The Lake Gaston Project

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Purpose and Need

- In 1980, Virginia Beach became the largest City in the state, but **it had no independent or reliable water supply**
- Dependent upon Norfolk for surplus only supply
- Surplus was inadequate since 1976
- The City restricted water often, and in one case had to ration water.
- The City restricted water and placed a moratorium on extensions of the water systems for **five** consecutive years: 1992-97
Decades of Alternatives Analyses

- **New reservoirs**: Would not pass the environmental reviews – wetlands, irreversible habitat losses, etc
  - Examples: Ware Creek and King William Reservoirs

- **Regional Groundwater Aquifer**: could not provide sufficient quantities long-term

- **Seawater Desalting**: Too expensive (then and now)

- Alternatives to the Gaston pipeline were the subject of extensive regulatory and legal debate

- *In 1982, Virginia Beach decided to pursue the Lake Gaston Water Supply Project on behalf of itself and its partner, Chesapeake*
The Lake Gaston Water Transfer
60 MGD from the Roanoke River Basin
15-year Permitting and Legal Odyssey

- Project required multiple state and federal permits and a host of local permits from the localities along the pipeline’s route.
- Six formal environmental studies/reviews over 12-year period.
- Three District Court rulings, two Appellate Court rulings, two refusals by Supreme Court to grant opponent’s appeals.
- Every study and every ruling confirmed the need and efficacy of the project.
Project Overview

- Pump Station - 125 miles west of Virginia Beach on the Pea Hill Creek tributary of Lake Gaston
- 64 of 76 miles of pipeline are within a VA Power ROW or an abandoned railroad ROW
Basic Project Features

- 76-miles of 60-in Dia. Ductile Iron and Pre-stressed Concrete Cylinder Pipe
- 6 Trenchless Highway Crossings (incl. I-95)
- 2 Railroad Trenchless Crossings
- 52 Open-Cut Highway Crossings
- 6 Overhead River/Swamp Crossings (5 used existing piers within the abandoned railroad right-of-way)
Construction Highlights

• Schedule:
  - 21 Months
  - Five Pipeline Contracts
  - 7500 ft./week Max. Pipe Production Rate
  - Prior construction of critical path items significantly reduced construction time
Pump Room – Five Dual Speed Pumps
500/1,200 HP
Pressure Control Locations

PIPELINE PROFILE

PEA HILL CREEK PUMP STATION
PRESSURE CONTROL STRUCTURES
TERMINUS FACILITIES
WEIR/AERATION STRUCTURE

ELEV. (FT.)

122 KILOMETERS (76 MILES)
Intake

- Continuous slot wedge-wire
- **Dimensions (ea. Screen):** 7 ft. Diameter by 14 ft. Long screen element
- **Slot opening width:** 1.0 mm
- **Max. Velocity through slot:** 0.5 ft. Per second
Pump Station Designed to Control Noise and Aesthetics
City Wanted to be Good Neighbor
Sea Level Rise

- Approx. 60% of sea level rise may be due to land subsidence – groundwater withdrawal is a major contributor.

- DEQ proposing major cuts to big groundwater users in Hampton Roads.

- The Lake Gaston pipeline has relieved much of the Region’s dependency on municipal groundwater.
Benefits of the Lake Gaston Project

- Eliminated a chronic, structural water shortage in South Hampton Roads
  - It changed the region
- Norfolk surplus water available to other localities
- Reduced groundwater withdrawals from the regional aquifer
- A significant project legacy may be the role it plays in reducing land subsidence
QUESTIONS?