# Washington Aqueduct: 150+ Years of Water Supply Planning

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BUILDING STRONG®

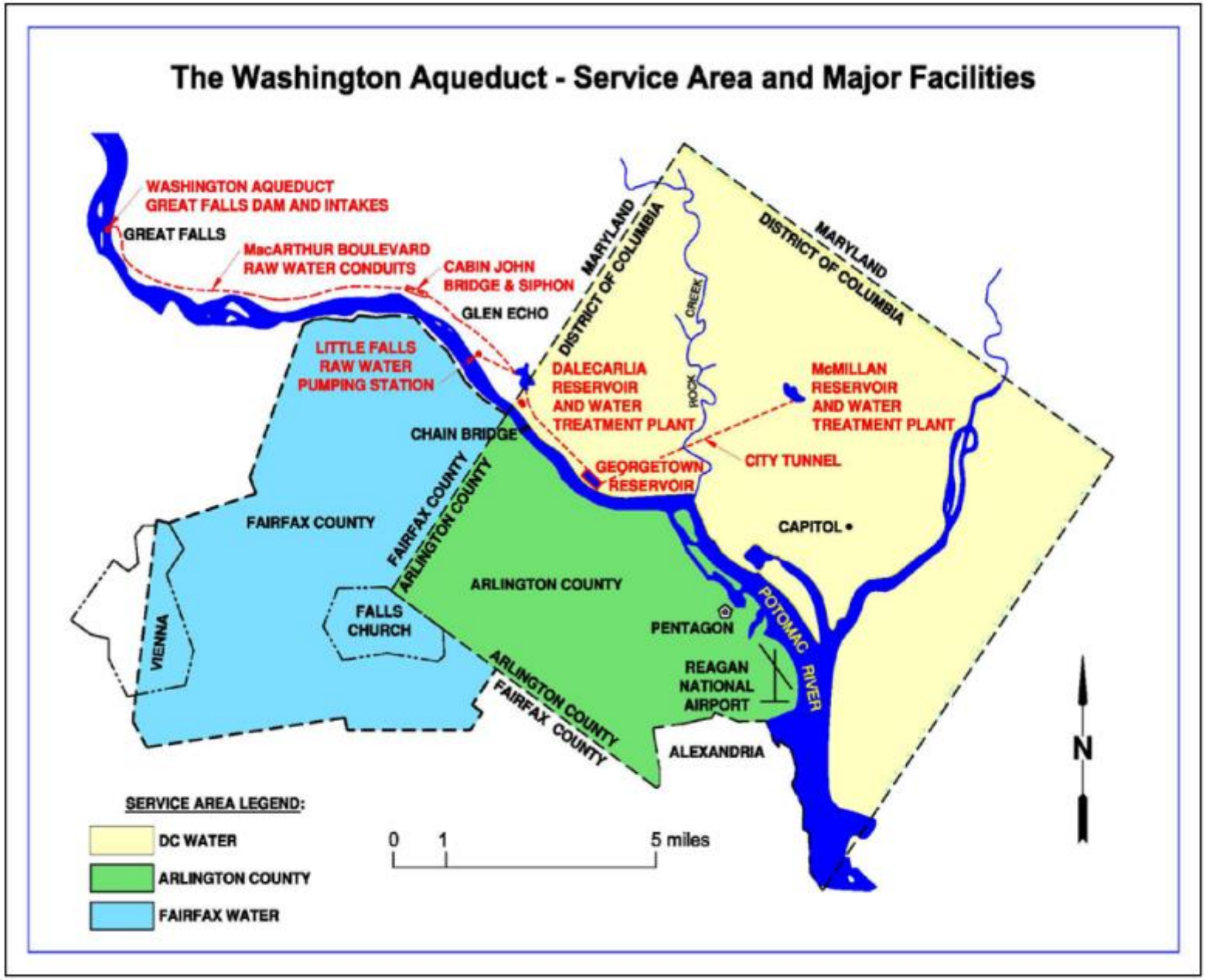
# Washington Aqueduct: Little Known Facts

2-Time
*"Longest Bridge in the World"*
Record Holder

Once Had its Own Police Force and Jail Cells

The Washington Aqueduct, Capitol Dome, and Arlington Cemetery Share a Common Engineer

Pilot Tested Direct Potable Reuse in the early 1980's



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# A Brief History of Water Supply

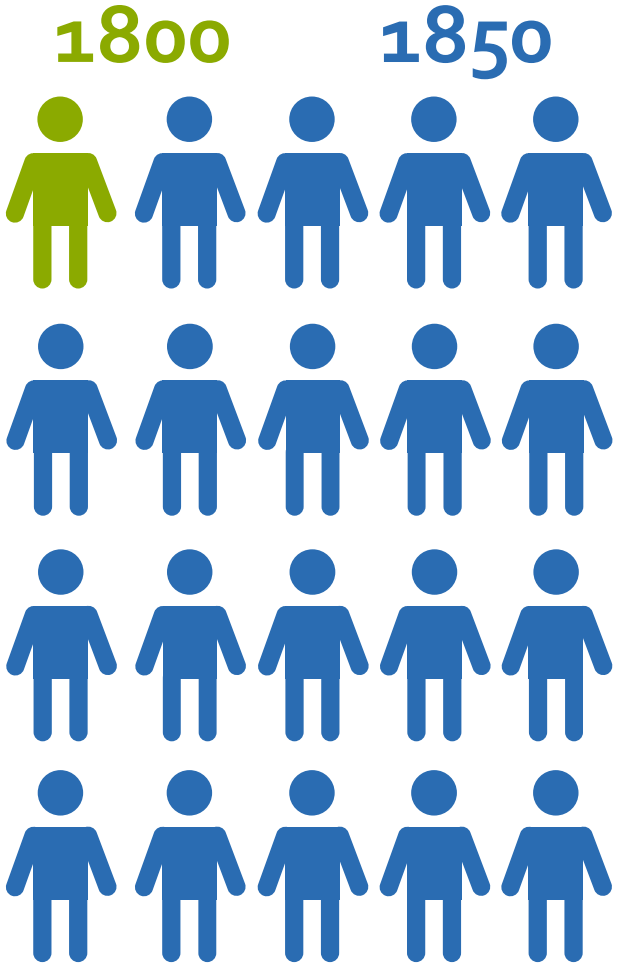
The Birth of Washington's Water System

Managing Supply as a Region

Meeting the Challenges of Tomorrow

# The Birth of Washington's Water System

# The Growth of Our Nation's Capital: 1800-1850




https://www.worldmapsonline.com/historicalmaps/kr-1852-washingtondc.htm

# Early Schemes:
# Skinner's Grand Basin (1830)

- I. K. Sinner proposed a 200 ft x 600 ft x 5 ft deep basin (C&O Canal water)

http://www.pbs.org/program/national-mall-americas-front-yard/

# Early Schemes:
# LTC Hughes Recommends Rock Creek (1851)

*"…Would supply 8 MGD, a sufficient amount to supply the city for the next 50 years."*

1900: ~55 MGD

https://www.awayn.com/listings/rock-creek-park-trails-washington-dc-united-states-rock-creek-park-washington-d-c/

# The Meigs Study and the Creation of the Washington Aqueduct (1852-1853)

- 1851: Fire at Library of Congress nearly consumes wooden dome
- Considered Great Falls, Little Falls, and Rock Creek

*"Let our Aqueduct be worthy of the Nation"*

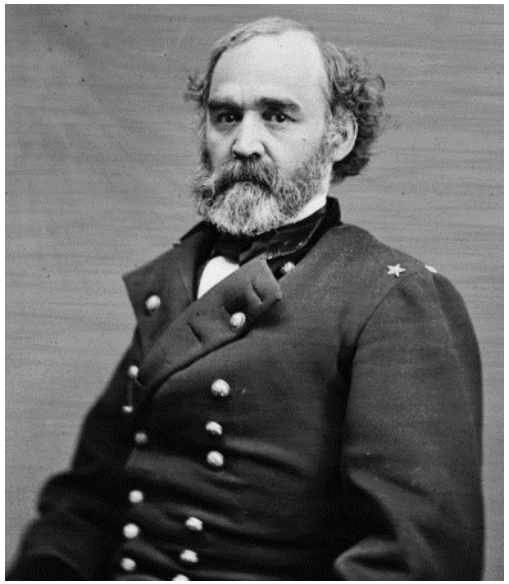
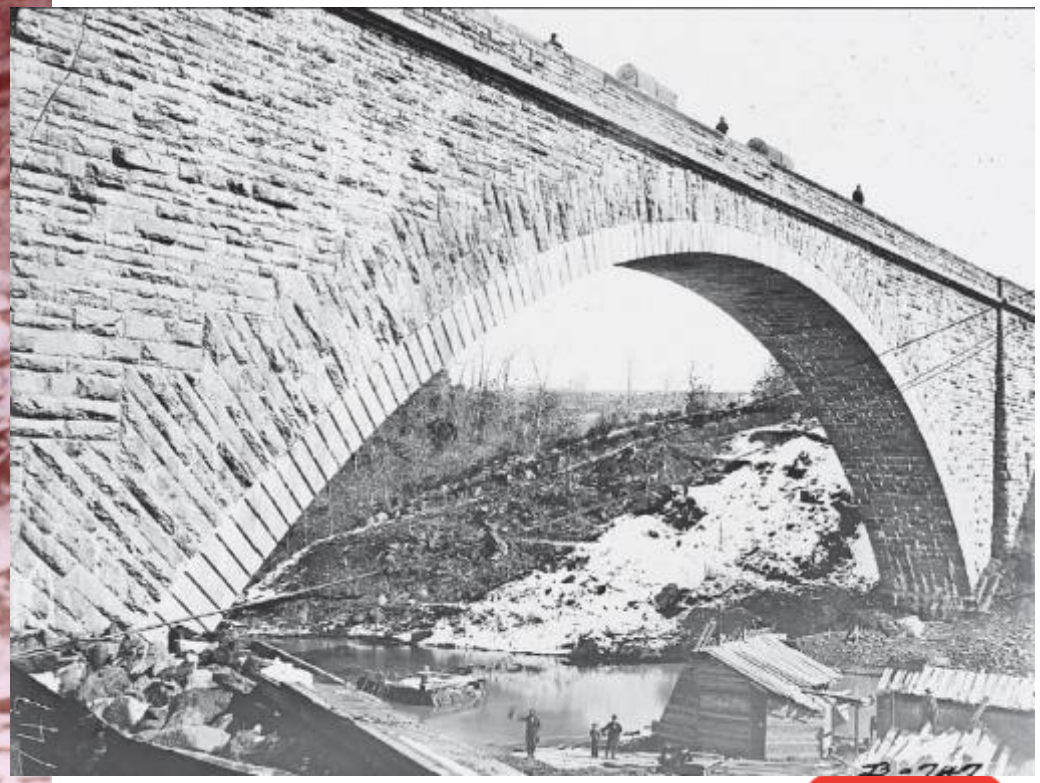


Photo credit: National Archives (Brady 1921–1940), John Plumbe/Stock Montage/Getty Images (http://people.howstuffworks.com/culture-traditions/holidays-christmas/10-worst-things-ever-to-happen-at-christmas2.htm)

# Initial Gravity System construction – 1853-1863

Conduit Size:

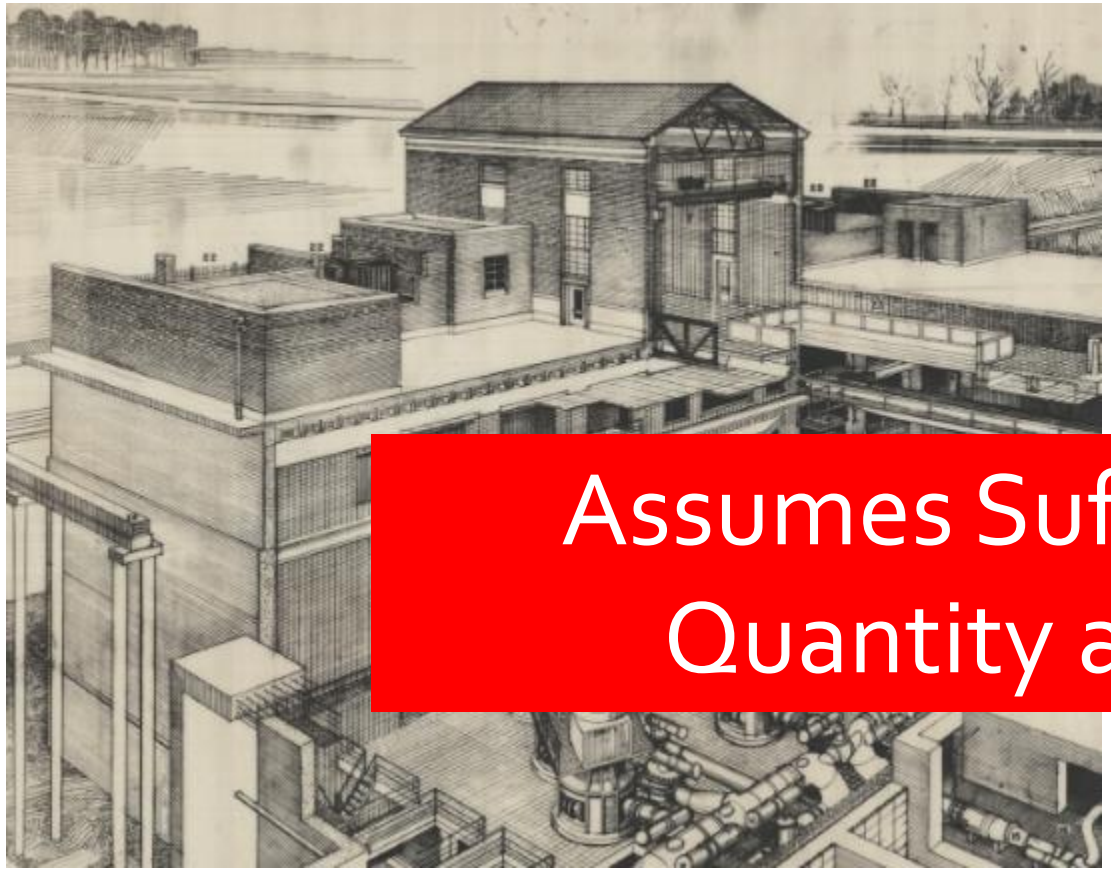
*7 ft (36 MGD) or*
*9 ft (68 MGD)?*



# Managing Supply as a Region

# The Postwar Construction Boom

**Dalecarlia Pump Station: 480 MGD**

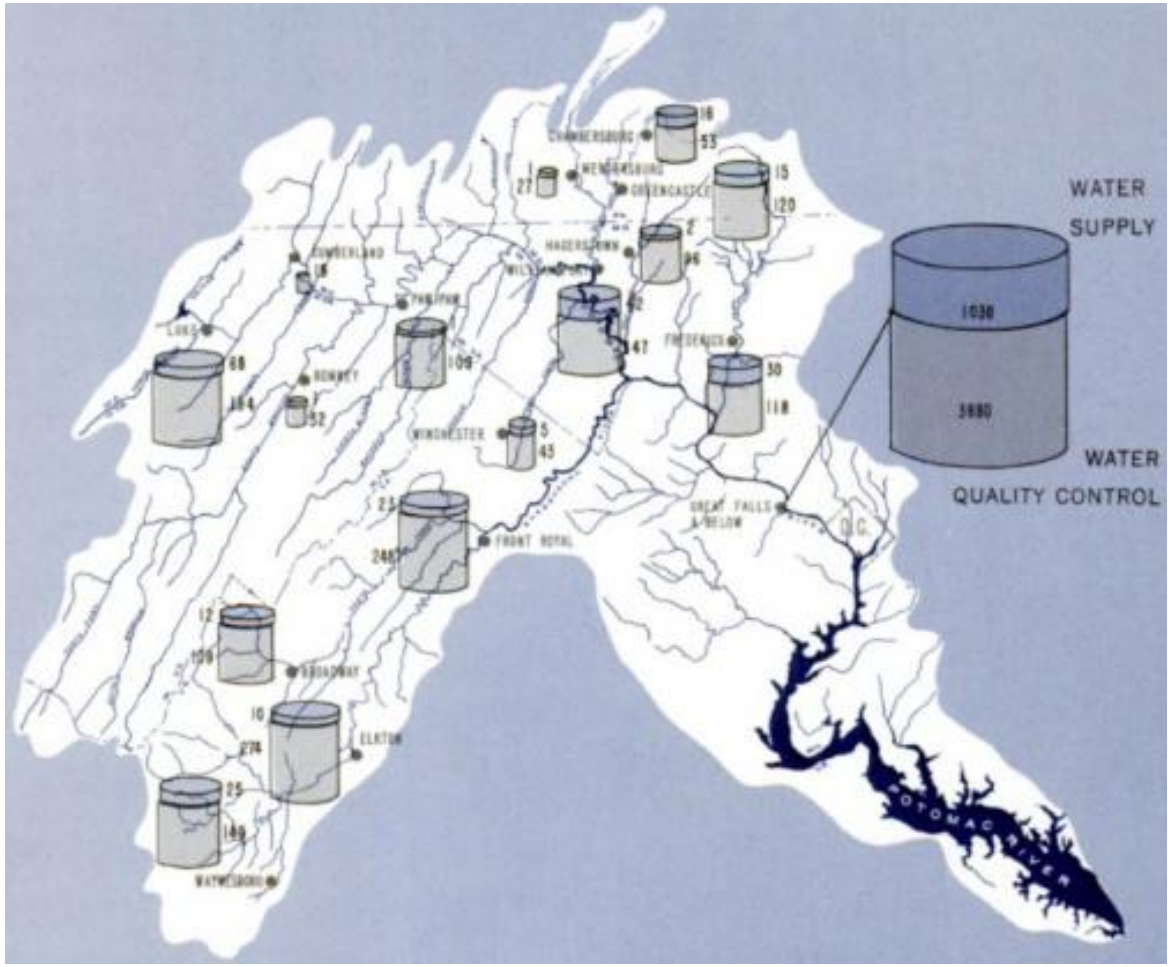


**Little Falls Pump Station: 525 MGD**

http://www.loc.gov/pictures/item/va1677.photos.368510p/

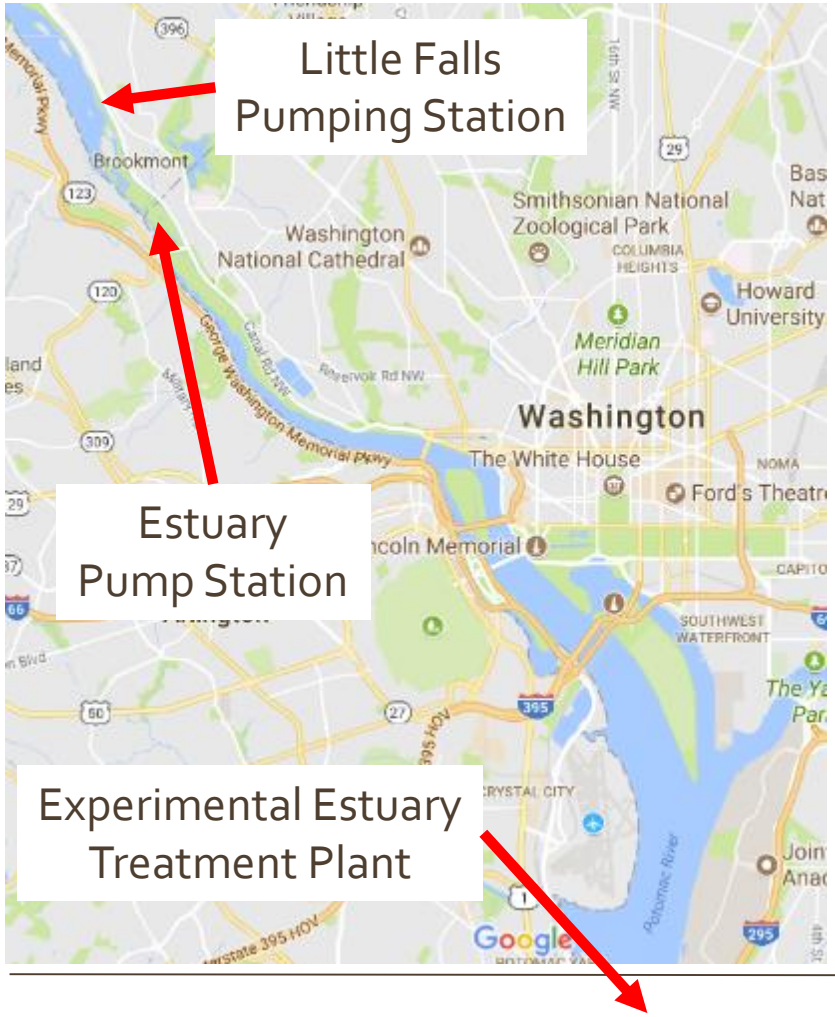
Assumes Sufficient Water Quantity and Quality

# 1963 Potomac River Basin Report & 1966 Drought




http://www.potomacriver.org/wp-content/uploads/2015/01/Lg_River_Flows_Hydrologic_Context.pdf

# The Estuary: A Pumping Station and a Pilot Plant




- The Estuary Pump Station at Chain Bridge (1979-1985)
  - A little salt, a little sewage

*"The water here flows back and forth with the tide, over the extensive flats between Georgetown and the Long Bridge, collecting and retaining the sewage of the cities; and, as these cities increase in size, the water will become less and less fit for domestic use."*

**- Montgomery Meigs, 1853**

# Rivers and Harbors Act of 1899

- Gives USACE permitting authority in navigable waters


https://www.pcconstruction.com/corbalis-water-treatment-plant/


http://www.hazenandsawyer.com/news/potomac-wfp/

# Cooperative Management of Potomac in Washington Metro Area (WMA)

USACE: 16 dams proposed

1963

1970s

Research on cooperative reservoir management

Low Flow Allocation Agreement (LFAA)

1978

1981

Jennings Randolph Reservoir Completed

Co-operative agreements signed to avoid LFAA

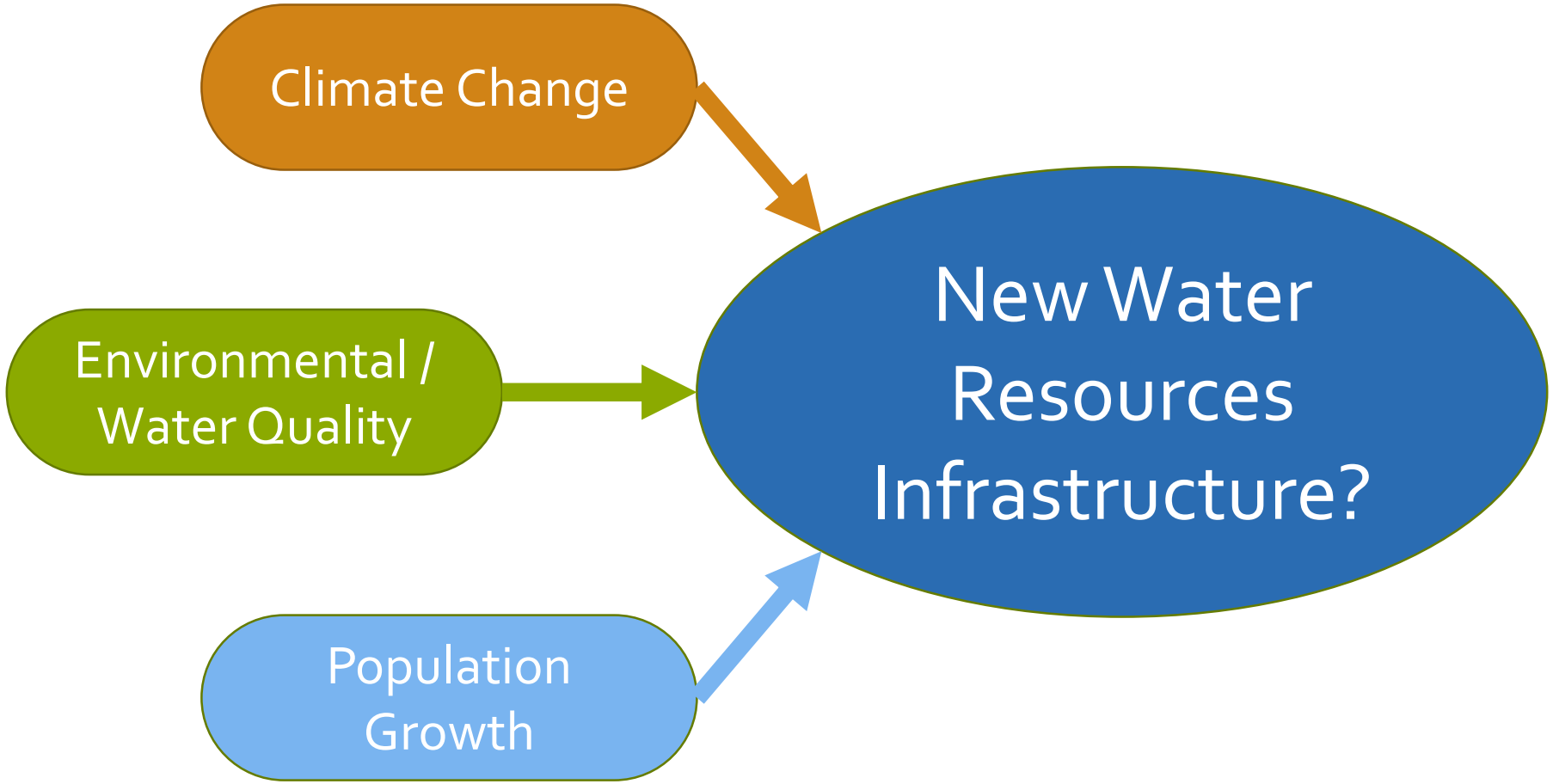
1982

2015

24% Population increase by 2040

# Meeting the Challenges of Tomorrow

# Drivers of Potential Projects



# A Promising Alternative: Travilah Quarry

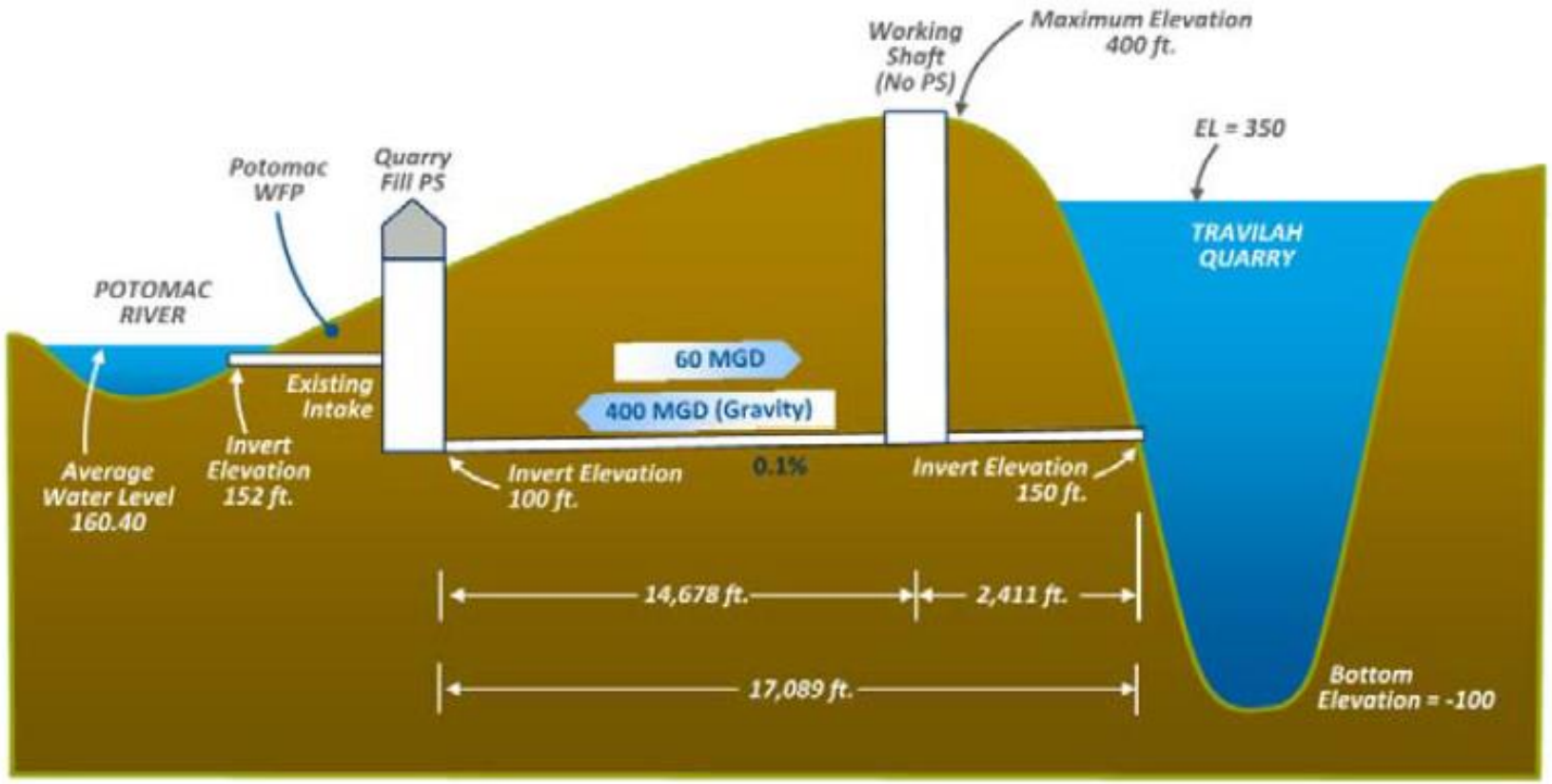
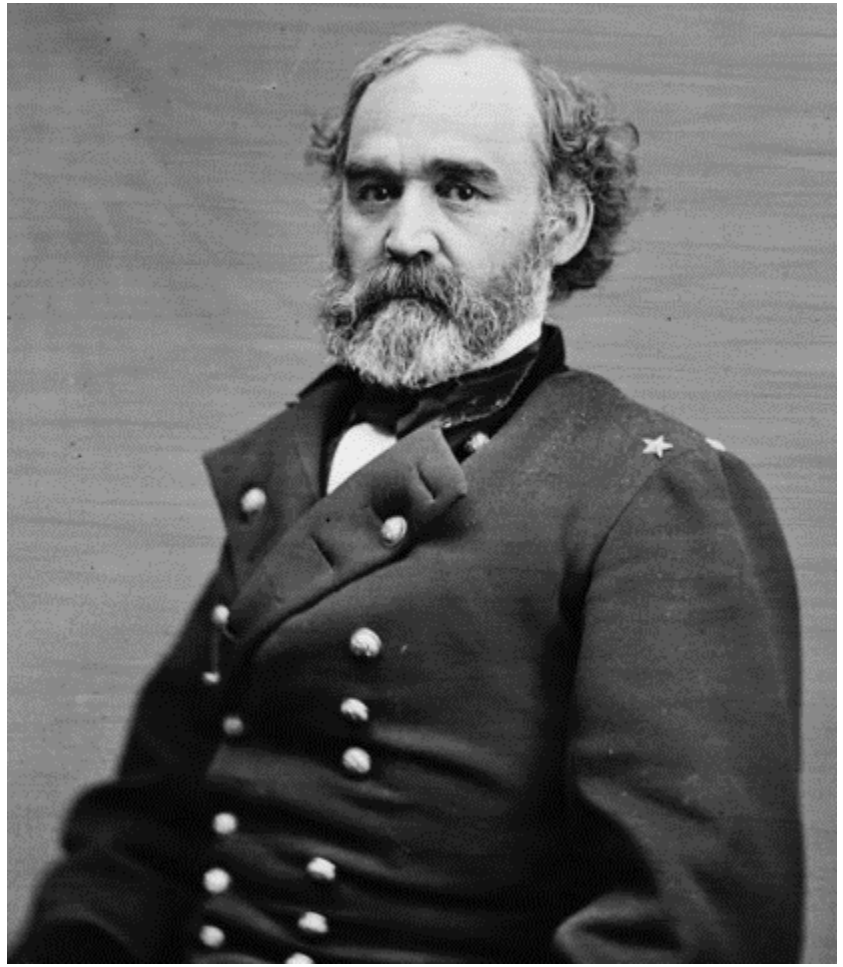



Figure 5 One Tunnel and One Pumping Station Alternative – Profile

Black and Veatch. 2015. Travilah Quarry Evaluation – Phase II.

# Montgomery Meigs at the Aqueduct's Groundbreaking



*"…this great work is destined I trust for the next 1,000 years to pour its healthful waters in to the capital of our union."*