Appendix F

Operations Plan

POMPTON LAKE
ACID BROOK DELTA AREA
OPERATIONS PLAN

Pompton Lakes, New Jersey

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TABLE OF CONTENTS

APPENDICES

INTRODUCTION

This Operations Plan presents details on the remedial measures to be implemented by E.I. du Pont de Nemours and Company (DuPont) in the Acid Brook Delta (ABD) Area to address impacts from historical operations at the former DuPont Pompton Lakes Works (PLW) located in Pompton Lakes, New Jersey. DuPont has selected Sevenson Environmental Services, Inc. (Sevenson) as the Remediation Contractor for construction operations associated with the ABD Area. The Revised Corrective Measures Implementation Work Plan (Revised CMI Work Plan) presents the remedial approach, and this document provides details on the tasks to be completed by Sevenson to complete remediation within the ABD Area.

The ABD Area includes a portion in Pompton Lake (i.e., lake sediments) termed the "delta" or ABD and the uplands portion defined as the soils and wetland areas between Lakeside Avenue and the water's edge along the lake (uplands). The ABD includes Pompton Lake south of the Lakeside Avenue Bridge, east of the discharge point of Acid Brook into Pompton Lake, and west of the centerline of the former Ramapo River channel. Based on extensive investigations conducted over the past two decades, delineation of constituents of potential concern (COPCs) has been completed in the ABD Areas. The COPCs include mercury in the ABD sediment and copper, lead, mercury, selenium, and zinc in the uplands soils.

SCOPE OF WORK

The purpose of this project is to mechanically excavate upland soils located adjacent to the shoreline, hydraulically dredge sediments within the ABD, process removed materials for disposition, and perform restoration on these disturbed areas.

Seventeen areas over approximately 1 acre have been defined for soil removal in the uplands. Removal depths generally range from 0.5 to 8.5 feet below ground surface (bgs). The current total in-situ estimated removal volume is 7,800 in-situ cubic yards

(cy). These areas will be backfilled with clean material and regraded to accommodate the restoration elements (i.e., plantings, park amenities, pathways).

Sediment will be dredged from approximately 26 acres in the ABD. The estimated sediment volume targeted for removal in the ABD is approximately 75,000 cubic yards. Hydraulic dredging activities will be performed to remove targeted material, with all dredging occurring within a rigid containment system (sheetpile wall). This area will be restored through placement of an eco-layer followed by planting and seeding.

OPERATIONS PLAN COMPONENTS

The Operations Plan includes six major construction components.

1. Mobilization and work area isolation measures
2. Soil excavation and hydraulic dredging of the designated areas
3. Dewatering and solids processing
4. Material handling
5. Transport to landfill
6. Demobilization and restoration

The six major components above can be further broken down to the tasks described below. The schedule for these major components is provided in Appendix E.

Mobilization and work area isolation measures:

- Obtaining necessary permits
- Performing additional treatability studies to support the projected design of the dewatering plant
- Mobilization and site preparation
- Installation and maintenance of the rigid sheeting used during dredging and eco-layer placement operations

- Fish collection and relocation
- Tree trimming and removal in areas that might interfere with work activities

Soil excavation and hydraulic dredging of the designated areas:

- Mechanical removal in upland areas along the shoreline on the south side of Lakeside Ave
- Mechanical debris removal operations as required prior to and during dredging operations
- Hydraulic dredging to remove target sediments in the ABD
- In-situ stabilization

Dewatering and solids processing:

- Mechanical dewatering (filter press) of hydraulically dredged sediment
- Mixing reagent with materials mechanically dredged to promote solidification
- Staging of processed materials

Material handling:

- Movement of materials into staging locations in preparation for offsite disposition
- Movement of materials onsite for ease of access due to the small staging area

Transport to landfill:

- Excavation of material from staged piles
- Loading materials into trucks
- Hauling materials to Pennsylvania Landfill

Demobilization and restoration:

- Placement of an eco-layer in the dredge area
- ABD and uplands restoration
- Demobilization

The remainder of this Operations Plan describes in detail how the above-listed tasks will be performed.

PREMOBILIZATION, MOBILIZATION SUPPORT ACTIVITIES, & SITE PREPARATION

Premobilization

DuPont and Sevenson will perform a number of pre-mobilization activities. The anticipated pre-mobilization activities are:

- Develop a number of project plans, including this Operations Plan, the Health and Safety Plan (HASP), Contingency Plan (Appendix G to the Revised CMI Work Plan), and Soil Erosion and Sediment Control Plan
- Identify and obtain local and state permits (e.g., storm water and sediment erosion control permits, electrical permits for temporary facilities, and sanitary permits, etc. as needed)
- Develop an acceptable restoration plan for the lakeshore bordering residential properties and to restore private docks and retaining walls

Mobilization

Upon receipt of the required permits and completion of all pre-construction submittals, Sevenson will mobilize personnel and equipment to the site. Key site personnel will include a Project Manager, Site Supervisor, Quality Control Representative, Site Health and Safety Officer, operators, and laborers.

Site security will be established during mobilization. Sevenson personnel will be present during weekday shifts and Saturdays. A security guard will patrol the site during non-working hours when Sevenson personnel are not on site.

Site Preparation

After mobilization, site preparation activities will be performed. Site preparation will consist of the following tasks:

- Construct temporary facilities
- Perform site layout surveying
- Install temporary fencing/visual screen along Lakeside Avenue (plus create walkway) and behind the Lakeside Middle School athletic fields
- Coordination with property owners for removal of docks and storage
- Construct access roads in Rotary Park
- Construct material processing areas

The access roads and material processing area will also be constructed prior to soil removal in the uplands.

The site configuration is detailed in Appendix A, Drawings 1, 1A, 2, 3, and 4. Generally, the land located within Rotary Park will be used for equipment staging during mobilization and load out of stabilized and dewatered material. The area created after removal of the targeted upland soils will become the staging area for the mechanical dewatering equipment.

The steps necessary for completing the site configuration are:

- Installation of the visual screen
- Modifications to Rotary Park for equipment staging and truck traffic
- Identification of access gates into Rotary Park
- Identification of conveyor system routes
- Placement of the Total Clean System (oversized screening and desanding equipment)
- Placement of six mix tanks used for slurry storage/preparation prior to injection into recessed chamber filter presses
- Placement of six recessed chamber filter presses
- Placement of slurry fast feed pumps to the presses
- Creation of an access ramp from the top of the bank down to the lower staging area
- Placement of asphalt pads for containment and bin blocks

The area in the vicinity of the existing public boat ramp will be used to launch the marine equipment for the in-water containment system. Other support vessels (e.g., small water craft, anchor handling barge, etc.) will also be launched from this location. The hydraulic dredge will be assembled on the shoreline adjacent to the uplands area and lifted into the water once the containment system is in place. Assembly of the hydraulic dredge pipeline will also occur at this location. Quality control of welding the pipeline together will be accomplished by using a data logger. The data collection device records the heater temperature and fusion pressure profile over time. All data is recorded and transmitted to the handheld computer where the joint report can be stored, viewed, printed or transferred to a desktop computer for archiving.

Due to scheduling and sequencing of work, three separate mobilizations will be required. The first will be for general mobilization and sheeting installation. The second

will be for the site preparation work. The third will be mobilization of the dewatering equipment. The schedule for these activities is detailed in Appendix E.

Offices and Infrastructure

Sevenson will place office and tool trailers at the PLW. One break trailer for the trades will be located at Rotary Park due to the space restrictions at the site. Sevenson will utilize busses to shuttle workers to the ABD Area in the morning and back to the PLW in the afternoon. Workers will park cars at a designated location at the PLW.

Sevenson will install a floating pier along the edge of the sheetpiling adjacent to the upland area as shown on Drawing 2 in Appendix A. The pier will be used for tying vessels off to at night and as an access point to the dredging work area.

Clearing and Grubbing

Clearing and grubbing will only take place where vegetation may inhibit the construction and will not extend into the buffer zones identified behind the Lakeside Middle School athletic fields. Clearing will be performed where staging areas and access roads will be constructed. Chipped trees suitable for re-use on site will be staged for habitat restoration. All other debris (e.g., brush, trees, stumps, roots, and rocks) found to be unsuitable for reuse will be disposed as spoil.

The areas that are cleared will only be grubbed if the rooting systems and stumps of the cleared vegetation will interfere with the temporary infrastructure. The stumps and root systems within the excavation areas will be removed as they are encountered during excavation activities.

Water Flow Management

Flow from the Acid Brook, storm sewer outfalls, and groundwater/surface water will need to be managed prior to work commencing in the uplands and ABD. Sevenson will

develop a collection sump at the most northern end of uplands Area A within Acid Brook. A small dam made of sand bags and stone will be constructed to intercept the flow from the brook. Ponded water will be transferred using two 12-inch Godwin type pumps into a high-density polyethylene (HDPE) line. The discharge line will head towards uplands Area B, pass through Area B, and discharge into the ABD area. Small swales may need to be cut to allow positive drainage to the discharge point. The average base flow is 0.7 cubic feet per second (cfs; approximately 300 gallons per minute [gpm]) and the maximum flow is 1.4 cfs (approximately 600 gallons per minute). Each Godwin pump is capable of pumping 2000 gpm. The two pumps will be capable of handling storm water flow events. Once Areas A and C have been remediated, the pumping operation will stop, and instead gravity flow through two HDPE pipes will be used. Should a storm event overwhelm the two gravity drainage pipes, water will flow around the pipes and across the staging area and not cause flooding upstream of Lakeside Avenue.

Since the ABD dredging area will have a rigid containment structure, the storm water from Acid Brook may need to be released into Pompton Lake. To accommodate this, a small section of the rigid containment structure located in the lake will have steel sheeting at a lower elevation (about 1 foot) to allow release of surface water into the lake. This weir will be approximately 5 feet wide. Sevenson will install permeable turbidity curtains prior to the weir discharge and in the lake near the discharge. Additional details on the rigid sheeting are provided below.

Surface runoff and storm sewer outfalls from staging areas will be directed towards the uplands work area. Any ponded water collected within the uplands will be pumped into the ABD.

WORK AREA ISOLATION MEASURES

Both the uplands and the ABD dredging area will include rigid structures. The rigid containment system will be steel sheeting. Appendix B shows a typical section and the design details performed by Sevenson for all of the sheeting installations.

Structural Inspection Prior to Isolation Measures

Before commencing any construction activity that could cause vibration (i.e., sheetpile barrier installation), Sevenson will retain a professional structural engineer to perform pre- and post-construction structural inspections for structures within 100 feet of the work location (i.e. garages, homes, etc.) where vibration may originate.

Upland Areas Isolation Measures

Sevenson will use a rigid containment structure along the perimeter of the uplands adjacent to the ABD dredging area to provide additional stability for the pad where the work and processing area will be located. The structure will be composed of steel sheeting (AZ19-700). Each sheet will be average of 25 feet long and capable of supporting an unbalanced height of 3 feet. A MOVAC vibratory hammer attached to a Komatsu PC300 (or equivalent) backhoe will be used to install the sheets. Sevenson examined the use of different containment alternatives (i.e., fiberglass sheeting) but felt that the steel sheeting will work the best in the high blow count substrate.

Access will be constructed along the perimeter of the interior of the sheeting (northwest side) to facilitate installation of the sheetpiling. A 30-foot-wide access-haul road will be constructed and the reinforced access roads will be comprised of a non-woven geotextile overlain by Tensar triaxial geogrid. Approximately 12 inches of crushed stone will be placed on top of the geotextile/geogrid. This access area will also serve two other functions. The first is an access road into the uplands for soil excavation. The second will help support a work platform/staging area for the processing equipment

detailed in Appendix A, Drawing 2. Drawing 3 in Appendix A shows the location of the access roadway for sheeting installation.

Acid Brook Delta

Prior to sheeting installation, a turbidity curtain will be installed. The silt curtain will be loaded onto a barge or flexi-float from the on-shore boat ramp staging area. The barge will be moved to the location where the silt curtains will be installed using towboats. The curtain will be installed approximately 20 feet outside of the proposed sheeting alignment. To install the turbidity curtain in each of these areas, the skirt of the curtain will be raised such that it is bunched up against the floats, a excavator on the flexi-float barge will move the floats and curtain into position in the river, the skirting will be dropped to the desired depth, and the curtain tension cable will be attached to a mooring buoy, which will be attached to a manta ray type anchor. Trip line buoys will also be attached to the Danforth type anchors and lighted buoys will be attached to the silt curtain floats.

Also, a rigid containment structure for containment purposes will also be installed in ABD. The open water sheeting installation will be performed from flexifloats (modular barges trucked and assembled on the water). An excavator will be loaded onto the barge. A MOVAC vibratory hammer attached to a Komatsu PC300 (or equivalent) backhoe will be used to install the sheets. Another barge will be used for sheeting material delivery to the installation area. Consistent with the uplands, sheeting for the ABD will also be AZ19-700 sheets with an average of 25 feet in length. Sheeting will be terminated at elevation 204 feet (approximately 2 to 3 feet above the water surface). Note that the sheeting will be offset 30 to 50 feet from the dredge footprint to allow full access to the targeted dredge area (see Appendix A, Drawing 6).

The sheeting will also have a 5 foot section lower in elevation (approximately 1 foot) than the other sections to allow drainage from the ABD. The weir opening will also

allow flow between the lake and the contained area should the water level rise. This will keep the wall from becoming unbalanced.

Sevenson also understands that there are sewer lines in place that run under the site. Sevenson will ensure that these lines are protected and service will not be interrupted during remedial activates.

Areas E5 and E6

Areas E5 and E6 are isolated from the other uplands removal areas. Soil removal within these areas will be accomplished using the steel sheeting selected for the uplands and ABD, with the sheeting offset approximately 10 feet from the footprint of excavation. Sheeting will be driven in a "U" shape around the work areas. Sheeting will be installed from the shoreline. Removal will occur from land and then the areas will be backfilled. Following backfill placement, the sheeting will be removed.

FISH REMOVAL WITHIN ACID BROOK DELTA

Following sheeting installation along the eastern perimeter of the ABD (effectively isolating the ABD from the remainder of the lake), fish and other organisms within the area will be removed and placed outside of the sheeting in accordance with the Fish and Wildlife Scientific Collection Permit. Fish removal will be accomplished using two small Jon boats and approximately five biologist/technicians. Electrofishing gear will be used to stun the fish and allow for their collection and relocation.

Other collection techniques will be used (e.g., seine nets, trap nets) to supplement the electrofishing to collect fish and other organisms (e.g., small life stages, minnows, catfish, turtles, etc.). Sevenson will collect as many fish as possible over a 5-day period. Information related to fish species will be collected, but length or weight measurements will not be collected.

ODOR, DUST, AIR, AND NOISE MITIGATION

Odor

Should odor become a problem during open excavation in the uplands or near shore areas, Sevenson can implement engineering and operational controls such as misters sprayed into the air with a perfuming agent to mask the odors to the surrounding community or the use of a foaming agent on an open material surface to provide a barrier to contain the odor. For the uplands, Sevenson will also expedite backfilling-accepted areas to minimize exposed soils to the surrounding environment. Excavated materials will be trucked to Rotary Park where materials will be mixed with a reagent in watertight roll off boxes. Stabilized material piles will be covered nightly. Due to the limited working space, very little processed material will be kept on site and therefore odors will be limited.

Hydraulic dredging will be used in the ABD. Dredged sediment will be transferred via a slurry line for transport to the dewatering equipment. All sediment remains within a contained system until the sediment is mechanically dewatered; therefore odors are not expected from this process. Filter cake will be staged in piles and transported offsite on a daily basis. Due to the limited working space, very little filter cake will be kept on site and therefore odors will be minimized. Whatever material piles are left on site each day will be covered nightly to limit odors.

Dust

Materials mechanically excavated from the uplands will be stabilized using a reagent material at a mix ratio of five to 10 percent by weight. The reagent sacks will be loaded directly into the mixing container and mixed mechanically. Therefore, the materials will be wet and unlikely to release dust. However, if materials dry out, Sevenson will wet the materials using on site water sprayers to prevent dust releases.

All trucks hauling materials will have a lined bed, inspected for materials on the exterior of the truck and cleaned as necessary, and covered prior to leaving the site. Plastic sheeting will be used to prevent spillage of material on the sides of the trucks. The sheeting will act as a bib. Sevenson will have a roadway sweeper on standby as necessary in the event that it is required on the roadway.

Sevenson does not anticipate dust issues associated with hydraulic dredging.

Air Monitoring

Perimeter air monitoring for dust (particulate) will be performed during soil excavation, material handling and processing, and dredging operations at fixed locations around the removal areas to provide coverage of areas upwind and downwind of the construction activities in the ABD Area. Sevenson will also perform air monitoring related to worker safety. The worker safety air monitoring activities will be detailed in the HASP.

Noise Mitigation

Sevenson will comply with all applicable Pompton Lakes noise ordinances. Sevenson will do the following, at a minimum:

- Use a vibratory method of driving sheet pile. This method will produce less noise than using a drop hammer to drive the sheet pile, and is expected to meet the requirements of the ordinance.
- Maintain construction equipment in good working order to prevent loud or intrusive noises, which should meet the requirements of the ordinance.
- Ensure insulation around the dredge engine is intact and new.
- Install hospital grade mufflers on the dredge.
- Maintain trucks in good working order and remind truck drivers to gently accelerate and not use engine breaks.

- Hold routine meetings with staff about the importance of keeping conversations on the water to a normal conversation level and eliminate the use of foul language.

Overall noise levels from construction should be similar to noise from routine truck traffic in the area.

Sevenson will take adequate measures for keeping noise levels to safe and tolerable limits as set forth by OSHA, EPA, and/or any local requirements. In the event of a noise complaint, the noise level will be monitored and contingencies will be implemented as necessary.

DEBRIS REMOVAL

Prior to any mechanical excavation in the uplands or during hydraulic dredging in the ABD, Sevenson will perform debris removal operations as needed to safely continue operations. The containment systems described above will be in place prior to initiation of any debris removal operations. Any SAV encountered will be removed using the hydraulic dredge and sorted using a mechanical shaker screen. SAV will be loaded into trucks for offsite disposition.

An excavator with a perforated bucket on a flexi-float barge will be used to perform debris removal activities (debris includes boulders, large rocks, and any other large objects that would hinder dredging operations). The perforated bucket will allow sediments to “pass through” the bucket while the oversized materials will remain in the bucket for removal. Sevenson may also utilize a specialized rake and grapple, depending upon the type of debris encountered for removal.

Debris will be removed and placed in a shallow-draft, material scow. The scow will be moved to the access pier in the vicinity of the processing area using a work boat. The

debris will be removed from the scow using a backhoe or crane stationed on shore, placed in transport trucks, and sent offsite for disposition.

UPLANDS SOIL REMOVAL

Conventional excavation techniques (excavator and bucket) will be used in the uplands. Sevenson estimates that 7,800 CY of uplands materials will need to be excavated. In order to provide heavy equipment access to this area, a reinforced road will be constructed along the interior of the sheet pile wall (Appendix A, Drawing 3). The roadway will also be used for access to install the required sheeting. A 30-foot-wide haul road will be constructed and the reinforced access roads will be comprised of a non-woven geotextile overlain by Tensar triaxial geogrid. Approximately 12 to 18 inches of crushed stone will be placed on top of the geotextile/geogrid. Some locations may require more materials due to the soft nature of the underlying soil.

As needed, “fingers” of crushed stone will provide access into the work areas that cannot be reached from the perimeter roadway. The finger roadways will be placed then removed as the excavator works its way out of a work area. Appendix A, Drawing 4 shows the proposed alignment of “fingers” that will be used for sediment removal and Drawing 5 shows the excavation operation process flow diagram. It is anticipated that work will begin in Area A, move to Area E7, and then progress to Area B. Following removal of material in Area B, work will continue east towards Area E6 as the final removal location.

A Komatsu PC300 (or equivalent) backhoe with a long stick will be used to excavate the soils. The PC300 will move temporary piles and stockpile the upland soils within the footprint of the excavation areas to allow gravity draining of the soils. A Komatsu PC220 (or equivalent) backhoe will then load the drained soils into Moxy trucks for hauling to the processing area. The processing area will be located within the existing Rotary Park. All work will be performed on top of a containment pad. Details of the pad are located in Appendix A, Drawing 1A.

In areas where deep excavation is required (i.e. greater than 6 feet) slopes will be cut back at a safe angle of repose to allow access into the area. Groundwater encountered will be removed using a Godwin dri-prime type pump. The water encountered will be pumped back into the contained area.

Uplands materials will be processed within watertight containment boxes (i.e., roll off dumpsters). Existing and/or anticipated weather conditions, as well as soil characteristics, may impact the dewatering process for the uplands materials. Therefore, the reagent application volume may require adjustments on a day-to-day basis.

Upon completion of the mixing, a grab sample of the processed material will be obtained and a paint filter test conducted. If a batch of processed soils fails the paint filter test, the soils will be subjected to additional dewatering with reagent material at a mix ratio of five to 10 percent by weight until the passing results are obtained. Soils that pass the paint filter test will be transferred to the staging/loading pad for transport and off-site disposition. Drawing 5 shows the excavation and processing flow diagram for the uplands. Stabilized soils within the boxes will then excavated and loaded into trucks for offsite disposition.

UPLANDS BACKFILL ACTIVITIES

Backfilling the seventeen uplands areas will be accomplished using materials from an approved backfill source, such as the Tilcon Riverdale quarry. The backfill will be bank run material meeting the specification criteria provided below. An adequate volume of fill will be placed to meet the final grade.

Sieve	Percent Passing
3 inch	100
No. 200	10-30

Materials will be trucked to the site and placed within the backfill area. The materials will be spread and compacted with several passes of a bulldozer working from the shoreline out towards the sheeting along the perimeter of the uplands areas. A bulldozer will advance the backfill materials. Materials below the waterline or in deep holes in the upland areas will be placed using an excavator until the materials rise above the water surface or to a level that be placed with a dozer. Materials will be placed up against the nearshore sheetpile wall. Once the elevation/grade is reached in the uplands, a geotextile will be laid down. Fill material will then be added to raise the uplands an additional 2 to 3 feet to create a working surface for processing equipment that will be used during hydraulic dredging. The geotextile will delineate the two zones of materials (backfill and materials added for staging area build up). Following dredging and demobilization of dewatering equipment, this additional material will then be reused as part of the eco-layer to be hydraulically spread within the ABD. Materials that were compacted from the overburden will be tilled or raked using an excavator attachment to loosen the soil for habitat development.

ACID BROOK DELTA DREDGING

Dredging within the ABD will be performed using a Dredging Supply Company, 8-inch Moray dredge. The estimated volume of targeted sediments to be dredged is approximately 75,000 from the ABD. Appendix A, Drawing 6 shows how this quantity was determined. The dredge will be launched from the newly created marina ramp adjacent to the uplands following final closure of the sheeting area. The dredge will then remain within the rigid sheet pile wall area for the duration of the ABD removal activities.

This dredge is capable of removing 50 to 120 cubic yards per hour on average. The hydraulic dredge can be operated in relatively shallow water depths (drawing 2 feet 9 inches of water, allowing the hydraulic dredge to perform in the shallow areas) and ranging up to water depths of 17 feet. Also the dredge can dig its way into shallow water creating enough water to operate.

Pipeline transport will be used as a direct route from the hydraulic dredge to the processing area.

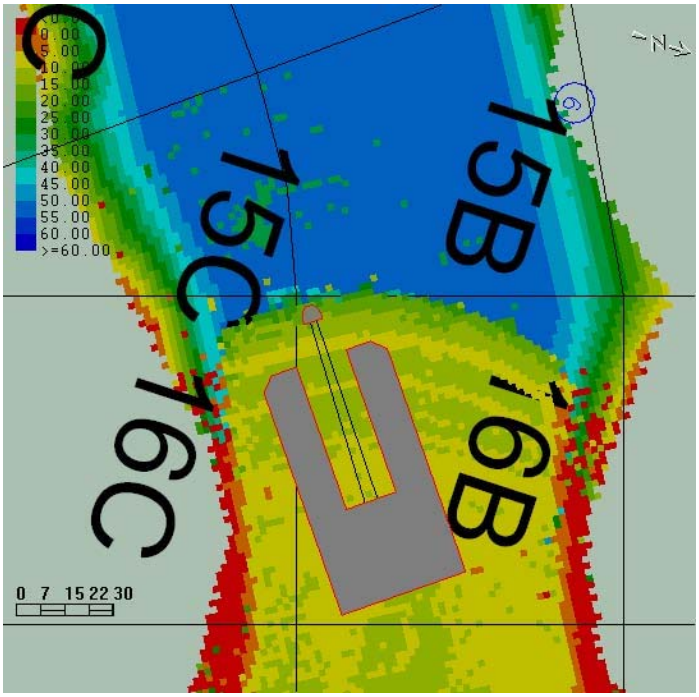
The details of the 8-inch Moray dredge are as follows:

- Overall length 42 feet and 10 inches
- Mean operating draft (with fuel) 2 feet 9 inches
- Fuel capacity 500 gallons
- Nominal pump capacity of 2,000 gpm
- Suction diameter 8 inches
- Discharge diameter 8 inches
- Impeller diameter 19 ¾ inches
- Maximum particle clearance 3 ½ inches
- Primary Mover - Caterpillar C7 ACERT industrial diesel engine, radiator cooled with residential grade silencer rated 275 bhp @ 2,200 revolutions per minute (rpm). EPA and California Air Resources Board (CARB) Tier III compliant

Positioning of the dredge will be accomplished using a real-time kinematic global positioning system (RTK GPS; Trimble 461 with heading). The positioning software used will be the Dredgepack system designed for a hydraulic dredge. The proposed contour surface will be programmed into the Dredgepack system giving the operator a heads up display of target removal depths/elevations.

The dredge will be operated in a manner so as to minimize the re-suspension of sediments at the cutter head. The operator will visually monitor turbidity in the vicinity of the dredge head while experimenting with various cutter speeds, pumping rates, depths of cut, and forward movement of the dredge to determine which combinations are appropriate for the site conditions and provide a reasonable rate of production with minimal loss of sediments to the water column. Sediment resuspension at the edge of a cut where sloughing may occur will be minimized by overlapping dredge passes.

Dredging will begin in the southeastern corner of the site. Work will initially progress towards the south to create working space for the dredge. Once a small area is deep enough for the dredge to maneuver, dredging will generally progress towards the north and west. Drawing 9 shows an approach to the sequence of the dredging work. The figure below shows the screen that the dredge operator will view during sediment removal operations.



View of Dredge Operator Screen

DEWATERING, SOLIDS PROCESSING, AND MATERIAL HANDLING

The proposed dredging operation is expected to generate slurry at a rate of 1,500 to 2,500 gpm containing seven to 15 percent solids by weight on average.

The dredging and dewatering operation will be staffed 12 hours per day, 5 days per week. The sixth day will be reserved for make-up of production or equipment repairs. The dredged slurry will be pumped through a vibrating shaker screen with 1 to 0.5-inch screens. The screens will remove debris, stones, large wood chips, and gravel from the

slurry. Screenings will be discharged onto the staging pad for transport to stockpiles. The screened dredge slurry will then gravity feed into a V-bottom tank and be drawn off the bottom and sent through the desanding units. The underflow from the desanders will then be directed over dual vibrating linear motion shakers with 200 mesh screens (74 microns) for further sand removal.

Sediment processing will be performed in a manner to allow segregation of coarse and sand materials from the fines (less than number 200 sieve) and debris.

The over flow from the desanders will be pumped to a gravity thickener to thicken (concentrate) the silt fraction of the sediments and decant the free water back to the ABD within the sheetpile area. The thickened sediments will be pumped into six 20,000 gallon agitated mix tanks. Filter press fast feed centrifugal pumps will draw from the agitated mix tanks to fill the six 219 cubic foot filter presses. Each filter press will have a dedicated centrifugal fast feed pump. In addition, one stand-by fast feed centrifugal pump will be available to service any of the six presses, if need be.

Upon transfer from the six 20,000 gallon agitated feed tanks, polymer will be added to the dredge slurry, through a flow meter, static mixer, and polymer injection system. The addition of polymer to the dredged slurry will be used to improve the filterability of the solids. Polymer will be fed from a chemical tote (250 gallons) via a PolyBlend system through an in-line static mixer. The chemical tote will be placed within a contained pad area to provide secondary containment. The amended slurry will be pumped to one of six 219 cubic foot recessed filter presses. Drawing 7 shows the process flow for the dredging and dewatering.

Filtrate will be discharged to the filtrate tank to be pumped for discharge to the rigid barrier surrounding the ABD. At the end of each filter run, a core blow will be conducted on the press to remove residual solids from the press feed lines. Any discharge from this process will be returned to the agitated mix tanks.

Sevenson has based its design on an 85% operating efficiency for the project. To ensure maximum production with minimum downtime, the process system includes redundancy for all pumps, chemical systems, and process equipment. Supporting calculations for the mass balance are provided in Appendix C.

Daily reporting to DuPont's site representative will include:

- Estimated daily dredge production in CYs
- Gallons of lake water pumped through the dewatering system and returned to the lake
- Gallons of polymer used
- Cycle time of filter cake dewatering process, and
- Routine sampling of dry cake to verify water content

IN-SITU STABILIZATION

For areas within the uplands and ABD where the lead concentrations require insitu treatment will be treated using Portland cement for stabilization or other in-situ treatment methods. The in-situ treatment will be applied by a chemical injection system through a specialized mixing head for in-situ stabilization. The mixing head will be attached on a hydraulic excavator that will be placed on a flexifloat type barge to access the sediments requiring in-situ stabilization.

Sevenson has proven that metals successfully meet TCLP standards with their in-situ treatment technology. Sevenson will obtain representative samples of the in-situ soils and sediments in advance of the mobilization to perform a treatability study to verify that this process will work on the ABD sediments and soils.

The footprint of the areas that will require in-situ treatment for lead is estimated to a 20 foot by 20 foot by four foot deep area surrounding each of the seven borings identified. The total volume to be treated will be 500 cy.

ACID BROOK DELTA ECO-LAYER PLACEMENT

An eco-layer will be hydraulically placed within the ABD dredge area following sediment removal. The materials will be consistent with specification provided in the Revised CMI Work Plan. An estimated neat quantity of 20,973 cubic yards of clean materials will be placed. An additional 10,487 cubic yards may be required for over placement or loss of materials into the mixing layer. The following sections describe Sevenson's means and methods for eco-layer placement, materials and sources, and verifying the thickness of the installed eco-layer.

The hydraulic spreader system consists of a feed hopper, oversized screening, and slurry system that will pump the sand hydraulically through a pipeline for placement through a diffuser system on a barge. The pump used to convey the sand slurry is a booster type pump commonly found on dredging projects.

The hydraulic spreader barge will be fitted with a nuclear density meter and a flow meter. Output from these two gauges will be fed into a "totalizer unit". The totalizer will keep track of the total quantity of material placed.

The spreader barge will be set up on a 4-cable winch system. The operator, using a single joystick, will control the winch system. The flow monitoring system will be tied into modified Dredgepack software. The flow monitoring system will feed in the density of the material and velocity just before the materials are discharged to the water surface. The operator will be able to look at a color-coded screen and see in real time how much material is being placed. Each layer thickness will be programmed into the software, and the operator will follow a color-coded system.

The 30-foot by 60-foot diffuser/spreader barge will be attached to the slurry system by 16SDR11 HDPE pipe. The spreader system will be attached to the 30-foot side of the barge. This barge will have a waterfall type discharge apparatus (steel plate angled towards the water) fabricated on the deck. The angled discharge plate will act to dissipate the energy in the material slurry delivered to the placement barge via the floating line. Therefore, the sand cover will enter the water in a controlled fashion with minimal fall velocity. Materials will be placed in two layers targeting two inches for the first pass and four inches for the second pass, for a total of six inches. An additional three inches has been accounted for over placement or loss of materials into the mixing layer.

Materials will be placed in two layers targeting two inches for the first pass and four inches for the second pass for a total of six inches.

The pump system is composed of a 900 HP dredge pump with a 38-inch-diameter impeller and two 8-inch-diameter Godwin pumps to deliver the slurry make up water into the mixing tank located next to the stockpiles at each potential staging location.

Appendix A, Drawing 8 shows the eco-layer process flow diagram. Note that placement of the first lift of the eco-layer will be performed at the same time as the dredging. The two areas will be separated by a turbidity curtain to eliminate cross contamination. This curtain will be installed prior to capping in order to provide sufficient time for solids settling. Placement of the final lift of the eco-layer will be performed after dredging activities are complete.

Sevenson's anticipated production rate calculated for eco-layer placement is based on the pumping distance to the site from the shoreline and any inefficiencies associated with moving anchors, maintenance, shift changes, weather delays, fueling, and material stockpiling logistics. An anticipated production rate of approximately 1,000 cubic yards per day (cy/day) was developed based on safe operating speeds of the placement

barge, equipment limitations of safe winching speeds, and feeding the slurry system with a consistent feed to minimize overspreading materials and minimize barge "jerking" through the water with the automation system.

Characteristics and efficiencies for pumping the eco-layer materials are:

- Velocity in the pipeline to pump a medium sand will be 14 to 18 feet per second.
- Flow rate will be approximately 6,000 to 7,500 gpm.
- Pump RPMs will range from 500 to 700 depending on pumping distance.
- Pump horsepower (HP) used will range from 500 to 900 depending on pumping distance.
- Keeping barge movement limited to less than 15 feet per minute.
- Eco-layer materials placement sequence will generally follow the same path used for dredging as shown in Drawing 9. The barge will need to be rotated one hundred and eighty degrees as it approaches the sheeting and the shoreline (i.e. spreader system will point towards the sheets or towards the shoreline to ensure materials reach these limits).

Materials will be placed in two layers. The second layer will nto be placed until all dredging is complete.

MATERIAL HANDLING AND TRANSPORT FOR OFFSITE DISPOSITION

Sevenson will temporarily stockpile material produced by the shaker screen, desanding and filter press units on the processing pad in the staging area. All piles will be covered with anchored tarps, and/or poly.

Trucks for hauling will be staged offsite at the trucking company yard. No trucks will be staged in the Borough of Pompton Lakes. Trucks will be ordered for just in time arrive to minimize the impact on the community. All truck hauling materials from the site will

have a lined bed, inspected for soil/sediment on the exterior of the truck and cleaned as necessary, and covered prior to leaving the site. A bib will be used between the loader and the truck so materials do not fall on the trucks. Drawing 2 in Appendix A shows the location where trucks will be loaded, inspected, and cleaned as needed. If a roadway sweeper is required on the roadway, Sevenson will have one on standby as needed. All processed soil/sediment leaving the site will have to pass the paint filter test. There will be no free water transported to the off-site licensed facility.

The off-site facility is located in Morrisville, Pennsylvania. The haul route to the off-site facility is provided in Appendix D.

METHOD FOR CONTROLLING EXCAVATION ELEVATIONS, DREDGING ELEVATIONS AND HORIZONTAL CONTROL

Sevenson will hire a local land surveyor (NJ Profesional Land Surveyor) to establish control points around Pompton Lake. Surveys to verify soil/sediment removal and establish grades/cut elevations will use a combination of RTK GPS, hydrographic survey techniques, and conventional total station techniques. These survey methods will be used to track the progress of removal.

Uplands Area Surveys

Uplands areas will be surveyed prior to, during after removal, and after backfilling. Uplands areas will be surveyed with RTK GPS to determine the existing elevations. Survey spot elevations will be performed on the predetermined locations identified in the Revised CMI Work Plan. To control horizontal and vertical accuracy of the surveys, the surveyor will check in to a known benchmark at the beginning and end of the survey.

Volume computations will be performed to determine the amount of material that lies within the template and/or how much has been removed to date. Topographic data will be imported to Trimble Terramodel software and used to compile a Digital Terrain

Model (DTM) surface using the Triangular Integrated Network (TIN) method. A second DTM three-dimensional surface will be developed within Terramodel using the excavation template. Volumes will be calculated using a surface-to-surface comparison to determine quantities that have been removed.

Dredging Hydrographic Surveys

Hydrographic surveys will be conducted within the ABD prior to and following dredging. Sevenson will also perform routine surveys, as needed, to track sediment removal volumes for progress payments and reporting.

The survey system on board the survey vessel will consist of:

- RTK GPS – Trimble SPS461 GPS Heading and Positioning Receiver
- Fathometer – ODOM MKIII single-beam dual-frequency (nominal 200/24 kHz) echosounder for water depth measurements
- A PC computer running Hypack for data collection and post processing
- A dual frequency transducer

Quality control lines will consist of a mixture of repeated bidirectional lines and lines running perpendicular to the standard line direction. The actual line locations may be selected in the field as environmental factors dictate. Sevenson will also run survey lines outside of the dredging area as a check of vertical accuracy.

Generally, lines will be run on a grid pattern in the dredging areas with a spacing of 50-feet (horizontal and vertical).

Twice daily bar checks will be performed prior to and immediately following each day's worth of collection to eliminate speed of sound and transducer draft errors.

Upon completion of the hydrographic survey, all data will be edited and processed using HYPACK software utilities. During processing, corrections for vessel motion and water surface variation will be applied, and errant soundings will be removed from the database. The output file will be an ASCII file that will be used for development of bathymetry maps and volumes.

Volume computations will be performed to determine the amount of material that lies within the template and/or how much has been removed to date. Sounding data will be imported to Trimble Terramodel software and used to compile a Digital Terrain Model (DTM) surface using the Triangular Integrated Network (TIN) method. A second DTM three-dimensional surface will be developed within Terramodel using the dredging template. Volumes will be calculated using a surface-to-surface comparison to determine quantities that have been removed.

For areas where the survey vessel cannot access, the surveyor will use the RTK backpack system. The surveyor will collect survey shots on 50-foot spacing. These shots will be used to supplement the hydrographic survey data.

Eco-Layer Thickness Verification

Two relatively thin lifts are proposed for the eco-layer placement. Sevenson plans to verify material thickness with the use of material collection “pans” that are placed on the bottom of the lake. Materials that are placed in the water column will settle into the pans. The pans will be winched to the surface for verification of thickness of materials. These pans can be placed within the path of the material placement barge and winched to the surface following a placement pass over them. Sevenson will work with DuPont to develop an appropriate spacing for the pans.

The final surface, following both layer placements, will be surveyed using a combination of hydrographic survey techniques and RTK backpack. Sevenson will also use clear

Lexan cores for eco-layer thickness verification as described in the contract specifications as needed.

ENVIRONMENTAL CONTROLS

Sevenson will place an oil boom around the dredge during fueling activities. Sevenson will use gasoline-powered boats to supply personnel, fuel, and consumables to the dredge. The dredge will have additional oil booms on board in the unlikely event that a spill does occur. Sevenson will protect against fuel or oil spills when refueling or servicing equipment and immediately correct any fuel or oil leaks in waterborne equipment. Wherever possible, biodegradable hydraulic oil will be used. These items will be discussed in greater detail in the Contingency Plan.

Sevenson will use turbidity curtains on the exterior of the sheeting within the lake during sheeting installation and it will remain in place for the duration of the project. Turbidity curtains will also be used to separate the dredging area and the capping area during ongoing operations.

DEMOBILIZATION AND RESTORATION

Demobilization

Upon completing all remedial work at the ABD Area, Sevenson will demobilize all equipment. Demobilization will include the following:

- Removal of office, break, storage, and tool trailers
- Removal of all heavy equipment including, excavators, dozers, loaders, forklifts, skidsteer, pumps, filter presses, tanks, filters, shakers desanders, dredge, marine debris removal equipment, cranes, barges, and scows
- Breakdown and removal of the dewatering equipment

- Removal of turbidity curtains and sheeting
- Removal of the asphalt processing and staging area and disposal of the berm material, stone, geotextile, liner and asphalt
- Decontamination of equipment, as necessary

Work will also include any restoration of areas disturbed to support construction activities that are not specifically identified as part of the restoration plan provided in the Revised CMI Work Plan. An example would be at the offsite trailer complex located at the DuPont facility where site grading might be required.

Restoration

Restoration Acid Brook Delta

The ABD area will initially be restored with the placement of the eco-layer. This will also include 0.41 acres of shallow shoals created near the shore. Restoration includes planting the shoal areas with freshwater floating-leaved aquatic vegetation material, installing wire-mesh perimeter protection around the installed plant material, and installation of aquatic habitat enhancement devises including large woody debris, brush piles, and coarse aggregate spawning bed material.

Plant material will be installed as colony patches to cover approximately 50% of the created shoal areas. Each planted colony patch will be protected with approved herb ivory fencing. Sevenson will use industry-accepted techniques to install the plant material. This activity will occur during the approved planting period.

Aquatic habitat enhancements including anchored brush piles, anchored tree trunks, and patches of fish spawning bed material will be installed. Sevenson will use minimally invasive equipment to get the materials placed and secured. These operations will take place during optimal construction time periods.

The pipeline used for storm water runoff in the Acid Brook will be removed. The stream channel will be restored with natural enhancements.

Shoreline Stabilization – Lakeside Avenue

Sevenson will install the required restoration features of the Lakeside Avenue shoreline stabilization. Shoreline stabilization activities will consist of the following:

- Installation of 700 linear feet of premium coir logs
- Coir logs will be 20-inch diameter/10-feet long premium coir logs
- Coir logs will be trenched into the subgrade, installed so that roughly half is submerged, and staked at a frequency of eight stakes (2" x 2" x 4' stakes) per every 10-foot section of coir log

Stakes will be inserted into the coir netting and cinched with coir twine.

- Installation of 350 dormant live stakes adjacent to the coir logs. Live stakes will be set evenly spaced two feet apart and alternating between the land and the water sides of the log. Live stakes will be installed as per the final restoration drawing details.

Sevenson will also perform the restoration of the Rotary Park Sidewalk.

Shoreline Stabilization – Acid Brook Area

Sevenson will install the required restoration features of the Lakeside Avenue shoreline stabilization. Shoreline stabilization activities in this area will consist of the following:

- Installation of 630 linear feet of premium coir logs
- Coir logs will be 12-inch diameter/20-feet long premium coir logs

- Coir logs will be trenched into the subgrade, installed so that roughly half is submerged, and staked at a frequency of fourteen stakes (2" x 2" x 4' stakes) per every 20-foot section of coir log
- Stakes will be inserted into the coir netting and cinched with coir twine
- Installation of 315 dormant live stakes adjacent to the coir logs. Live stakes will be set evenly spaced two feet apart and alternating between the land and the water sides of the log. Live stakes will be installed as per the final restoration drawing details.

Acid Brook

The perennial stream channel shall be restored with dimensions, pattern, and profile suitable to convey sediment load and flow as per the final restoration plans. The stream bed shall be restored using amended subgrade cobble/gravel/sand mixture; a grade control structure will also be installed. Stream banks will be established at stable 3:1 slopes and protected with erosion control matting and/or riparian plantings.

Stormwater Treatment Wetland and Rain Gardens

A stormwater treatment wetland will be constructed along the shoreline of Lakeside Avenue at the stormwater outfall south of Mandeville St. in accordance with the final restoration plans. Additionally, two rain gardens will be constructed; one along the southern edge of Rotary Park and another on the fringe of the school athletic fields.

Public Open Space

The public open spaces will be enhanced with additional access and plantings. Restoration of these areas will include excavation/grading/ backfill and planting to create a low open space terrace adjacent to Pompton Lake; installation of decorative stone wall landward of the terrace and associated with a new planting bed; removal and

replacement of former sidewalks with expanded porous pavement paths and sections of compacted stone paths; restoration and replacement of existing turf areas with sod, as necessary; replacement and expansion of existing irrigation system; removal, storage, and replacement/installation of select trees and shrubs from existing planting beds and creation of new beds for native plantings; installation of herbaceous and scrub/shrub plants along the slopes adjacent to Lakeside Avenue; creation of compacted stone pads for an educational pavilion and for kayak storage; and enhancement of boat ramp area parking with compacted stone. Public space restoration will also include removal and storage of park benches prior to project implementation and then subsequent installation of retained and new park benches.

In accordance with the restoration plans, the following sequence of activities will be conducted to reestablish sod:

- Drag the area to be sodded to level out any inconsistencies with a Toro Pro fine grader
- Apply starter fertilizer at a rate of 50 pounds (lbs) of nitrogen per 5,000 square feet
- Lay sod parallel and tightly together
- Thoroughly water sod immediately after installation (using water supplied by others)

Wetland and Wetland Transition Area Restoration Planting

Sevenson will install plant materials in accordance with the regulatory requirements and restoration plans issued for the project (as defined in the Revised CMI Work Plan). The wetland and transition area/upland backfill final grading and topsoil will be installed and prepared for planting in accordance with the restoration plan and specifications.

Plant material will include installation of emergent, herbaceous, shrub, and tree species as presented on the final restoration plans. Larger trees will be staked and guyed as

necessary and all trees will be saucer mulched with shredded hardwood mulch. Shrubs will be mulched individually or as contiguous planting beds.

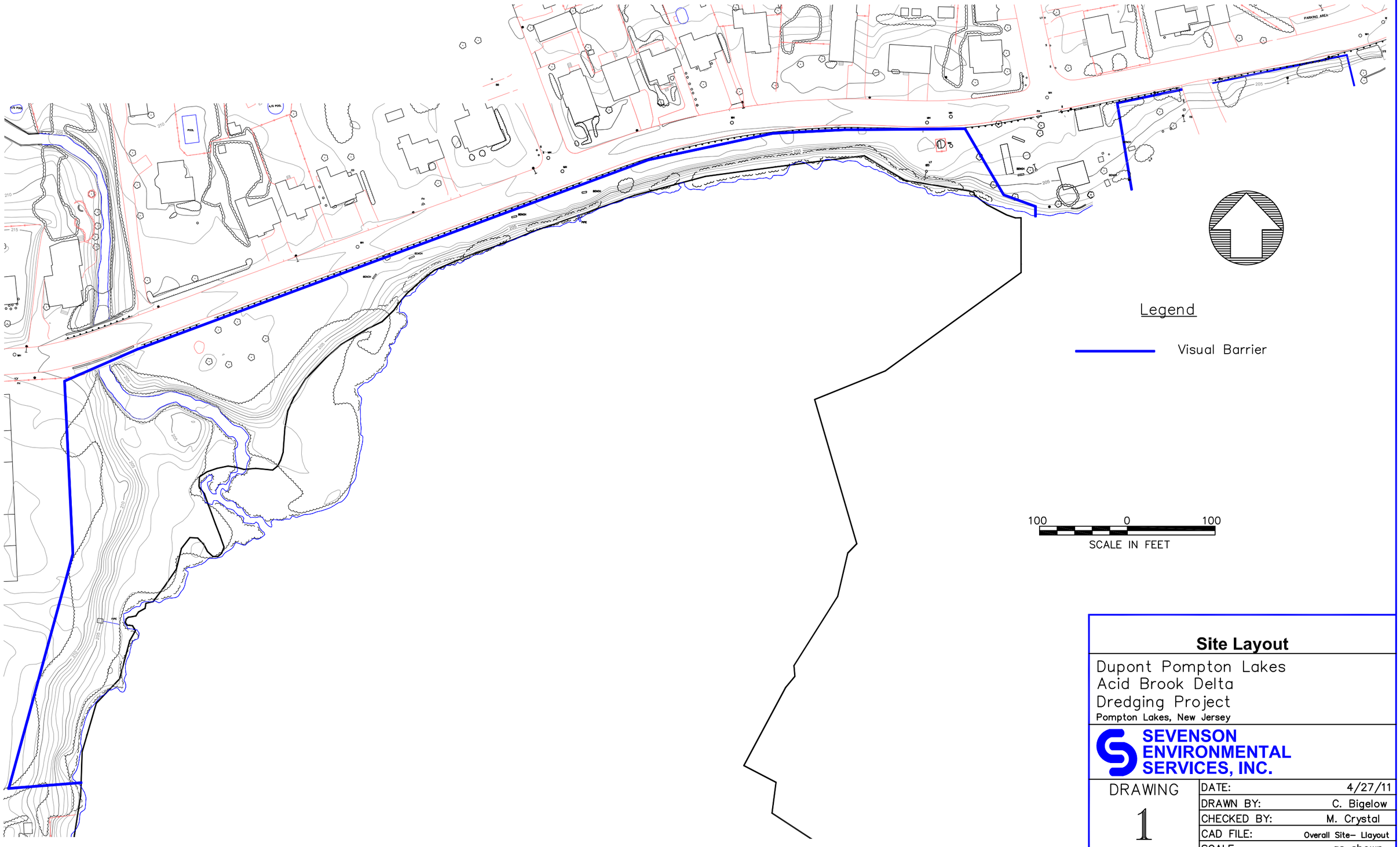
Seeding

Seeding will be conducted in all planting zones identified in the final restoration plans by Hydroseeding using a Finn T90 HydroSeeder. Areas not accessible to hydroseeding equipment (i.e., slopes, roadsides, etc.) will be hand broadcast seeded. All areas that were tracked or backfilled and have been compacted, will be tilled to loosen the soil.

Sevenson will conduct seeding in accordance with the following specifications:

- Seed mix specified for the four planting zones applied at a rate of 20 lbs per acre
- Straw mulch applied at a rate of two tons per acre
- Mulch binder consisting of earth bond polymer based liquid mulch binder

Restoration activities will be completed over two growing seasons due to the sequence of work and timing for specific plant species.



Legend

Visual Barrier

100 0 100

SCALE IN FEET

Site Layout

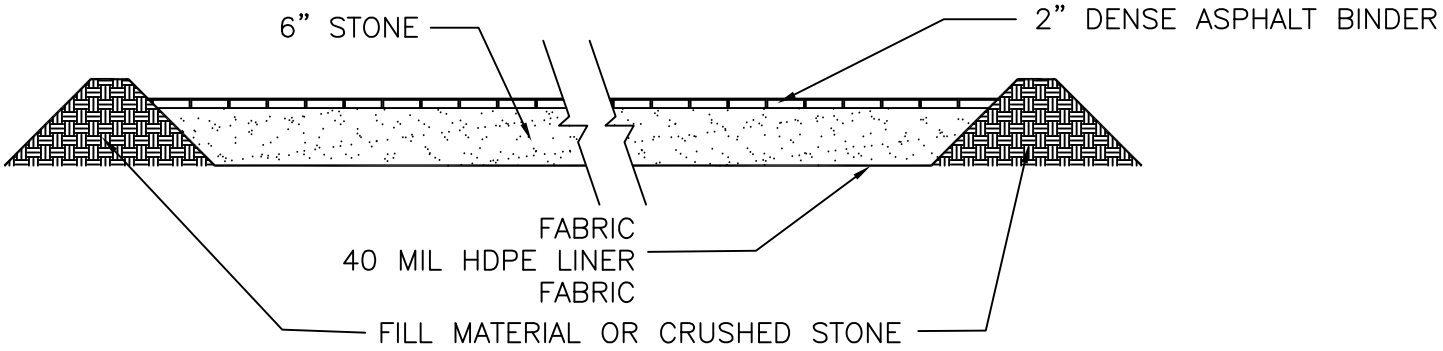
Dupont Pompton Lakes
Acid Brook Delta
Dredging Project

Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING 1

DATE:	4/27/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Overall Site– Llayout
SCALE:	as shown



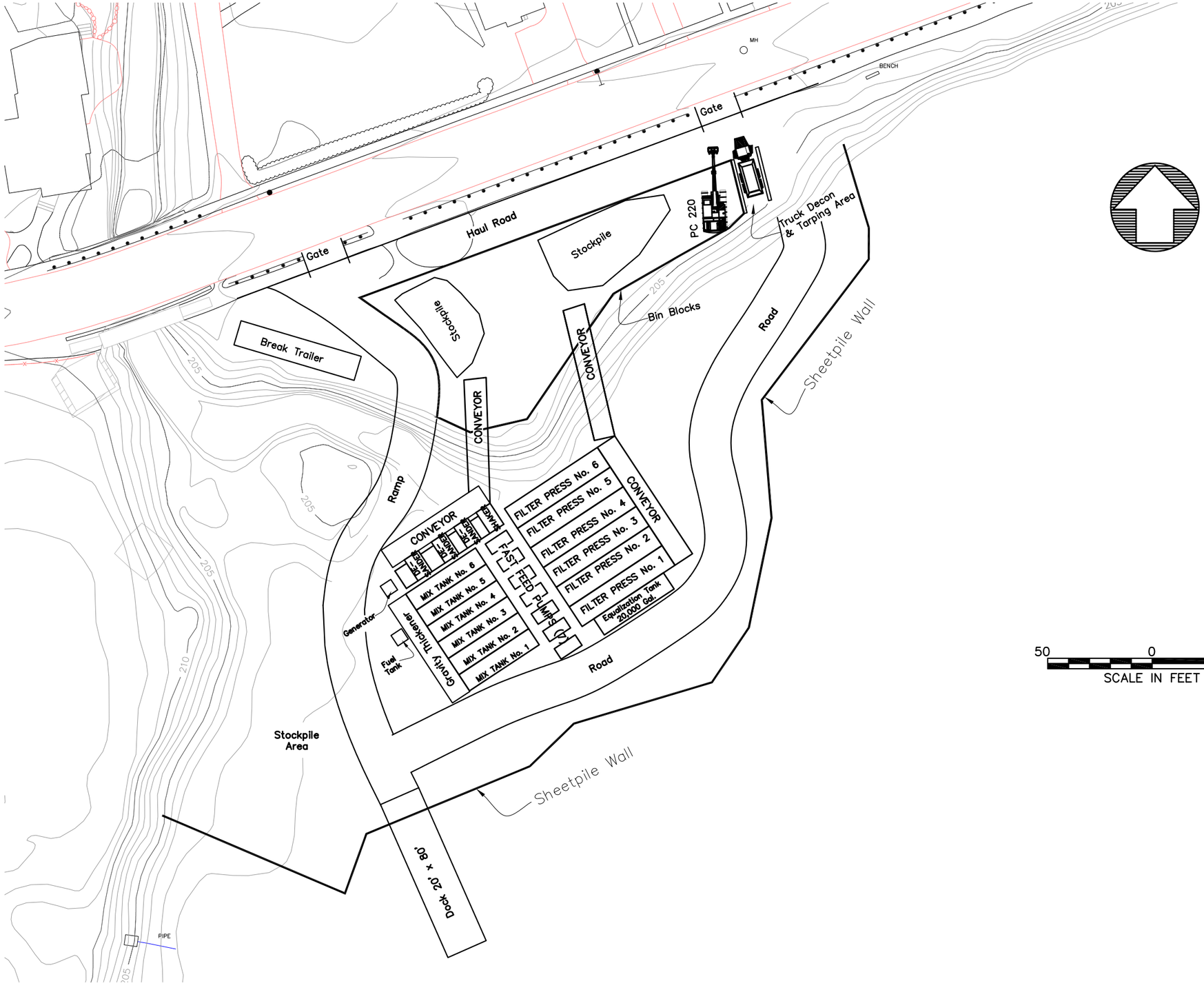
Typical Containment Pad

Dupont Pompton Lake
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON
ENVIRONMENTAL
SERVICES, INC.

DRAWING
1A

DATE:	4/28/11
DRAWN BY:	C. BIGELOW
CHECKED BY:	
CAD FILE:	CONTAINMENT
SCALE:	NONE



50 0 50
SCALE IN FEET

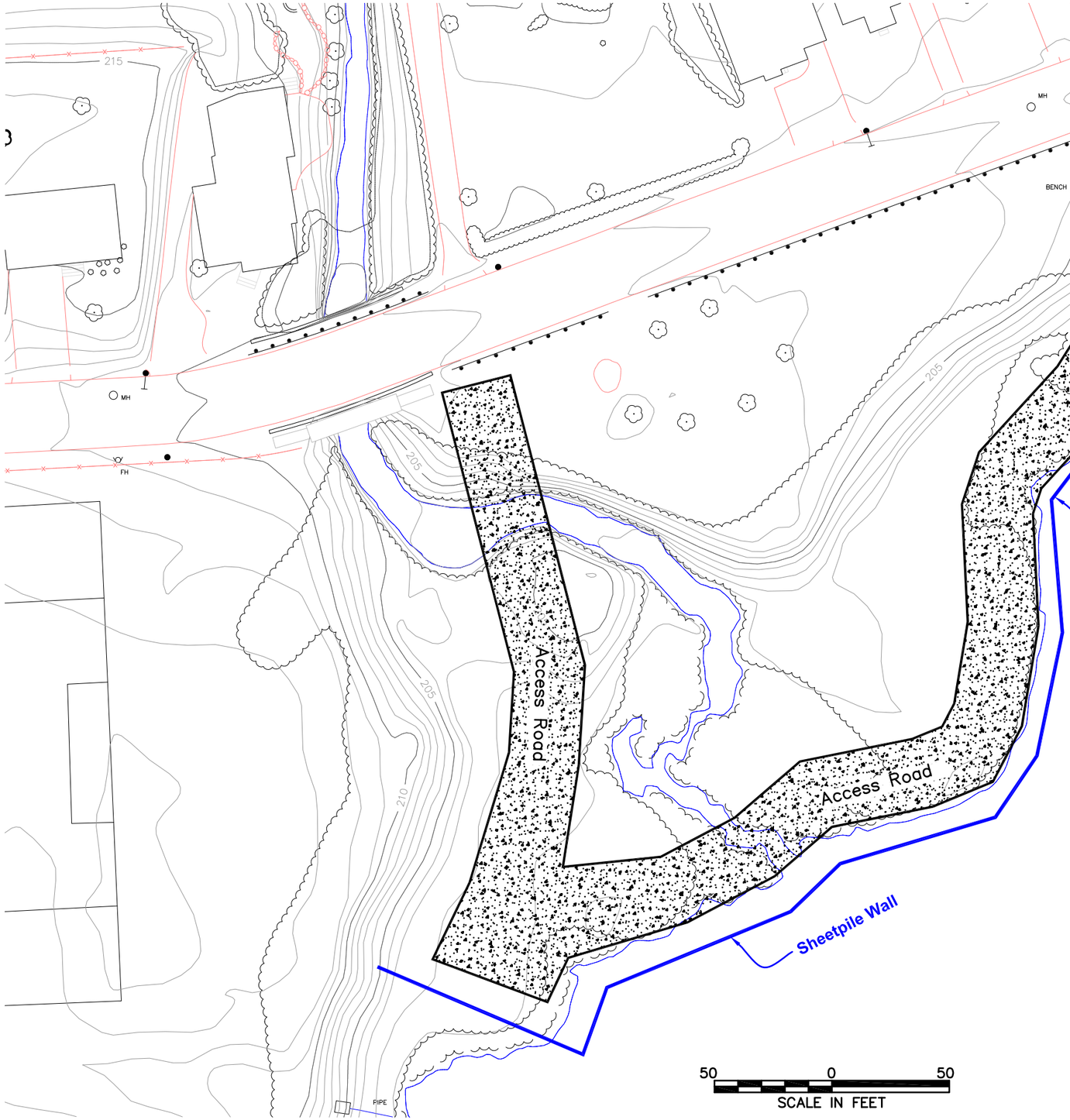
Dewatering Equipment Layout

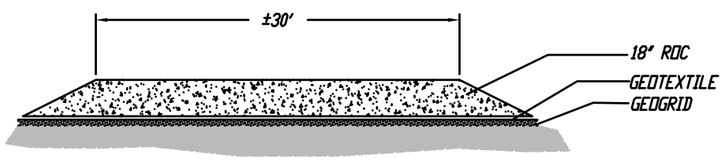
Dupont Pompton Lakes
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING
2

DATE:	4/27/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Dewatering Equipment–Layout
SCALE:	as shown





Access Road Detail
NTS

Temporary Access Road

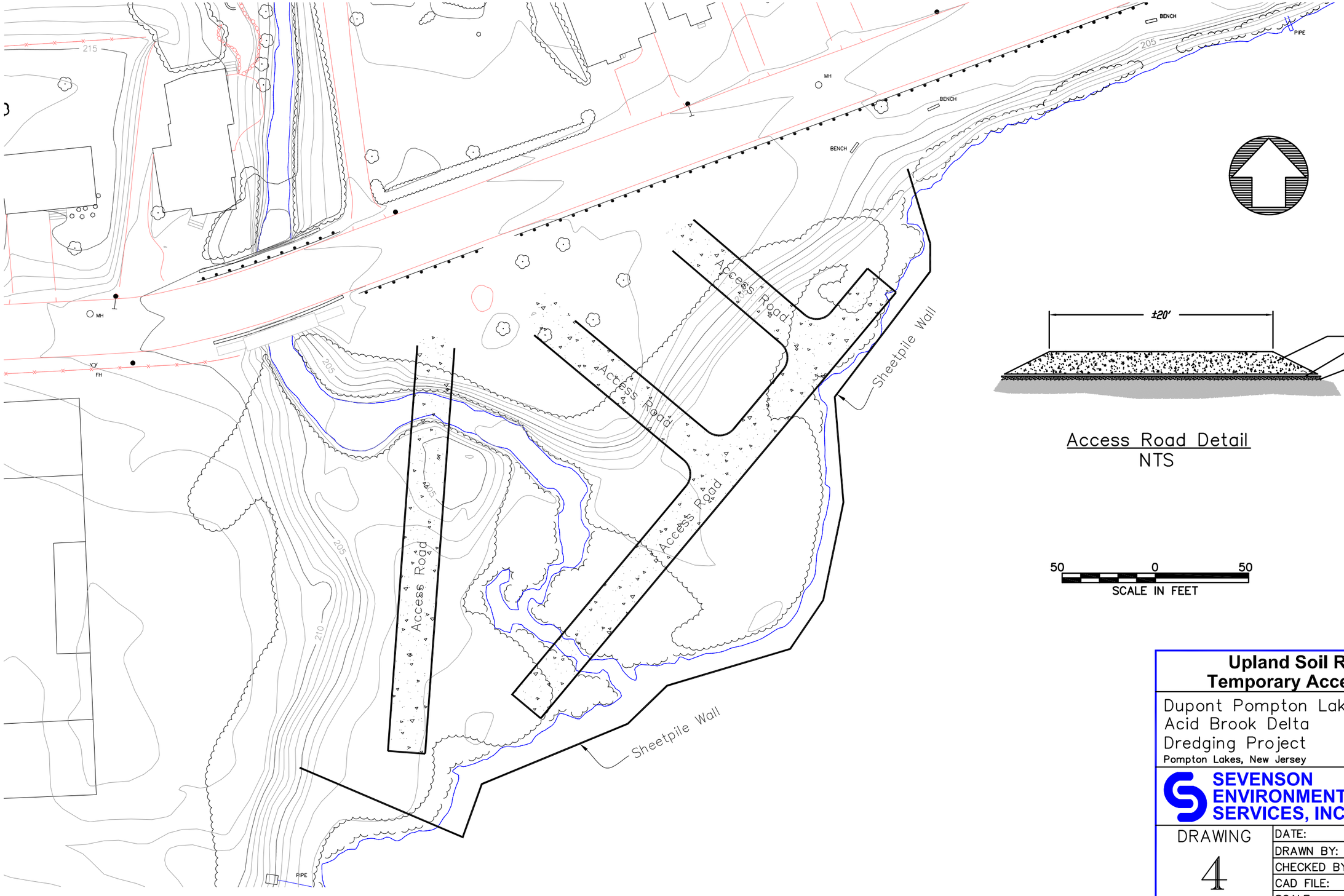
Upland Soil Remediation Access Roads and Sheetpile Wall Alignment

Dupont Pompton Lakes
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING 3

DATE:	4/28/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Sheetpile Wall Upland
SCALE:	as shown



Access Road Detail
NTS

50 0 50
SCALE IN FEET

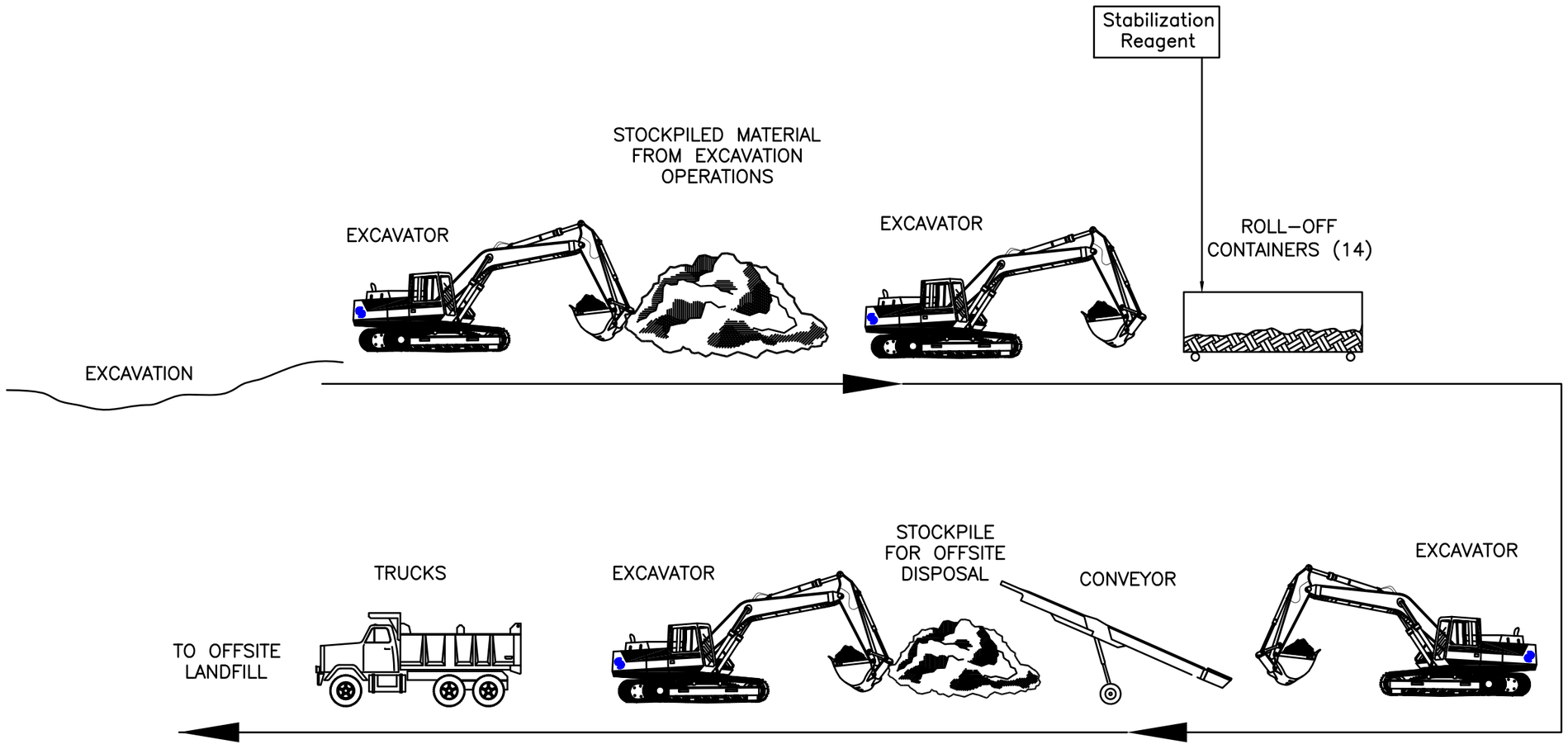
Upland Soil Removal
Temporary Access Roads

Dupont Pompton Lakes
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING 4

DATE:	4/29/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Access Roads
SCALE:	as shown



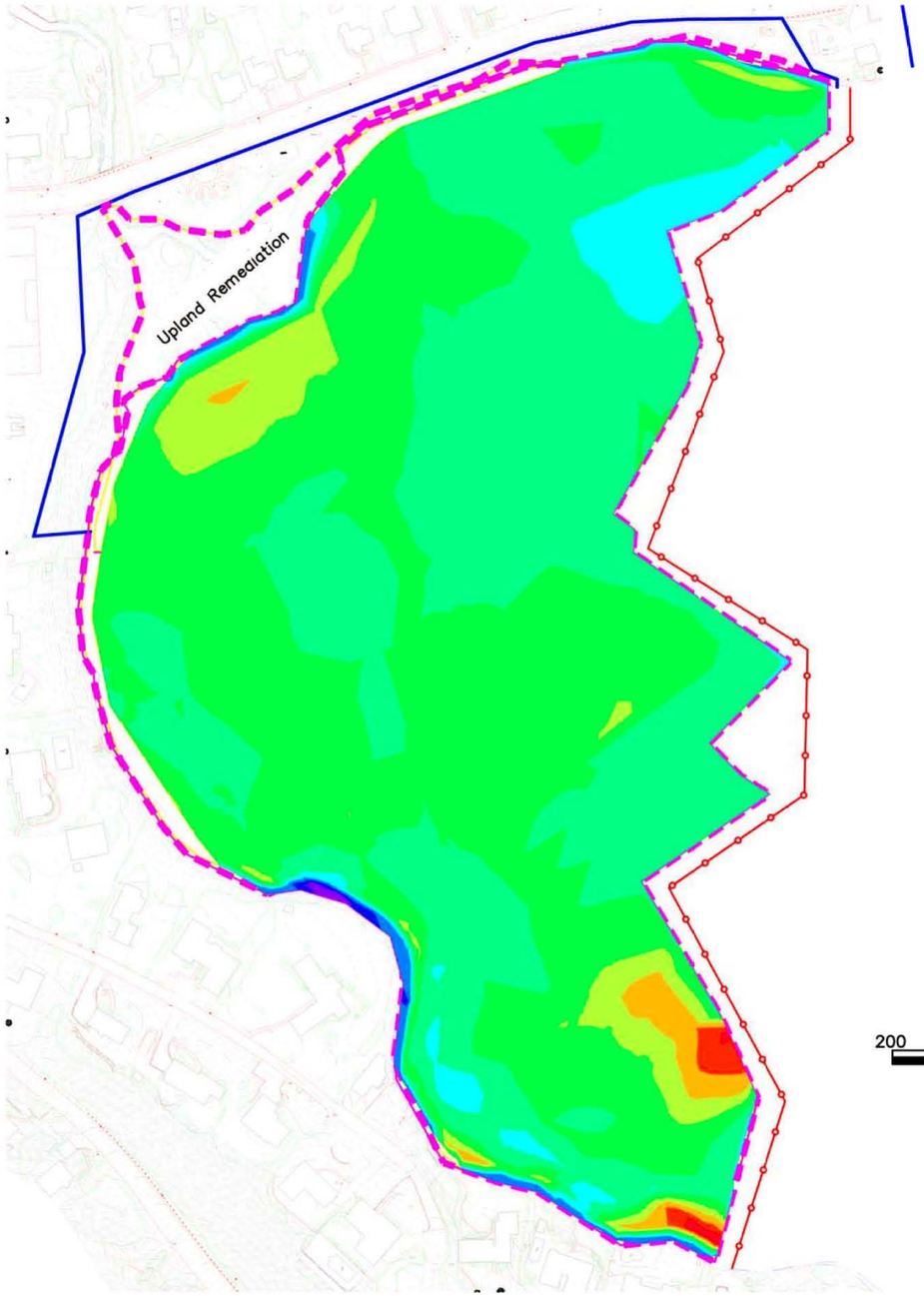
Excavation Operation Process Flow Diagram

Dupont Pompton Lakes
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING 5

DATE:	4/28/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Solid–PFD
SCALE:	NONE



Legend

Sediment Removal Limit

Proposed Sheeting

Excavation Depth Table			
Number	Maximum Depth	Minimum Depth	Color
1	−7	−6	
2	−6	−5	
3	−5	−4	
4	−4	−3	
5	−3	−2	
6	−2	−1	
7	−1	0	
8	0	1	
9	1	2	
10	2	3	

200 0 200

SCALE IN FEET

Revised 9/6/2011

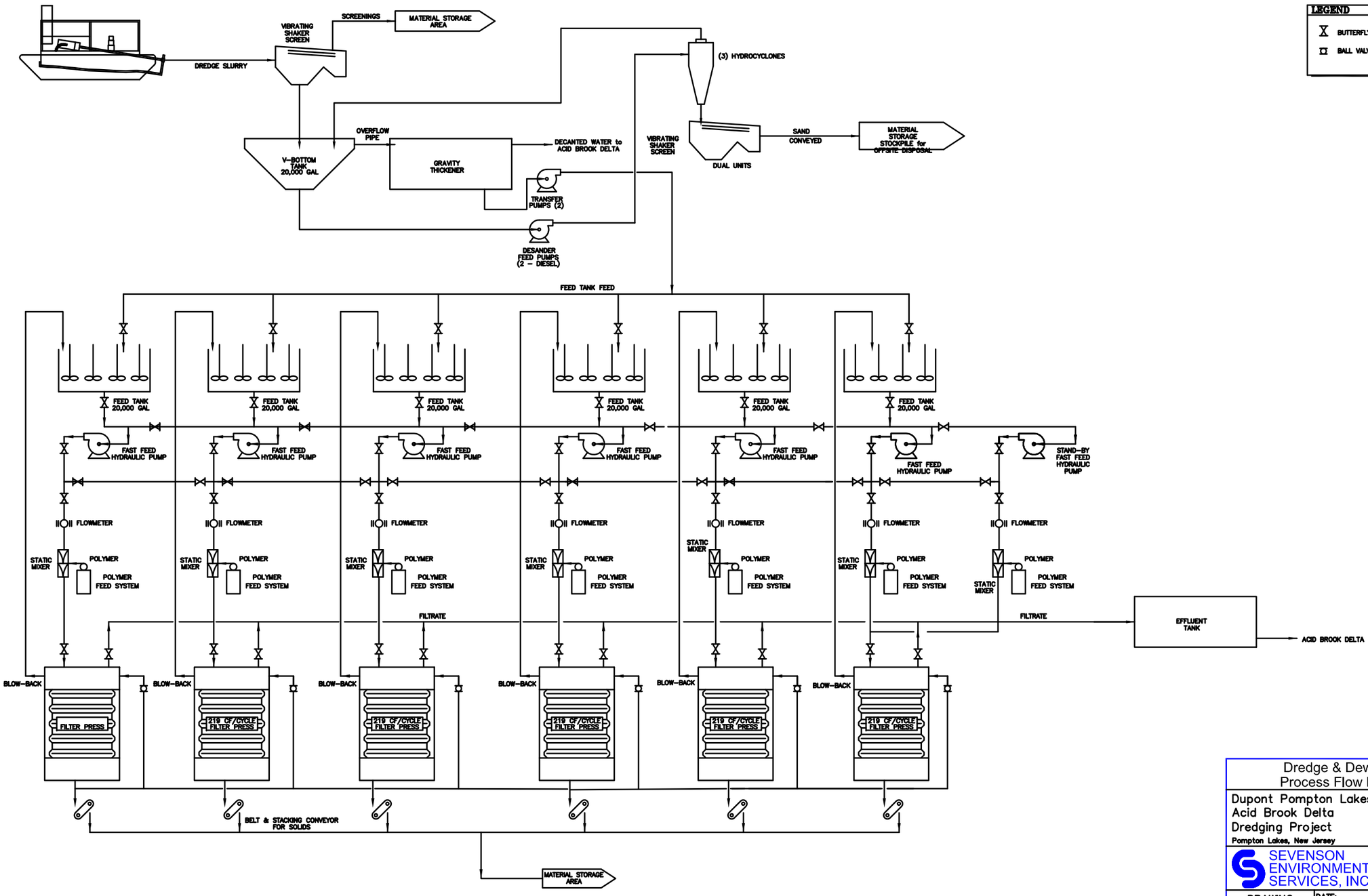
Upland Remediation & Sediment Removal
Sevenson Estimated Volumes

Dupont Pompton Lakes
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING 6

DATE:	4/29/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Sediment Removal
SCALE:	as shown



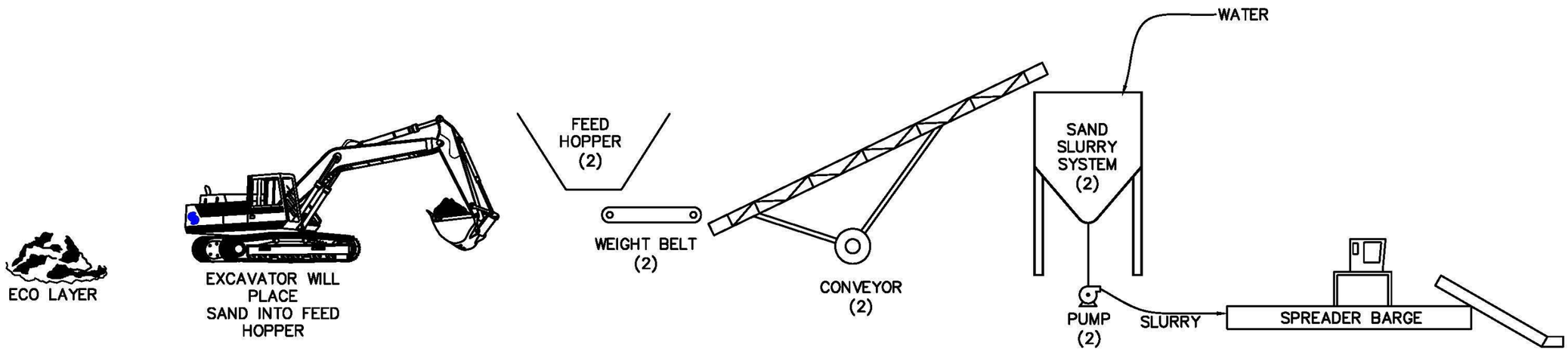
Dredge & Dewatering
Process Flow Diagram

Dupont Pompton Lakes
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING 7

DATE:	4/28/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Dewating-PDF
SCALE:	none



Eco-Layer
Process Flow Diagram

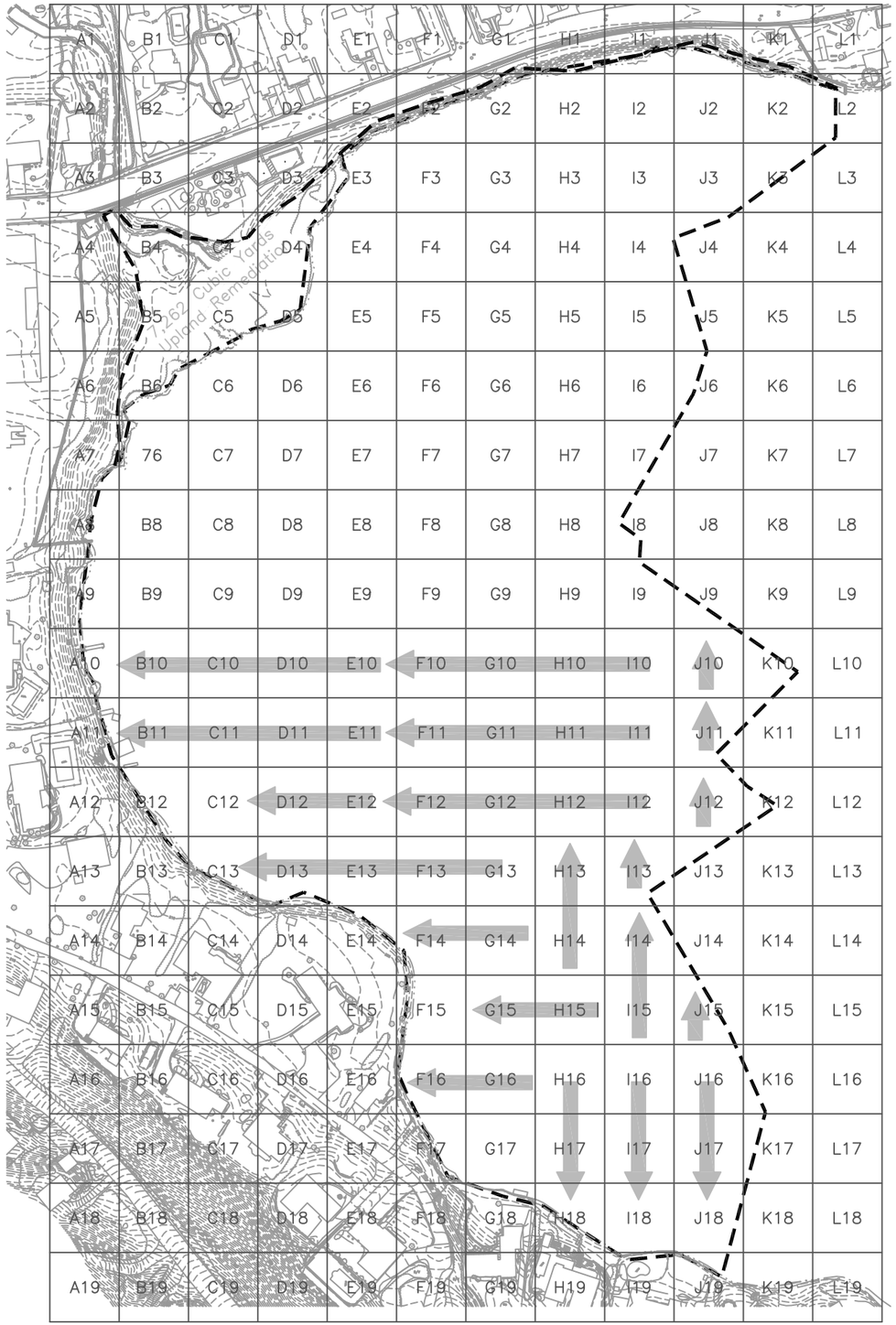
Dupont Pompton Lakes
Acid Brook Delta
Dredging Project

Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

DRAWING 8

DATE:	4/28/11
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Capping-PFD
SCALE:	none



Legend

- Sediment Removal Limit
- Example Dredge Sequence And Cap Sequence
- L13 DREDGE MANAGEMENT UNIT ID

0 200' 400'

GRAPHIC SCALE

Dredge Sequence and Cap Sequence

Dupont Pompton Lakes
Acid Brook Delta
Dredging Project
Pompton Lakes, New Jersey

SEVENSON ENVIRONMENTAL SERVICES, INC.

FIGURE 9

DATE:	5/20/2011
DRAWN BY:	C. Bigelow
CHECKED BY:	M. Crystal
CAD FILE:	Sediment Removal
SCALE:	as shown

Sheetpile Barrier Wall Design Detail

POMPTON LAKES ACID BROOK
RIGID BARRIER INSTALLATION –TECHNICAL APPROACH

The technical approach selected by Sevenson Environmental Services (SES) for the installation and operation of the "rigid barrier" at the Pompton Lakes – Acid Brook remediation project consists of driving approximately 2300 linear feet of Arcelor – Mittal AZ-19 interlocking steel sheet piling. A turbidity curtain will be installed outboard of the sheeting as a secondary containment system. The alignment of the sheeting wall will follow the path depicted on Arcadis drawing 2-2.

Soil borings, located within the work area, performed in November 2010, generally indicate a variable layer of PEAT over a very dense sub-rounded gravel and Sand. The consistency of the lake bed soils transitions with depth to dense, mostly with a change in soil classification to SAND. Penetration resistance values in the very dense to dense granular soils vary from a high of N=75 to a more common range of N=20, plus or minus. The driving of double pairs of sheets is judged to be moderately hard to nominally hard, based on these soil consistency values.

Predicated on the soil conditions, a section modulus / wall thickness material was selected that will permit the driving to proceed through the lake bed soils. The relative stiffness of the sheeting section also serves as the basis for the design of the cantilever barrier. The design calls for sheets 23 feet long with an unbalanced hydrostatic load of 3 feet which yields a total deflection of 0.4 feet at the top of the barrier.

Sheeting installation will be performed from floating barges using vibratory equipment that will tend to liquefy the granular soils ahead of the tip of the sheets. The liquefaction will be a very temporary condition that will not impact any neighboring structure or the completed barrier. The alignment of the finished rigid barrier will be established and monitored in the field using GPS equipment. Sheeting installation will permit adjacent pairs to be deflected between 5 degrees to 10 degrees, such that the installed barrier will negate the use of any specially fabricated corner sections. Removal of the installed barrier will also be accomplished using the vibratory equipment.

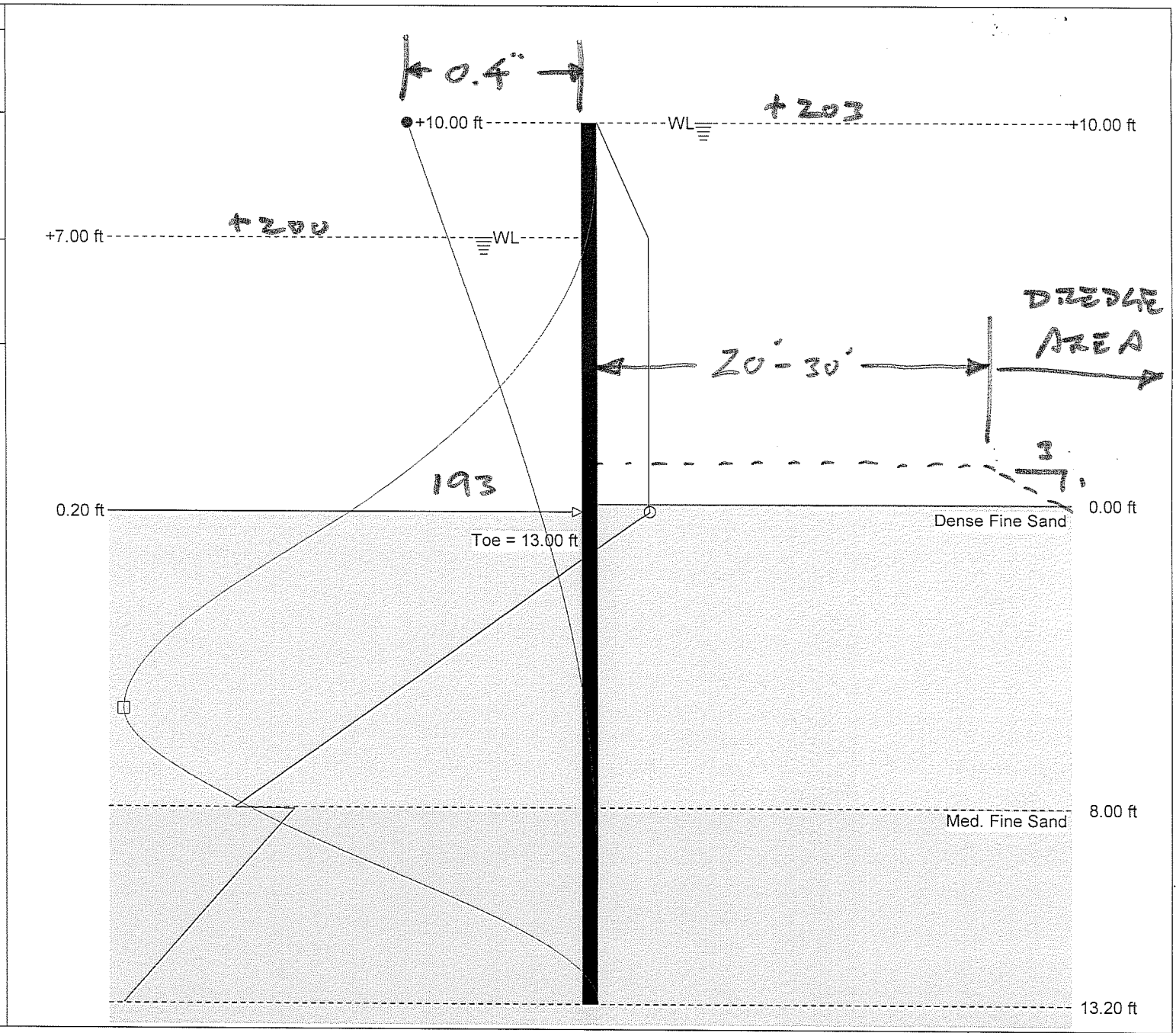
Client: 11-1055 Pompton Lake Barrier

Title: Sheet Piliing Barrier Wall
Designer: jg
Page: 1
Date: 4.25.11

Sheet: Arcelor AZ 19-700
Works: Temporary
Pressure: Coulomb
Analysis: Net Pressure
FOS: 1.18 ($K_p \div 1.2$; $C_{pas} \div 1.2$)
Toe: Cantilever

Maximum	d (ft)
○ 191.0 psf	0.20
□ 13698.4 ftlb/ft	5.43
● 0.4 in	-10.00

Active Water @ 203'
Passive Water @ 200'
Sediment at 193'



Glynn Geotechnical Engineering
415 South Transit Street
Lockport, NY
Tel: 716.625.6933
Fax: 716.625.6983
EMail: www.glynngroup.com

Sediment Processing Mass Balance

SEVENSON ENVIRONMENTAL SERVICES, INC. MASS BALANCE
Sediment Processing of Acid Brook Delta Using De-sanders Followed By Filter Presses

Project Name: Pompton Lakes
Date: Final
Revision: 2

Insitu Material

		2" Overcut	DuPont's Volume
Volume, cubic yards	**81,926**	**6,926**	**75,000**
Oven Dry Solids, %	**30.30%**		
Specific Gravity	**1.27**		
Density, tons per cubic yard	1.07		
Silt and Finer Mass, dry weight	**68.50%**		
Sand and Coarser Mass, dry weight	**31.50%**		

Filter Press Inputs

Silt and Finer Mass, Dry tons	18,140
Cake Oven Dry Solids, %	**58.00%**
Cake Density, tons per cubic yard	1.20
Cycle Time, minutes	110
On- Line Factor, %	82%
Press Size, cubic feet per drop	**219**
Number of Presses	**8.00**
Feed Oven Dry Solids, %	**7.00%**
Available Operating Hours, hours/day	**10**
Available Operating Days, days/week	5
Dry Additives, lbs per gallon	0
Filtrate Solids, ppm	50

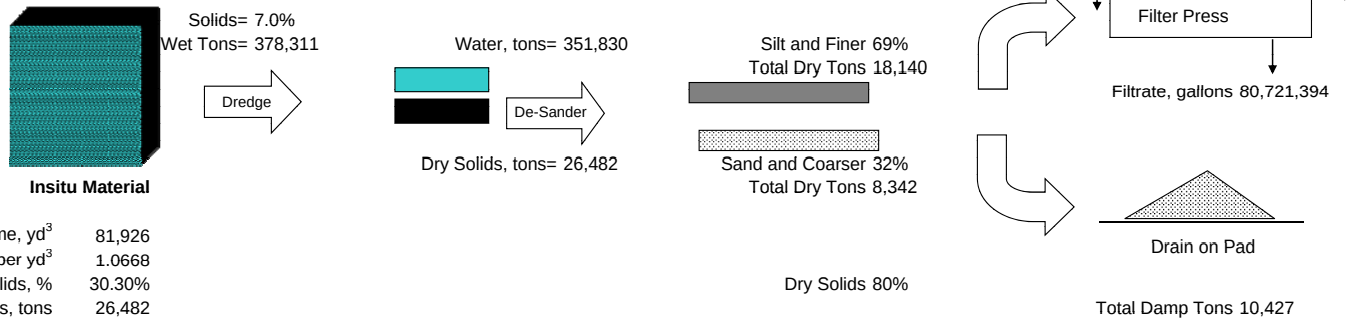
Process Calculations

De-sander Material Removal, dry tons	8,342		
Gravity Drained Sand Dry Solids, %	80%		
De-sander Material Removal, wet tons	10,427	**115.41**	
Filter Cake Production, total wet tons	31,276	**346.15**	
Filter Cake Production, tons/operating day	**346**	**461.56**	**Tons/Day**
Operating Days, days	**90**	**4.5**	**Months**
Job Production Duration, weeks	18.07		
Filtrate+Drain Water Prod, gallons per day	893,401		
Filtrate+Drain Water Production total gallons	80,721,394		
Average Filtrate+Drain Water Prod (gpm)	1,827		
Designed WWT Water Production (gpm)	**2000**		
CY / Day Insitu	**907**		
Dry Tons / Day	**293**		

Upland Soil Remedial
7,800 CY Insitu
10,140 Tons Insitu
811 Additives
10,951 Tons for Disposal

T&D Sediments	**41,703 Tons**
Total Cake & Sand	33,015 CY
Filter Cake	26,063 CY
Sand	6,951 CY

Process Summary



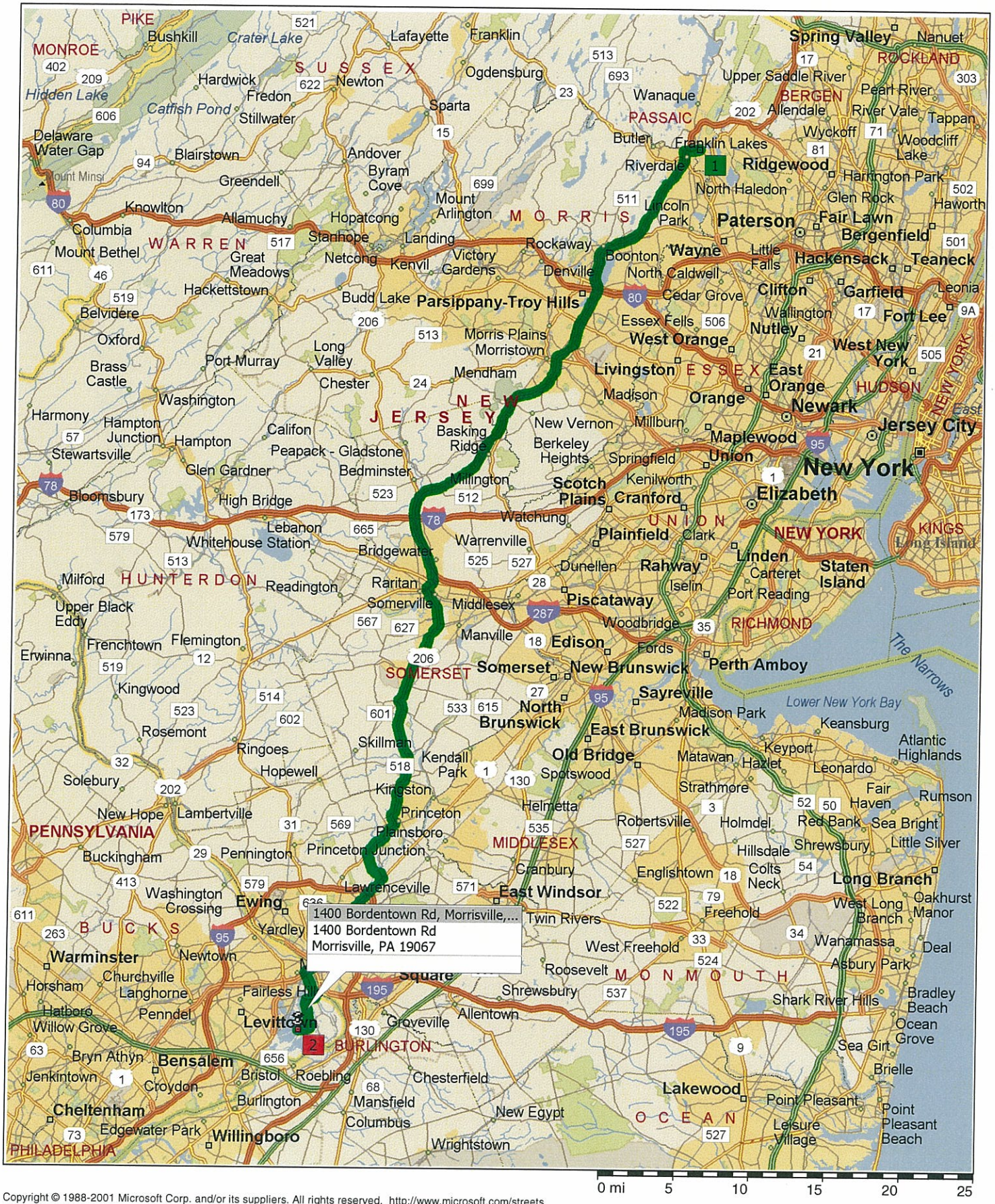
Insitu Material

Volume, yd^3	81,926
Density, tons per yd^3	1.0668
Dry Solids, %	30.30%
Dry Solids, tons	26,482
Sediment Mass, wet tons	87,399

Haul Route

Pompton Lakes to 1400 Bordentown Rd, Morrisville, PA 19067

74.7 miles; 1 hour, 34 minutes

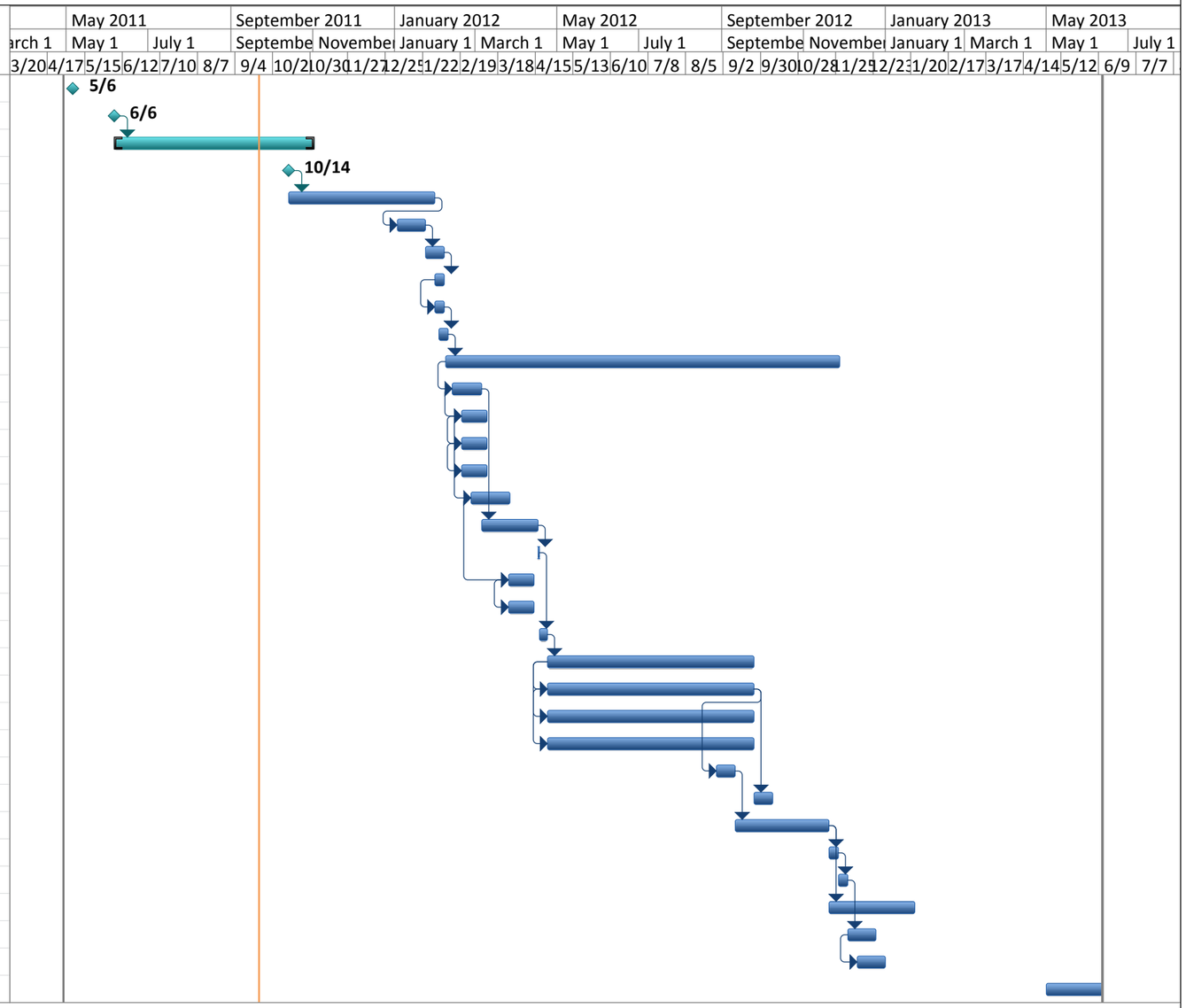


9:00 AM	0.0 mi	1 Depart Pompton Lakes on CR-689 [Paterson Hamburg Tpke] (West) for 0.3 mi
9:01 AM	0.3 mi	Continue (West) on Paterson Hamburg Tpke for 0.8 mi
9:03 AM	1.1 mi	Turn LEFT (South) onto Ramp for 0.2 mi towards I-287 / RT-23
9:03 AM	1.2 mi	Merge onto I-287 (South) for 35.7 mi
9:36 AM	36.9 mi	Turn off onto Ramp for 0.5 mi towards US-202 / US-206 / US-22 W / Somerville / Flemington
9:37 AM	37.5 mi	Continue (South) on US-206 [US-202] for 1.0 mi
9:39 AM	38.5 mi	Continue (South-West) on Ramp for 0.2 mi towards RT-28 / US-206 S / Somerville / Princeton
9:39 AM	38.7 mi	At roundabout, take the SECOND exit for 164 yds
9:39 AM	38.8 mi	Exit roundabout onto US-206 for 20.0 mi
10:06 AM	58.8 mi	Turn LEFT (South) onto Province Line Rd for 2.1 mi
10:10 AM	60.9 mi	Continue (South) on Ramp for 0.3 mi towards US-1
10:10 AM	61.2 mi	Continue (South-West) on US-1 [Brunswick Pike] for 8.2 mi
10:21 AM	69.0 mi	Entering Pennsylvania
10:22 AM	69.4 mi	Bear RIGHT (West) onto Ramp for 0.1 mi towards South Pennsylvania Ave / Morrisville
10:22 AM	69.6 mi	Bear RIGHT (South) onto S Pennsylvania Ave for 1.7 mi
10:26 AM	71.3 mi	Continue (South) on Ramp for 0.1 mi towards Tyburn Rd
10:26 AM	71.4 mi	Continue (West) on New Tyburn Rd for 0.6 mi
10:27 AM	72.0 mi	Turn LEFT (South) onto New Ford Mill Rd for 1.9 mi
10:32 AM	73.9 mi	Bear RIGHT (South) onto Local road(s) for 87 yds
10:32 AM	73.9 mi	Bear RIGHT (West) onto Bordentown Rd for 0.8 mi
10:34 AM	74.7 mi	2 Arrive 1400 Bordentown Rd, Morrisville, PA 19067 [1400 Bordentown Rd, Morrisville, PA 19067]

Schedule

Pompton Lake Acid Brook
Delta Area

ID	Task Name	Duration	Start	Finish
1	Bid Due	0 days	5/6/11	5/6/11
2	Contract Award for Premobilization Activities	0 days	6/6/11	6/6/11
3	Pre Mob Activities (Permitting, HASP, etc.)	106 days	6/6/11	11/1/11
4	Award Field Activities	0 days	10/14/11	10/14/11
5	Procure Sheet Piling	70 days	10/14/11	1/30/12
6	Offsite Mobilization	15 days	1/3/12	1/23/12
7	Mobilization	10 days	1/24/12	2/6/12
8	Site Preparation and Staging Area Construction	5 days	1/31/12	2/6/12
9	Install Access Roads and Site Grading	5 days	1/31/12	2/6/12
10	Clearing and Grubbing	5 days	2/3/12	2/9/12
11	Install & Operation of Bypass Acid Brook	210 days	2/8/12	11/27/12
12	Install Upland Sheet Pilling and Access Road Behind Wall	16 days	2/13/12	3/5/12
13	Upland Area Material Removal and Access "Fingers" As Needed	15 days	2/20/12	3/9/12
14	Upland Material Stabilization	15 days	2/20/12	3/9/12
15	Upland Material T & D	15 days	2/20/12	3/9/12
16	Backfill Upland Area	21 days	2/27/12	3/26/12
17	Install Sheeting in ABD	30 days	3/6/12	4/16/12
18	Install Silt Curtains	1 day	4/17/12	4/17/12
19	Mob & Install Dewatering Plant Equipment	15 days	3/26/12	4/13/12
20	Mob & Install Dredge Equipment	15 days	3/26/12	4/13/12
21	Fish Relocation	4 days	4/18/12	4/23/12
22	Dredge	110 days	4/24/12	9/24/12
23	Sediment Dewatering	110 days	4/24/12	9/24/12
24	Sediment T & D	110 days	4/24/12	9/24/12
25	Material Handling	110 days	4/24/12	9/24/12
26	Mob & Install Capping Equipment	10 days	8/28/12	9/10/12
27	Demobilize Dewatering Equipment	10 days	9/25/12	10/8/12
28	Place Eco-Layer Within ABD	50 days	9/11/12	11/19/12
29	Demob Capping Equipment	5 days	11/20/12	11/26/12
30	Remove Processing Pad	5 days	11/27/12	12/3/12
31	Remove All Sheeting	46 days	11/20/12	1/22/13
32	Upland Site Restoration	15 days	12/4/12	12/24/12
33	Sevenson Demobilization	15 days	12/11/12	12/31/12
34	Wetland Restoration	30 days	5/1/13	6/11/13



Project: Pompton 4.29.11
Date: 9/22/11

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

Sevenson Environmental Services, Inc.