Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Project Objective
- Remove an estimated 250,000 cubic yards of sediment from the Canal in order to restore its flow capacity

Project Goals
- Protect the historical integrity of the Canal
- Maintain technical quality
- Maintain water supply

Critical Project Elements
- Develop dredging plan acceptable to stakeholders
- Focused outreach to public officials and stakeholders
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Project Area
Dry Excavation

- Canal separated into reaches varying in manageable lengths
- Each Reach with Access Area and Truck Ramp
- Flow Bypassed through Work Area (portadam or other structure with piping to convey flow into the Millstone)
- Flow diversion structures to facilitate removal on short notice to safeguard against high flow (flood) events
- Low-ground pressure excavators and dozers used to excavate sediment
- Sediment within the dewatered canal section will be reworked and air dried prior to excavation
- Allows for higher degree of accuracy during removal (increased volume control)
- Requires intensive water management operations
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Mechanical Dredging

- Conducted in the wet using hydraulic excavator operating from shallow-draft barge or flexi-float system
- Hydraulic clamshell bucket to be used on dredge to minimize turbidity (1-3 cubic yard bucket)
- Dredge maneuvering with non-penetrative methods (anchors, guidelines, etc.)
- Dredged sediment to be placed into 10-20 cubic yard scows or 20 cubic yard containers on flexi-floats
- Scows unloaded to trucks or hydraulically pumped to dewatering area
- Sediment dewatered by air-drying, stabilization, geobags, or mechanical dewatering system
- Potential for multiple dredge units operating simultaneously
- Access concerns in shoreline areas
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Hydraulic Dredging

- Conducted in the wet using hydraulic cutterhead dredge
- Requires separate Submerged Aquatic Vegetation (SAV) / debris removal operations prior to dredging to prevent clogging
- Dredge maneuvering with non-penetrative methods (anchors, guidelines, etc.)
- Booster pumps required facilitate transport of dredged sediment through plastic pipeline to dewatering area
- Dredged sediment to be dewatered using geobags or mechanical dewatering system
- High comparative production rate
- Water generation significantly more than other investigated removal methods
- Requires extensive water treatment / water management operations
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Conceptual Traffic Routes

- Project Area
- Truck Route
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Section 106 of the National Historic Preservation Act – Cultural Resources Investigations and SHPO Review
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Potentially Required Permits

- U.S. Army Corps of Engineers
- Delaware and Raritan Canal Commission
- NJ Department of Environmental Protection
  - Freshwater wetlands
  - Flood hazard area
  - No net loss reforestation
  - Water lowering
  - Fish stocking
  - NJPDES Water Quality Certification
  - Section 106 consultation
- Somerset-Union County Soil Conservation District
  - NJPDES Construction
  - Soil erosion and sediment control

Dredge Methodology

<table>
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<tr>
<th>Potential Requirements</th>
<th>Mechanical Wet</th>
<th>Dry Excavation</th>
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Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Level II Environmental Information Document

- Key Environmental Issues
  - Public use
  - Surface water
  - Floodplains and riparian zones
  - Biotic (plant and animal communities)
  - Forest
  - Wetlands
  - Threatened and endangered species
  - Cultural resources
  - Impacts on water users
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Staging Area and Site Access Selection Process

Wetland Investigation
- Secondary source data
- Preliminary field investigation
- Wetland delineation and survey
## Project Schedule

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- **J** = January, **F** = February, **M** = March, **A** = April, **M** = May, **J** = June, **J** = July, **A** = August, **S** = September, **O** = October, **N** = November, **D** = December
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Typical Staging and Dewatering Area – Mechanical Excavation and Mechanical Dredging
Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

Typical Staging and Dewatering Area – Hydraulic Dredging / Off-loading