

# 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

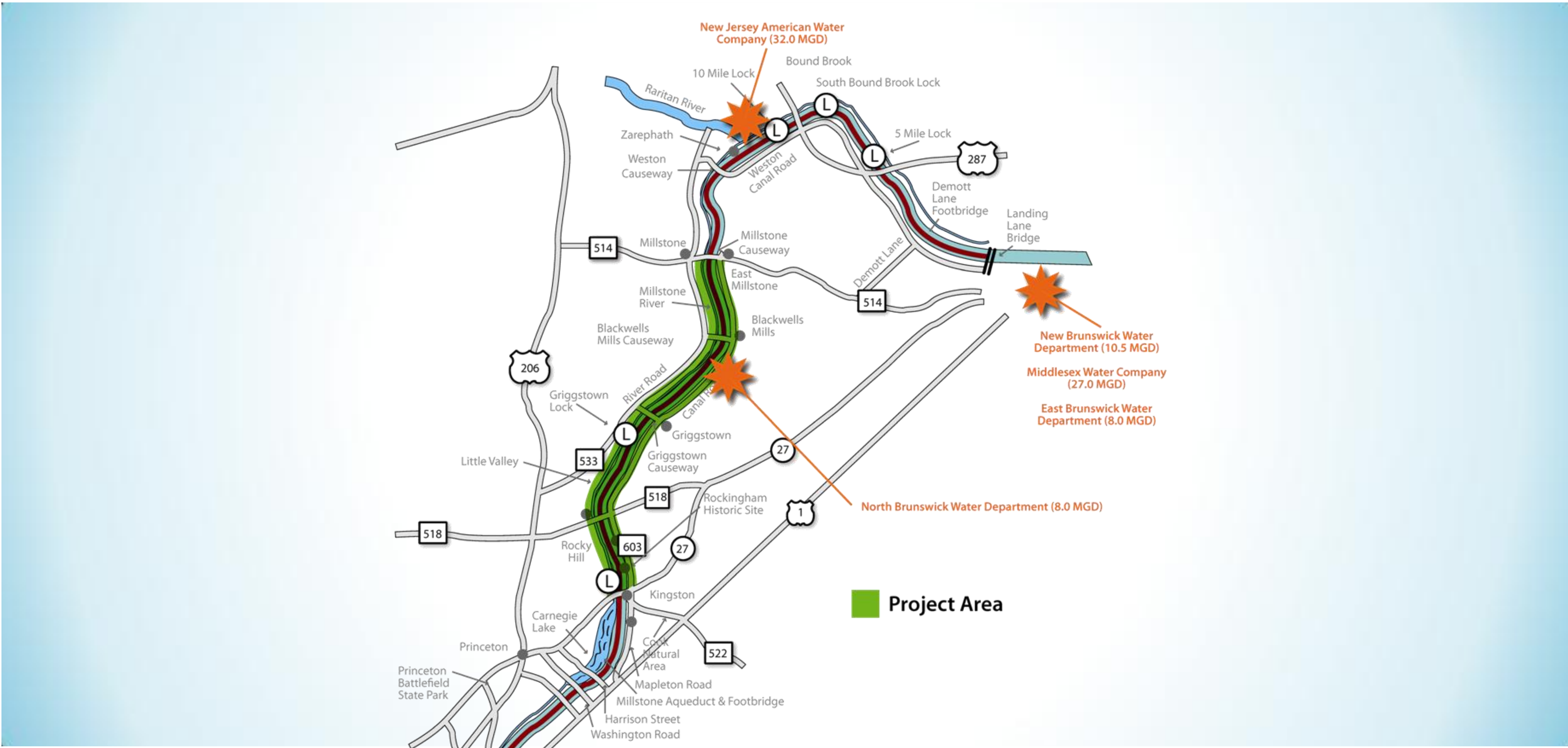
## Critical Project Elements

- Develop dredging plan acceptable to stakeholders
- Focused outreach to public officials and stakeholders



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## Project Area



New Jersey Water



Supply Authority

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

## Dry Excavation

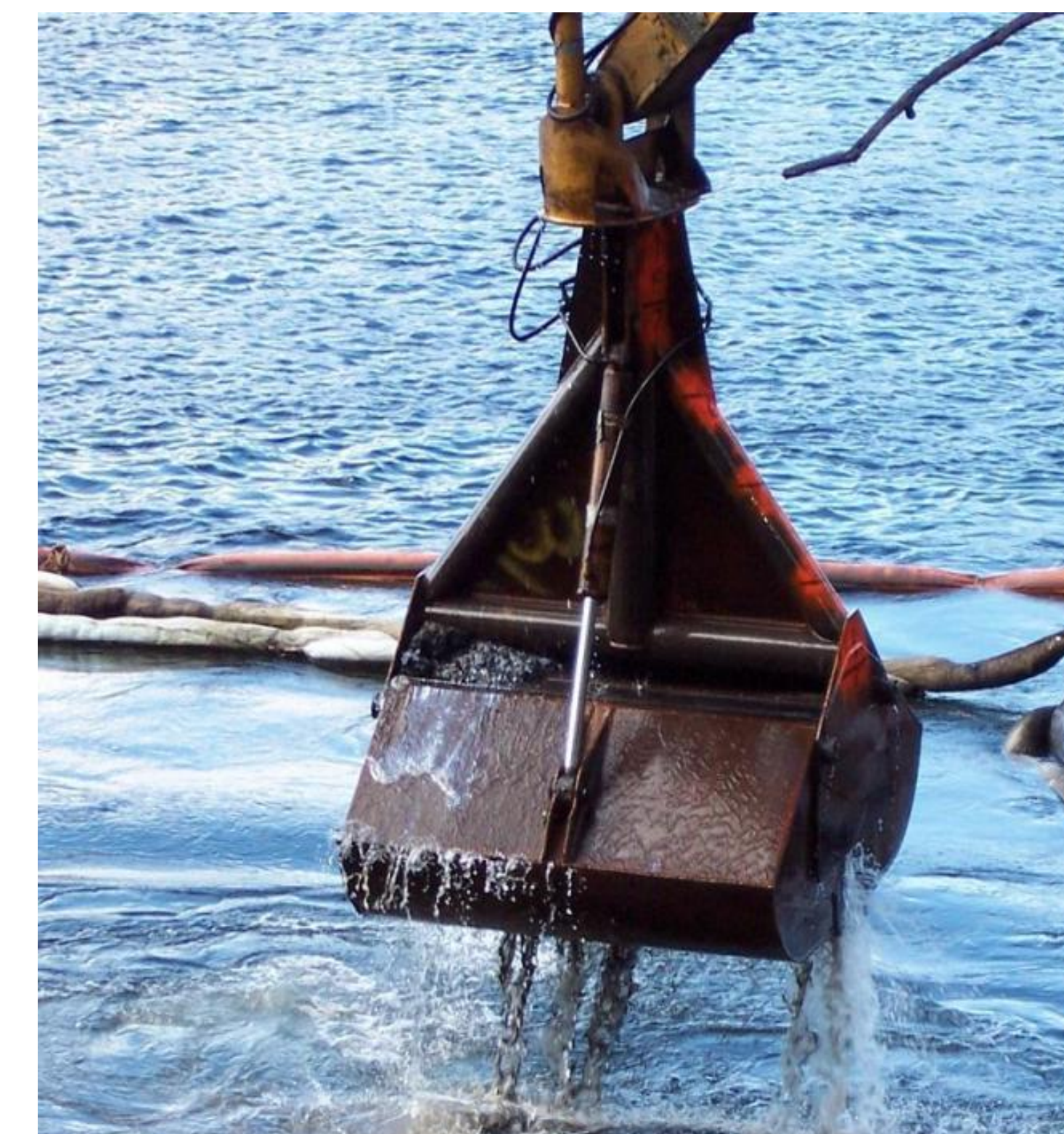
- Canal separated into reaches varying in manageable lengths
- Each Reach with Access Area and Truck Ramp
- Flow Bypassed through Work Area (portadam or other structure with piping to convey flow into the Millstone)
- Flow diversion structures to facilitate removal on short notice to safeguard against 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



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## 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



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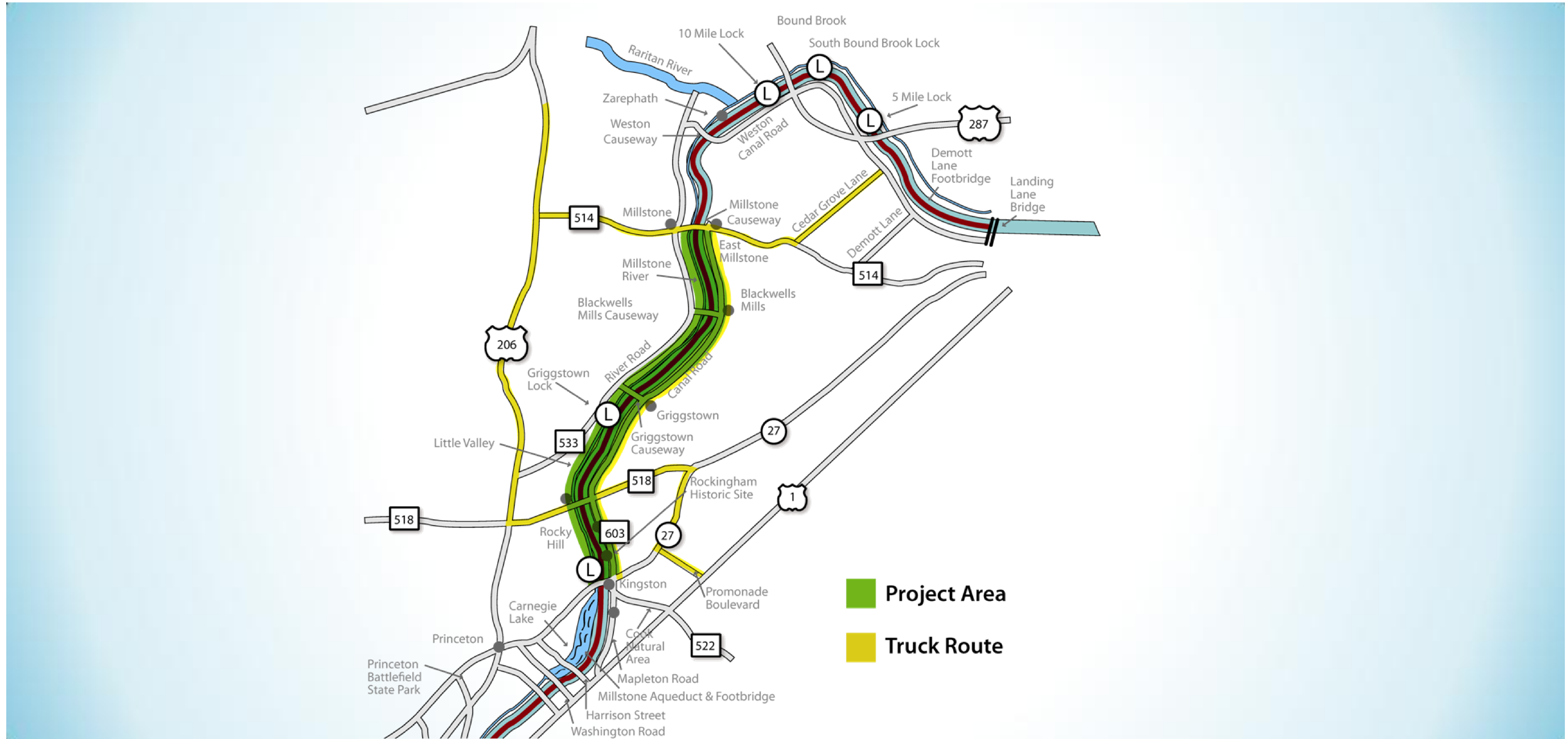
## Hydraulic Dredging

- 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



# 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



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# 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		
		Mechanical Wet	Dry Excavation	Hydraulic
Potential Requirements	Canal Draining		✓	
	Staging Areas	✓	✓	✓
	Access Areas	✓	✓	✓
	Tree Clearing	✓	✓	✓
	Tree Trimming	✓	✓	✓
	Wetland and Wetland Transition Area Impacts	✓	✓	✓
	Species Relocation/ Restocking	✓	✓	✓
	Flood Hazard Area Disturbance	✓	✓	✓
	Traffic Impacts	✓	✓	✓
	Historical Site Impacts	✓	✓	✓
	Trail Closures	✓	✓	✓

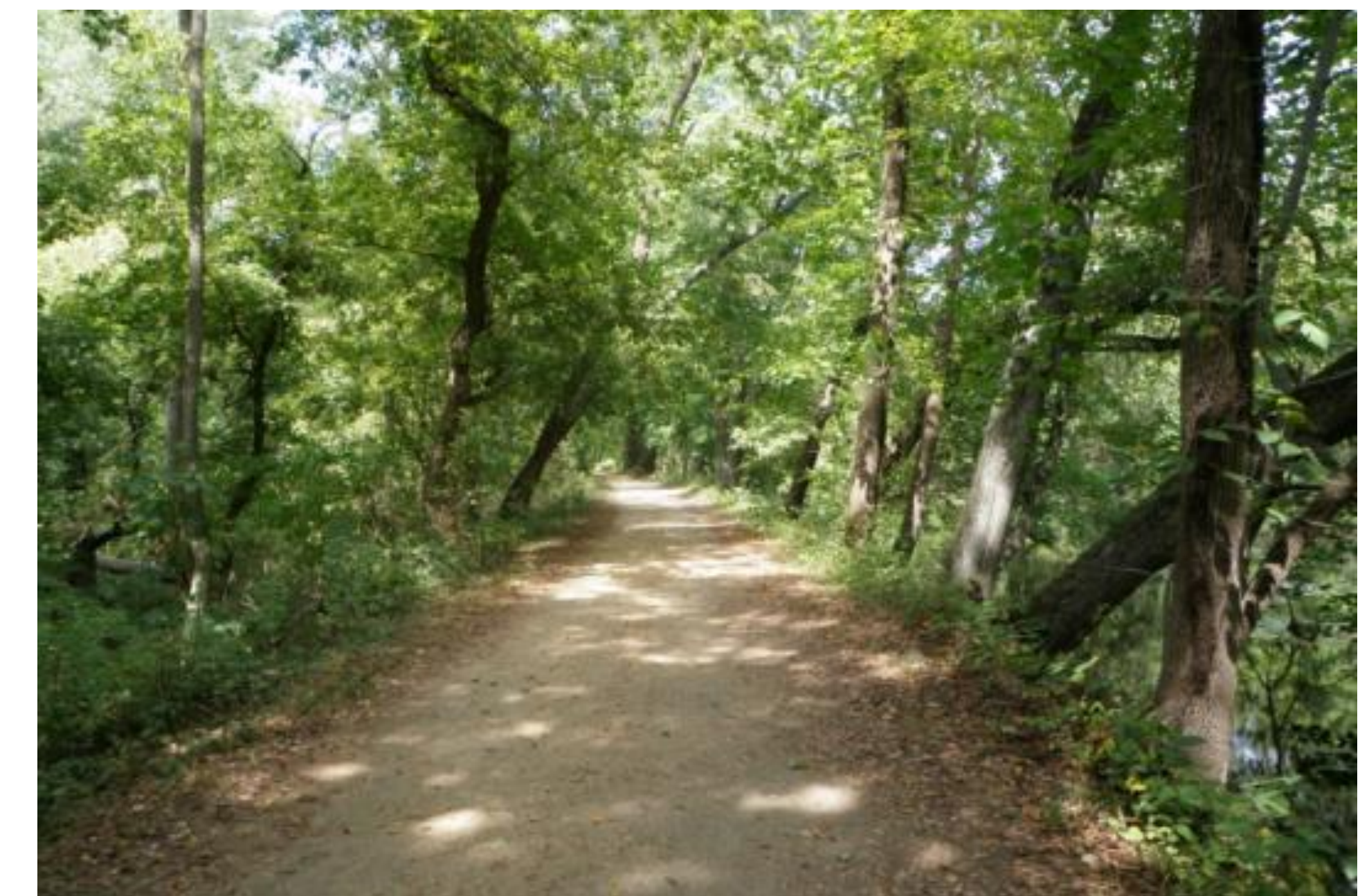




# Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

## Level II Environmental Information Document

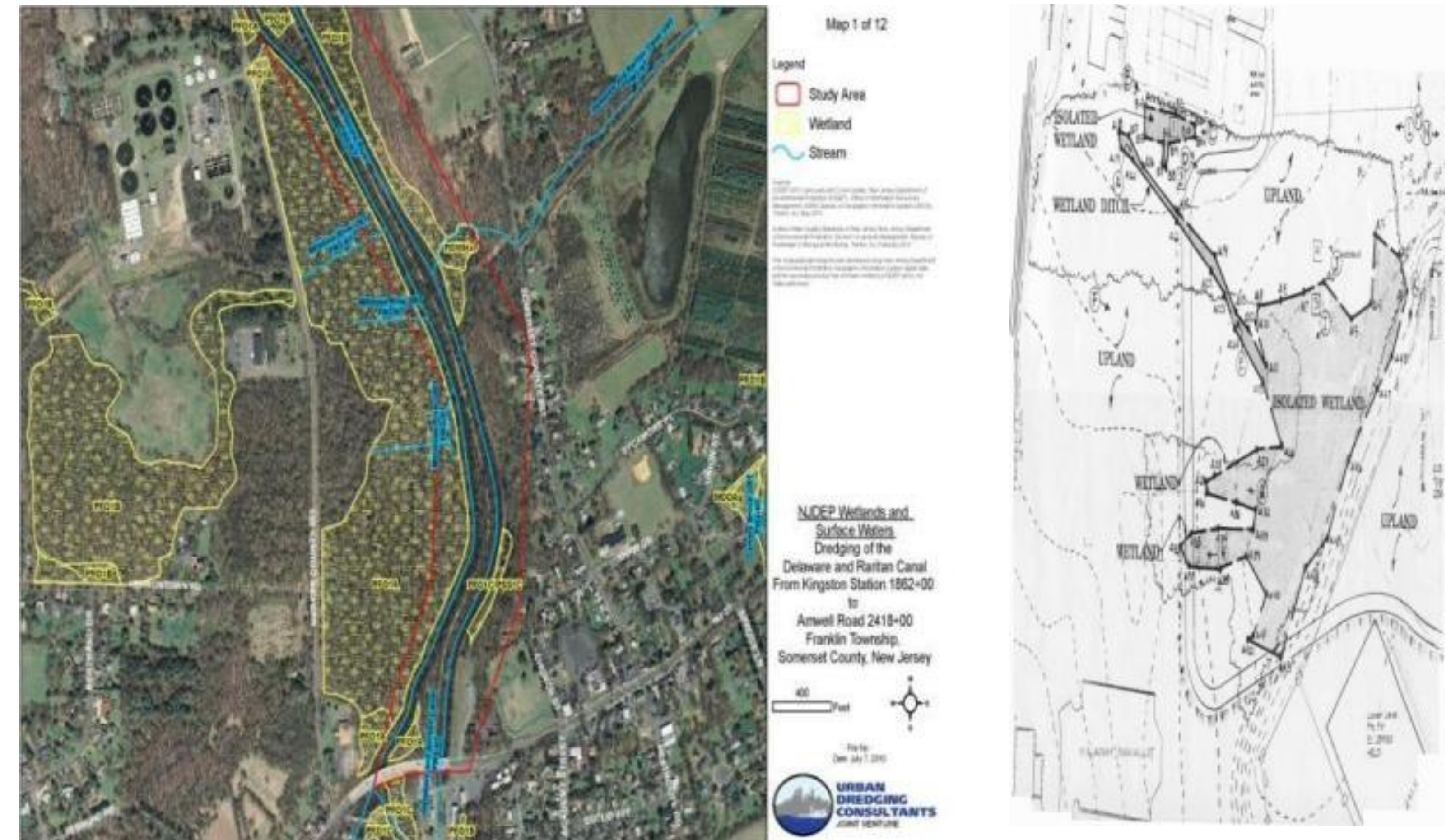
- Key Environmental Issues
  - Public use
  - Surface water
  - Floodplains and riparian zones
  - Biotic (plant and animal communities)
  - Forest
  - Wetlands
  - Threatened and endangered species
  - Cultural resources
  - Impacts on water users



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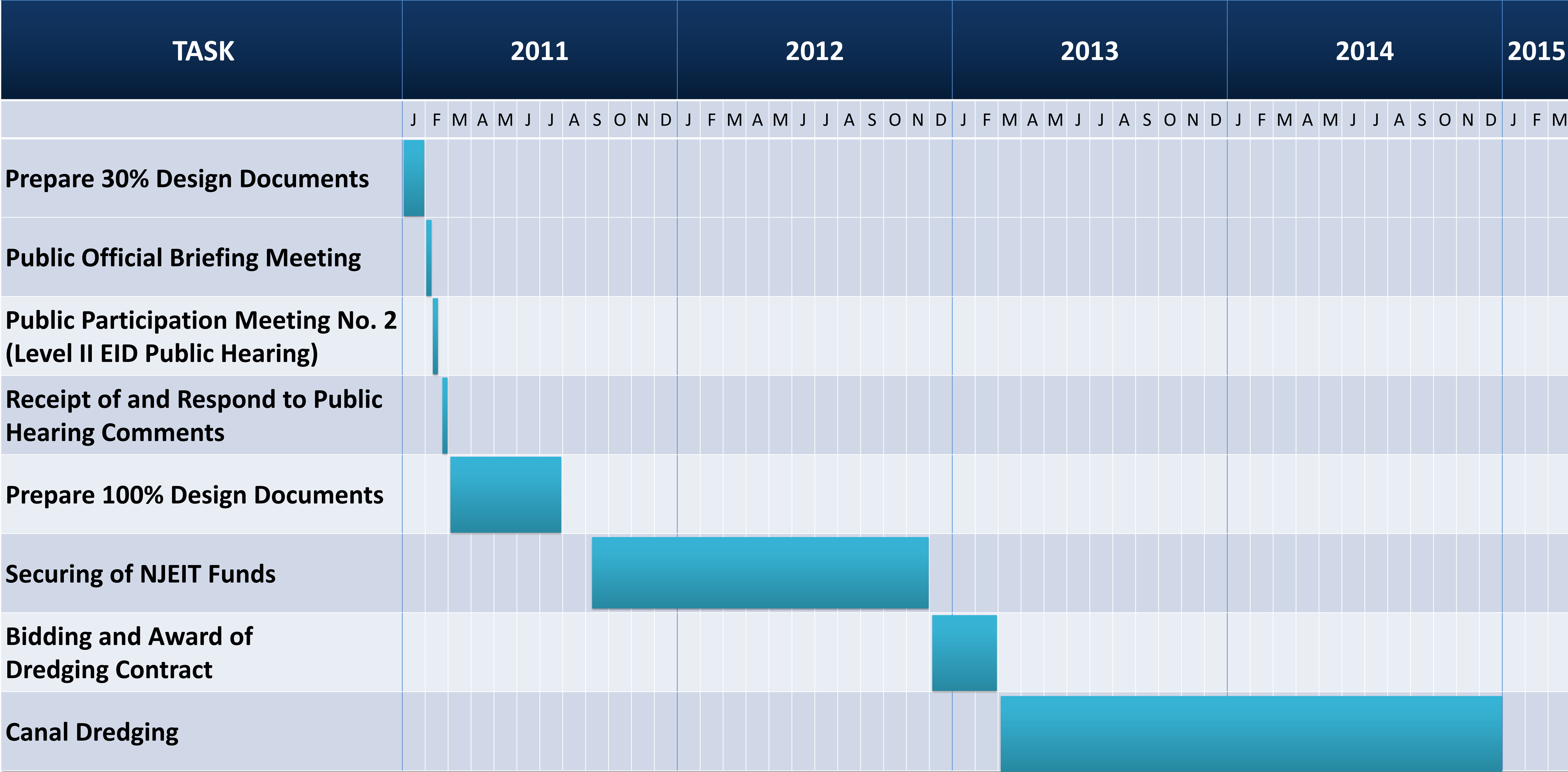
## Staging Area and Site Access Selection Process Wetland Investigation

- Secondary source data
- Preliminary field investigation
- Wetland delineation and survey



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## Project Schedule



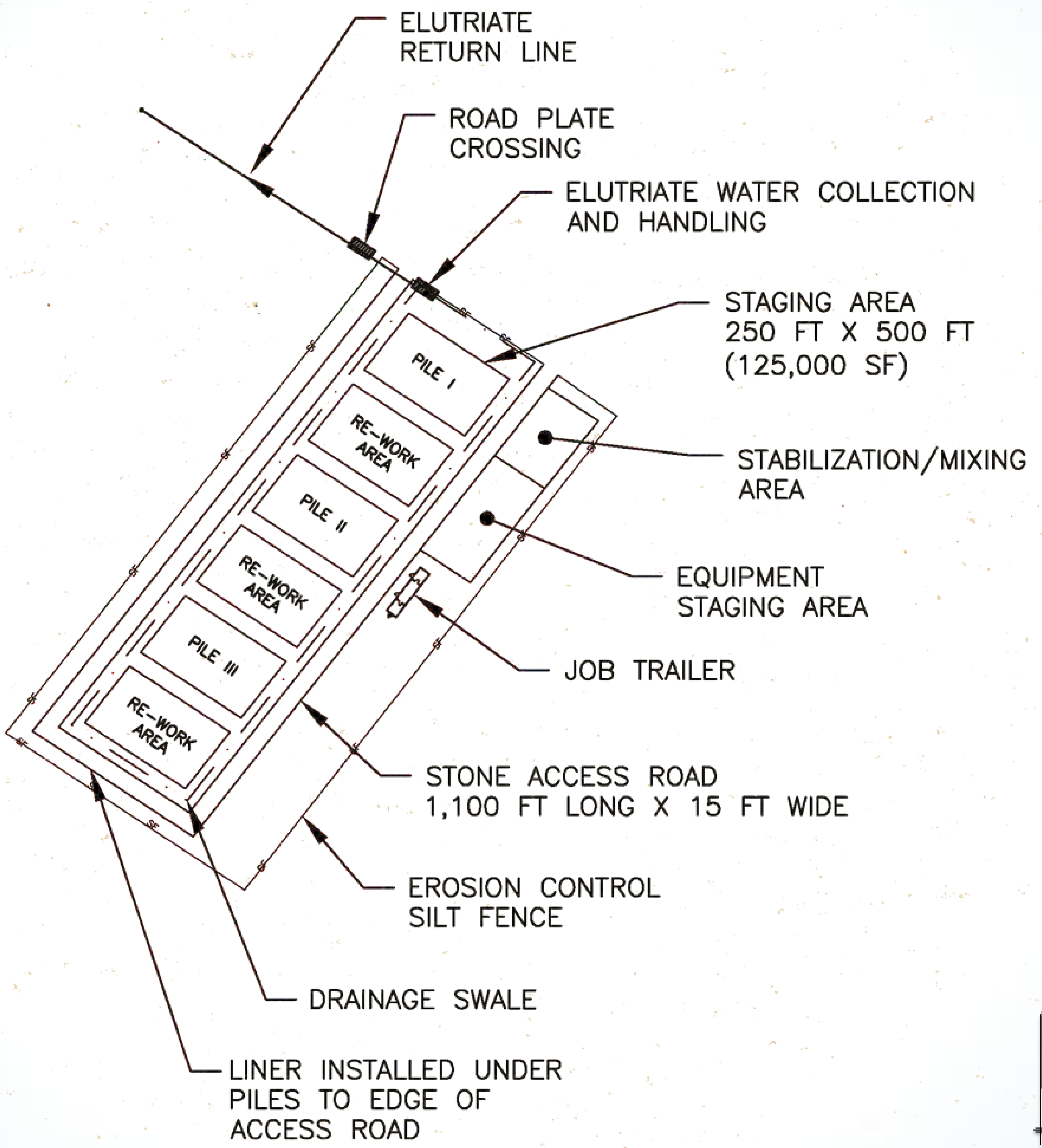
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# Dredging of the Delaware and Raritan Canal from Kingston to Amwell Road

## 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

