

III. MODULE III SUPPLEMENT
CORRECTIVE ACTION REQUIREMENTS
RELATED TO ACID BROOK DELTA SEDIMENTS
AND UPLAND SOIL AREAS

A. Introduction

1. This Module III Supplement contains the selected corrective measures for the Acid Brook Delta (“ABD”) sediments and the Upland Soils area. 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. This Permit Module III Supplement is the culmination of the permit modification process initiated in April 1, 2011 by the Permittee’s submittal of the permit modification application. The permit modification process included the following:
 - An information session on the draft permit modification was held at the Borough Council Chamber, Pompton Lakes, New Jersey on October 20, 2011.
 - Publication of the Public Notice of the draft Permit Modification on November 20, 2011 in the Suburban Trends and Bergen Record.
 - A public comment period starting on November 20, 2012 and ending on January 13, 2012.
 - A public hearing at the Pompton Lakes High School on January 5, 2012.
 - Results of a 2011 bathymetric survey submitted to EPA by the Permittee in a document dated January 9, 2012 entitled “Comparison of the 2011 and 2007 Bathymetric Surveys, Acid Brook Delta, Pompton Lake, Pompton Lakes, New Jersey”.

After receipt of additional relevant information and public comments, which include written comments and comments made in the public hearing, the final permit modification was developed after evaluating and addressing the comments, which EPA deems significant and relevant to the corrective action of the ABD study area.

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 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 remedy is also evaluated in terms of the reduction of toxicity, mobility or volume of hazardous material. A remedy is also evaluated in terms of the concentration levels of hazardous constituents that must be achieved to be protective of human health and the environment.

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 ABD sediments and Upland areas 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 remedial alternatives evaluated, a description of the process of evaluating remedial alternatives and the remedial alternative selected. DuPont submitted a HSWA Permit Modification Application, dated April 1, 2011, which included the remedies proposed in the RASR/CMS.

In September 2011, the Permittee submitted a revised Corrective Measures Implementation Work Plan (“CMIWP”) containing information on the proposed implementation of the final remedies for the ABD, which are excavation of Uplands Soils and dredging of the sediments in the ABD. The CMIWP includes a Project Operations Plan (in Appendix F of the Corrective Measures Implementation Plan), 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. The Project Operations Plan will be updated as set forth below, and may be further amended, as deemed necessary, based on the data gathered and the findings during implementation of the required work set out in this Permit Modification.

D. Updated CMIWP and Schedule

1. Within 30 days of the permit modification effective date, or by such other date as is approved by EPA, the Permittee shall submit to EPA, for approval, an updated Appendix F. of the CMIWP with respect to the dredging operation, based on the conditions set forth in condition III.E of this Permit Modification.

2. As part of the updated Appendix F of the CMIWP, 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 receiving EPA approval of the updated Appendix F of the CMIWP, including any modifications, 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 and Upland Soils

1. ABD Sediments

a. Qualitative 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 ABD.

The following qualitative RAOs for sediment shall apply in order to be protective of ecological receptors:

- Reduce the potential for mercury methylation in near-shore sediment (defined as sediment within 200 feet of the shoreline in water less than 5 feet deep); and
- Reduce the area of exposure of ecological receptors to elevated mercury concentrations in sediment.

This removal is intended to:

- Remove 100% of the mercury from the near shore environment where there is the maximum potential for methylation of mercury;
- Reduce the mass of mercury in the surficial sediment (0 to 0.5 feet) by approximately 97%;
- Reduce the mercury mass in the deep sediment (> 0.5 feet) by approximately 93%; and
- Reduce the total mercury mass in the ABD by approximately 95%.

b. Selected Remedial Alternative #4 from the RASR/CMS, as Revised by EPA -- Dredging of the ABD Sediments

The removal area consists of the area within (west of) the “RAO line” centered at the discharge point of Acid Brook into Pompton Lake (see Figure 1 of this Permit Modification). The sediment removal, which will take place as part of the

dredging operation, shall focus on the mercury-impacted sediments and shall include all sediments located within (west of) the “RAO line”. The underlying peat may also be removed where necessary to capture sediments not separated from the peat.

c. Confirmation of Implementation of the Remedy for the ABD Sediments

Confirmation of dredging completion shall be conducted. Both traditional and dredge mounted survey techniques shall be used to verify that the horizontal and vertical limits of sediment removal have been achieved. Upon satisfactory evidence that excavation has been completed in compliance with this Permit Modification, the Permittee shall cover the dredged area with a minimum of 6 inches of granular material which shall serve as a layer within which the benthic community will re-establish itself. Where the peat layer is not well-established, an additional 6” shall be removed and a minimum of 12” restorative layer shall be placed.

d. Sediment Sampling Plan

(1) Within 30 days of the effective date of this Permit Modification, or by such other date as is approved by EPA, Permittee shall design and submit to EPA, for approval, a Sediment Sampling Plan (“SSP”), including an implementation schedule, designed to: (a) delineate the mercury concentration in the sediment for the area east of the “RAO line” (i.e., the area of the lake that is not targeted for dredging), and along the channel down to the Pompton Lake Dam; and (b) characterize the sediment quality for the portion of the Ramapo River from the Pompton Lake Dam downstream to the wetlands area adjacent to Riverside Park, Wayne, New Jersey (“Riverside Park”). Subsequent remedial activity shall be determined based on the findings of the SSP. Data collected as part of the SSP shall also be used to support the Ecological Risk Assessment described in condition E.1.f, below.

(2) Prior to submittal of the SSP for EPA approval, Permittee shall make arrangement for consultation (in a meeting and/or teleconference) with EPA, NJDEP, and the United States Fish and Wildlife Service (“USFWS”) to discuss the SSP.

(3) The Permittee shall implement the SSP upon its approval by EPA and submit an SSP report in accordance with the schedule contained in the SSP.

(4) Upon EPA approval of the SSP report, including any modifications to the report resulting from EPA comments, the report will be used by EPA to determine whether any areas east of the “RAO line” require remedial activity.

e. Lake System Sampling and Monitoring Program

Within 30 days of the effective date of this Permit Modification, Permittee shall design and submit to EPA, for approval, a Sampling and Monitoring Program (“SMP”) designed to establish baseline conditions and conduct long-term monitoring of the lake system (Pompton Lake and the Ramapo River downstream to the Pompton Lake Dam), which program shall include a proposed monitoring schedule, and shall include the measurement of the following applicable parameters, at a minimum: (1) heavy metals: mercury, copper, lead; (2) methylmercury; (3) appropriate bio-monitoring parameters, including, but not limited to, the validation of rate of mercury deposition in leaf litter and of mercury bioaccumulation. Data collected as part of the SSP shall also be used to support the Ecological Risk Assessment described in condition D.1.f, below.

(1) The SMP shall include establishment of a baseline. The baseline sampling shall take place in the dredging area prior to the initiation of the dredging operation.

(2) The SMP shall include a schedule for data collection, analysis, quality assurance, reporting, and record-keeping. The lake system shall be monitored for a minimum of five (5) years following completion of all required dredging and restoration activities.

f. Ecological Risk Assessment

Two years after dredging and re-establishing the layer over the dredged area in accordance with this Permit Modification, the Permittee shall conduct an Ecological Risk Assessment (“ERA”) of the lake system. This ERA shall be an updated ERA, utilizing risk data, bioaccumulation factors, and other relevant information.

1) Within 30 days after the excavation of all contaminated sediment requiring removal, or by such other date as is approved by EPA, Permittee shall submit an ERA Workplan to EPA, for approval, which contains a schedule to conduct a post-excavation ecological assessment of the delta and lake.

(2) Upon receiving EPA approval of the ERA Workplan, Permittee shall implement the Workplan in accordance with its schedule.

(3) Permittee shall submit the ERA report for EPA approval in accordance to the schedule within the approved SSP Workplan. The need for any subsequent remedial activity shall be determined based on the findings of the approved ERA report.

(4) In the determination of additional appropriate remedial activity is necessary, relevant factors shall be evaluated, including but not limited to: whether exposure presents unacceptable risk to ecological receptors, evidence regarding likelihood of contaminated sediment to resuspend/redistribute, evidence for attenuation of exposure through natural processes (burial by natural sediment loads), proximity of contaminated sediment to special habitats (or other resources) of significance, balancing remedial options with disturbance to lake ecology and human uses of lake, and limits of available technology

2. Remediation and Restoration Plan for the Upland Soil Areas

Within 30 days of the effective date of this Permit Modification, or by such other date as is approved by EPA, the Permittee shall design and submit to EPA for approval, an updated Remediation and Restoration Plan (“ Plan”), including a post-remedial monitoring program and an implementation schedule, for the Upland Soil Areas designed to ensure that the potential pathways for ecological receptors to mercury-contaminated soil will be addressed. The Remediation and Restoration Plan to be updated was submitted by the Permittee as part of the CMIWP.

Prior to submittal of the updated Plan, Permittee shall make arrangements for consultation (in a meeting and/or teleconference) with EPA, NJDEP, and USFWS to discuss its development.

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

a. RAOs for Upland Soil Areas

(1) Quantitative RAO for 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. The updated plan shall incorporate excavation so that after excavation, levels of analytes are below the surface and subsurface soil criteria set out in the RAOs in the Table below.

Uplands RAOs and Removal Criteria

Analyte	Surface Soil Criteria (mg/kg)	Subsurface Soil Criteria (mg/kg)
Copper	1,100	3,100
Mercury	20.5	23
Lead	400	400
Selenium	5.05	390
Zinc	1,507	23,000

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

The RAO for the remedy selected to address the Upland Soil Areas within the wetlands transition zone and wetlands must address the potential ecological exposure pathways to contaminants in the soil.

In the updated Plan for the Upland Soils located within the wetlands transition zone and wetlands, the Permittee shall incorporate the following considerations, at a minimum:

- the root depth of the various plant species proposed for use in the restoration (roots should not reach into the contaminated zone);
- the rate of mercury uptake by the various plant species proposed for use in the restoration (to demonstrate that the selected species will not act as a vegetative pump);
- the rate of mercury deposition in leaf litter and of mercury bioaccumulation;
- the need to develop a site-specific criteria for delineating limits for any soil excavation in the Plan; and
- the ability of any engineering controls to eliminate or minimize ecological exposure.

b. Selected Remedial Alternative #4 from the RASR/CMS -- Excavation of the Upland Soil

The selected remedy is Alternative #4 from the RASR/CMS, 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 2 of this Permit Modification):

Permittee shall excavate in accordance with Alternative #4, of the RASR/ CMS with the RAOs being the lower of the NJDEP Soil Remediation Standards (“SRS”) and the “Ecological Soil Delineation Criteria” developed in the RIR (which is the Table in E.2.a(1) above);

(2) For the Upland Soil areas within the Wetlands Transition Zone and the Wetlands (as depicted in Figure 2 of this Permit Modification):

Permittee shall adhere to the 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.

c. Confirmation of Implementation of the Remedy for the Uplands Soils

The Permittee shall confirm that the Upland Soil Areas are remediated and restored in accordance with the 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.

Figure 1: Figure showing Pompton Lake, ABD and the RAO Line.

Figure 2: Figure showing the Uplands Soils Areas and the Wetland Transition Zone line.

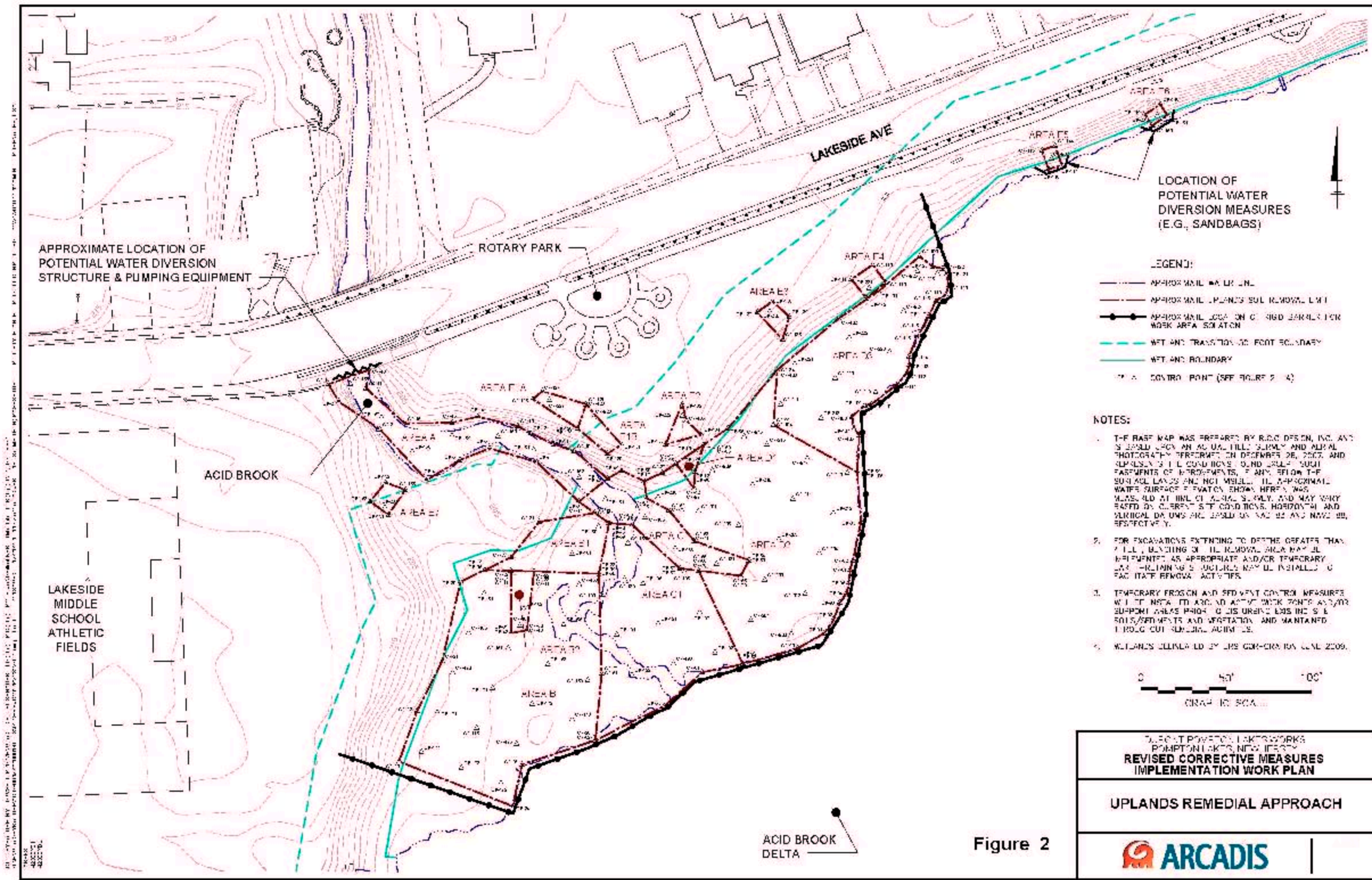


Figure 2