# Watershed Advisory Committee Rocky River March 11, 2021

#### NORTHEAST OHIO REGIONAL SEWER DISTRICT





# Agenda

- Welcome & Introduction
- Water Resource Project Acquisition
- Report a Flood Tool (RAFT) Feature
- Master Planning
- Strategic Support
- Inspection and Maintenance
- Design & Construction
- Looking Ahead





# **Program Highlights**

Frank Greenland, Director of Watershed Programs Matt Scharver, Deputy Director of Watershed Programs







Year	CCS Spent	
2016	\$72,190	
2017	\$2,626,418	
2018	\$4,218,308	
2019	\$9,178,445	
2020	\$6,940,369	
2021	\$1,232,573	
Total	\$24,269,243	





### Community Cost-Share: 2021 Changes to Title V

The District is proposing minor changes to Title V Stormwater Management Code, Chapter 9 – Community Cost-Share Program (CCS). The language change will provide clarity in the implementation of the CCS Program.

\* NEORSD Title V Stormwater Management Code - *Change #1*: **Section 5.0903:** Eligible Community Cost-Share Program Activities – Member Communities may use Community Cost-Share Program funds for design, construction, operation, and maintenance of their Local Stormwater System... (the word "design" added for clarity)

#### \*NEORSD Title V Stormwater Management Code - Change #2:

• Section 5.0905 (b): Member Communities may accumulate up to five (5) years of Community Cost-Share funds. Member Communities must apply by December 31<sup>st</sup> of Year Five to be able to receive their funds from Year One.





# Local Sewer System Evaluation Studies (LSSES)



### 2022 MCIP Funding

2022 MCIP funding level to be determined

Implementation Schedule:

- March: RFP Released
- April 22-29: Pre-Proposal Meetings
- May 21: MCIP Submissions Due Date
- June July: Proposal Review Meetings
- September: Recommendations presented to Bd









# Questions

Brandywine Creek Hudson - BR00232



#### Water Resource Project Property Acquisition

#### Program Goals

- Support Design and Construction project needs
- Mitigate the threat of erosion and flooding
- Protect functioning regional stormwater assets
- Leverage acquisition dollars through partnerships

#### Success to date: Threat Mitigation/ Asset Protection

- Fee Simple : 45/ \$ 9,674,651
- Permanent Easements: 93/ \$740,605

#### Success to date: Partnerships

- Flood / Erosion Mitigation: 23 homes
- District Dollars invested: \$1,818,904
- Dollars Leveraged: \$4,761,969





#### **Acquisition Process**

Outreach

Appraisal

**Appraisal Review** 

FMV Offer

**Board Approval** 

Closing /Leasing

Maintenance and Inspection

#### Demolition

Water Resource Project



#### **Questions?**

#### Lilah Zautner, Project Manager for Property Acquisition zautnerl@neorsd.org 216.299.2751





### **Report a Flood Tool**

Northeast Ohio Regional Sewer District

### Report a Flood Tool

**Basement Flooding & Street Flooding** 



Report A Flood Tool

Click anywhere on this tab to record a flooding event in Survey123. A new page will be loaded that contains the survey.

Report Flooding Event



### Report a Flood Tool – What is it?

 A web based data collection form managed by the District, available through the District's ArcGIS Online Platform

 Associated Web Application showing the locations of flooding incidents

 Data can also be collected via a custom excel sheet or paper form





### **Report a Flood Tool - Form**

Basement Flooding D

- Yard Flooding O-
- Street Flooding ()
- Additional Comments/Pictures **(**)

Floor Drain	Toilet	Sink
Windows	Doors	Foundation (Walls/Floors)
scribe the characte	ristics of the water	
cribe the characte	ristics of the water	Slight Odor

#### How deep was the water (in inches)?

How often has this occurred in the past year?

>24 Hours

123





## **Report a Flood Tool - Map**



210 features 0 selected





### **Report a Flood Tool - Questions**

How can I access the RAFT form?

• Will other people be able to access the data?

• Will training be offered?





### **Report a Flood Tool - Benefits**

 Centralized repository for recording flooding incidents in a consistent format

• Understand what types of issues are occurring, how frequently, and where

Prioritize projects based on incident type and frequency

• Help validate hydraulic models



### **Report a Flood Tool - Contacts**

Eric J. Baker, GISP <u>bakere@neorsd.org</u> or

gis@neorsd.org





### **Rocky River Stormwater Master Plan**

Plum Creek – Olmsted Falls





#### Stormwater Master Planning (Status through 2/22/2020)



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### **Rocky River Stormwater Master Plan**



### SWMP Study elements submitted to District in September 2020

- Final SWMP Report
- Community Reports
- Inspection/Maintenance Action Plan
- Electronic Data Deliverables
- **121 Problem Areas** with Planning Level Recommendations Identified
- Problem areas in the Rocky River subwatershed have been nominated to the SW Construction Plan and are in the process of being prioritized.

\$275 Million in construction costs



### **Stormwater Master Plan** Problem Area Determination

Watershed	Problem Areas	Stand-alone Projects	Estimate Costs
Abram Creek	7	3	\$43,193,000
Baker Creek	7	14	\$21,848,000
Baldwin Creek	10	5	\$48,593,000
Blodgett Creek	7	5	\$17,637,000
French Creek	2	0	\$ 1,035,000
Plum Creek	3	1	\$ 8,639,000
Rocky River EB	16	11	\$81,078,000
Rocky River MB	3	1	\$ 3,502,000
Rocky River WB	16	10	\$49,766,000
Totals	71	50	\$275,291,000





### Rocky River Stormwater Master Plan Design & Construction Phase

Projects initiated based upon the Rocky River Stormwater Master Plan:

- Abram Creek Detention Basins Near Big Creek Parkway - Middleburg Heights
- Cleveland Hopkins Airport Debris Rack Replacement – Cleveland
- Sheldon Road Bridge Replacement Brookpark & Middleburg Heights
- Route 82 Culvert Replacement Strongsville
- Baldwin Creek Relief Storm Sewer at Stormes Drive - Parma







### Rocky River Stormwater Master Plan Advanced Stormwater Planning

- Goal to ready projects for full design
  - Projects that require additional information to understand full RSS impacts
  - Breakdown of complex, preferred alternatives into manageable projects
  - Acquisition/Easement procurement
  - Coordination considerations with outside stakeholders
- Problem Area BDPA\_o6: York & West Pleasant Valley Roads ASP underway







### **Stormwater Master Plan** Data Sharing with Community Members



- Culverted Stream CCTV/PACP Reports
- Spherical Imagery of Open Streams
- Inventory of RSS Crossings
- SWMM Models of Sub-watersheds
- SWMP Community Report



# Questions







#### Stormwater Strategic Support Roles & Responsibilities

- Manage the RSMP Stormwater Planning Level Models
- Assign stormwater related risk (and its probability) to help prioritize and phase RSMP Construction Projects
- Support the District's urgent storm response and reporting
- Provide assistance to local stormwater issues with RSS benefits.





#### Ohio's Population and Stormwater Management Regulations By Decade







#### Ohio's Population and Stormwater Management Regulations By Decade







### **Development History**

- Nearly all the houses upstream of the flooded properties were built later
- Several houses were built without any **SCMs**
- Some SCMs • were constructed for flood control purposes

**Northeast Ohio Regional Sewer D** 



#### Legend

1485 SWI Building Age -SWI CuyahogaParcels

- 1800s
  - 1900 to 1944 Pre-WWII
- 1945 to 1967 Post-WWI
- 1968 to 1990
- Post 1990
- No Building or Age Not Available

#### 2020 March/April Nearmap

- Red: Band 1 Green: Band 2 Blue: Band 3
  - Drainage Boundary







Sprag ue Ro + 1 Stuartict a Dales Ct 0 Helen Dr Tiffany Valley Ln Royal Valley Drinckneya Dr CorkwoodiDr ē

#### Big Creek North Royalton Problem Area [BCNRo2]

- Model updated with additional detail
- Model verified using customer reports of flooding during historical storm events
- Developing alternatives to mitigate both RSS and LSS flooding



Oakridge



### April 16, 2018 Urgent Storm Event: Street Flooding



Confirmed Residential Reports of Surface Flood Routing and Extensive Roadway Flooding along Maplegrove Ave

⊎акгідде



### General Topic: Informative Flooding Photos Building, Street, & Property Flooding

Hemlock Creek, Seven Hills

### General Topic: Informative Flooding Photos Property Flooding

Hemlock Creek, Seven Hills

### General Topic: Informative Flooding Photos Building Flooding

Hemlock Creek, Seven Hills

### April 16, 2018 Urgent Storm Event: Street Flooding

Confirmed Residential Reports of Surface Flood Routing and Extensive Roadway Flooding along Maplegrove Ave

wakridge

Confirmed Residential Reports of Property and Extensive Roadway Flooding along Oakridge Drive Confirmed Residential Reports of Surface Flood Routing along Oakridge Drive
# CRN SWMP Model: 10-year design storm







# Updated Model: 10-year design storm







# **BCNRo2: Alternative Development & Evaluation**



Optimize Existing SCM Storage – Explore Converting Some Wet Storage to Dry Storage

# Questions

Maplegrove Avenue Crossing Outlet

# Stormwater Inspection & Maintenance (SWIM)

- Inspection Program
- Root Cause Failure Analysis (RCFA)
- Maintenance Program













### Completed Inspections 10/2020 - 02/2021 178 Total Inspections

- 150 SWIM Inspections
- 28 Responsible Party Benchmark Inspections





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### Headwaters of the Rocky East Branch, North Royalton

Failed footbridge, stream has scoured along both sides. Multiple methods of artificial surface protection have also been scoured. Channel is incised (no access to floodplain)















Northeast Ohio Regional Sewer District Tributary to Rocky West Branch, Sunset Memorial Park Cemetery, Olmsted Township





# **SWIM** Root Cause Failure Analysis (RCFA)



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# **SWIM** Root Cause Failure Analysis (RCFA)

Problem Identification

- Greenhaven Parkway and Riverview Road in Brecksville, Unnamed Trib to Cuyahoga
- Intersection frequently floods
- Sediment vaults require repeated maintenance







# SWIM Root Cause Failure Analysis (RCFA) Data Collection



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- Goal: Find the source of the sediment
- Mapped the LSS, including all outfalls >12" diameter
- Performed STEPL analysis on all stream segments draining to intersection
- Height and length measured on each eroding bank
  - Assigned a Lateral Recession Rate for each bank, ranging from .01' to .5' per year based on bank material and surface protection (lack thereof)
  - Calculated volume of sediment from each segment



# SWIM Root Cause Failure Analysis (RCFA) Study Area







# **SWIM Root Cause Failure Analysis (RCFA)** *Data Analysis*



Brecksville Road culvert outlet Contributes about 18 tons sediment/yr (6%)

Northeast Ohio Regional Sewer District South of Whitewood Rd Contributes 10 tons sediment/yr (3%)



## SWIM Root Cause Failure Analysis (RCFA) Recommendations

Address top contributors

- Reconnect Carriage Hill to floodplain
- Stabilize Brecksville Road
  culvert outlet
- Restore channel south of Whitewood Road to historic location
- Stabilize outfalls north of Whitewood Road

- Make sediment removal maintenance more effective and efficient – utilize existing detention basin
- Opportunities throughout to install engineered log jams, notably north and south of Whitewood Road



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# **SWIM** 2021 Maintenance Program







## SWIM 2021 Maintenance Program



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### 10/2020 – 02/2021 Maintenance Projects

Project Type	Projects (Count)	Debris Removed (CY)	Sediment Removed (CY)
Sediment & Debris	23	1,033	0
Other	1		
Total	24	1,033	0



\*no maintenance in Black River Watershed during this time period



# SWIM Maintenance Task Tributary to Baldwin Creek





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BDNR001, North Royalton - Partial Culvert Removal



# SWIM Maintenance Task Minnie Creek Dredging









### Northeast Ohio Regional Sewer District

MN00019, Olmsted Township - Dredging to restore stream conveyance



# Questions?





# Stormwater Design and Construction Program



# **Stormwater Storymap**







13

17

Stabilization Near...

#### **NEORSD Stormwater Design & Construction Program**

19

Restoration

Berkshire Drive

Stabilization Near.

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 watershed.

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Twinsburg

Cuyahoga Valley National Park

Heights

Complete All Projects Construction Design THEAST OHIO REGIONAL SEWER DIST REGIONAL STORMWATEF MANAGEMEN' PROGRAM Q 1 Abram Creek / Big Creek 2 Baldwin Creek Bank 3 Baldwin Creek Bank 4 Baldwin Creek Parkway Detention. Stabilization at Pleasan. Stabilization Near Abb... Bratena Stabilization at East. South leveland Euclid Heig 1.15月1日日日 Cleveland 6 Beechers Brook Bank 5 Bear Creek Culvert 7 Big Creek Chevrolet 8 Big Creek Stabilization Stabilization Boulevard Detention ... Removal locky R ve 12 Chippewa Creek Bank 10 Brandywine Creek -11 Brandywine Creek -9 Big Creek Stream Barlow Community.. Owen Brown Bridge. Stabilization Upstream. Stabilization at Harris... Sagarfore Hills Two 14 Chippewa Creek 15 Chippewa Creek Flood 16 Chippewa Creek Chippewa Creek Bank Stabilization at Route 21 Floodplain Control. Reduction Near Echo... Stabilization at.. tronosville Brunswick k 18 Chippewa Creek Stream 20 Culvert Repair at Chippewa Creek Stream Colombo Park Stream

Brunswick

Hills Twp

## Projects in Design and Construction

Project Name	City	Next Step/Submittal	Estimated Construction NTP	Со	Estimated Construction Cost	
West Creek Bank Stabilization by Sandpiper Drive	Parma	Construction	17-Jun-20	\$	1,295,090.00	
Chippewa Creek Stabilization at Condominiums	Brecksville	Construction	28-Aug-20	\$	1,282,013.50	
Rocky River Trib Re-alignment along Ridge Road	North Royalton	Construction	1-Dec-20	\$	438,471.10	
Pepper Luce Creek Stabilization Near Lander Road	Pepper Pike	Construction	23-Nov-20	\$	593,034.90	
Doan Brook Culvert Debris Removal	Cleveland	Construction	10-Nov-20	\$	543,900.00	
Strongsville SR82 Culvert	Strongsville	Construction	1-Jan-21	\$	500,000.00	
Debris Racks and Access Road Improvements	various	GMP	1-Apr-21	\$	1,500,000.00	
Rocky River Stabilization & Sewer Protection	North Royalton	Bid Docs	1-Sep-21	\$	839,000.00	
Chippewa Creek Stabilization Route 21	Brecksville	Bid Docs	15-Sep-21	\$	1,295,000.00	
Chippewa Creek Stream Stabilization near Broadview Road	Broadview Hts	Bid Docs	29-Sep-21	\$	1,738,000.00	
Baldwin Creek Stabilization near Abbey Road	North Royalton	100% Design	18-Aug-21	\$	775,600.00	
Bear Creek Culvert Improvements	North Randall	Bid Docs	16-Feb-22	\$	1,021,900.00	
Big Creek Flood Reduction near Sprague Road	various	90% Design	17-Nov-21	\$	742,000.00	
Pepper Luce Creek Stabilization Near Gates Mills Blvd	Pepper Pike	90% Design	5-Jan-22	\$	2,200,000.00	
West Creek Stabilization	Brooklyn Hts	90% Design	19-Jan-22	\$	16,554,000.00	
Abram Creek - Big Creek Prky Flood Reduction Phase 1	Middleburg Hts	-	2021	\$	787,938.00	
Brandywine Creek Barlow Dam Improvements	Hudson	70% Design	1-Oct-21	\$	1,354,000.00	
Chippewa Creek Flood Reduction Project Near Echo Lane	Broadview Hts	60% Design	23-Mar-22	\$	8,200,000.00	
Brandywine Creek - Owen Brown Bridge Replacement	Hudson	50% Design	2022	\$	1,106,500.00	
Big Creek Phase 1 BCPA07 - Ridgewood Basins	Parma	50% Design	2-Feb-22	\$	1,000,000.00	
Baldwin - Stormes Drive Basin	Parma	50% Design	16-Mar-22	\$	2,500,000.00	
Abrams Creek Flooding at Sheldon Road	various	FUNDING	2023	\$	2,000,000.00	
Hemlock - Seven Hills Phase 1	Seven Hills	Design RFP	1-Dec-22	\$	2,000,000.00	
Hemlock Creek near Hemlock Road	Independence	D/B RFQ/RFP	2023	\$	1,200,000.00	
Shaker Lakes Dam Modifications: Phase II - Upper Lake Dam	various	Final Design	1-Mar-22	\$	8,500,000.00	
Big Creek Near Ridge Road	Parma	Pre-Design BODR	2023		tbd	

For this meeting, we will focus mostly on projects under construction, and briefly discuss inhouse design projects.

- 7 projects under construction contract
- 20 projects in some procurement or design phase
  - 4 projects under reimbursement contract to community
- \* Upcoming projects subject to change



## What Do Stream Restoration Projects Look Like?

#### What Do Stream Restoration Projects Look Like?

Beechers Brook Stabilization Project in Mayfield Village:





Stickney Creek Stream Restoration & Utility Repair Project in the City of Brooklyn:





Baldwin Creek Stabilization Project in the City of Parma:





#### What are the Typical Components of Stream Restoration Projects?









#### Rocks

Sometimes referred to as "riprap," rocks are used to stabilize streambanks and line the bottom of the stream to make it less vulnerable to erosion. Sizing of the rocks depends on the amount of flow that the stream experiences. Limestone and sandstone are commonly used.

#### Pools & Riffles

Pools are deeper sections of the stream usually built on the outside of bends. *Riffles* are shallow areas of the stream with protruding rocks at the surface. Both structures work together to reduce the energy of the stream.

#### Floodplains

Floodplains are areas where streams can flow out of their main channels during large storm events to provide some temporary flood storage and dissipation of stream energy. After a large storm event, water on the floodplains will infiltrate or slowly flow back into the stream channel. Floodplains also have a positive impact on water quality by allowing sediment and nutrients to settle out and not be carried downstream.

#### Vegetation

Vegetation typically installed on stream restoration projects include:

- Trees and shrubs;
- Live stakes, which are woody cuttings harvested from trees in the dormant season. They are installed along streambanks and develop dense root systems to help hold the soil together and minimize future erosion;
- Herbaceous plugs and seeding.

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# Pepper Luce Creek at Lander Road City of Pepper Pike

### **Pepper Luce Creek Streambank Stabilization**

- Arrest streambank erosion
- Protect utility assets
- Create & expand floodplain

Professional Service Firm:	Jacobs			
<u>Contractor:</u>	Tucson			
Construction Phase:	NTP - 11/23/20			
Bid Estimate:	\$760,000.00			
<u>Award:</u>	\$593,034.90			

Failed gabion baskets & streambank erosion



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# Pepper Luce Creek at Lander Road City of Pepper Pike

- Purchased 1 residential property and acquired easements on several others
- Installation of Fabric Encapsulated Soil Lifts (FESLs)
- Expanding floodplain
- Tied into gabions at downstream end of project (had to shorten project due to easement refusal from 1 property owner)





# Pepper Luce Creek at Lander Road City of Pepper Pike

before



after







## **Doan Brook Culvert Debris Removal** Remove 1950 cubic yards







## Doan Brook Culvert Debris Removal Construction Complete

### Doan Brook Culvert in Cleveland University Circle around Euclid Ave and Chester Ave





before







# Chippewa Creek Stabilization at Condominiums in Brecksville



Eroding streambank within 12 ft of the condominiums

Erosion within 6 ft of local sanitary sewer

Stream infrastructure more cost effective than acquisition

Construction Award: \$1,282,013

Excavate Floodplain on left bank



# Chippewa Creek Stabilization at Condominiums in Brecksville



## West Creek Stabilization by Sandpiper Drive



Northeast Ohio Regional Sewer District Stream infrastructure more cost effective than acquisition

Large area of property impacted including large trees

Construction Award: \$1,295,090



## West Creek Stabilization by Sandpiper Drive Construction Complete



# City of North Royalton - Ridge Road Repair and Rocky River Tributary Stabilization

Problem: Bank erosionadjacent to Ridge RoadProject benefit to RSS:

- Reduces sediment deposition
- Creates a new stable stream channel

**Construction Award:** \$438,471





## City of North Royalton - Ridge Road Repair and Rocky River Tributary Stabilization




### In-House Design Projects

#### Hemlock Creek in Seven Hills

- Excavate and grade south bank of stream to increase cross section and create more floodplain area to reduce energy on north eroding bank
- To be constructed 2<sup>nd</sup>
   Ort 2021





Regional Sewer District

### In-House Design Projects

#### Lakeview Dam Repairs

- ODNR inspection report maintenance items
- Concrete surface repairs on downstream face of dam
- Air vent modifications
- To be constructed 2021











## **Cost-Saving Programs**

• Crisis Assistance *—Up to \$300 sewer credit* -Experienced financial hardship within last 6 months (loss of job, loss of income, death in family, medical expenses, etc.)





### **Cost-Saving Programs**

Homestead

-65 and older or permanently disabled
-Household income must not exceed
\$33,500

Affordability

 Annual income is at or below 200% of the poverty level

Customer Service: (216) 881-8247





## **Cost-Savings Programs**

Northe	east Ohio al Sewer District	<b>Residential</b>   Business   Careers   Industrial	
About Us 👻	Customer Service 👻 Busin	ss 👻 Community 👻 Stormwater 👻	Careers - Blog Q
<b>NOTICE:</b> March 11, March 11, 2021 Fina discussions and de meeting begins. <u>Fir</u>	Got Questions? FAQ Billing, Rates & Account Information	)VID-19 emergency, and in accordance with House attended through video conference that allows th rd. If you wish to address the committee, please u <u>i.m.</u>	e Bill 404, signed into law by Governor DeWine, the ne public to electronically observe and hear the use the Q&A option on the livestream before the
	Cost-Saving Programs	Ways to Save On Your Bill	
	About Your Sewers: Common Problems and Responsibilities	Homestead	
	Contact Us / Ask Us	Affordability	
		Crisis Assistance	what it takes to
		Summer Sprinkling	ur Great Lake





# WTL Contact

Meiring Borcherds 216.881.6600 Ext. 6159 Cell: 440 409 1766 borcherdsm@neorsd.org

#### NORTHEAST OHIO REGIONAL SEWER DISTRICT



Stormwater Program: Community Resources
<u>http://www.neorsd.org/communitystormwaterresources.php</u>



