

Stabilization Along the Cuyahoga River: Avoiding a “Tow Away Zone”

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Agenda

- Regional Stormwater Management Program
- Project Background
- Challenges
- Solution
- Constructability

NORTHEAST OHIO REGIONAL SEWER DISTRICT



REGIONAL
STORMWATER
MANAGEMENT
PROGRAM



Inspect &
Maintain



SW
Master
Plans



Construct
Projects



Encourage
Good
Practices



NEORSD Stormwater Design & Construction Program

Navigate using the tabs below and by clicking the images to view more details on our completed, current design, and current construction stormwater projects. Zoom in to view satellite imagery and Regional Stormwater System features (e.g. streams, culverts, conduits, etc). Use the "Zoom To" drop down menu to locate your watershed.



- All Projects
- Complete
- Design
- Construction



1 Baldwin Creek Bank Stabilization at East...



2 Baldwin Creek Stabilization Near Abb...



3 Baldwin Creek Stabilization Near Abb...



4 Beechers Brook Bank Stabilization



5 Big Creek Chevrolet Boulevard Detention...



6 Big Creek Chevy Branch Stream Stabilization in...



7 Big Creek Chevy Branch Stream Stabilization in...



8 Big Creek Stabilization



9 Big Creek Stream Stabilization...



10 Chippewa Creek Bank Stabilization at Route 2...



11 Chippewa Creek Floodplain Control...



12 Chippewa Creek Stream Stabilization Near...



13 Chippewa Creek Stream Stabilization Near...



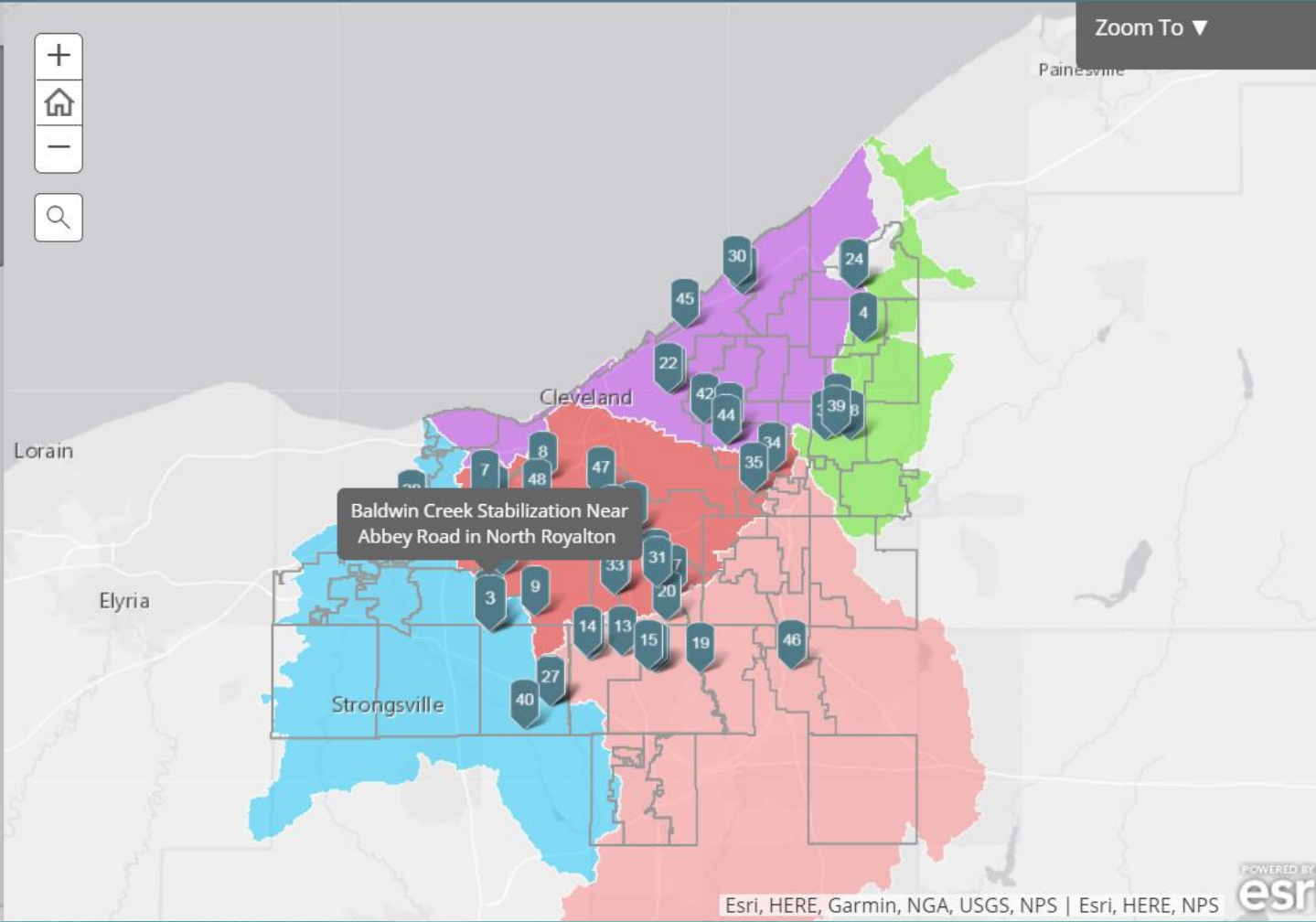
14 Chippewa Creek Stream Stabilization Near...



15 Chippewa Creek Stream Stabilization Near...



16 Chippewa Creek Stream Stabilization Near...



SAVE THE DATE

Stormwater Design Preview

Tuesday, July 10, 2018 10 a.m. – Noon

Watershed Stewardship Center in Parma

Join us for an advance look at upcoming Regional Stormwater Management Program projects, expectations, and opportunities. Details and additional resources available at neorsd.org/opportunity

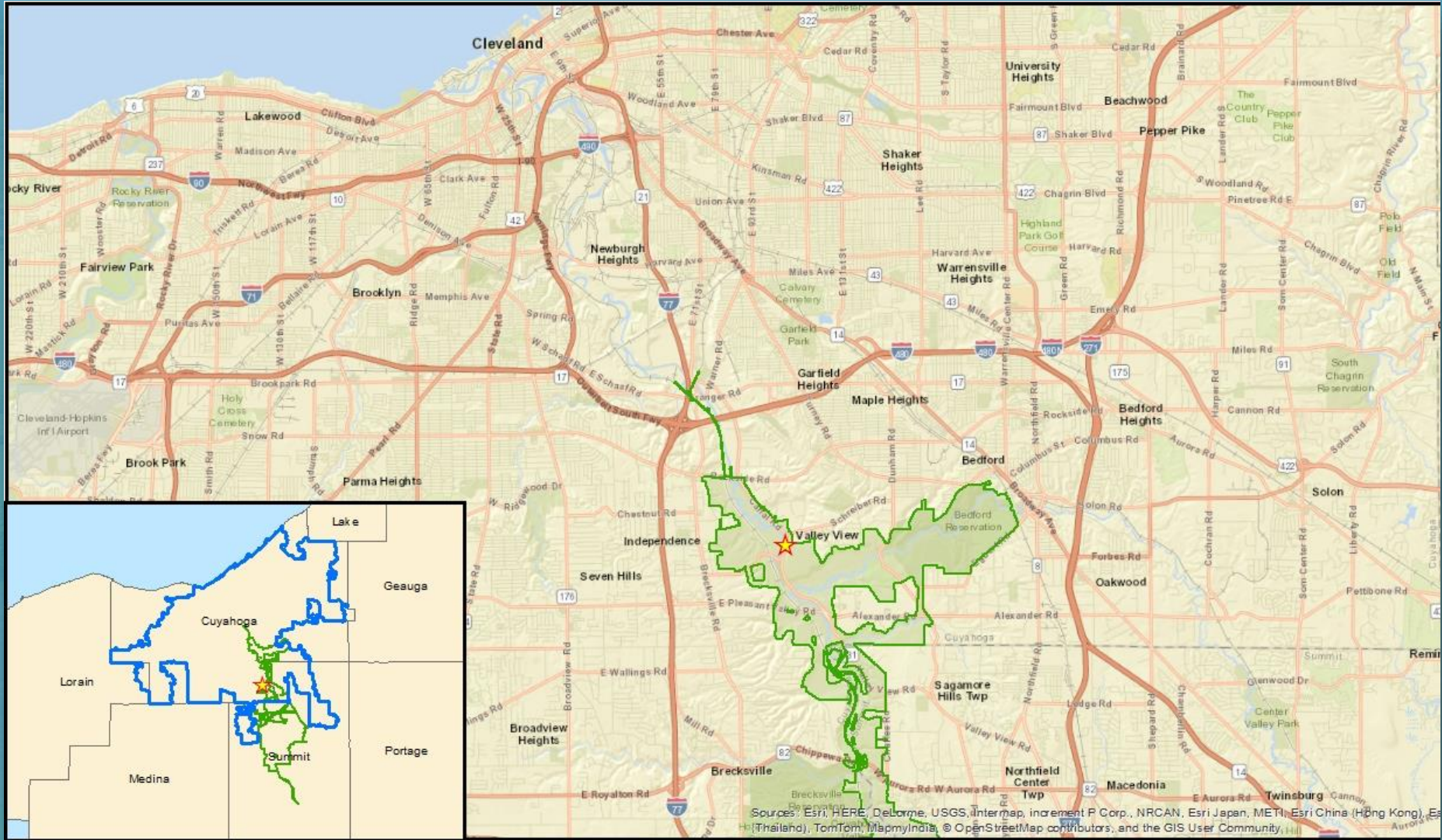
BUSINESS



**Northeast Ohio
Regional Sewer District**



Towpath Project Location



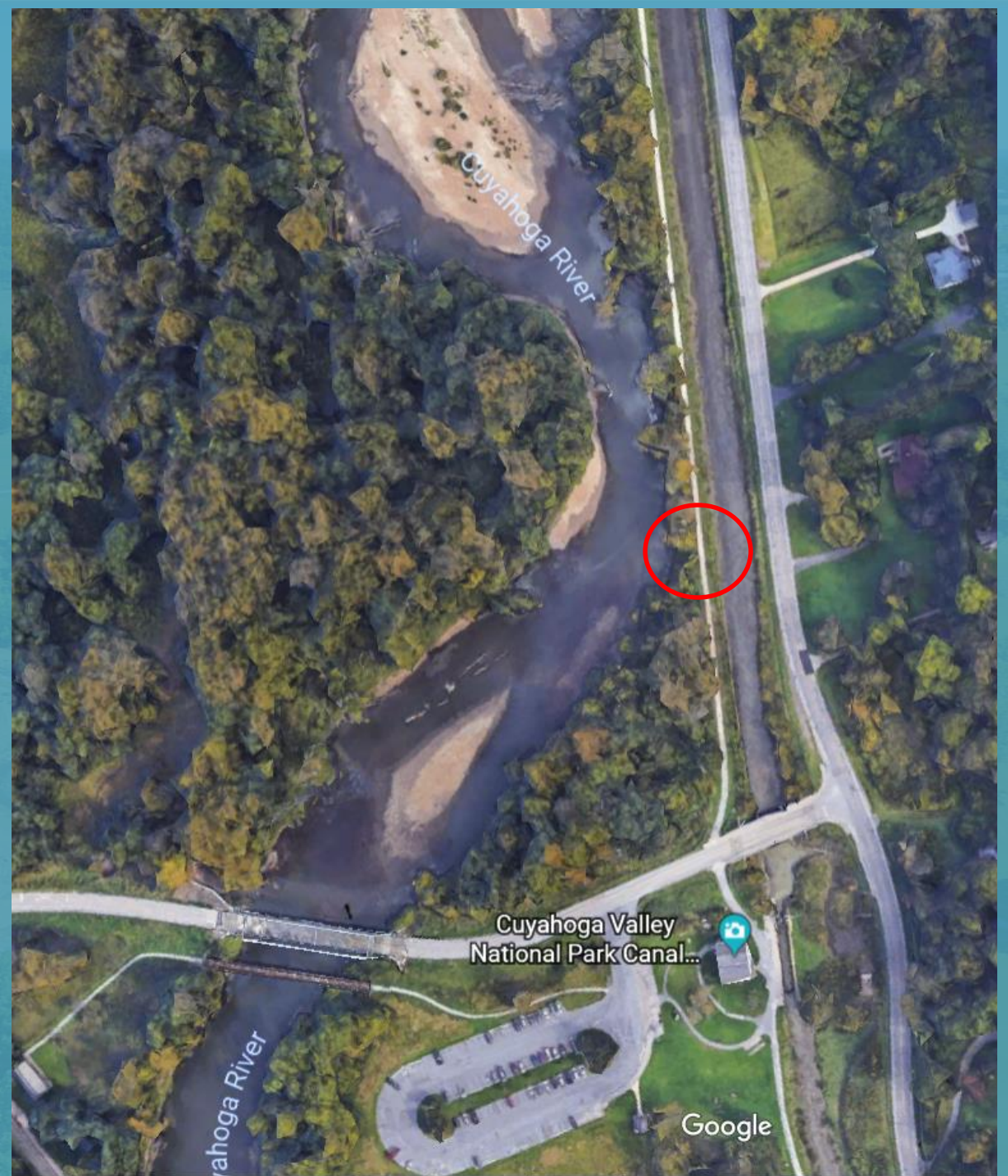
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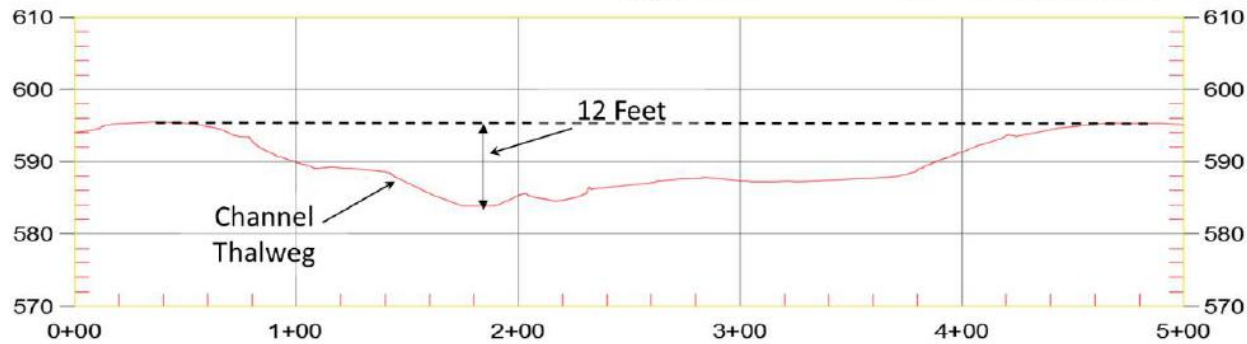
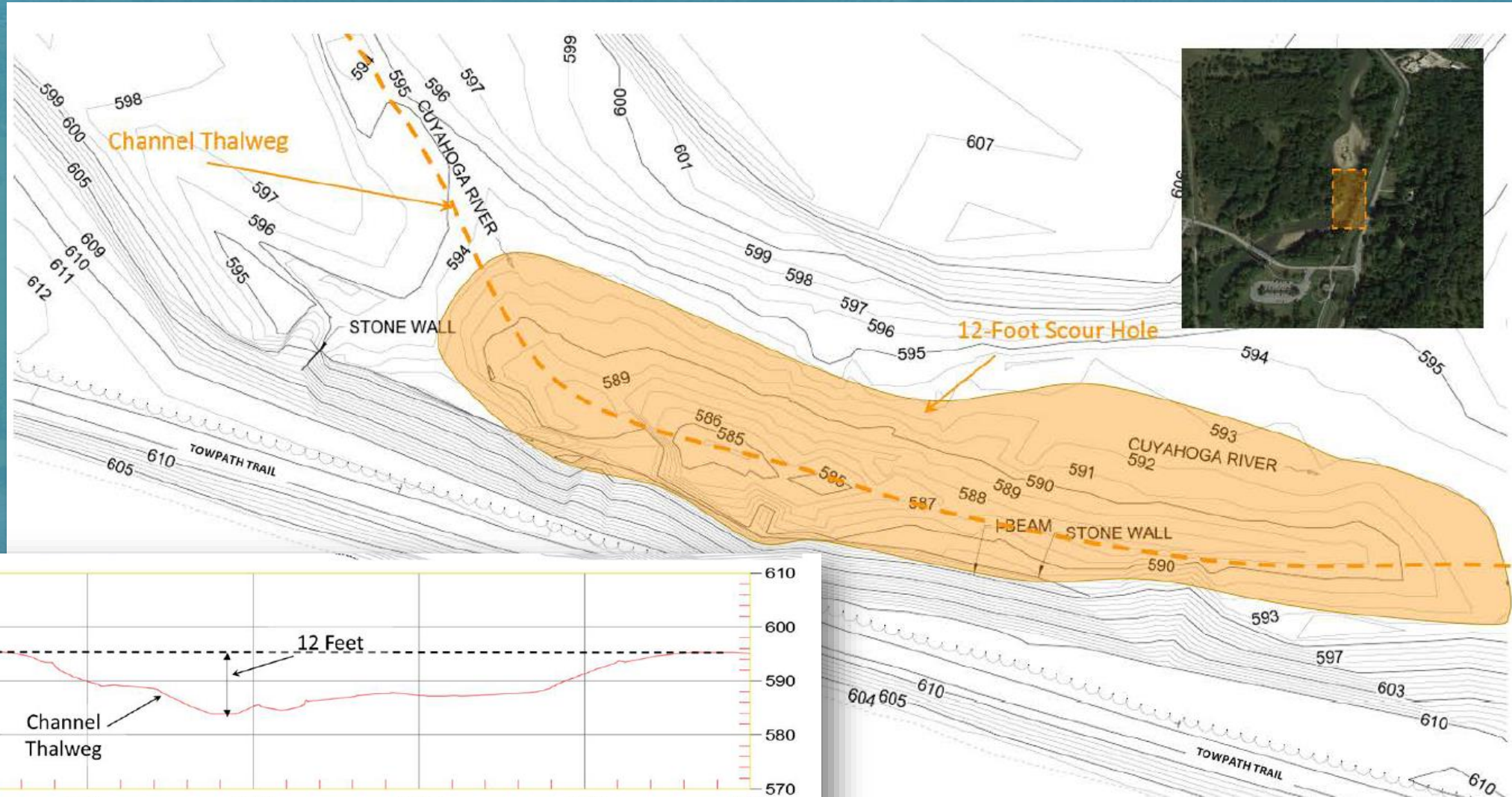
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Project is located in the Cuyahoga Valley National Park

Cuyahoga River was eroding the right bank to the point of undermining the Ohio and Erie Canal Towpath Trail



Scour Hole Formation



Previous Stabilization Efforts



Sandstone Sheeting

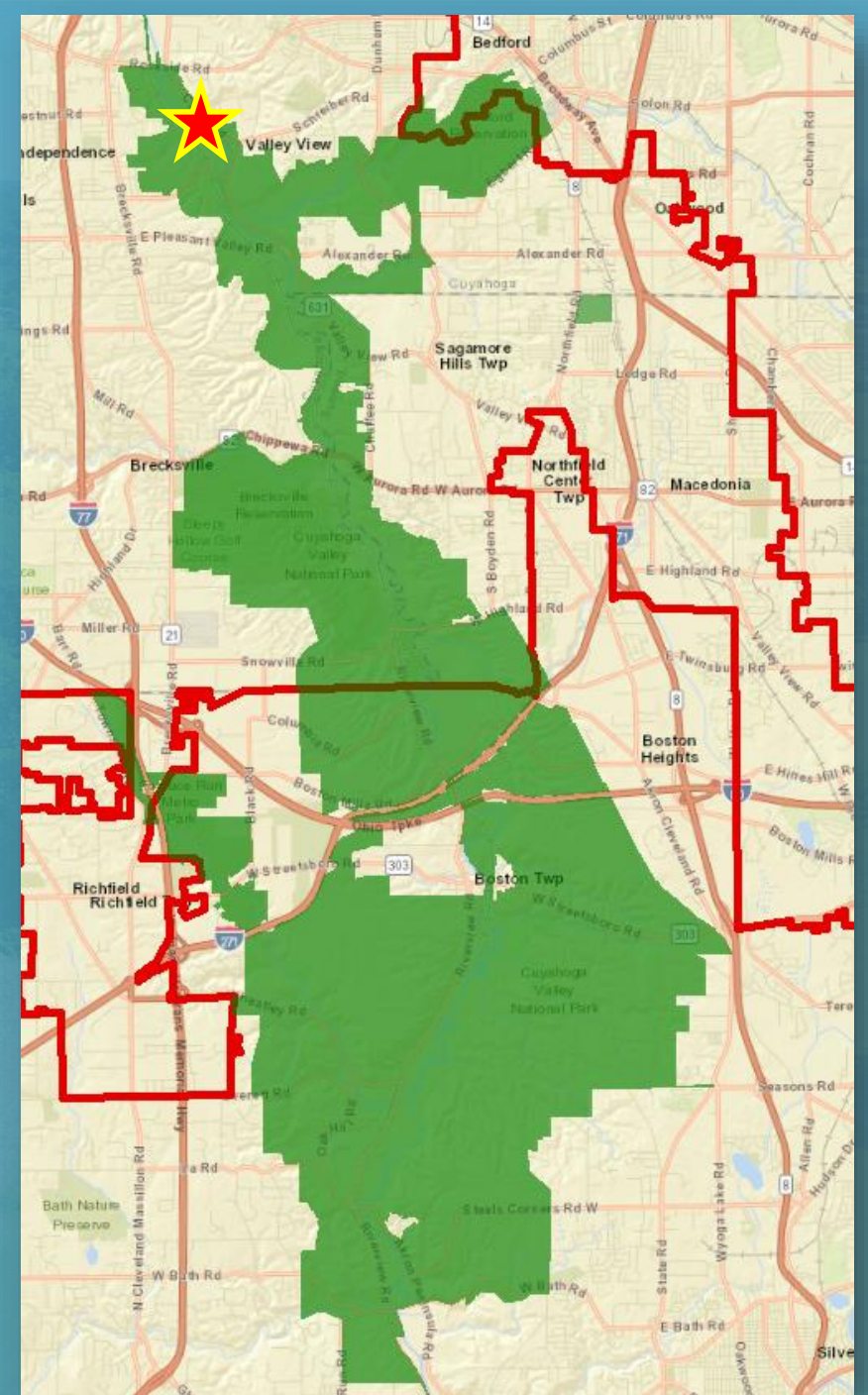


Piles

Challenges

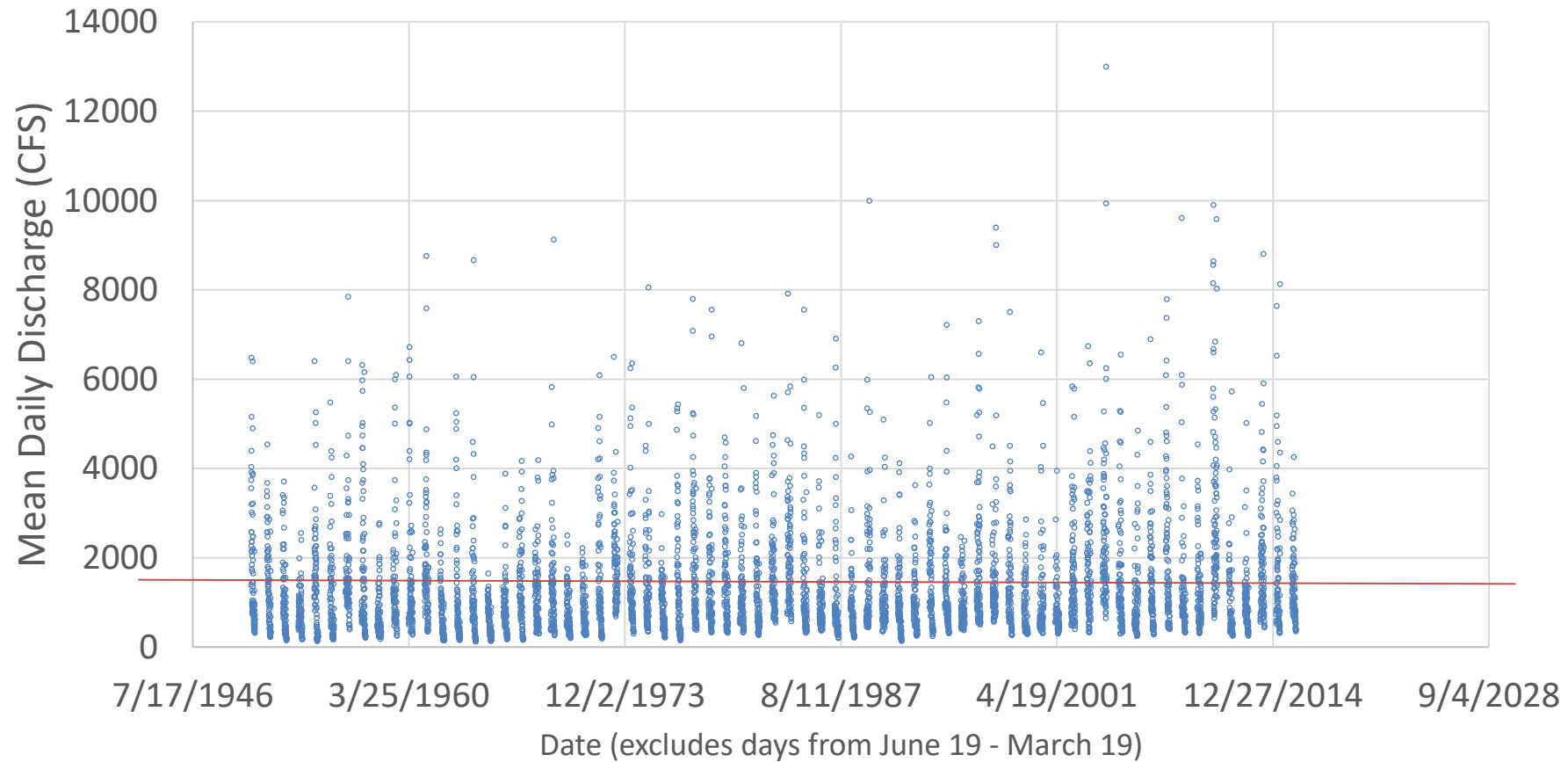
Cuyahoga Valley National Park

- Programmatic Environmental Assessment
 - Solution, material preferences
- Towpath considerations
- Permitting
 - Access
 - Planning, Environment and Public Comment (PEPC) process



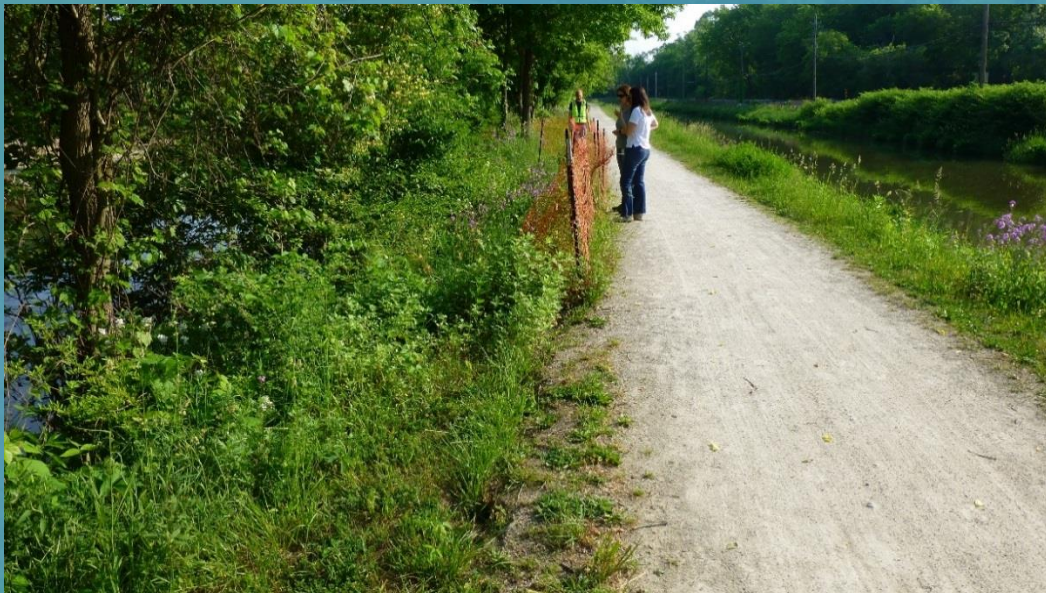
Working in the Cuyahoga River

Mean Daily Discharge by Date - Springtime Only 1950-2016



Towpath Trail Constraints

- Limited Space for equipment
- Heavily utilized recreational trail, important to minimize closures



Site is Physically Constrained

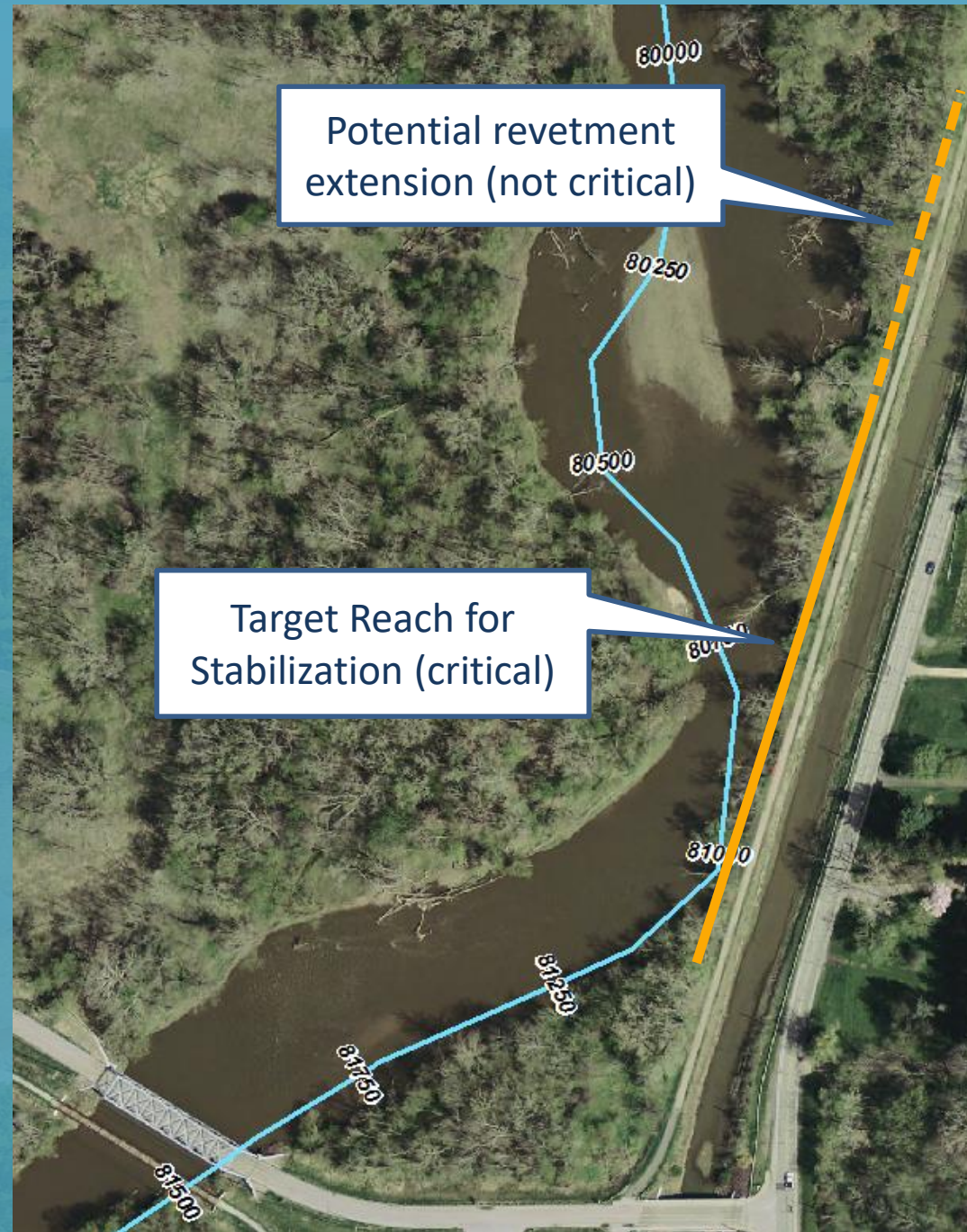
- Narrow Towpath between Canal and Cuyahoga River
- Trail is heavily utilized
- Limited laydown area
- Archeological Exclusion Area
- Load limits on Hillside, Canal Road, Towpath



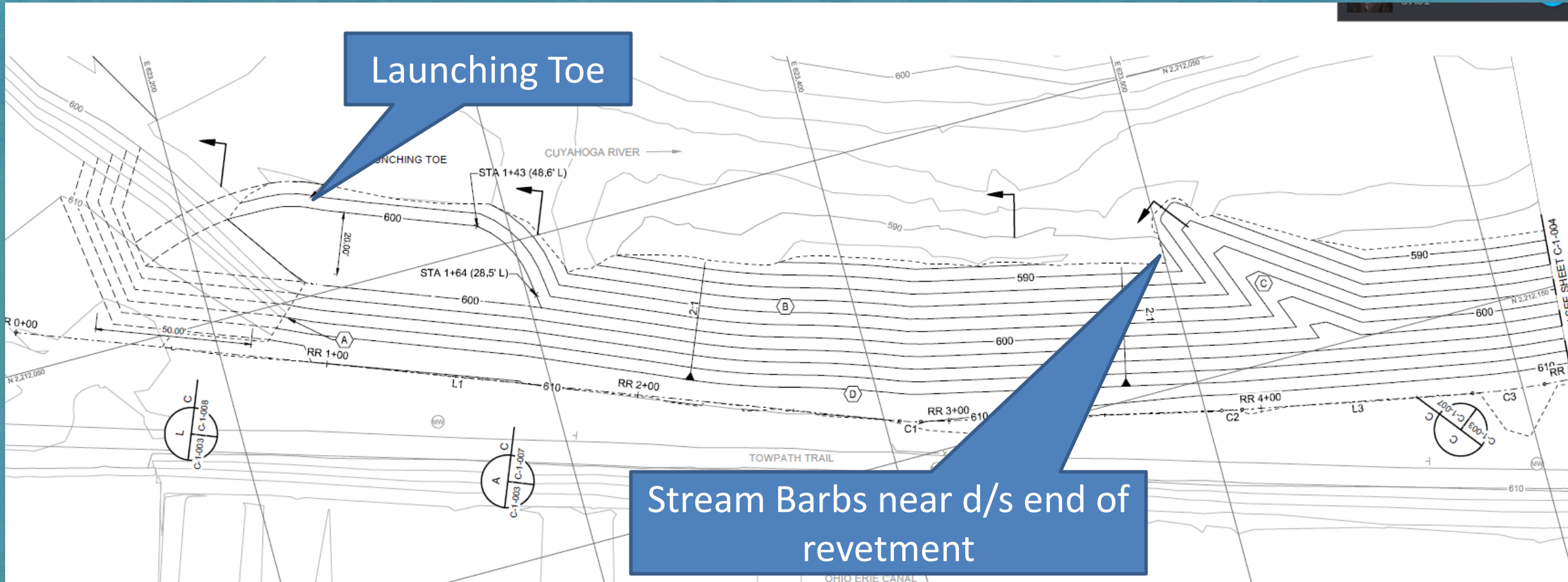
Solution

Alternatives Analysis

- Riprap
- Flow Redirection (stream barbs, spur dykes)
- Riprap selected as preferred solution
 - $D_{50} = 18''$



Rip Rap Revetment Design





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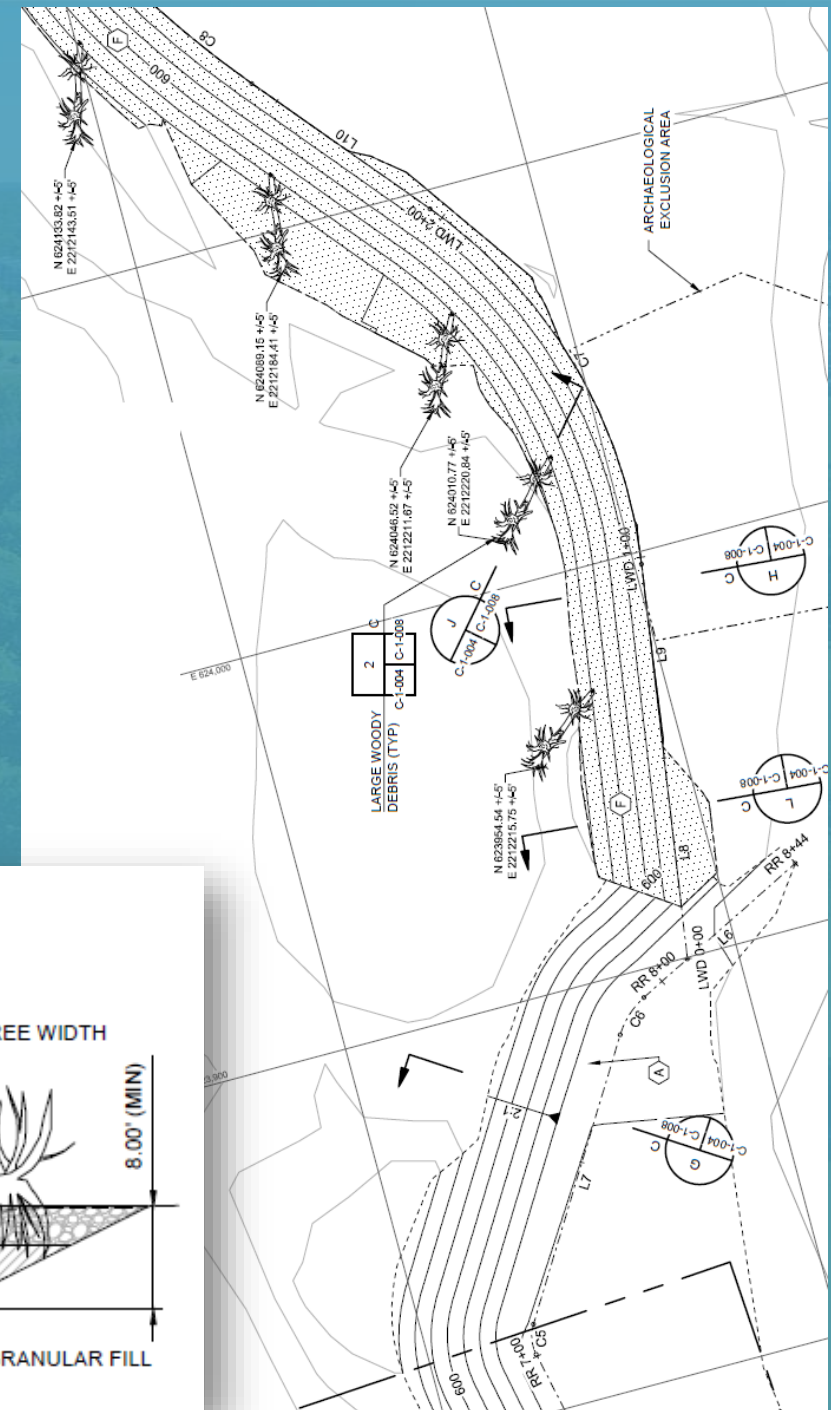
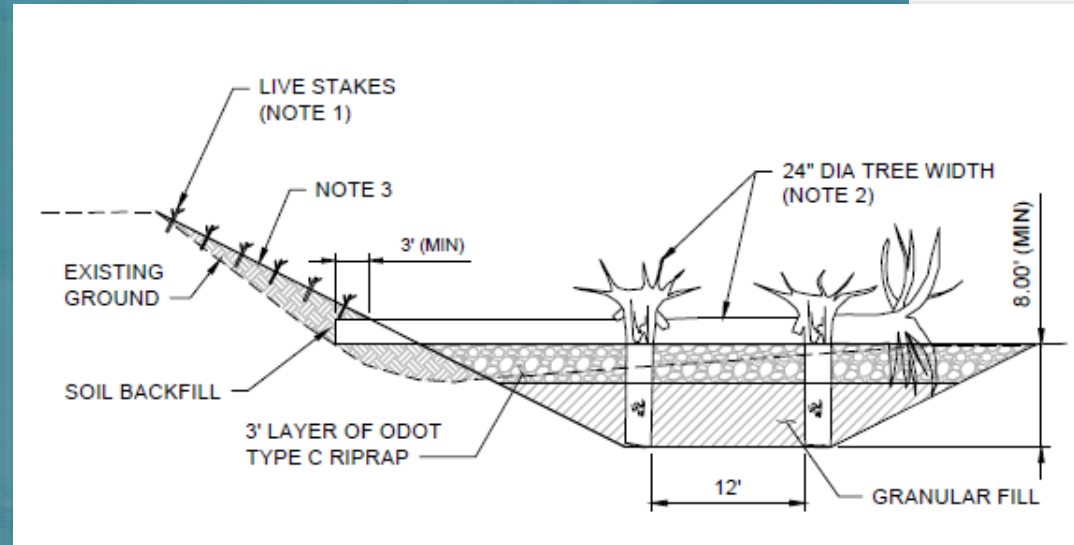
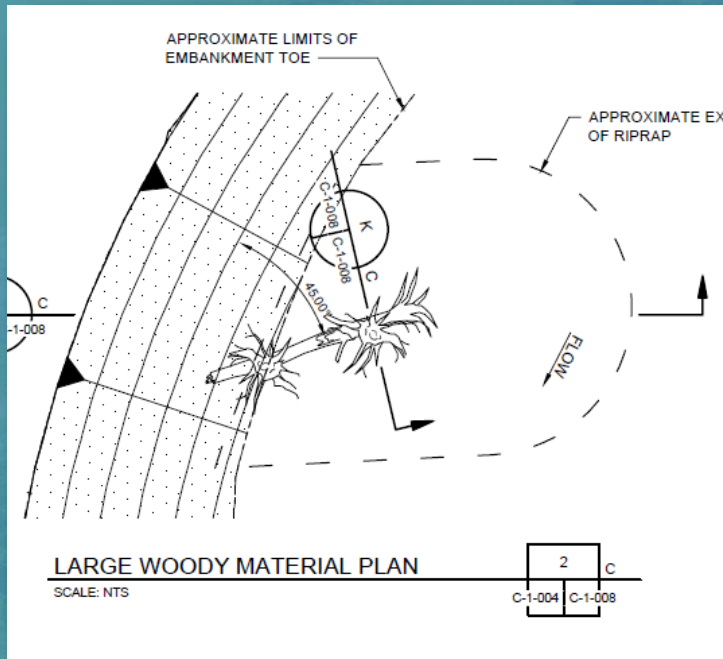
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Pilot natural stabilization method selected in downstream, less critical area:

Large, woody debris structures:

H: 24" dia., 36'-40' long with root wad intact

V: 24" dia., 12'-14' long



On-Site Trees used for LWD Structures



LWD Structures Installation



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LWD Structures Installation



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Removal of Sandstone Sheets and Piles

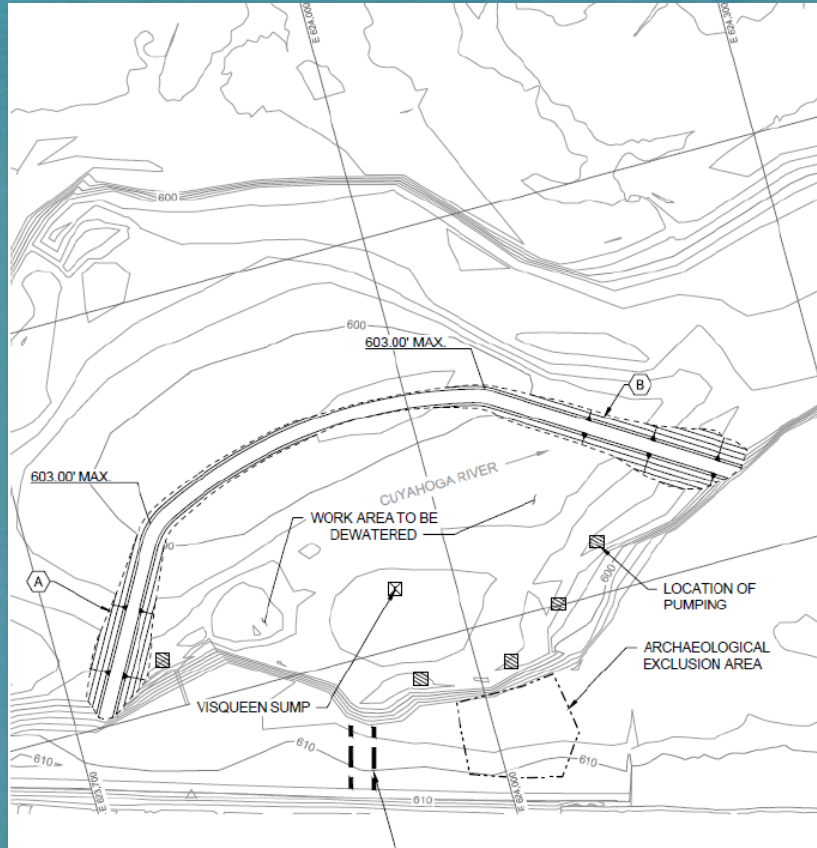


Contractor's Site Access Approach to Minimize Towpath Trail Closures





Inflatable Cofferddam Used for Installation of LWD Structures





Cofferdam around Large Woody Debris Installation



Northern
Regional Sewer District

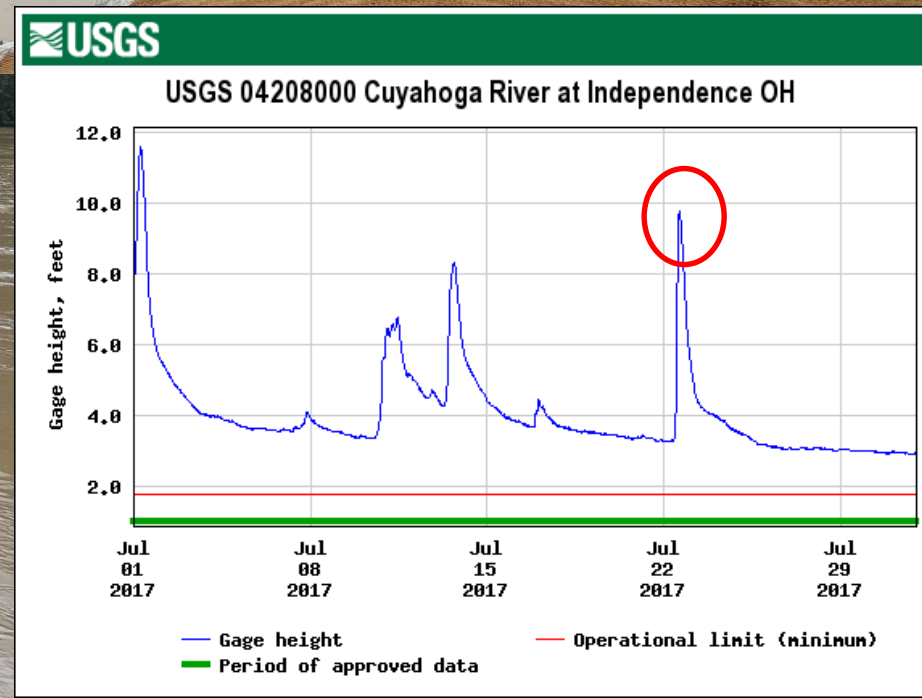
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current clear change



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Post-Construction

July 22, 2017 Storm Event



July 23, 2017 Post-Storm Event





November 2017


A landscape photograph showing a river on the left, a stone-lined bank in the foreground, and a grassy area with several young trees and shrubs. The trees have some autumn-colored leaves. In the background, there are more trees and a road with a car. The sky is overcast. A semi-transparent teal banner is in the top left corner.

November 2017



Deposition

April 2017

An aerial photograph showing a large-scale construction project, likely a dam or flood control structure. A prominent blue conveyor system is visible, extending from a large pile of sand or gravel on the left towards a body of water. The water is a muddy brown color. To the right of the water, there is a paved road with a few vehicles, including a red car. Further right, there are several houses and more trees. The entire scene is surrounded by a dense forest of green trees.

June 2017

An aerial photograph showing a river flowing through a dense forest. A bridge crosses the river, and a road runs alongside it. The riverbank is eroded in some areas, showing sandy soil. A small cluster of houses is visible on the right side of the image.

September 2017

An aerial photograph showing a wide, muddy river flowing through a landscape of bare, brown trees. A long, straight bridge spans the river, with a road and a railway track running alongside it. In the lower right, a small cluster of houses is visible. A teal banner is overlaid on the top left.

April 2018

Project Details



Design: June 2016 – Jan 2017

Construction: May 2017 – November 2017

Construction Cost: \$1.28M

Thank You!

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