



Stormwater Management- A Regional Approach



 **Northeast Ohio
Regional Sewer District**

Association of State Floodplain Managers

May 21, 2019


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Northeast Ohio Regional Sewer District

Why We Are Here...



Cuyahoga River - 1952

Why We Are Here...



Cuyahoga River – 1960s

Who we are...Organization

- Political subdivision of Ohio
- Created in 1972 by Court Order
 - Code of Regulations
 - Governed by seven Trustees
- Separate and distinct from the City of Cleveland and Cuyahoga County

What We Do...Organization

- Stormwater & sanitary services to 62 communities
 - 1 million customers
 - 90+ billion gallons treated annually
 - 200 MGD average flow at 3 wastewater treatment plants
 - 312 miles of interceptor sewers
 - 400 miles of Regional Stormwater System
- Water quality monitoring
- Lake Erie beach monitoring and maintenance



Regional Stormwater Management Program Development

1978

- Regional Plan for Sewerage & Drainage Study (147 problem locations)

2004

- Regional Intercommunity Drainage Evaluation (RIDE) Study (513 problem locations)

2007

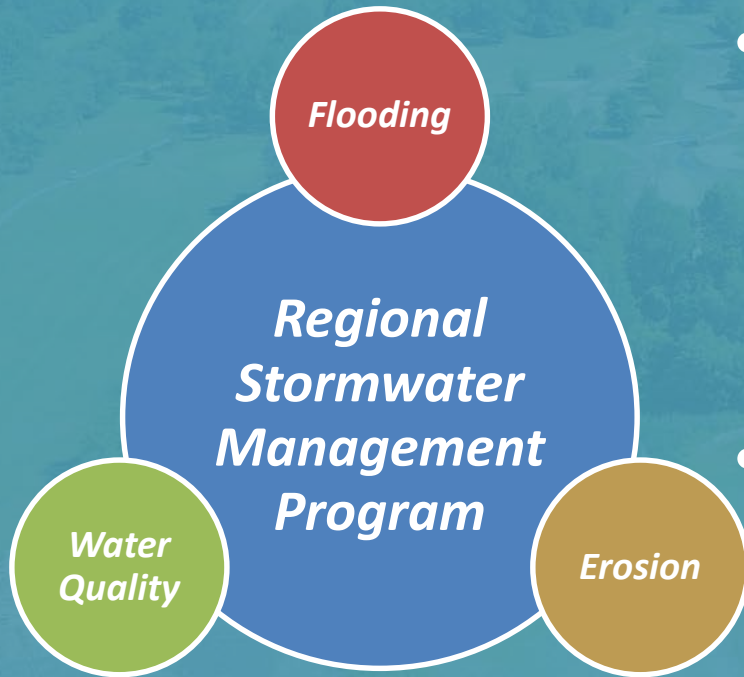
- Stormwater Roadmap Development

2008-2010

- Stormwater Management Program Implementation Projects (\$200 Million in Critical Projects)



Program Need



- A watershed-based approach to stormwater management is necessary to effectively and efficiently plan, design, construct, and maintain long-term solutions to stormwater problems.
- An adequate funding source is necessary to provide a watershed-based approach to stormwater management.

RSMP Litigation History

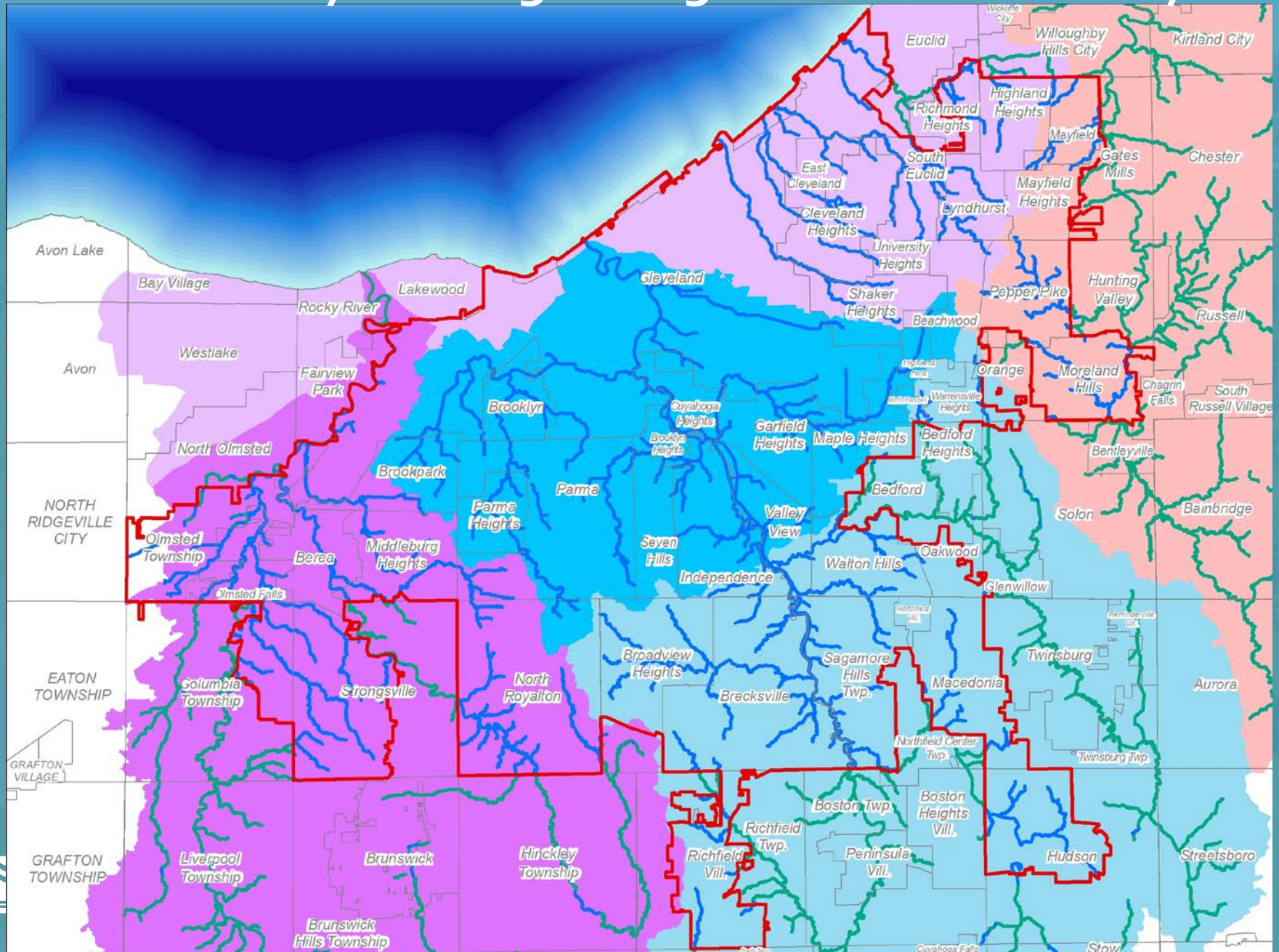
- *January 10, 2010*: NEORSD Board adopts program
- *January 2010 - February 2012*: Cuyahoga County Common Pleas
- *January 2013*: Program initiated
- *September 26, 2013*: Eighth District Court of Appeals overturns program; Program suspended
- *September 15, 2015*: Supreme Court overturns Appeals Court ruling
- *January 2016*: Program reinstated

Why a Regional Program...

- Address intercommunity drainage
- Ability to address maintenance needs
- Comprehensive, stream focused solutions
- Consistent funding source



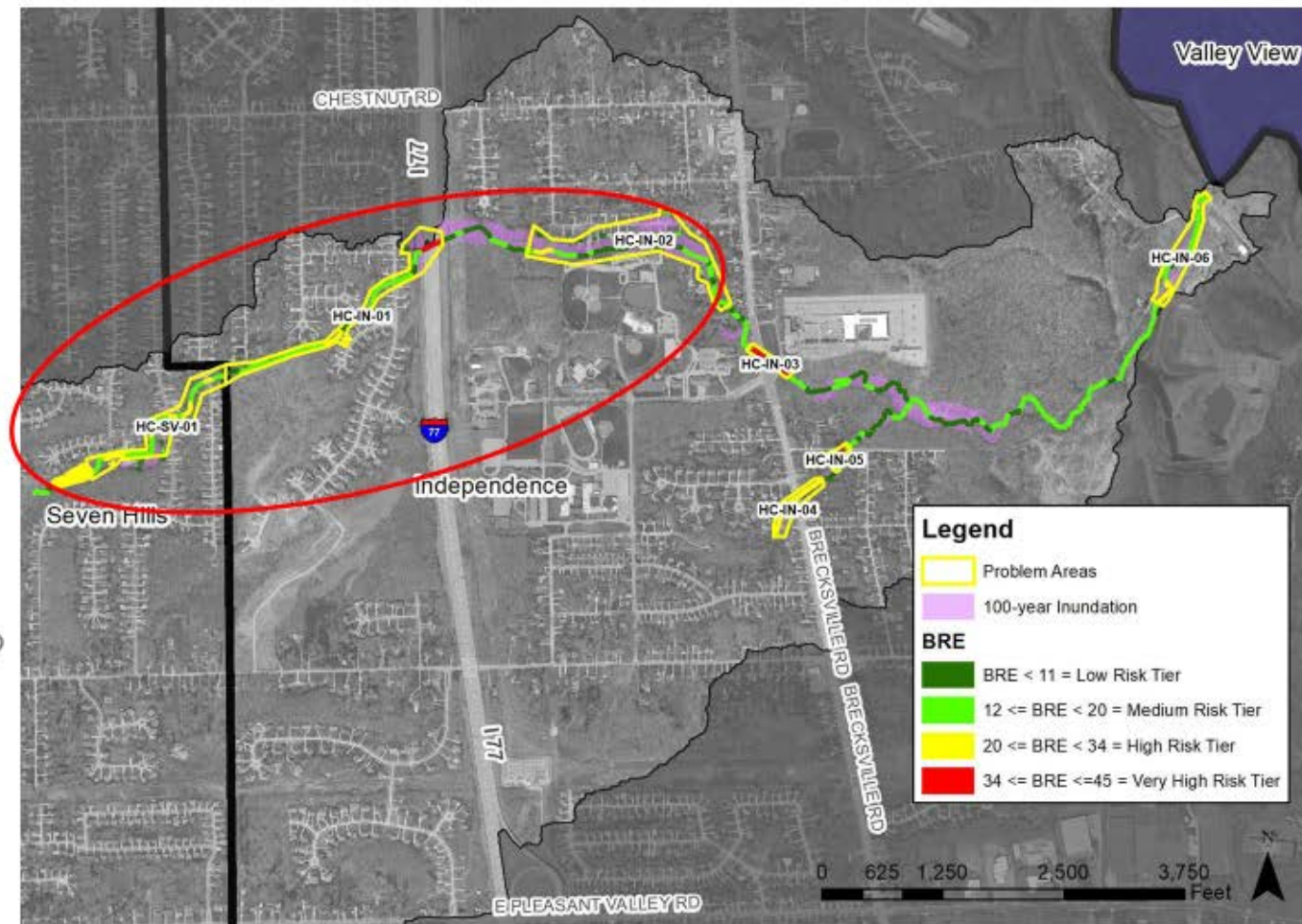
Intercommunity Drainage...Regional Stormwater System



Intercommunity Drainage...Regional Stormwater System

Task 3: Hemlock Creek Problem Areas: Overview

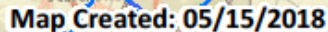
- 7 problem areas defined overall
 - 1 in Seven Hills
 - HC-SV-01
 - 6 in Independence
 - HC-IN-01
 - HC-IN-02
 - HC-IN-03
 - HC-IN-04
 - HC-IN-05
 - HC-IN-06
 - Can basin upgrades change DS problems?



Inspection and Maintenance

- Ability to inspect and evaluate the whole system
- Address maintenance needs





Forest Overlook Basin
Hemlock Creek (Seven Hills)
Prior to Storm



Peak Storm Water Level (Rainfall was 1.62-inches)



Post Storm (80 Cubic Yards of Sediment & Debris)



Post Storm Event Response



Bonny Banks RSS Basin

Before Sediment Removal:

- 8 Inspection WOs
- 8 Maintenance Projects
- 319 CY Sediment Removed



Winter 2018:

- 16700 CY of Sediment Removed



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Sediment & Debris Removal since 2013



1,600+
truck loads

- *586 projects*
- *32,869 cubic yards of sediment and debris removed*

Comprehensive, stream focused solutions

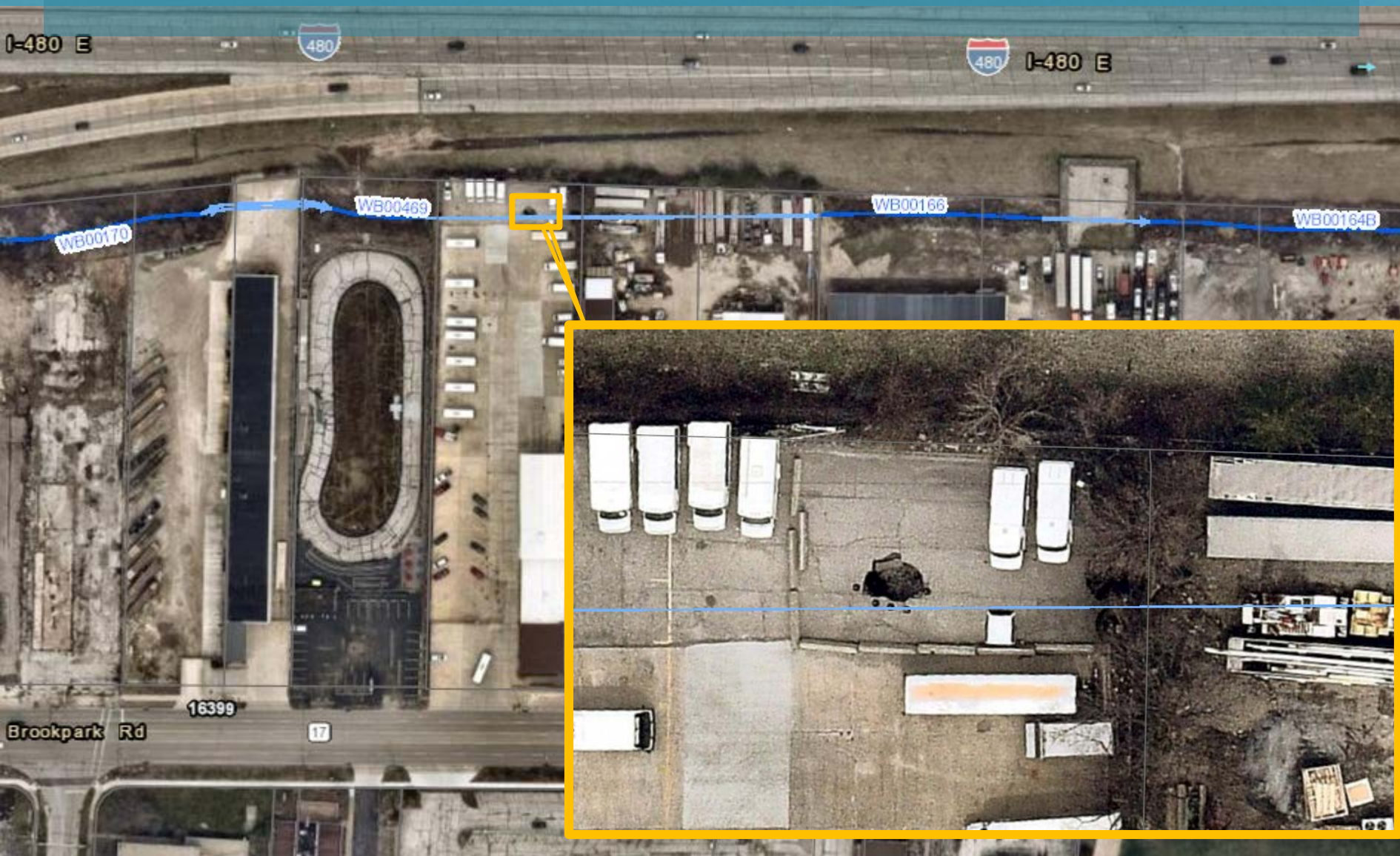


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West Branch Big Creek Culvert Collapse



West Branch Big Creek Culvert Collapse



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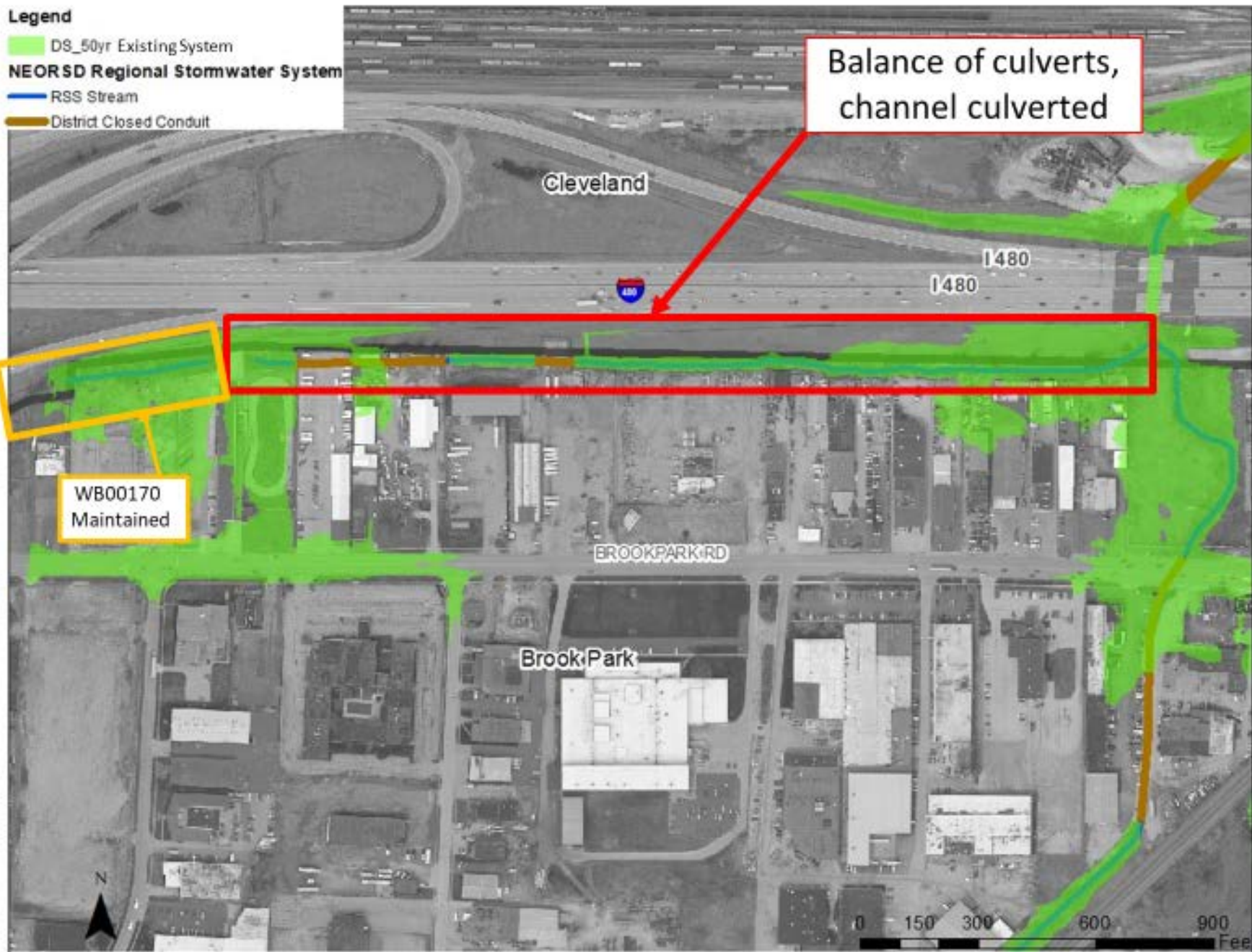
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Comprehensive, stream focused solutions



Legend

- DS_50yr Existing System
- NEORS Regional Stormwater System
- RSS Stream
- District Closed Conduit

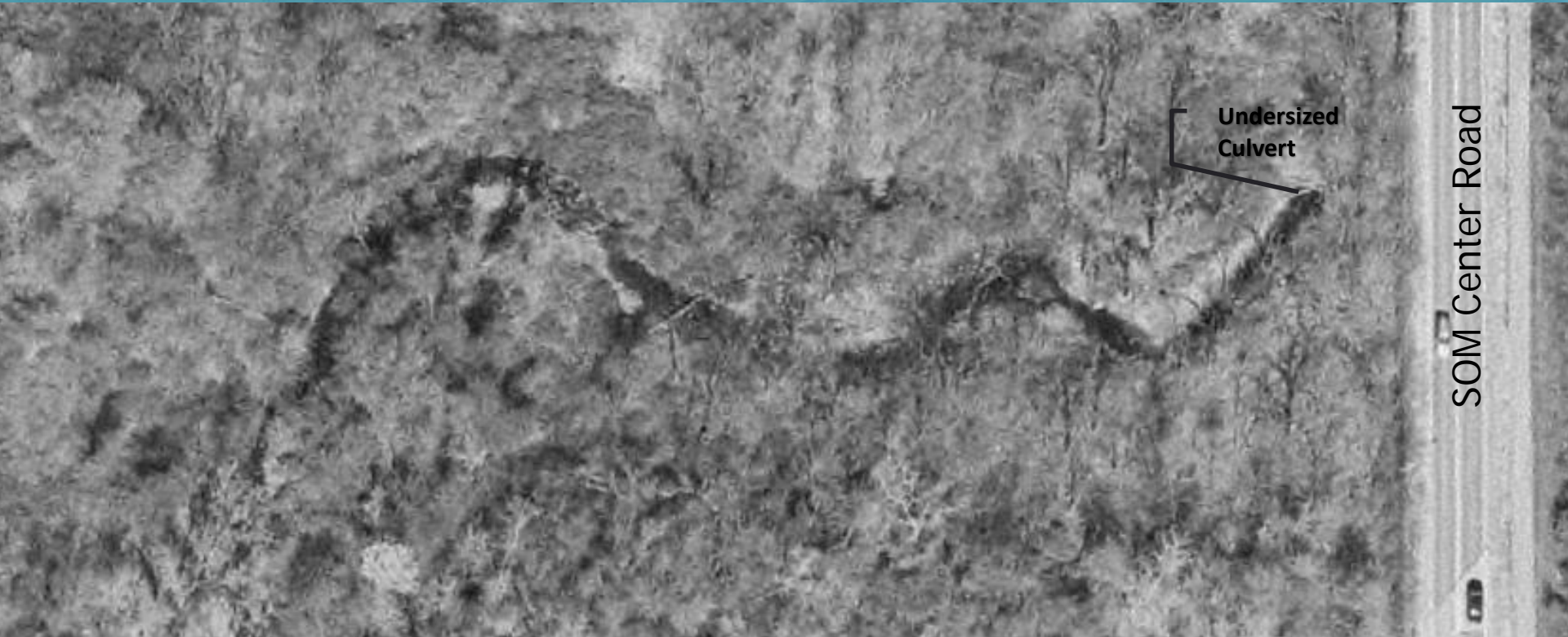


Beecher's Brook Bank Stabilization

Stream Focused Solutions

- Flooding
- Erosion
- Water Quality

Beecher's Brook Culvert 2002



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Beecher's Brook Culvert 2002



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Beecher's Brook Culvert 2006



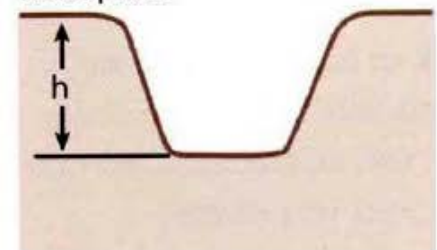
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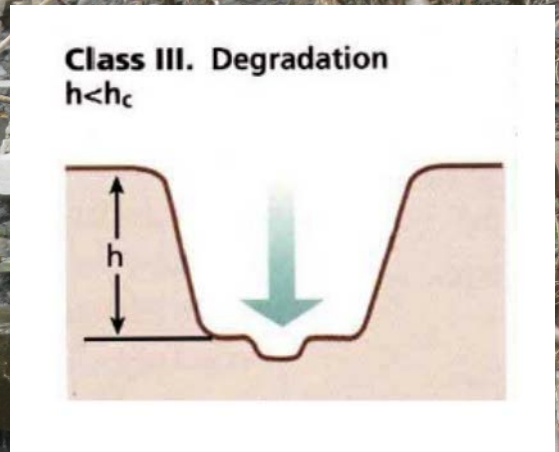
Class II. Channelized*
 $h < h_c$
floodplain



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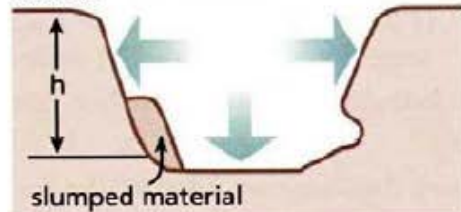


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Class IV. Degradation and Widening
 $h > h_c$

terrace

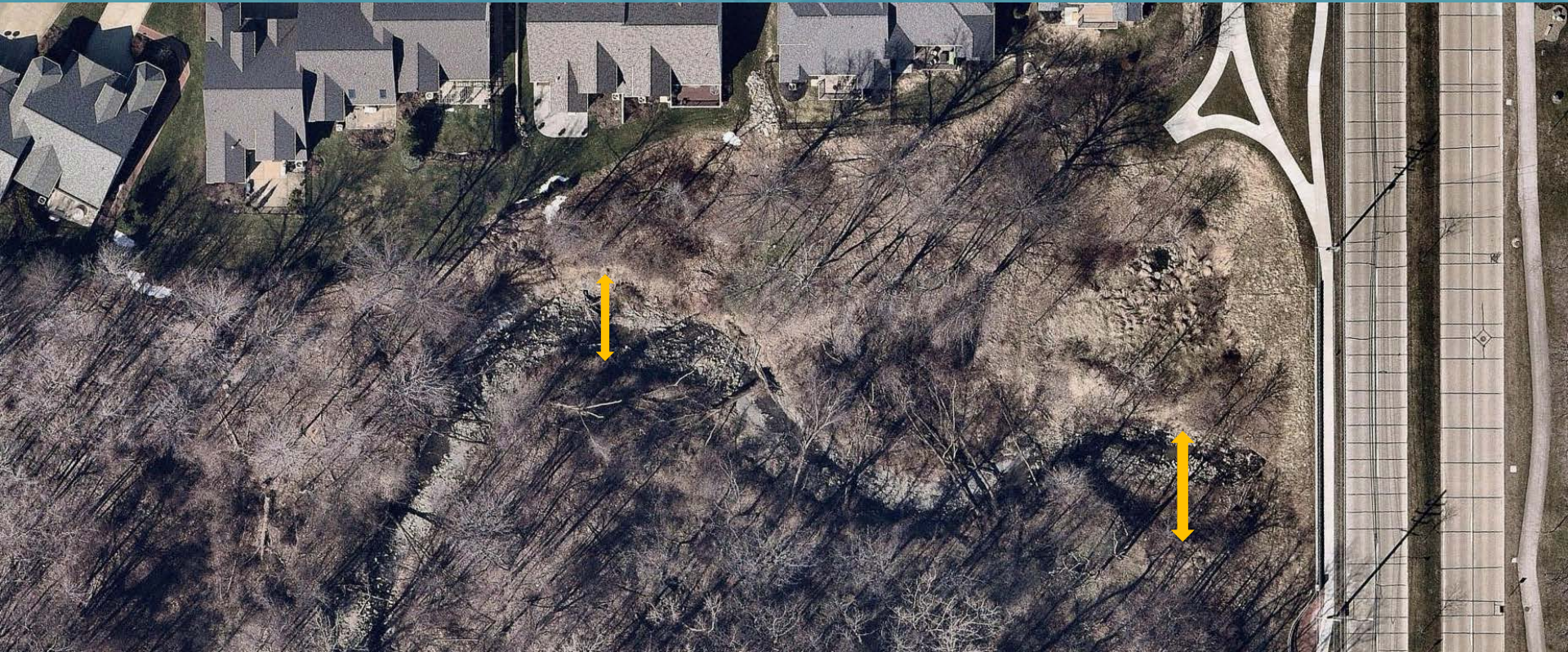


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Beecher's Brook Culvert 2017



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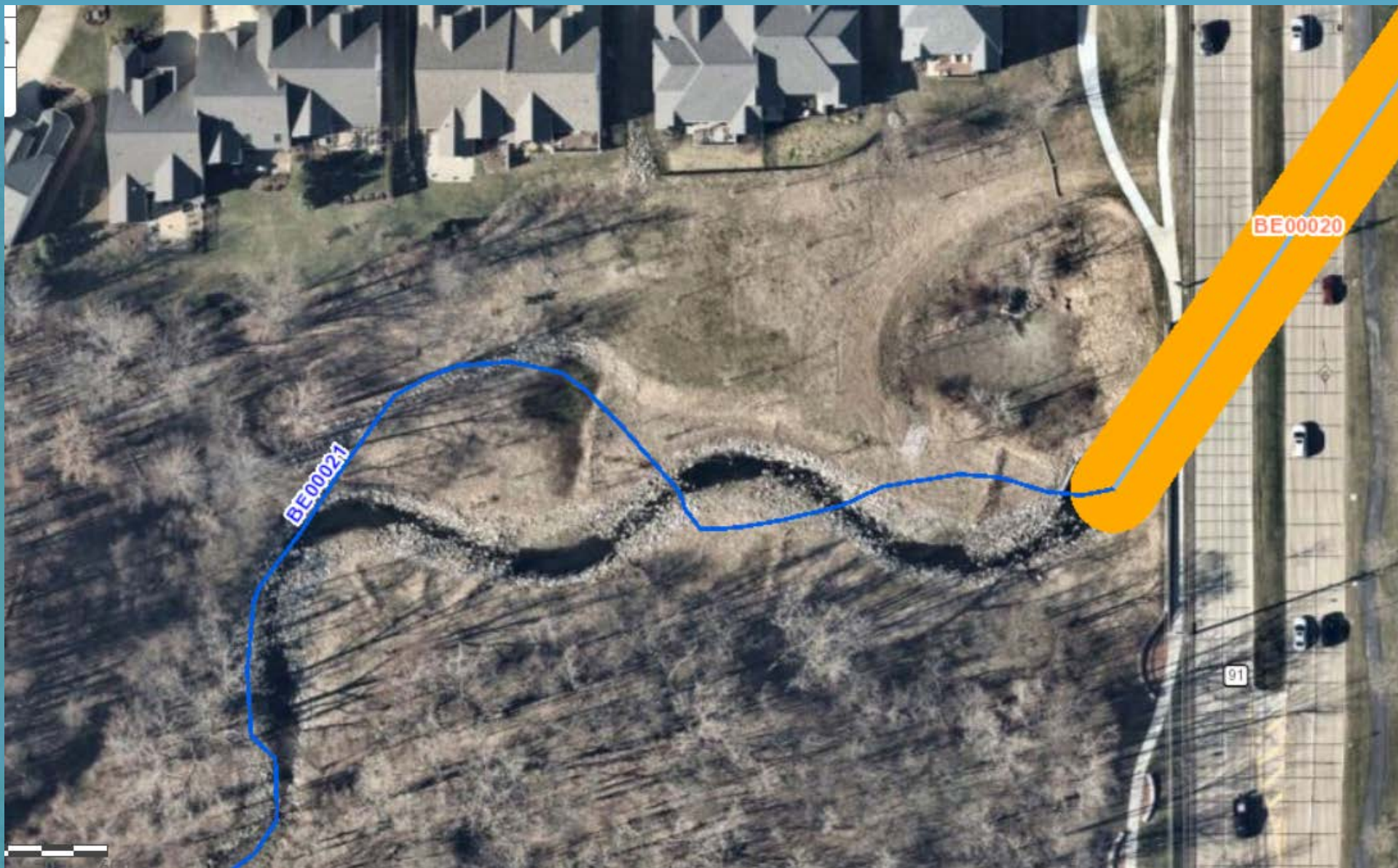
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QUESTIONS?

Janet Popielski, PE
popielskij@neorsd.org