

# T. N. Elliot Dam Spillway Rehabilitation



## Agenda

- Introduction
- History
- Existing Structure
- Legislative Requirements
- Scope of Work
- Project Cost
- Project Schedule
- Additional Benefits
- Summary



# T. N. Elliot Dam Rehabilitation

## History & Background

1968 – 71 Dam Construction Period

### Reservoir

74.5 square mile watershed  
Full Pool volume is 5.3 billion gallons  
790 acres of surface water

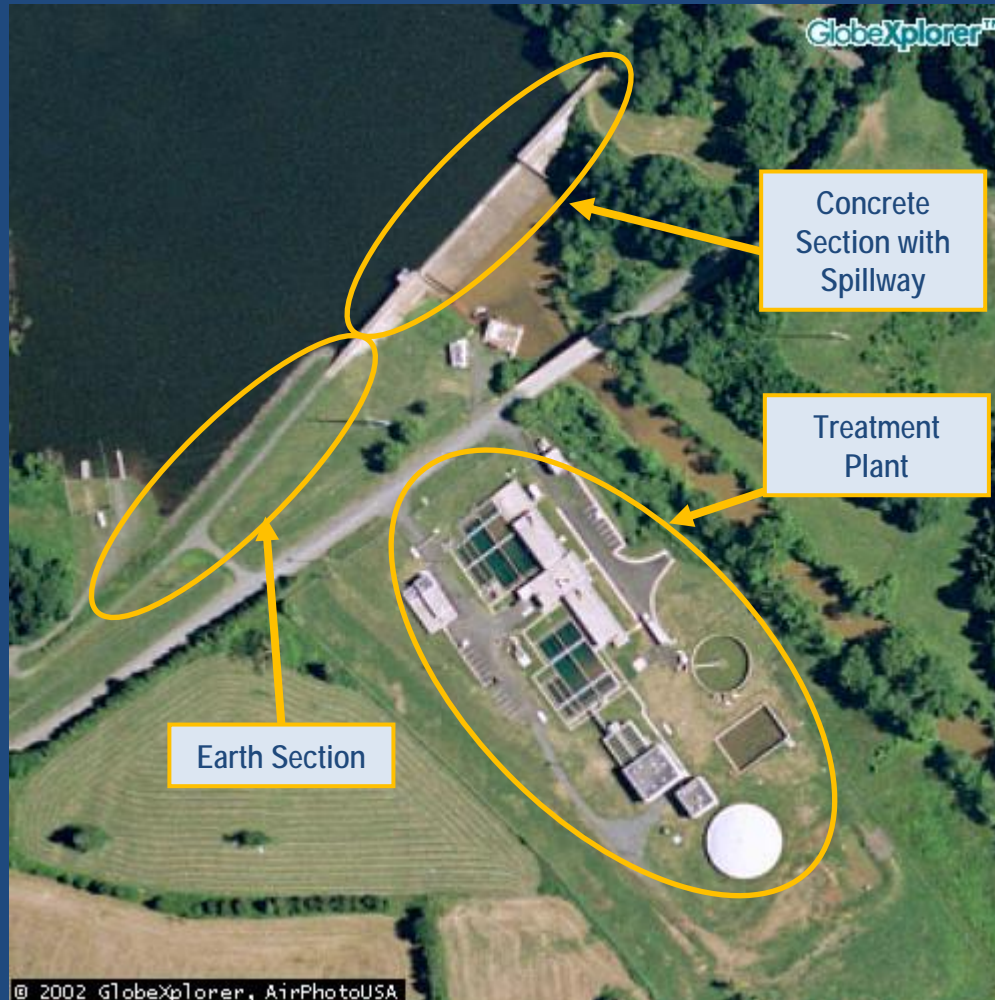
### Water Treatment

Supplies 14 MGD to City of Manassas Water  
Treatment Plant



# T. N. Elliot Dam Rehabilitation

## Existing Structure



## Earthen/Concrete Dam

- Total Structure - 1,306 ft
- 74 ft high
- 636 ft concrete gravity section
- 220 ft principal spillway
- 670 ft. earthen section
- 5' rubber bladder installed





# T. N. Elliot Dam Rehabilitation

## Regulatory Requirements

Year 1968 – Original design for 0.5 PMF

Year 2000 – Department of Conservation and Recreation (DCR) Dam Safety identifies design storm to be 100% Probable Maximum Flood (PMF)

### Spillway Design Floods

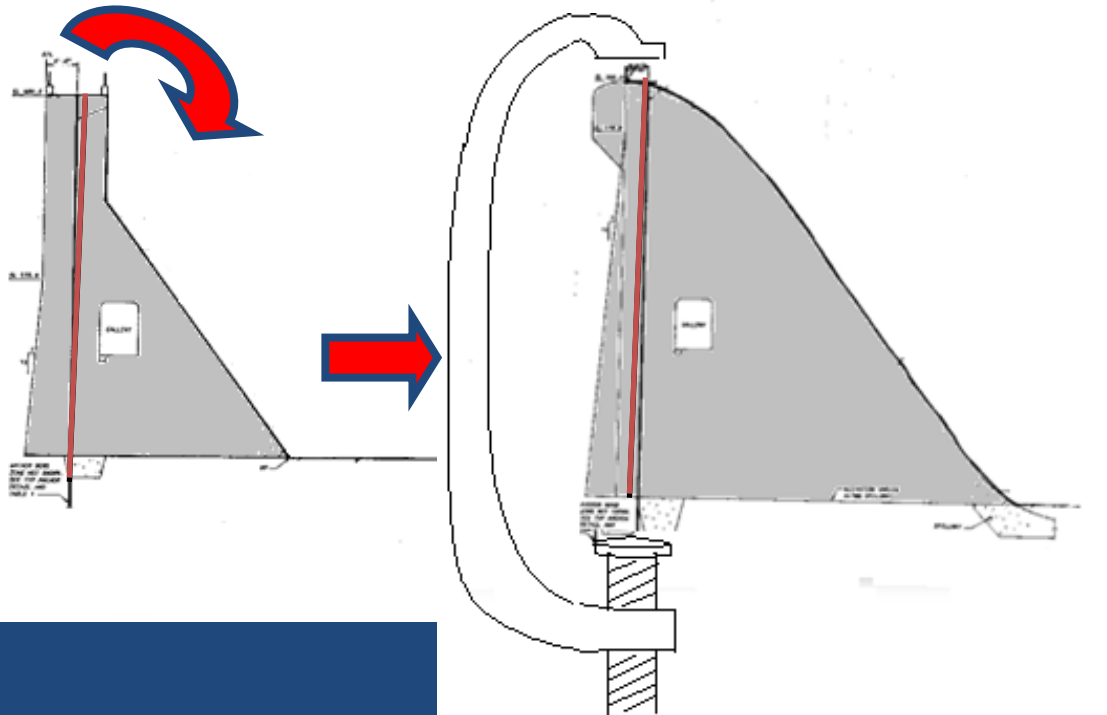
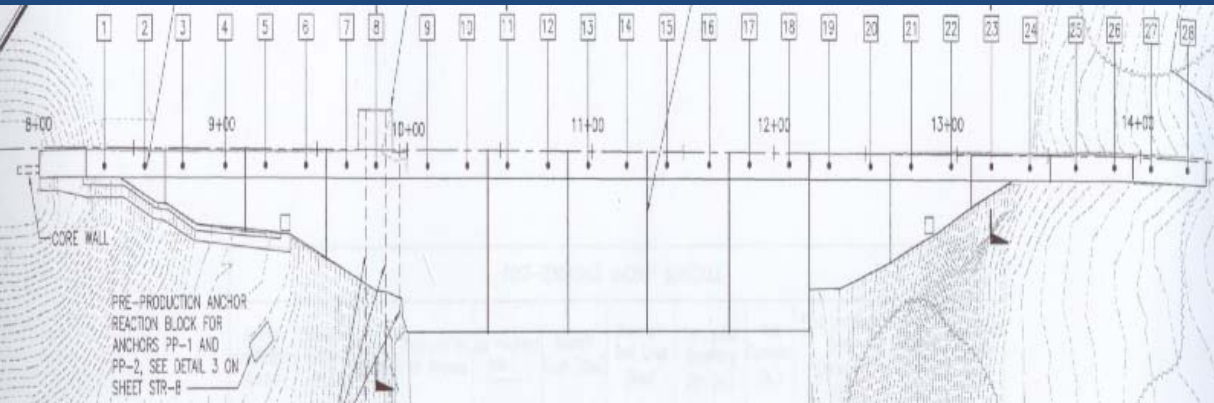
Hazard Classification	Class	Spillway Design Flood
High	Medium	PMF

Event	Peak Inflow (cfs)	Peak Stage (ft)	Overtopping Depth (ft)
10 Year Flood	9,920	289.5	Not Overtopping (298')
25 Year Flood	14,400	290.7	Not Overtopping (298')
100 Year Flood	27,500	294.2	Not Overtopping (298')
500 year Flood	51,700	298.0	Not Overtopping (298')
PMF	164,600	307.8	9.8



# T. N. Elliot Dam Rehabilitation

## Scope of Work



Install 28 post-tension anchors through the structure into bedrock for increased stability

Encase the earthen section in roller compacted concrete (RCC) to minimize erosive forces and undermining of the structure

Replace existing 5 ft tall bladder with pneumatic crest gates for increased strength and resiliency

Install pneumatic gate controls

Construct parapet walls to prevent water from bypassing the dam during a flood event

Install under drains in the foot of the dam.



# T. N. Elliot Dam Rehabilitation

## Additional Benefits

### Pneumatic Crest Gates

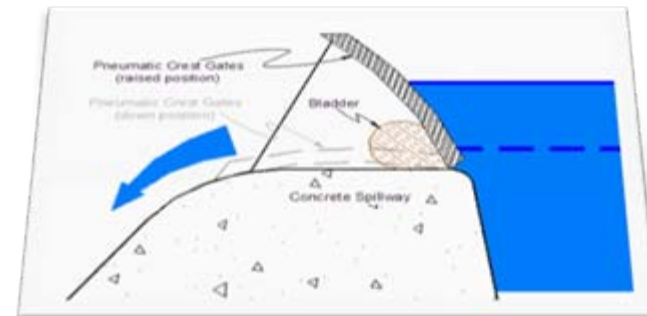
- Provides increased control and added protection over the existing system.
- Current System consists of exposed bladder

### Parapet Walls

- Increase flood control by diverting water to acceptable areas

### Cone Valve

- Existing valve rarely exercised, replace worn valve with new valve.



# T. N. Elliot Dam Rehabilitation

## Project Schedule



- Bid March
- Award Contract:
  - May of 2011
- Start Construction:
  - June of 2011
  - 18-24 month construction
  - Drawdown Period
    - Oct. '11 – Mar '12
    - Replenish Reservoir
      - Mar '12 – June '12
- Construction Completed
  - Spring of 2013



# T. N. Elliot Dam Rehabilitation Project Cost Estimate

• Mobilization	\$910,000
• Sediment and Erosion Controls	\$50,000
• Clearing and Grubbing	\$50,000
• Excavation/ Demolition/ Dewatering	\$350,000
• Fill	\$150,000
• RCC	\$1,605,000
• Reinf. Concrete Parapet Walls	\$340,000
• Anchors	\$3,315,000
• Rip Rap	\$120,000
• NOVEC Pole Retaining Wall	\$440,000
• Bladder Removal/ Replacement	\$500,000
• Crest Gates	\$750,000
• <u>Contingencies</u>	<u>\$1,730,000</u>
GRAND TOTAL	\$10,310,000





# T. N. Elliot Dam Rehabilitation

## Project Cost

\$ 10,310,300	Construction
\$ 850,000	Design Cost
\$ 300,000	URS Construction Phase Services
<hr/>	
\$ 11,460,000	Total: Project Cost

\$ 2,715,000	PWCSA & Manassas Park Revenue
\$ 5,000,000	State Revenue
\$ 2,994,000	Bond Revenue
\$ 751,000	Water Fund
<hr/>	
\$ 11,460,000	Total: Funding

} City of Manassas - 32.6%



# W-28 Spillway Improvements

## Why must we do this project now?



- Regulatory project required per State Dam Regulations
- \$5 million dollars obtained 2 years ago working with Senator Chuck Colgan may be at risk
- Conditional permit could be revoked subjecting the City to potential enforcement by DCR per Section 10.1-609 and 10.1-613 of the State Code
- If Dam can not be used the City water supply is at risk
- Excellent bidding climate for construction



# T. N. Elliot Dam Rehabilitation

Questions?

