Implementation Areas.

Figure U-1: Upland Soil Removal Areas.

List of Acronyms



- LEGEND**
- APPROXIMATE FULL POOL ELEVATION (201.4')
 - 0.5-FOOT TOPOGRAPHIC CONTOUR
 - 1-FOOT TOPOGRAPHIC CONTOUR
 - ▭ CORRECTIVE ACTION IMPLEMENTATION AREA
 - ▭ AREAS OF TARGETED PEAT REMOVAL

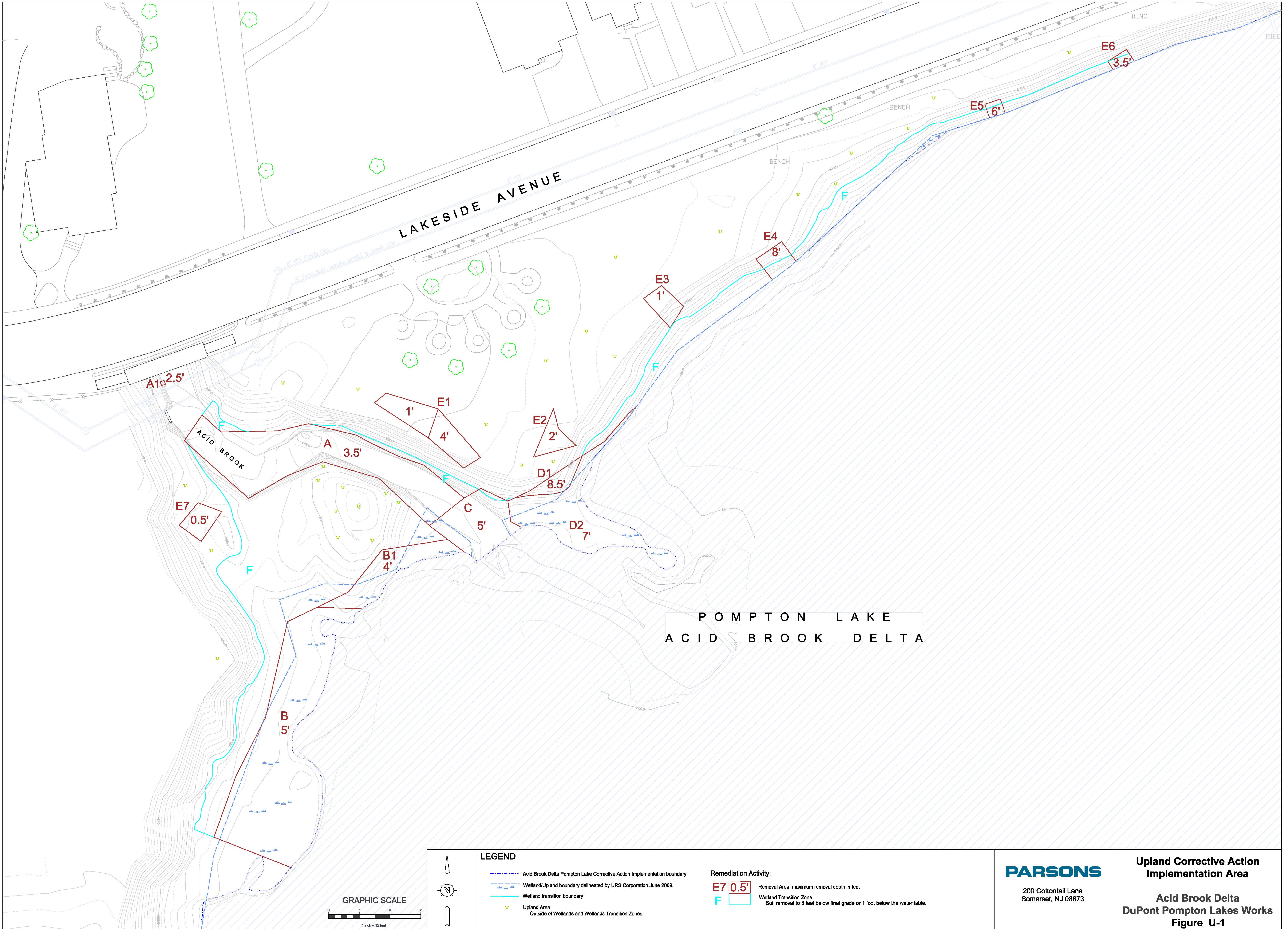
- NOTES:**
1. THE BASE MAP WAS PREPARED BY R.C.C DESIGN, INC. AND IS BASED UPON ACTUAL FIELD SURVEY AND AERIAL PHOTOGRAPHY PERFORMED ON DECEMBER 28, 2007, AND REPRESENTS THE CONDITIONS FOUND EXCEPT SUCH EASEMENTS OF IMPROVEMENTS, IF ANY, BELOW THE SURFACE LANDS AND NOT VISIBLE. HORIZONTAL AND VERTICAL DATUMS ARE BASED ON NAD 83 AND NAVD 88, RESPECTIVELY.
 2. THE TOPOGRAPHIC SURVEY IS BASED ON AN UPDATED SURVEY COMPLETED BY URS IN 2011 IN THE AREA NEAR ACID BROOK.
 3. FOR THE THIESSEN POLYGONS ASSOCIATED WITH LOCATIONS 537-207A, -209A, -213A, -227A, -228A, -229A, -263A, AND -268A, 6 INCHES OF PEAT IS PROPOSED FOR REMOVAL. FOR THE THIESSEN POLYGON ASSOCIATED WITH LOCATION 537-211A, 12 INCHES OF PEAT IS PROPOSED FOR REMOVAL.

DUPONT POMPTON LAKES WORKS
 POMPTON LAKES, NEW JERSEY

**CORRECTIVE ACTION
 IMPLEMENTATION AREAS**



FIGURE
1



**MODULE III SUPPELMENT CORRECTIVE ACTION REQUIREMENTS
POMPTON LAKE STUDY AREA INCLUDING ACID BROOK DELTA SEDIMENTS
AND UPLAND SOIL AREAS**

ABD	Acid Brook Delta
CMI WP	Corrective Measures Implementation Work Plan
HSWA	Hazardous and Solid Waste Amendments of 1984
EAB	Environmental Appeals Board
EPA	United States Environmental Protection Agency
ERA	Ecological Risk Assessment
HASP	Health and Safety Plan
LTMP	Long-Term Monitoring Plan
LTMP WP	Long-Term Monitoring Plan Work Plan
NJDEP	New Jersey Department of Environmental Protection
NJRDCSRS	New Jersey Residential Direct Contact Soil Remediation Standards
PLSA	Pompton Lake Study Area
QAPP	Quality Assurance Project Plan
RAOs	Remedial Action Objectives
RASR/CMS	Remedial Action Selection Report/Corrective Measures Study
RIR	Remedial Investigation Report
SWMU	Solid Waste Management Unit
USFWS	United States Fish & Wildlife Service