

Black Creek Consolidated Drain Project Status Update 6/5/20

Muskegon County Drain Commissioner

Brenda M. Moore (Drain Commissioner)

Stephanie Barrett (Deputy Drain Commissioner)



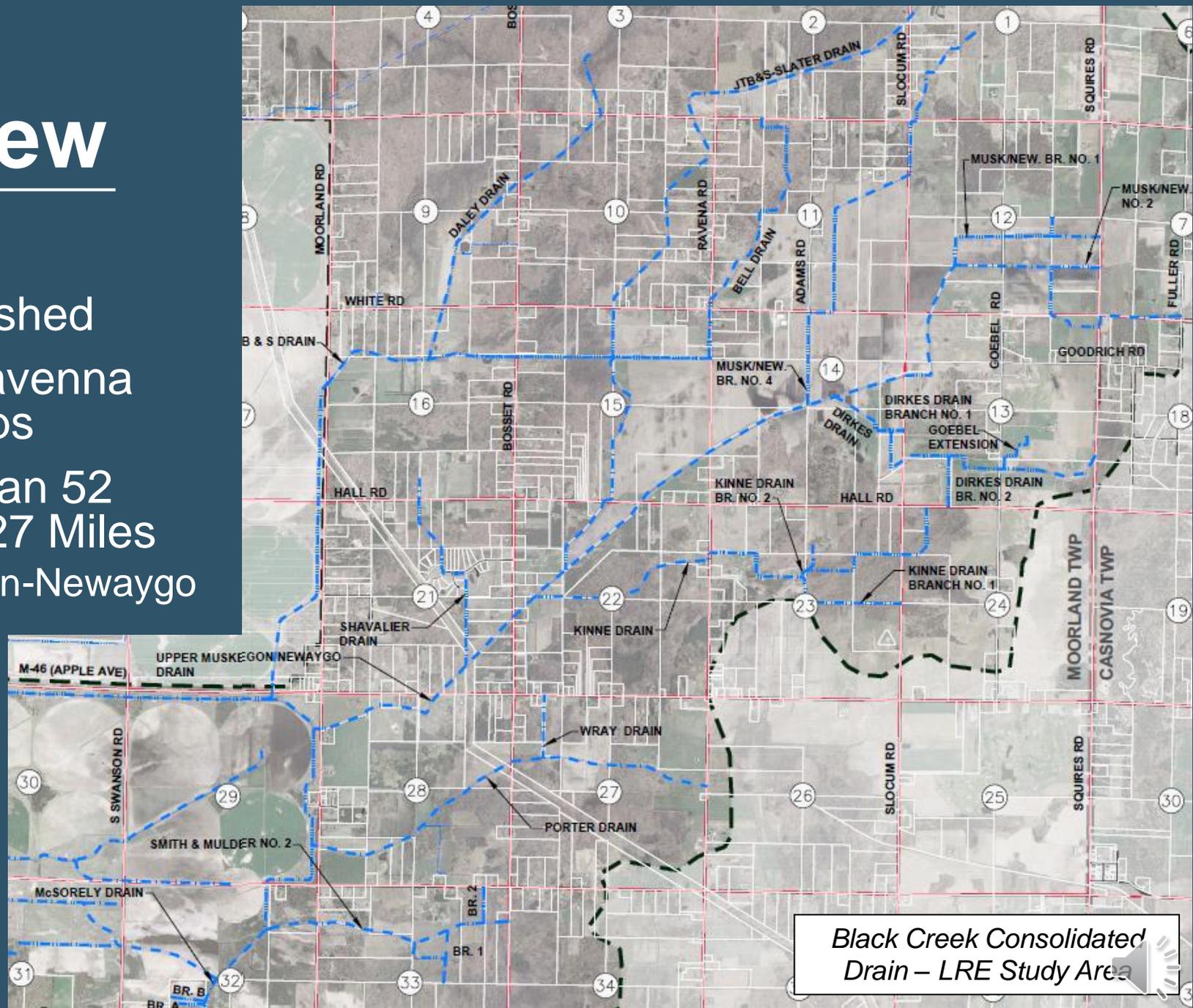
Presentation Overview

- Drain Overview
- LRE Services to Date
- Drainage Issues
- Project Goals & Objectives
- Proposed Project Scope
- Next Steps



Drain Overview

- Tributary to Mona Lake
- 17,500 acres +/- Watershed
- Egelston, Moorland, Ravenna and Casnovia Townships
- Drain Length – More than 52 Miles / LRE focus SE 27 Miles
 - Former Upper Muskegon-Newaygo
 - Former Dirkes
 - Former Kinne
 - Former Porter / Wray
 - Former Smith & Mulder
 - Former McSorely



Black Creek Consolidated Drain – LRE Study Area

LRE Services to Date

LRE retained in 2017 to study / design 27 miles of Drain in southeast sector of Drainage District. Services completed to date include:

- Conduct topographic survey and engineering inspection.
- Analyze hydraulic capacity of the Drain and identify impairments.
- Evaluate improvement alternatives and develop recommendations.
- Complete engineering design.
- Prepare drawings and specifications for bids and construction.



Drainage Issues

Woody debris obstructions in the Drain:

- Reduces hydraulic capacity.
- Increases frequency of flooding.
- Promotes channel instability (erosion).



Porter Drain – Woody Debris near Sta. 38+00



Upper Muskegon-Newaygo Drain – Leaning Tree Exacerbating Erosion near Sta. 34+00



Drainage Issues

Localized Bank Erosion:

- Results in loss of land / property.
- Increases sediment input, which reduces hydraulic capacity of Drain; thereby, increasing frequency of flooding.
- Increases nutrient loading attached to sediment.



Upper Muskegon Newaygo Drain – Bank Erosion Contributing Sediment near Sta. 21+00



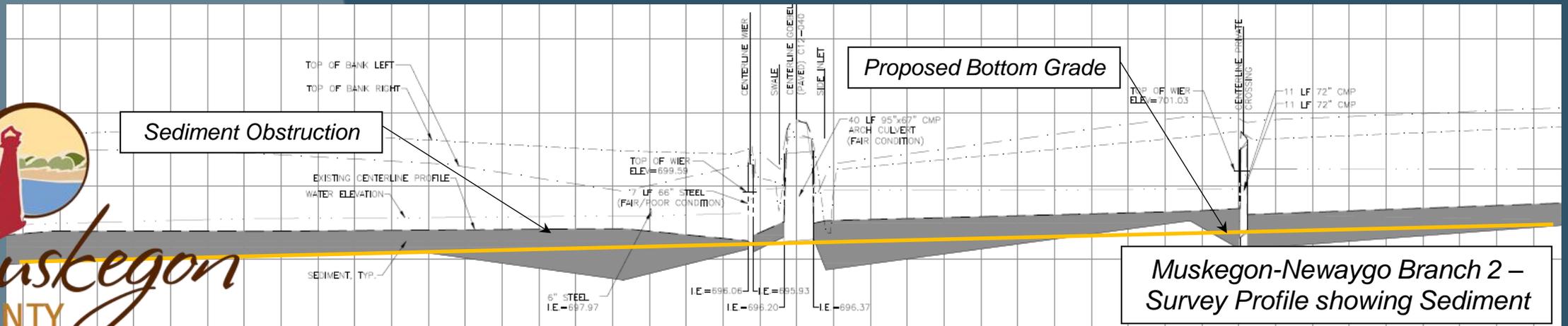
Muskegon Newaygo Drain – Bank Erosion near Sta. 16+00



Drainage Issues

Sediment Deposition:

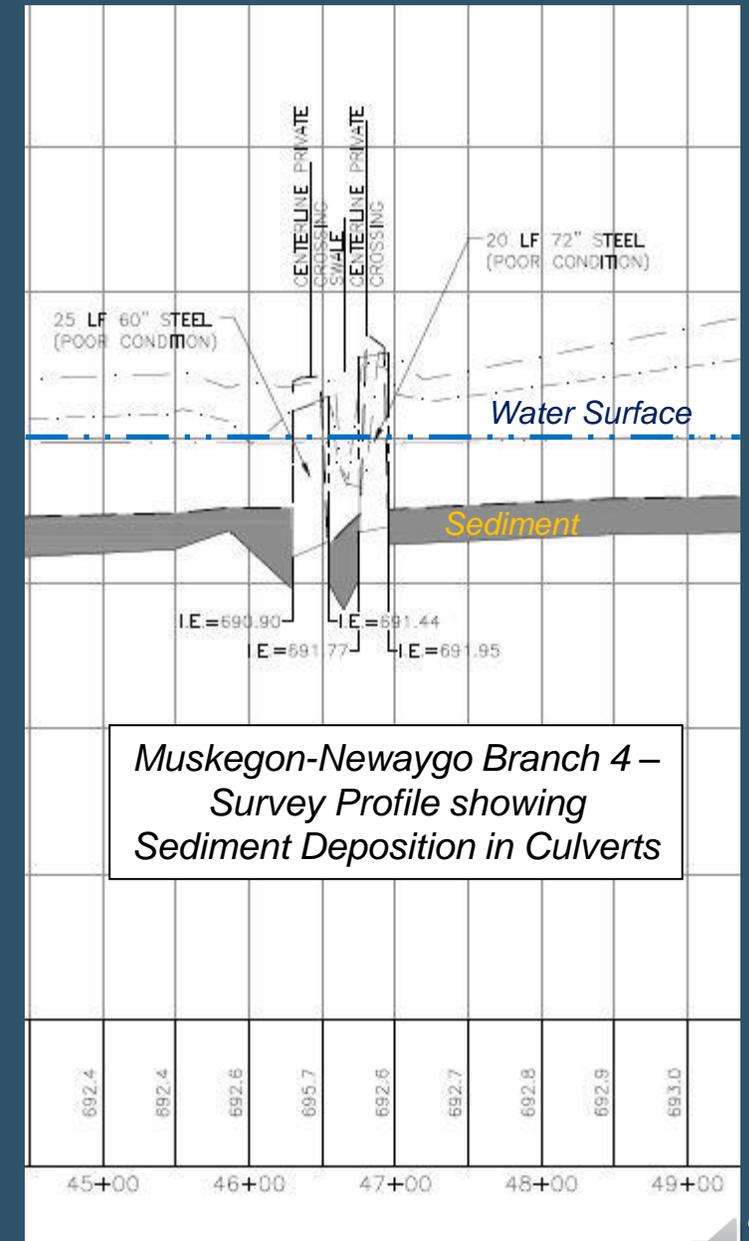
- Reduces hydraulic capacity of Drain and obstructs flow, thereby, increasing frequency of flooding.
- Limits function of agricultural tiles.



Drainage Issues

Sediment Deposition:

- Reduces hydraulic capacity of Drain (including culverts) and obstructs flow, thereby, increasing frequency of flooding.



Drainage Issues

Sediment Deposition:

- Reduces hydraulic capacity of Drain (including culverts) and obstructs flow, thereby, increasing frequency of flooding.



*Upper Muskegon-Newaygo
Drain – Sediment Deposition
in Channel and Culverts*



Drainage Issues

Failing Infrastructure:

- Many Crossings are in Poor Condition and Beyond Service Life (Threat to Public Safety)
- Sediment Deposition has Reduced Hydraulic Capacity causing Flooding.
- Culvert Inverts set too High or too Low relative to Profile.
- Abandoned Crossings obstructing Flow.

Muskegon-Newaygo Branch 4 – Slocum Road Crossing in Poor Condition



Upper Muskegon-Newaygo Drain – Crossing in Poor Condition near Sta. 48+00



Project Goals & Objectives

Protect Public Health, Welfare and Convenience by:

- Clearing Drain easement to remove woody debris and obstructions to flow.
- Stabilizing areas of channel erosion and instability to reduce property loss and improve water quality.
- Restoring hydraulic capacity of the county drain system to reduce flooding and improve agricultural production.
- Replacing (or removing) failing infrastructure, including aging or undersized county drain crossings.



Proposed Project Scope

Protect Public Health, Welfare and Convenience by:

- Selectively clearing the Drain easement and removing woody debris / obstructions from the county drain system to restore the hydraulic capacity, reduce flooding and improve agricultural production.



Before – Woody Debris Obstructing Flow



After – Stabilized Channel Free of Obstructions



Proposed Project Scope

Protect Public Health, Welfare and Convenience by:

- Stabilizing areas of channel erosion and instability to reduce land loss / sediment load and improve water quality



Before – Bank Erosion / Channel Instability



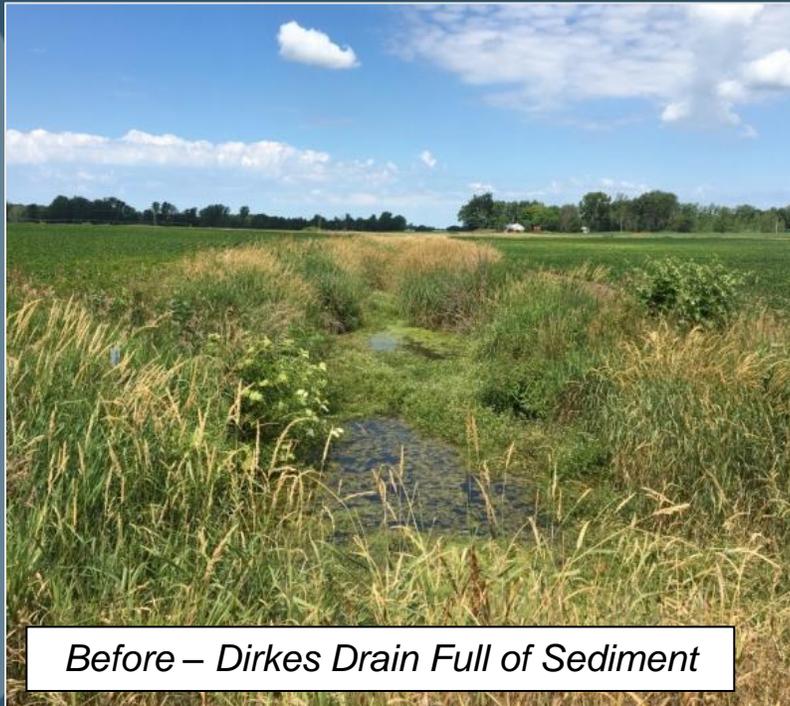
After – Stabilized Channel Free of Obstructions



Proposed Project Scope

Protect Public Health, Welfare and Convenience by:

- Excavating channel to restore hydraulic capacity of the county drain system to reduce flooding and improve agricultural production.



Before – Dirkes Drain Full of Sediment



After – Dirkes Drain Restored Channel



Proposed Project Scope

Protect Public Health, Welfare and Convenience by:

- Excavating channel to restore hydraulic capacity of the county drain system to reduce flooding and improve agricultural production.



Proposed Project Scope

Protect Public Health, Welfare and Convenience by:

- Replacing (or removing) failing infrastructure including drain crossings.

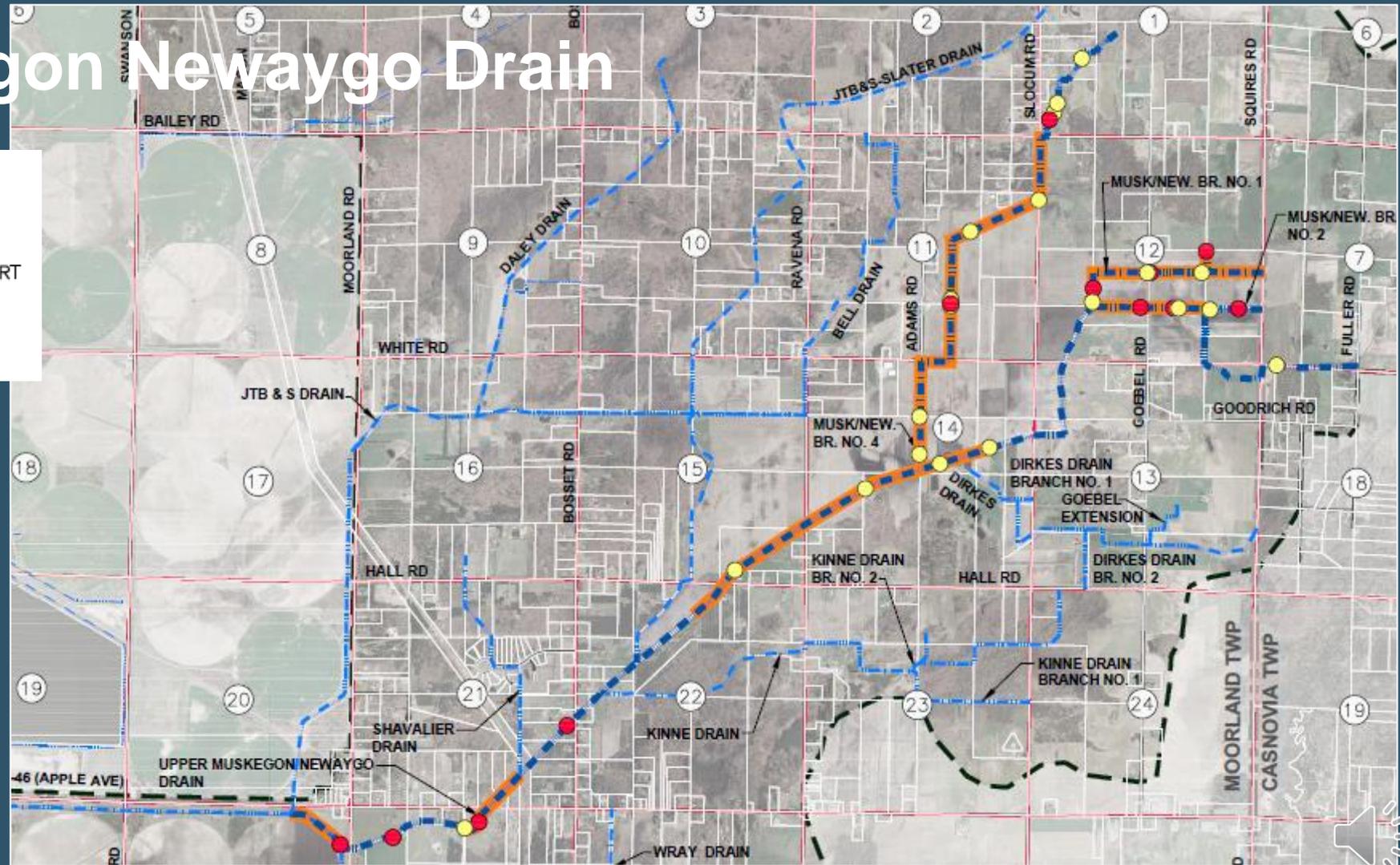


Proposed Project Scope

Upper Muskegon Newwaygo Drain

LEGEND

- OPEN CHANNEL EXCAVATION
- REMOVE OR REPLACE CULVERT
- BANK STABILIZATION BMP

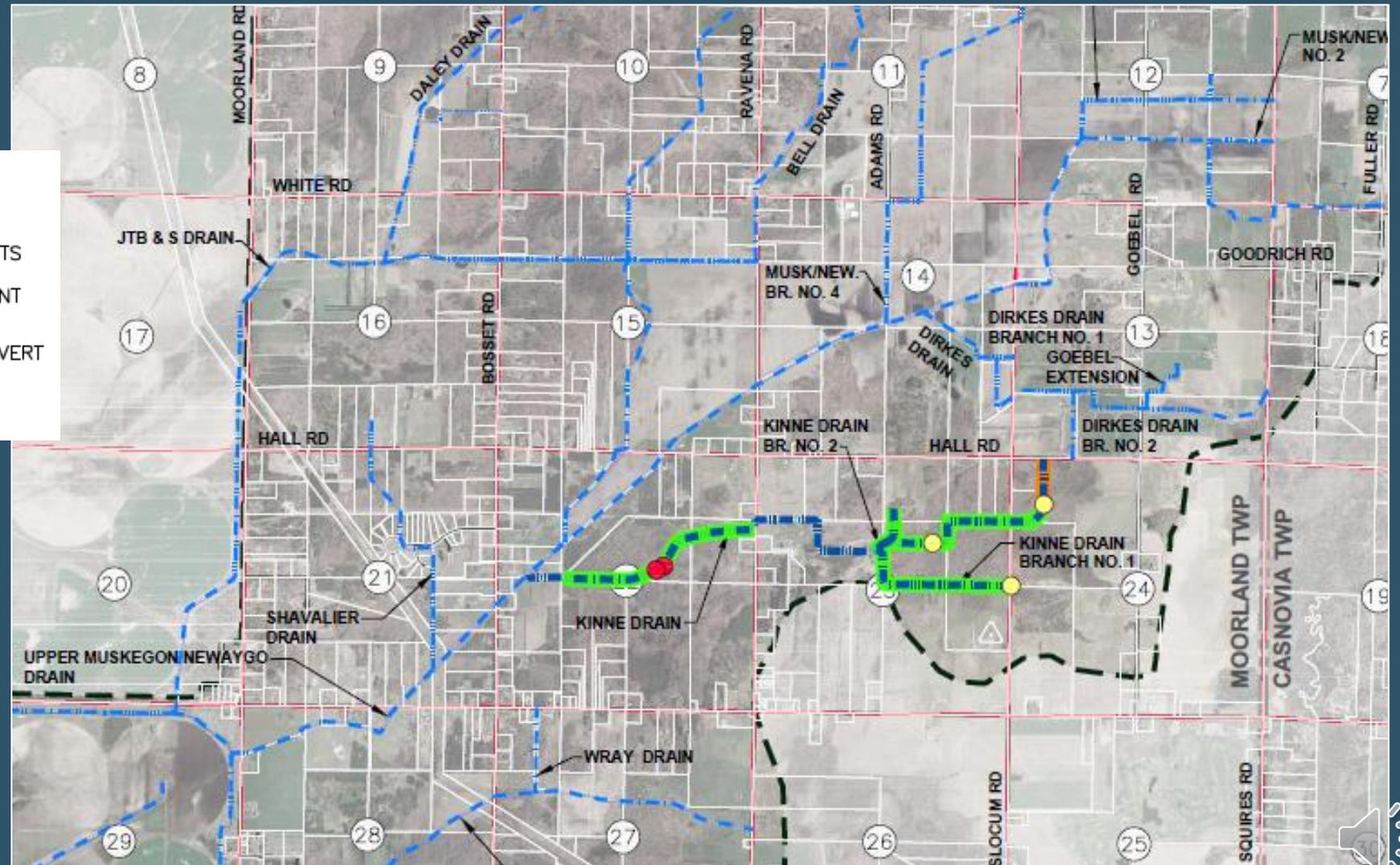


Proposed Project Scope

Kinne Drain

LEGEND

-  OPEN CHANNEL MAINTENANCE/IMPROVEMENTS
-  WOODY DEBRIS MANAGEMENT
-  REMOVE OR REPLACE CULVERT
-  BANK STABILIZATION BMP

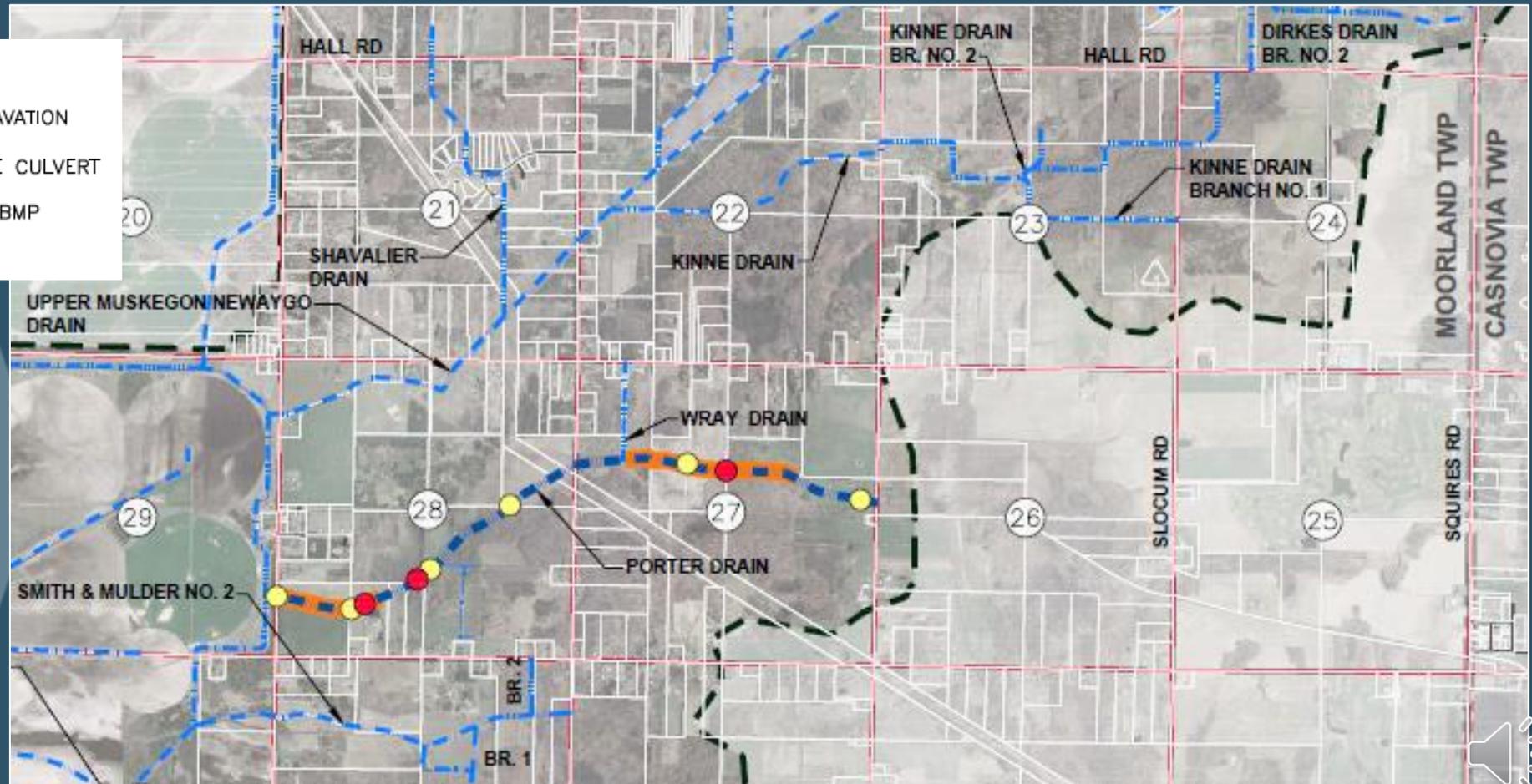


Proposed Project Scope

Porter / Wray Drains

LEGEND

- OPEN CHANNEL EXCAVATION
- REMOVE OR REPLACE CULVERT
- BANK STABILIZATION BMP

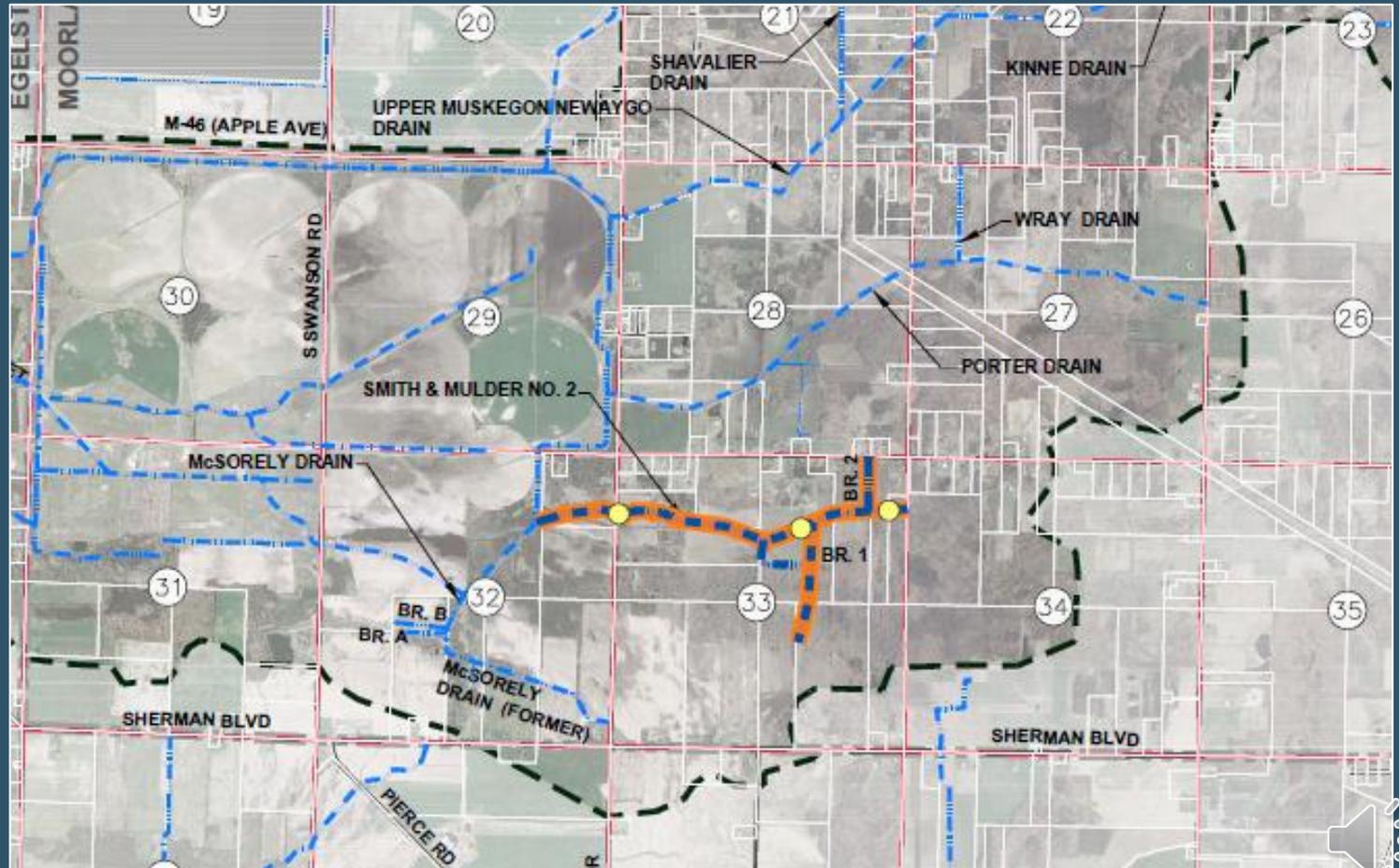


Proposed Project Scope

Smith & Mulder No. 2 Drain

LEGEND

- OPEN CHANNEL EXCAVATION
- REMOVE OR REPLACE CULVERT
- BANK STABILIZATION BMP



Next Steps

- Finalize Construction Drawings and Specifications
- Bid Project to Qualified Contractors
 - 12 Separate Divisions
 - Bid Opening – Tentatively Set for July 16, 2020
- Hold Day of Review – Tentatively Set for July 29, 2020
- Construct Project – Fall 2020 to 2022



The End

THANK YOU

