DuPont Pompton Lakes Works
2000 Cannonball Road
Pompton Lakes, NJ 07442

The miracles of science™

April 1, 2011

Mr. Barry Tornick
RCRA Programs Branch
U.S. Environmental Protection Agency Region II
290 Broadway Ave, 22nd Floor
New York, NY 10007-1866

RE: HSWA Permit Modification Application
DuPont Pompton Lakes Works
Pompton Lakes, New Jersey
USEPA ID #NJD002173946

Dear Mr. Tornick:

As requested by the U.S. Environmental Protection Agency, DuPont is submitting this application for modifying HSWA Permit No. NJD002173946 for the purpose of documenting the selection of a remedy to address soil and sediment within the Pompton Lake Delta Area.

As we have discussed and presented in the Corrective Measures Implementation Work Plan (CMI WP) submitted in December 2010, DuPont is in the process of selecting a remediation contractor to assist in developing the procedures to implement the selected remedy. It is anticipated that once the contractor deliverables are complete, the CMI WP will be finalized and submitted for approval. It is imperative that this plan be processed in a timely manner, as the permits required to implement the remedy need to be approved by multiple agencies prior to mobilization.

Based on our ongoing discussions with the permitting agencies, the first field effort required would need to be initiated no later than March 2012 so that the removal of fish and other wildlife from the designated work area is completed prior to May 1, 2012. If that time line is not met, then the project will be delayed until the next window of opportunity is available which is in July 2012.

If you have any questions, please contact me at (973) 492-7733.

Sincerely,

David E. Epps, P.G.
Project Director, Pompton Lakes Works
DuPont Corporate Remediation Group

cc: PLW Central File

PERMIT MODIFICATION APPLICATION

RESOURCE CONSERVATION AND RECOVERY ACT
HAZARDOUS AND SOLID WASTE AMENDMENTS PERMIT
USEPA ID NO. NJD002173946

E.I. du Pont de Nemours and Company, Incorporated
Pompton Lakes Works
2000 Cannonball Road
Pompton Lakes, Passaic County, New Jersey 07442

Submitted by:
DuPont Corporate Remediation Group

Submitted to:
U.S. Environmental Protection Agency

April 1, 2011

TABLE OF CONTENTS

1.0 Introduction 1
1.1 Facility Permit Information 1
1.2 Purpose of Document 1
1.3 Document Organization 1
2.0 Background 2
2.1 Operations 2
2.2 Physical Setting 2
2.3 Previous Investigation/Remediation Activities 2
2.3.1 Acid Brook Delta Remedial Investigation 3
2.3.2 Uplands Area Remedial Investigation 3
2.3.3 Shoreline Properties Remedial Investigation 4
2.4 Acid Brook Delta Conceptual Model 4
2.5 Remedial Action Selection Report/Corrective Measures Study 5
2.6 Corrective Measures Implementation Work Plan 5
3.0 Remedy Selection Process 7
3.1 Remedial Action Objectives 7
3.1.1 Quantitative Remedial Action Objectives (Applicable Remediation Standards) 7
3.1.2 Qualitative Remedial Action Objectives (Narrative Standards) 8
3.2 Achievement of Remedial Action Objectives 9
3.2.1 Sediment 9
3.2.2 Soil 9
3.3 Screening of Technologies and Remedial Alternatives 9
4.0 Remedy Implementation 11
4.1 Remedy Description 11
4.2 Remediation Contractor Deliverables 12
4.3 Public Involvement Plan 13
4.3.1 Public Participation Activities 13
4.4 Implementation Schedule 14
4.5 Reporting 14
5.0 References 16

Figures

1 Site Location Map
2 Uplands Remedial Approach
3 Acid Brook Delta Remedial Approach

Acronyms

ABD	Acid Brook Delta
ABD RIR	Acid Brook Delta Remedial Investigation Report
ACO	Administrative Consent Order
CFR	Code of Federal Regulations
CMI WP	Corrective Measures Implementation Work Plan
COC	constituent of concern
CRG	Corporate Remediation Group
EMA	Eastern Manufacturing Area
ERA	ecological risk assessment
HSWA	Hazardous and Solid Waste Amendments
mg/kg	milligrams per kilogram
NJDEP	New Jersey Department of Environmental Protection
PLW	Pompton Lakes Works
RAO	remedial action objective
RASR/CMS	Remedial Action Selection Report/Corrective Measures Study
RCRA	Resource Conservation and Recovery Act
RDCSRS	Residential Direct Contact Soil Remediation Standard
RI	remedial investigation
TCLP	toxicity characteristic leaching procedure
Uplands RIR	Uplands Area Remedial Investigation Report
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

1.1 Facility Permit Information

The former DuPont Pompton Lakes Works (PLW) site is located at 2000 Cannonball Road in Pompton Lakes, Passaic County, New Jersey (see Figure 1). In 1988, DuPont entered into an Administrative Consent Order (ACO) with the New Jersey Department of Environmental Protection (NJDEP) for PLW. In 1992, DuPont was issued a Hazardous and Solid Waste Amendments (HSWA) permit under the Resource Conservation and Recovery Act (RCRA) by the U.S. Environmental Protection Agency (USEPA). The HSWA permit, USEPA ID No. NJD002173946, was renewed in 1996. The ACO and HSWA permit required DuPont to conduct a remedial investigation (RI) to evaluate potential contamination at/or emanating from the site.

1.2 Purpose of Document

This document is being submitted at the request of USEPA. Its purpose is to provide the necessary information, as defined in 40 Code of Federal Regulations (CFR) 270.42, for modification of the existing HSWA permit for the facility and to document the selection and implementation of the remedy to address sediment and soil in the area where Acid Brook discharges to Pompton Lake.

1.3 Document Organization

The remainder of this document contains information on the evaluation and implementation of the approved remedial alternative to address sediment and soil in the area where Acid Brook discharges to Pompton Lake. Brief summaries of the remaining sections are presented below:

- Section 2: *Background* – provides summaries of the operational history and physical setting of the site, results of previous investigation/remediation activities conducted, and the conceptual model for the area where Acid Brook discharges to Pompton Lake.

- Section 3: *Remedy Selection Process* – presents a description of the project remedial action objectives (RAOs) and summary of the technology and alternative screening and evaluation process.

- Section 4: *Remedy Overview* – provides a description of the approved remedial alternative, deliverables to be submitted by the selected remediation contractor, methods to be utilized to inform the public of ongoing activities, and general project schedule and reporting requirements.

2.0 BACKGROUND

2.1 Operations

In the late 1800's, the H. Julius Smith Blasting Cap Plant and the American Smokeless Powder Plant were operating in Wanaque River Valley, and the Metallic Cap Company was operating in Acid Brook Valley. In 1902, DuPont purchased the site and began operation of the DuPont Electric Exploder Company in Wanaque River Valley. In 1908, DuPont opened the DuPont Cap Works in Acid Brook Valley. In 1926, DuPont ceased production in Wanaque River Valley and consolidated operations in Acid Brook Valley, which is now referred to as the former Eastern Manufacturing Area (EMA). Production continued in the EMA until operations permanently ceased in April 1994.

2.2 Physical Setting

Pompton Lake is a 196-acre impoundment of the Ramapo River that was originally formed in 1858 when the Pompton Lake Dam was constructed by the U.S. Army Corps of Engineers at the southern end of the lake. The Ramapo River flows over the Pompton Lake Dam. In 1908, a larger dam was constructed, and the size of the lake was increased. The mean depth of Pompton Lake is approximately 7 feet and the maximum depth is approximately 25 feet. The bathymetry of the lake is dominated by two major features: the original channel of the Ramapo River, which runs along the eastern shoreline of the lake at water depths greater than 6 to 8 feet, and a broad embayment along the central western shoreline, where water depths are generally less than 4 feet. A highway bridge (Lakeside Ave) crosses a narrow portion of the northern end of the lake. Private residences are located along much of the lake shoreline.

For the purpose of this project, the Acid Brook Delta (ABD) area includes the broad embayment portion in Pompton Lake near where Acid Brook discharges to the lake and the property historically referred to as the uplands (i.e., the area of the ABD that is not submerged) located along the banks of Acid Brook as it discharges to the ABD and along Lakeside Avenue.

2.3 Previous Investigation/Remediation Activities

Beginning in 1990, DuPont performed numerous investigations at PLW, Acid Brook, ABD, and uplands area adjacent to the ABD to identify the nature and extent of site-related contamination in soil, groundwater, surface water, and sediment. Results from these investigation activities were then used as the basis for implementation of a variety of onsite and offsite remedial activities directed at protecting human health and the environment. Onsite remedial activities included stabilization through installation and operation of a groundwater pump and treat system to capture and treat the onsite volatile organic compound plume, and completion of approximately 30 soil remedial and interim remedial activities. Extensive offsite soil cleanup and groundwater monitoring have also been performed. Between 1991 and 1997, Acid Brook was the subject of remedial efforts that included streambed remediation and excavation of floodplain soil.

2.3.1 Acid Brook Delta Remedial Investigation

Between 1995 and 2008, various work was conducted within the ABD area including multiple phases of ecological investigation, scientific studies, and RIs which culminated in the submission of the *Draft Remedial Action Proposal* (DuPont Corporate Remediation Group [CRG], 2006) and the *Revised Acid Brook Delta Remedial Investigation Report* (ABD RIR) (DuPont CRG, 2008). A summary of the data collection efforts and evaluation presented in the ABD RIR are presented below:

- Sediment thickness ranges from 0 to 5.2 feet. Sediment thickness, although variable, is generally less than 2 feet. Sediment is often, but not always, underlain by peat. The peat is the original ground surface prior to the construction of the dam.

- Water depth ranges from less than 1 foot near the mouth of Acid Brook to more than 18 feet near the Pompton Lake Dam.

- In sediment, mercury concentrations along with other site-related metals generally decrease with distance from the mouth of Acid Brook. Mercury was identified as the primary constituent of concern (COC).

- Surface water methylmercury concentrations represent an integration of methylmercury produced by the underlying sediment. This data clearly shows that the near-shore sediment is the most important site of mercury methylation in the ABD area.

- In general, the distribution pattern of mercury in sediment is consistent with the physical parameters of the conceptual model (i.e., the mercury concentrations decrease with distance from the discharge point of Acid Brook; increases with sediment depth which is consistent with operational history; and are limited to the sediment overlying the peat).

In correspondence dated May 2008, NJDEP confirmed that mercury delineation in Pompton Lake was complete. Subsequently, NJDEP approved the ABD RIR on June 19, 2008.

2.3.2 Uplands Area Remedial Investigation

The uplands area encompasses approximately 2.6 acres south of Lakeside Avenue. Of those 2.6 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 1 acre is relatively flat wetlands along the lake's shore. To enhance investigation efforts, the uplands were divided into five areas (Areas A through E) to delineate the vertical and horizontal extent of site-related constituents in soil. Existing soil analytical data was used to focus the delineation sampling. Horizontal delineation in surface soil (0 to 0.5 feet) was based on the lower value of NJDEP's November 2009 Residential Direct Contact Soil Remediation Standards (RDCSRS) and ecological soil delineation criteria to allow protection for use of the uplands by humans and ecological receptors. The RDCSRS was used as the criteria for evaluating soil greater than 0.5 feet deep in the uplands and surface soil for the shoreline.

Sampling results indicated that Areas A through E were delineated to the applicable criteria. The results of this investigation are presented in the *Remedial Investigation Report, Pompton Lake Uplands* (Uplands RIR) (Parsons, 2010) which was submitted on June 30, 2010. The Uplands RIR is currently under review by NJDEP and USEPA.

2.3.3 Shoreline Properties Remedial Investigation

Soil sampling within the floodplain was also conducted to determine whether historic flooding may have deposited sediment containing site-related metals onto the shoreline properties. A floodplain analysis was completed to identify the low-lying areas of the adjacent properties along the lake. Samples were then collected from properties along the western shoreline adjacent to Pompton Lake south of Lenox Avenue and north of the Pompton Lake Dam, and analyzed for lead and mercury for characterization purposes. The results of the shoreline sampling indicated that the surface soil had not been impacted by ABD sediment during historic flooding events. The results of this investigation are presented in the Uplands RIR.

2.4 Acid Brook Delta Conceptual Model

Extensive data has been collected in the ABD and uplands area. A conceptual model has been formulated through integration and analysis of the data. The principle elements of the model are summarized below.

- Geology/Hydrogeology: Water depth in the ABD area ranges from less than 1 foot near the mouth of Acid Brook to approximately 12 feet on the southwest shore, west of the Ramapo River channel. ABD sediment ranges in thickness from 0 to 5.2 feet with an average thickness of 1.5 feet. The underlying peat ranges in thickness from 0 to 4.3 feet with an average thickness of 1.9 feet. Bathymetric surveys were performed approximately 14 years apart, the most recent in 2007. Generally, the top of sediment elevation seems to show very little change over this period. There appears to be some minor increase in sediment thickness; however, this may be a function of the increased resolution of the 2007 data rather than an actual increase in sediment thickness. Regardless, the variation is less than 0.2 feet.

- Media of Concern: The medium of concern for Pompton Lake is sediment in the ABD. For the uplands, soil is the primary medium of concern.

- ABD COCs: Several site-related metals have been investigated as part of the ABD investigations including lead, mercury, copper, selenium, barium, and zinc. Barium, copper, selenium, and zinc concentrations are below the current RDCSRS. In areas where lead is above the RDCSRS, the lead-impacted area will be addressed by remediation of the co-located mercury-impacted area. Each of these constituents exhibit similar spatial distributions in that the highest concentrations are near-shore in the vicinity of the Acid Brook discharge. Mercury is the sole COC that methylates and, therefore, has the potential for bioaccumulation. Methylmercury was identified as a COC in preliminary studies. It was, however, determined that methylmercury distribution was based primarily on location and not on the concentration of mercury in the sediment. Therefore, mercury is the constituent driving the remediation both in areal extent and in depth and is the

primary COC. The highest mercury concentrations (greater than 100 milligrams per kilogram [mg/kg]) were generally found in sediment near the Acid Brook discharge.

- Uplands COCs: Barium, copper, lead, mercury, selenium, and zinc were identified as COCs for either human health and/or ecological receptors in some areas of the uplands. Lead and mercury are the primary COCs with detected concentrations above the RDCSRS.

- Potential Receptors: Humans may have direct contact with surface water and sediment during recreational activities. Recreational activities on the lake are restricted due to elevated levels of coliform and bacteria within the surface water and signs are posted that prohibit swimming and wading in the lake. There is also a state consumption advisory for fish due to mercury, polychlorinated biphenyls, chlordane, dioxin, and DDX (NJDEP, 2008). Current uses of the lake include boating and fishing. However, potential exposure to sediment is minimal from these activities. It is expected that current use of the lake will continue into the future. Ecological receptors, aquatic species in particular, have direct contact with surface water and sediment. Both humans and ecological receptors may have direct contact with surficial soil and, to a lesser extent, subsurface soil. Surface water flow (i.e., rainfall) may potentially transport soil containing COCs in the uplands to the lake. Therefore, the focus on risk management for sediment will be on the potential concern for ecological receptors. However, as presented in the RASR/CMS for ABD, both the triad weight-of-evidence and ERA (Exponent, 2003) indicated that the potential for unacceptable risk for the delta is minimal.

2.5 Remedial Action Selection Report/Corrective Measures Study

The *Remedial Action Selection Report/Corrective Measures Study* (RASR/CMS) (DuPont CRG, 2009) was prepared to evaluate potential remedial alternatives to address elevated mercury concentrations in soil and sediment in the ABD and uplands area, and propose a remedial alternative to meet the established RAOs. A detailed analysis was completed for five alternatives to evaluate the general suitability of various remediation technologies in terms of their effectiveness in providing protection to human health and the environment as well as their implementability. The alternative selected in the RASR/CMS was removal of soil in the uplands and sediment in the ABD area. NJDEP and USEPA approved the RASR/CMS on October 22, 2009. More detailed information on the proposed remedy is presented in Section 3.0.

2.6 Corrective Measures Implementation Work Plan

The *Corrective Measures Implementation Work Plan* (CMI WP) (ARCADIS/Parsons/URS, 2010) was prepared to assist in the planning, execution, and communication of the remediation of sediment and soil in the ABD and uplands area that has been impacted as a result of operations at the former PLW site. Another purpose of the CMI WP is to provide stakeholders with available information related to the equipment, processes, and methods anticipated to be used as part of remediation.

The remedial approach outlined in the CMI WP was developed based on data collected through November 2010. Details regarding implementation of the remedial action will be

further developed in coordination with the selected remediation contractor during future design activities. DuPont intends to identify the selected remediation contractor prior to commencement of design activities to enter into a collaborative process with the contractor to develop the final design. As such, the approach provided in the CMI WP may be modified in the future to promote efficiencies in work methods identified by the selected contractor.

The CMI WP, submitted on December 22, 2010 is currently under review by NJDEP and USEPA.

3.0 REMEDY SELECTION PROCESS

The purpose of this section is to provide a summary of the information presented in the RASR/CMS.

3.1 Remedial Action Objectives

RAOs are developed to address potential unacceptable risks associated with site conditions and the exposure pathways identified. They are media-specific goals that are aimed at protecting human health and the environment. RAOs were developed in the RASR/CMS as long-term, media-specific goals and were used to assist in selecting a remedial alternative to address elevated mercury concentrations in sediment and various metals concentrations in uplands soils.

For this project, potential exposure for human receptors to impacted soil and sediment is expected to be minimal. Recreational activities on the lake are restricted and it is expected that current use of the lake (boating and fishing) will continue in the future. Potential exposure to sediment is minimal from these activities. Previous investigations indicated that the ABD near-shore area had higher dissolved mercury and methylmercury concentrations in surface water when compared to portions of the ABD area further from the shore and the rest of Pompton Lake. For ecological receptors, both the ERA and triad weight of evidence approach indicated that sediment does not pose an unacceptable risk to benthic macroinvertebrates. In developing RAOs for the ABD area, both quantitative and qualitative RAOs were considered in reducing potential exposure to COCs in soil and sediment.

3.1.1 Quantitative Remedial Action Objectives (Applicable Remediation Standards)

Quantitative RAOs are typically defined as promulgated numerical criteria that have been developed to be protective of human health and/or ecological receptors for a particular medium (i.e., sediment, soil). The specific values used for humans may be different than those for ecological receptors because of the differences in toxicity and exposure between the two receptor groups and the medium type. Therefore, while the concentration of a particular constituent in sediment may be unacceptable for ecological receptors, the same concentration in sediment may not result in an unacceptable risk for humans.

For uplands soil, both human health and ecological criteria have been selected as the RAOs. As presented in the approved work plan for surface soil (0 to 0.5 foot), the RAOs are based on the lower value of the RDCSRS and ecological soil delineation criteria. As discussed in the *Baseline Ecological Evaluation* (DuPont CRG, 2009), the limited size, fragmented habitat, and frequent disturbance of the uplands area limits its value as an ecological habitat. Using the lower value of the RDCSRS and ecological soil delineation criteria allows protection for use of the uplands by humans while also providing adequate protection for ecological receptors. For subsurface soil (deeper than 0.5 foot), the RAO is the RDCSRS. As such, the criteria for the COCs considered in establishing the RAOs for the uplands area are provided 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

Therefore, to achieve the project RAOs, uplands soil with COCs exceeding the applicable criteria will be addressed.

3.1.2 Qualitative Remedial Action Objectives (Narrative Standards)

There are no promulgated applicable remediation standards for sediment to use as a quantitative RAO. However, remediation standards can be narrative standards to which contaminants must be treated, removed or otherwise cleaned in order to meet health risk or environmental standards. As such, qualitative RAOs (narrative standards) were developed for ABD area sediment to set long-term goals for protecting human health and the environment.

It is anticipated that current use of the lake will continue in the future by both human and ecological receptors. Restrictions on human use can be enforced as they currently are; however, restrictions cannot be applied to ecological receptors. While the potential for unacceptable risks were shown to be minimal, the ecological data for the ABD area indicated that mercury concentrations in some biota were higher in the ABD area than in reference areas.

Previous investigations concluded that mercury in ABD area sediment appears to be tightly bound to the fine-grained particles as indicated by toxicity characteristic leaching potential (TCLP) data (DERS, 1994). However, biological processes in the upper few centimeters of sediment are able to mobilize some mercury in the form of methyl mercury, which then enters the food chain (Exponent, 2003). Furthermore, the near-shore area within the ABD have higher dissolved mercury and methylmercury concentrations when compared to portions of the ABD further from the shore and the rest of Pompton Lake.

In order to be protective of ecological receptors, the following qualitative RAOs for sediment were developed:

- Reduce the potential for mercury methylation in near-shore sediment; and

- Reduce the area of exposure of ecological receptors to elevated mercury concentrations in ABD sediment.

These RAOs will be achieved in a manner that balances short-term and long-term risks to people and the environment.

3.2 Achievement of Remedial Action Objectives

3.2.1 Sediment

In determining the areal extent of the remedial action to meet the RAOs (RAO Limit), the sediment delineation data were statistically evaluated to develop specific objectives for addressing mercury in sediment. In addition, site-specific information collected during various investigations provided the following lines of evidence to support the extent where remedial action is needed and the protectiveness of the selected remedial alternative:

- Addressing sediment in the near-shore environment will reduce the greatest potential for mercury methylation; hence the bioavailability of mercury.

- Mercury concentrations in the surficial sediment beyond the proposed remedial area are greatly reduced and are also influenced by background conditions (i.e., Ramapo River).

- Mercury concentrations in the deeper sediment are stable with little potential to methylate.

- Dissolved mercury and methylmercury in the surface water beyond the proposed RAO Limit are similar to background concentrations.

In implementing the RAO specific objectives, the proposed remedy will result in the following:

- Approximately 97% reduction in mercury in the surficial sediment (0 to 0.5 feet) and 100% reduction of mercury in the near-shore environment of the ABD;

- Approximately 93% reduction in mercury in the deep sediment (>0.5 feet); and

- Approximately 95% reduction overall of mercury in the ABD area.

3.2.2 Soil

The final soil RAOs developed for the uplands are protective of both humans and ecological receptors. Concentrations of COCs in soil exceeding the applicable RDCSRS will be addressed; thus, meeting the RAO established for the project.

3.3 Screening of Technologies and Remedial Alternatives

Once the RAOs and RAO Limit were established, a technology screening process was undertaken to evaluate the general suitability of various remediation technologies to meet the RAOs and specific objectives. Effectiveness and implementability (technical and administrative factors) were evaluated for each technology. Following this evaluation, additional aspects of the technologies were evaluated to assess the relative merits of the retained technologies. The evaluation criteria used for detailed analysis were reduction in toxicity, mobility, or volume; and remediation sustainability. Retained technologies were then used to formulate potential remedial alternatives for further evaluation.

The analysis of potential remedial alternatives focused on sediment within the RAO Limit since it represents the majority of impacted material subject to remediation. It is anticipated that the remedy for the uplands soil will be conducted concurrently with sediment remediation. The following remedial alternatives were evaluated as part of the RASR/CMS:

- Alternative 1: No Action
- Alternative 2: In-Situ Stabilization
- Alternative 3: Capping
- Alternative 4: Removal
- Alternative 5: Removal and Capping

Based on the screening evaluation of the five remedial alternatives listed above, two were retained for further review (Alternatives 4 and 5). Alternative 4 was selected because:

- Removal reduces the potential for mercury methylation in near-shore sediment within the ABD area.

- Removal increases the amount of material removed from the lake and will, therefore, increase the water storage capacity of Pompton Lake.

- There are no concerns regarding contaminant mobility if the contaminant is removed.

- There are no concerns regarding cap stability during storm events.

- There is no need for a long-term cap monitoring program.

While Alternative 5 is a viable remedial alternative for the ABD and uplands area, Alternative 4 is the preferred alternative for remediation of sediment and soil.

4.0 REMEDY IMPLEMENTATION

The purpose of this section is to provide a summary of the information presented in the CMI WP as it relates to the permit modification being requested.

4.1 Remedy Description

Sediment from the ABD area and soil from the uplands area have been identified for removal through excavation and dredging (see Figures 2 and 3). This section briefly outlines the components of the remediation. Based on information known to date, the major components of the remedy being proposed for remediation of soil and sediment are summarized below. It should be noted that final operational details for each component are not known at this time. DuPont will identify and select a remediation contractor that is qualified to complete the remediation and construction activities. Once selected, the contractor will collaborate with DuPont to refine the remedial approach and develop additional documentation as part of the CMI WP on the construction activities to be implemented.

- Installation of a Containment System: A containment system will be installed around the ABD area to provide an engineering control to protect the surrounding water from re-suspended sediment that may be generated during dredging activities. The system will enclose the removal area and will be put in place prior to any removal activities. The uplands removal area will be isolated with control measures to reduce the potential for erosion or washout from disturbed areas to uncontained areas of the ABD or other areas within the uplands.

- Dredging and Excavation: Removal activities within the ABD and uplands area will be performed using dredging (in the wet) or excavation equipment. Removed sediment will generally be pumped or placed into small scows or other suitable containers on a barge for subsequent transport/re-handling. The removal area consists of approximately 26 acres centered at the discharge point of Acid Brook into Pompton Lake. Water depth in most of this area is less than 5 feet with the exception of the southwest portion of the removal area adjacent to the shore. Approximately 57,000 cubic yards mercury-impacted sediment will be targeted for removal.

- Transport and Re-handling: The dredged sediment will be moved to the shoreline, where the sediment will be processed or transferred for processing. The uplands soil will likely be loaded directly into trucks for transport.

- Solidification Treatment: Excavated material will be dewatered and solidified, as required, to meet disposal requirements. Sediment in the ABD area is a very soft, fine-grained material with very low strength, and may require solidification prior to transport and disposal. The uplands soil is typical of conventional earthwork projects and may not require any solidification prior to disposal.

- Disposal or Reuse: After any necessary solidification treatment, the sediment and soil will be transported by truck for disposal or reuse at an offsite facility that is licensed to accept non-hazardous solids. The sediment and soil could also be reused, for example, as cover at an operating landfill.

- Restoration: Following removal, the uplands area and adjacent wetlands will be restored in accordance with the permit and restoration plan which will include re-grading to accommodate the restoration elements, planting with native vegetation, and placement of park amenities and pathways for public use. For the ABD, the dredged area will be restored by placing a granular layer of sand (i.e., eco-layer) over the dredged area to establish a zone for benthic community re-colonization over time. Additionally, planting and seeding of desirable aquatic native vegetation in the ABD area will take place. The plantings, along with the sand layer, will expedite restoration and increase the ecological functions of both the aquatic and benthic habitats.

Water column monitoring will be performed during dredging and eco-layer placement activities within the ABD area; air monitoring will be conducted during excavation, dredging, and material handling and processing activities; and monitoring will be conducted for activities that may cause a vibration (e.g., rigid barrier installation within the ABD area) at structures within a specified distance from the work area.

It is possible that the selected remediation contractor may determine that methods other than those described above are better suited for site conditions. Therefore, it is important to note that the approaches described herein may be modified in the future.

4.2 Remediation Contractor Deliverables

In consultation with DuPont, the contractor will provide certain pre-mobilization submittals including, but not limited to, the following:

- Health and Safety Plan: This plan will identify the project-specific health and safety procedures and will present information such as training, certification, environmental and personnel monitoring, hazards and associated controls, work zones, identification of key personnel, standard operating procedures, and safety programs.

- Quality Assurance Project Plan: This plan will identify the project-specific procedures for sample collection and handling as well as the minimum requirements for analytical testing. The plan will address sampling and analysis activities, and will present quality assurance/quality control guidelines for such activities.

- Construction Quality Assurance Plan: This plan will present the procedures necessary for proper construction evaluation and documentation during the implementation of the elements necessary to complete remedial activities including the materials, procedures, and testing necessary for proper construction, evaluation, and documentation. Additionally, the plan will present key personnel and organizational structure needed for construction quality assurance.

- Operations Plan: This plan will summarize the materials, procedures, timelines, and controls that will be used during project activities including, but not limited to: equipment; work schedule; control measures for storm water, erosion, noise, and dust; and materials handling and staging approach.

- Contingency Plan: This plan will set forth procedures for responding to emergency conditions or events that may occur during the performance of remedial activities.

- Soil Erosion and Sediment Control Plan: This plan will outline the erosion and sediment control measures to be implemented prior to the initiation of removal activities.

Additionally, the proposed remediation and restoration activities will require permit approvals from state and local authorities which will be coordinated between DuPont and the selected remediation contractor.

4.3 Public Involvement Plan

A Public Involvement Plan has been developed to identify additional approaches that DuPont intends to implement in order to maintain open, transparent, timely, and consistent communications with residents of Pompton Lakes and other internal and external stakeholders during implementation of the remedy and related activities. The goals of this plan are to:

- Maintain an open and honest communication process.

- Provide information to external audiences about safe remediation efforts.

- Maintain the required level of environmental compliance during remediation efforts.

- Foster support among key stakeholders through coordinated communications and community outreach efforts.

- Ensure effective communication on evolving issues, opportunities, and challenges that may potentially affect planned projects and activities.

4.3.1 Public Participation Activities

DuPont will conduct activities and develop communications tools to provide timely dissemination of information to the public and encourage ongoing, two-way communication with external stakeholders. The following are general descriptions of community involvement activities. Additional activities/measures may be implemented to support specific project goals.

- Meetings – As appropriate, DuPont will communicate in a variety of forums including community meetings; briefings for local, state, and federal elected officials; meetings with citizens and groups; and educational/informational sessions. We anticipate that information sessions will be conducted to present the selected remediation contractor operation plan once it is developed.

- Information Outreach Office – DuPont operates the Pompton Lakes Works Remediation Project Office in downtown Pompton Lakes. The office supports continuing outreach activities concerning environmental remediation work related to former manufacturing operations at the site. The center houses information materials and documents relevant to the ABD project.

- Website – DuPont will continue to maintain and update the project's public web site (www.pomptonlakesworks.com).

- News Releases – DuPont will issue news releases and/or community advisories to announce public meetings and pertinent site-related information.

- Fact Sheets – DuPont will prepare fact sheets as needed. These fact sheets will be available to all internal and external stakeholders.

4.4 Implementation Schedule

A detailed schedule for implementation of the remedial action presented in this document will be developed in coordination with the selected remediation contractor and will be presented once the design is completed. The duration for the project is outlined in the existing HSWA Modified Compliance Schedule dated May 4, 2010.

The schedule for implementation of the remedial activities may be impacted by work hour restrictions due to proximity of the ABD and uplands area to the Lakeside Middle School, the ABD fish window and stocking program, and local and/or state laws. It is anticipated that typical work hours for active removal/processing activities will be from 8:00 am to 6:00 pm, Monday through Saturday. It is expected that an additional hour will be required at the start and end of each work day for preparation/set-up and general shut-down activities. As such, it is anticipated that typical work hours during which personnel will be onsite will be from 7:00 am to 7:00 pm, Monday through Saturday.

Adjustments in work activities and timing may be required when school is in session to minimize interference with school-related traffic. The fish window has been identified as May 1 through July 31 and, therefore, intrusive construction activities (e.g., installation of rigid containment barrier) must be coordinated around this timeframe. Additionally, coordination may also be required if fish stocking were to occur in the vicinity of Pompton Lake. The remediation contractor will also adhere to any local and state laws or ordinances that may govern or restrict the performance of work during regular or extra work hours.

4.5 Reporting

Following completion of the work, a Corrective Measures Completion Report will be prepared in general accordance with the current RCRA Corrective Action Plan guidance (USEPA, 1994). In general, the report will describe the following:

- Purpose of remedial action;
- Summary of soil/sediment remediated;

- Detailed descriptions of the source and quantity of fill used;
- Deviations from the design and/or modifications necessitated by field conditions;
- Documentation regarding achievement of RAOs;
- As-built drawings;
- Summary of significant actions;
- Summary of inspection findings; and
- Detailed description of restoration activities.

5.0 REFERENCES

ARCADIS, Parsons, and URS. December 2010. *DuPont Acid Brook Delta Corrective Measures Implementation Work Plan*.

DERS. June 1994. *Delta Sampling Report.*

DuPont CRG. September 2009. *Remedial Action Selection Report/Corrective Measures Study*.

DuPont CRG. 2009. *Baseline Ecological Evaluation.*

DuPont CRG. January 2008. *Revised Acid Brook Delta Remedial Investigation Report*.

DuPont CRG. November 2006. *Draft Remedial Action Proposal*.

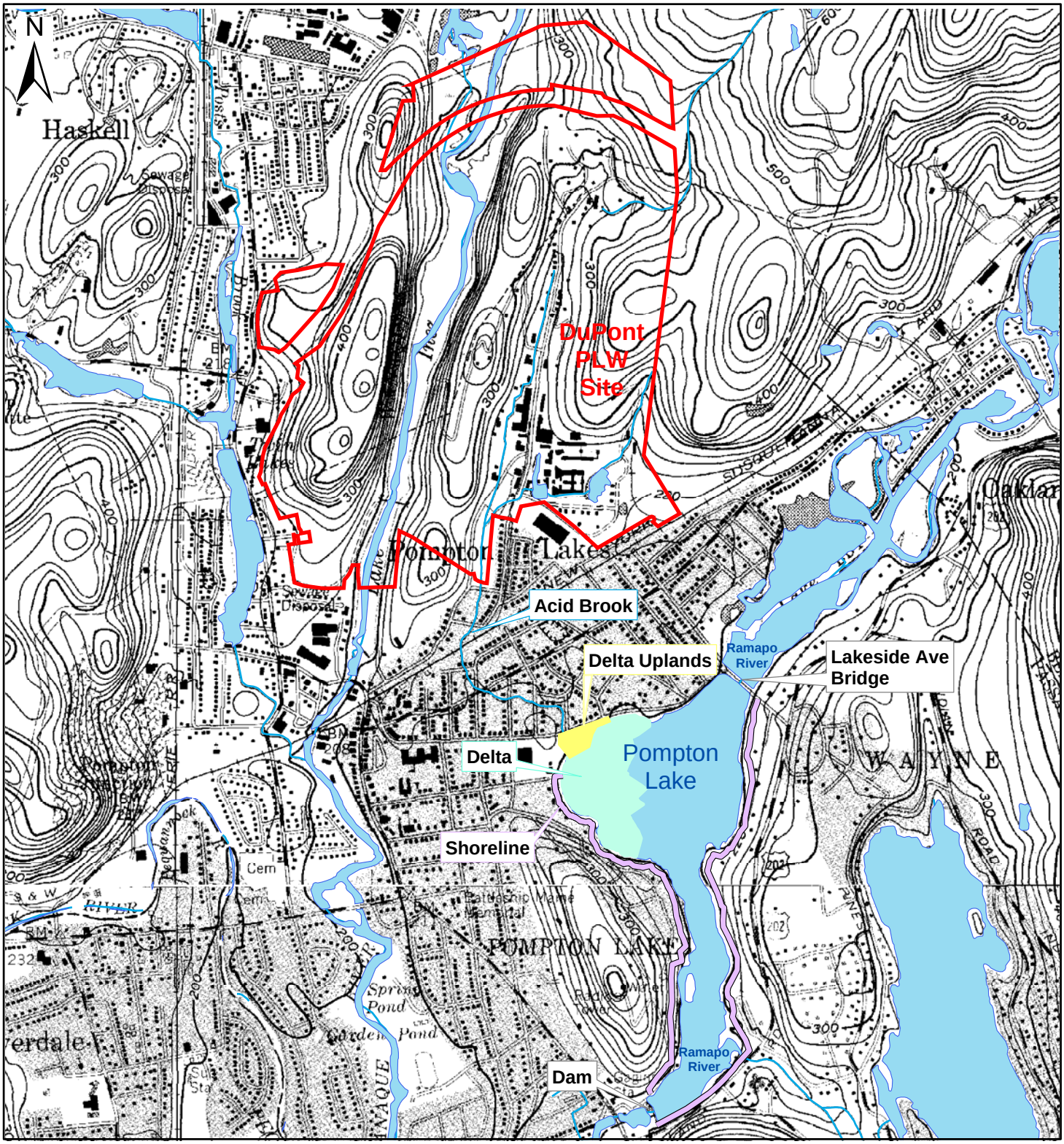
Exponent. 2003. *Revised Acid Brook Delta Ecological Investigation Phase 2 Report*.

NJDEP. 2008. *Amendment to the Northeast Water Quality Management Plan. Total Maximum Daily Load Report to Address Phosphorus Impairment in Pompton Lake and Ramapo River in the Northeast Water Region*.

Parsons. June 2010. *Uplands Area Remedial Investigation Report.*

USEPA. May 1994. *RCRA Corrective Action Plan (Final).* OSWER Directive 9902.3-2A.

FIGURES



Legend:

Base is portions of the USGS Wanaque and Pompton Plains QUAD.

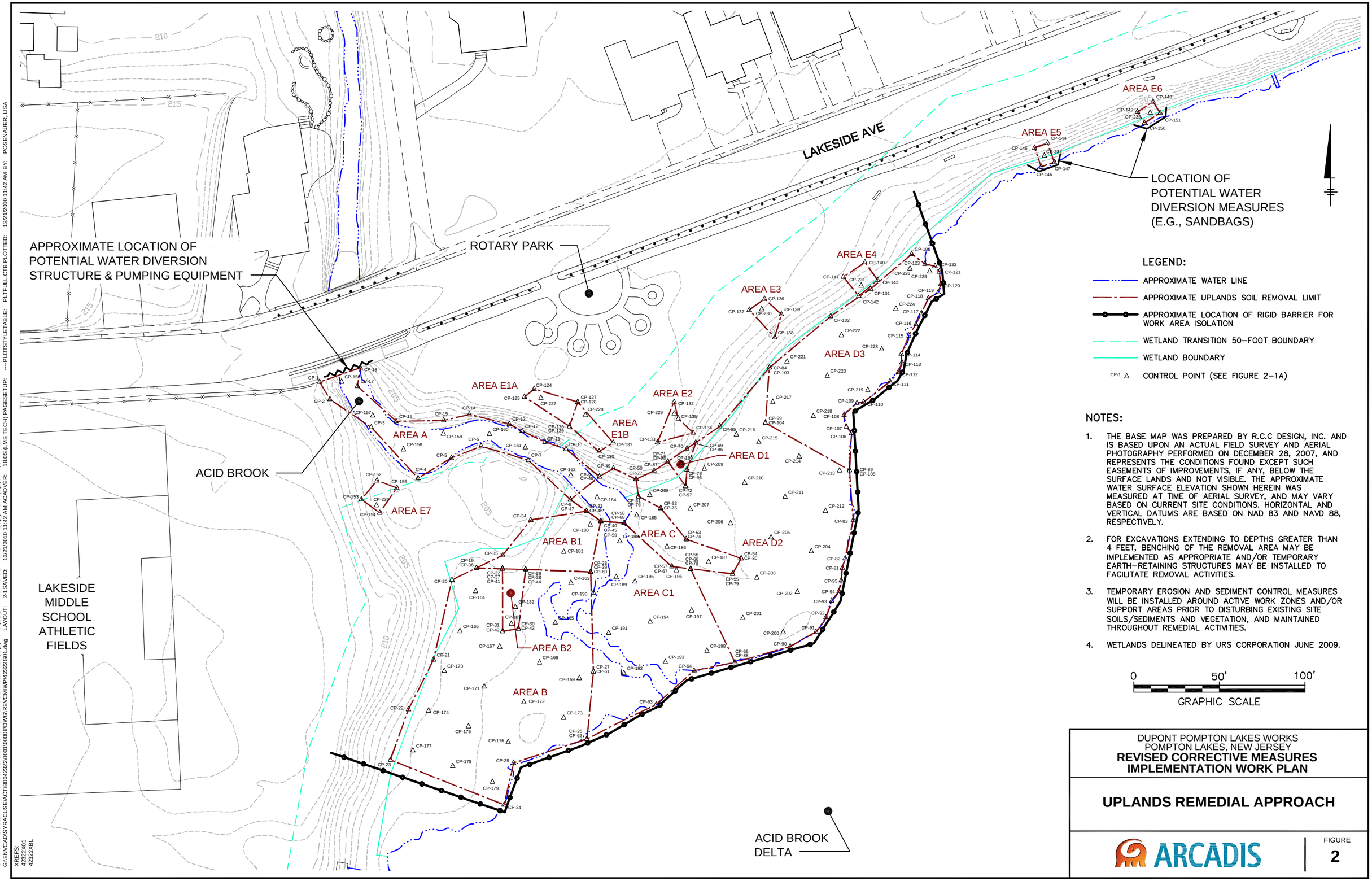
PARSONS

200 Cottontail Lane South
Somerset, New Jersey 08873

Site Location Map

DuPont Pompton Lakes Works
Pompton Lakes, New Jersey

Figure 1



NOTES:

1. THE BASE MAP WAS PREPARED BY R.C.C DESIGN, INC. AND IS BASED UPON AN 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. THE APPROXIMATE WATER SURFACE ELEVATION SHOWN HEREIN WAS MEASURED AT TIME OF AERIAL SURVEY, AND MAY VARY BASED ON CURRENT SITE CONDITIONS. HORIZONTAL AND VERTICAL DATUMS ARE BASED ON NAD 83 AND NAVD 88, RESPECTIVELY.
2. FOR EXCAVATIONS EXTENDING TO DEPTHS GREATER THAN 4 FEET, BENCHING OF THE REMOVAL AREA MAY BE IMPLEMENTED AS APPROPRIATE AND/OR TEMPORARY EARTH-RETAINING STRUCTURES MAY BE INSTALLED TO FACILITATE REMOVAL ACTIVITIES.
3. TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED AROUND ACTIVE WORK ZONES AND/OR SUPPORT AREAS PRIOR TO DISTURBING EXISTING SITE SOILS/SEDIMENTS AND VEGETATION, AND MAINTAINED THROUGHOUT REMEDIAL ACTIVITIES.
4. WETLANDS DELINEATED BY URS CORPORATION JUNE 2009.

DUPONT POMPTON LAKES WORKS
POMPTON LAKES, NEW JERSEY
REVISED CORRECTIVE MEASURES IMPLEMENTATION WORK PLAN

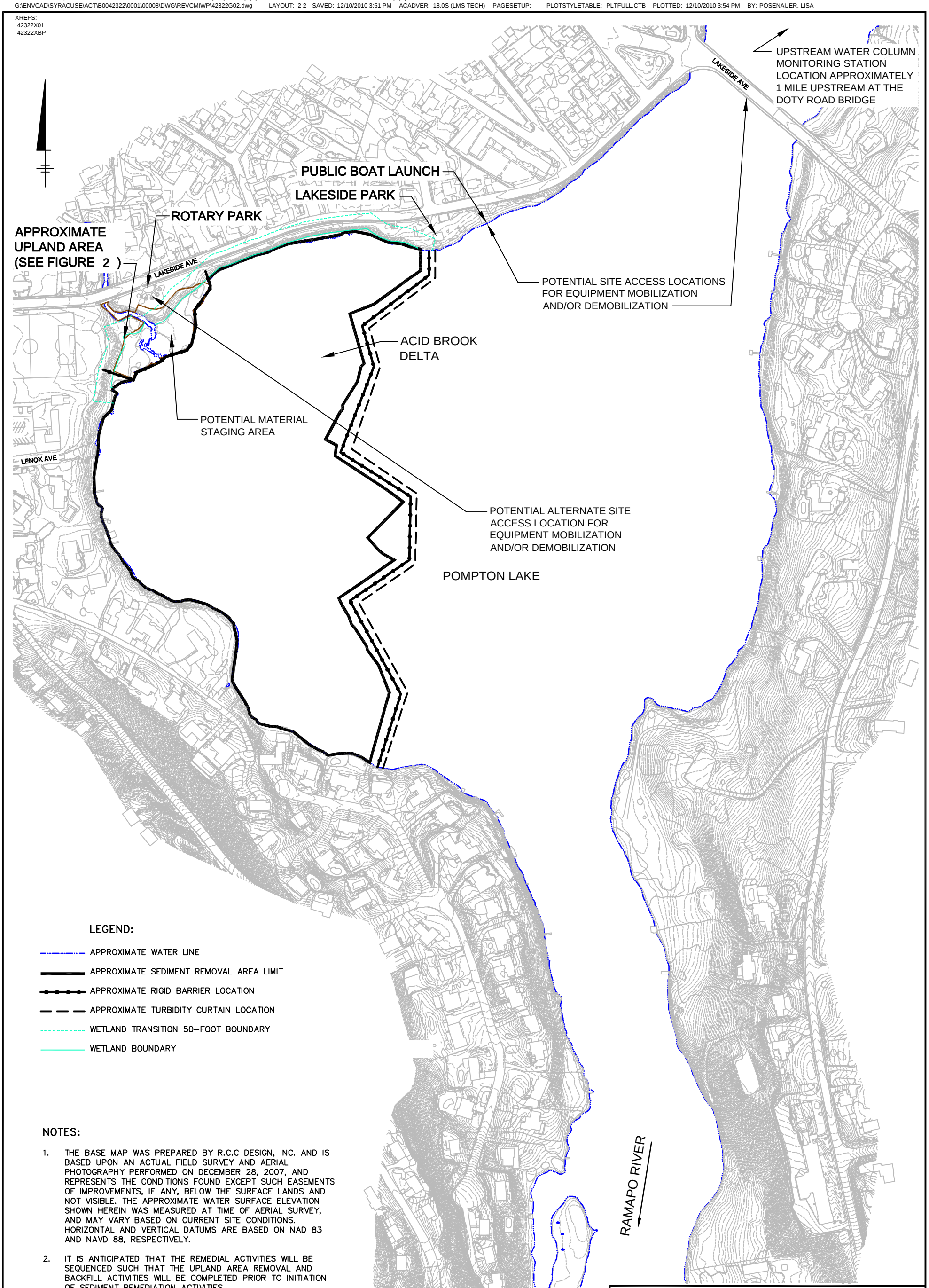
UPLANDS REMEDIAL APPROACH

ARCADIS

FIGURE
2

CITY: SYRACUSE, NY DIV/GROUP: 141/ENVCAD DB: L.POSENAUER LD:(Opt) PIC:(Opt) PM: H.VANDEWALKER TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACT\B0042322\0001\00008\DWG\REV\CMWP42322G01.dwg LAYOUT: 2-1SAVED: 12/21/2010 11:42 AM ACADVER: 18.0S (LMS TECH) PAGESETUP: ----PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/21/2010 11:42 AM BY: POSENAUER, LISA
XREFS:
42322X01
42322XBL

XREFS:
42322X01
42322XBP



LEGEND:

- APPROXIMATE WATER LINE
- APPROXIMATE SEDIMENT REMOVAL AREA LIMIT
- APPROXIMATE RIGID BARRIER LOCATION
- APPROXIMATE TURBIDITY CURTAIN LOCATION
- WETLAND TRANSITION 50-FOOT BOUNDARY
- WETLAND BOUNDARY

NOTES:

1. THE BASE MAP WAS PREPARED BY R.C.C DESIGN, INC. AND IS BASED UPON AN 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. THE APPROXIMATE WATER SURFACE ELEVATION SHOWN HEREIN WAS MEASURED AT TIME OF AERIAL SURVEY, AND MAY VARY BASED ON CURRENT SITE CONDITIONS. HORIZONTAL AND VERTICAL DATUMS ARE BASED ON NAD 83 AND NAVD 88, RESPECTIVELY.
2. IT IS ANTICIPATED THAT THE REMEDIAL ACTIVITIES WILL BE SEQUENCED SUCH THAT THE UPLAND AREA REMOVAL AND BACKFILL ACTIVITIES WILL BE COMPLETED PRIOR TO INITIATION OF SEDIMENT REMEDIATION ACTIVITIES.
3. WETLANDS DELINEATED BY URS CORPORATION JUNE 2009.
4. ADJ = ADJACENT TO ACTIVE REMEDIATION AREA.

0 300' 600'
GRAPHIC SCALE

DUPONT POMPTON LAKES WORKS
POMPTON LAKES, NEW JERSEY
REVISED CORRECTIVE MEASURES IMPLEMENTATION WORK PLAN

ACID BROOK DELTA REMEDIAL APPROACH

ARCADIS

FIGURE
3