

Waldo Intercounty Drain

Hearing of Necessity



Larkin Township Hall

June 17, 2019

10:00 A.M.

Agenda

- Background information on drain
- Drainage district review
- Engineering review
- Recommendations and estimate of cost for improvements

Drain Background

- Existing Drain
 - 20 miles of open drain
 - Includes:
 - Main Branch
 - Branches No. 1 through No. 7
 - Bennett Drain, Ott Drain, Beckman Drain
 - 130 existing crossings
 - Watershed area of 26,672 acres

Drain Background

- Previous Projects
 - Waldo Drain – Established in 1905
 - Ott Drain – Established in 1913
 - Beckman Drain – Established in 1914
 - Waldo Drain Petition Project in 1917
 - Waldo Drain Petition Project in 1974

Drain Background

- March 16, 2018 - Petition filed with Midland County Drain Commissioner
- May 17, 2018 –Hearing of Practicability
 - Determined to move forward with preliminary engineering study
 - Testimony of Poor Drainage and Flooding

Drainage District

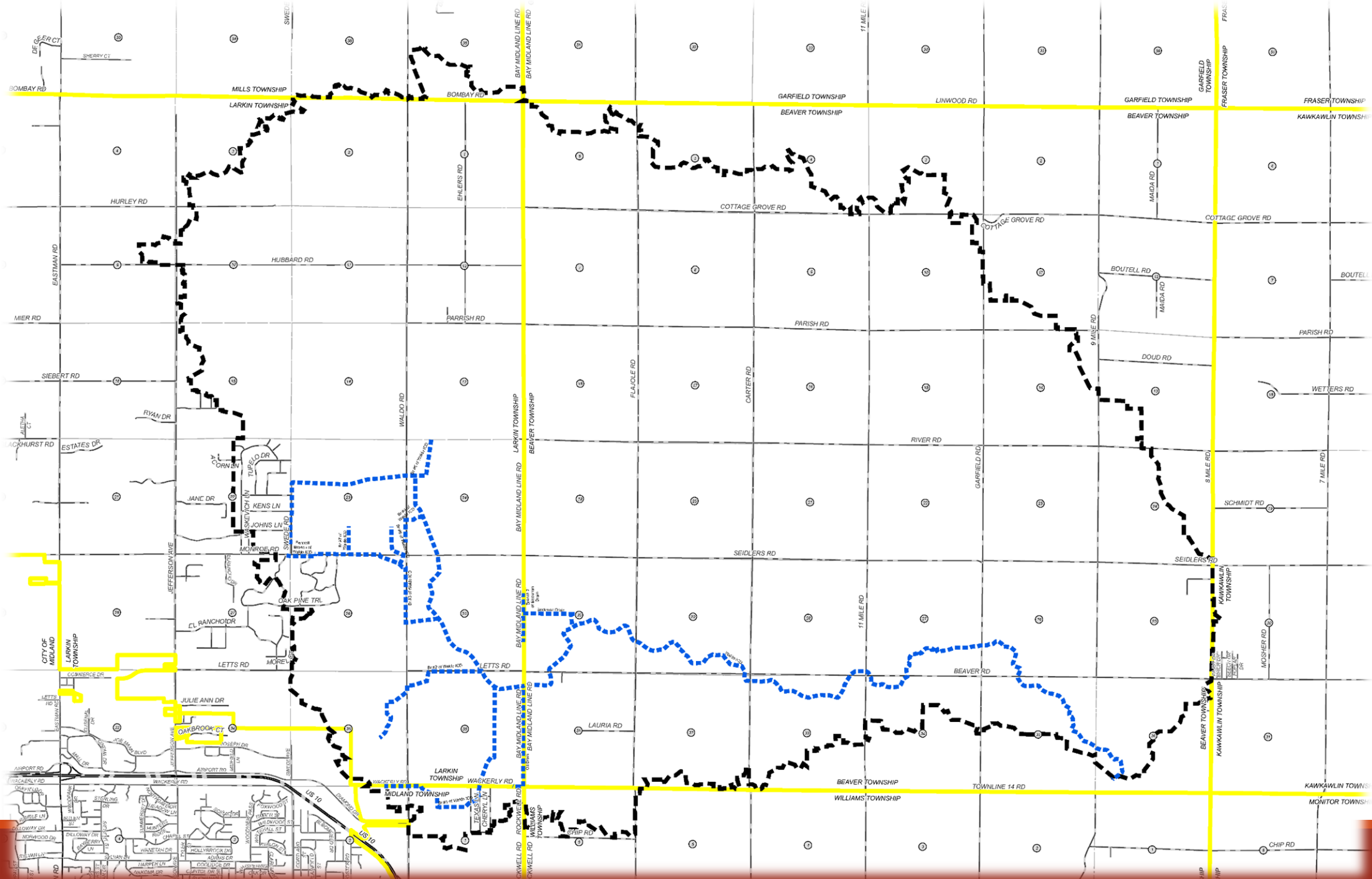
- What is a drainage district?
 - Lands that contribute storm water to the drain
 - Lands special assessed for improvements
 - Drainage district includes:
 - County and township government
 - Bay County: Beaver Twp, Williams Twp, Kawkawlin Twp
 - Midland County County: Larkin Twp, Midland Twp, Mills Twp, City of Midland
 - Landowners (Approximately 2,200 parcels)
 - Bay County – 1156 Parcels
 - Midland County – 1011 Parcels

Drainage District

- How is drainage district determined?
 - Identify lands that drain towards the county drain
 - Directly or indirectly connected to drain
 - Based on surface water flow
 - Reviewed existing maps and aerial photos
 - Reviewed available contour maps
 - Field reviewed district boundary

Drainage District

- Drainage district map shows revised boundary
 - Added lands that currently utilize the Waldo Drain, but were not previously in the Drainage District
 - Removed lands that don't currently utilize the Waldo Drain, but were in the Drainage District
- A Day of Review of District Boundary will be held to finalize changes.



Drainage District

- Drainage District-----26,672 acres
 - Bay County-----17,105 acres
 - Bay County Parcel Count-----1156
 - Midland County-----9,567 acres
 - Midland County Parcel Count-----1011

Notification

- If you received a notice of this meeting, your property is currently in the Drainage District or proposed to be added to the Drainage District

Engineering

- Survey and inspection of drain
- Hydrologic and hydraulic analysis - flow capacity and culvert sizing
- Development of proposed improvements
- Estimate of cost

Survey and Inspection of Drain

- Surveyed approximately 20 miles of drain
 - Drain elevations at 500 ft. intervals
 - Drain cross sections at 1,000 ft. intervals
 - Topographic features within 50 ft. of drain
- Identified the following items
 - Levels of sedimentation
 - Areas of erosion
 - Log jams and obstructions
 - Crossings that are inadequate

Survey Results

- Waldo Drain – Main Branch
 - Approximately 11.5 Miles in Length
 - Total fall in Main Branch is 84 Ft
 - Average Grade 0.14%
 - 0.5' to 3' of sediment in drain
 - Heavy Sedimentation in areas
 - Areas of standing water
 - Areas of brush and vegetation obstructions

Main Branch near point beginning



Main Branch Downstream of Garfield Rd



Main Branch Downstream of Garfield Rd



Main Branch Downstream of Garfield Rd



Main Branch downstream of 11 Mile Road



Main Branch near 11 Mile Road



11 Mile Road Crossing



Main Branch downstream of Carter Road



Main Branch upstream of Carter Road



Main Branch upstream of Carter Road



Main Branch at downstream end of Beaver Road



Main Branch downstream of Flajole Road



Main Branch upstream of Flajole Road



Main Branch downstream Bay-Midland Co. Line Road



Main Branch between Monroe Road and Letts Road



Main Branch downstream of Monroe Road



Main Branch along Swede Road



Survey Results

- Waldo Drain – Branch No. 1
 - Approximately 2 Miles in Length
 - Total fall in Branch No. 1 is 23.5 Ft
 - Average Grade 0.21%
 - 0.5' to 3' of sediment in drain
 - Heavy Obstructions and Sedimentation
 - Areas of severe standing and stagnant water

Branch No. 1 near outlet into Main Branch



Branch No. 1 near Texas Lane



Survey Results

- Waldo Drain – Branch No. 2
 - Approximately 1.4 Miles in Length
 - Total fall in Branch No. 2 is 24 Ft
 - Average Grade 0.33%
 - 0.5' to 3' of sediment in drain
 - Heavy Obstructions and Sedimentation
 - Areas of severe standing and stagnant water



Branch No. 2 near along Letts Road



Branch No. 2 downstream of Waldo Road



Survey Results

- Waldo Drain – Branch No. 3
 - Approximately 1.5 Miles in Length
 - Total fall in Branch No. 3 is 19.5 Ft
 - Average Grade 0.24%
 - 0.5' to 3' of sediment in drain
 - Heavy Sedimentation

Branch No. 3 downstream of Waldo Road



Branch No. 3 along Monroe Road



Survey Results

- Waldo Drain – Branch No. 4
 - Approximately 0.4 Mile in Length
 - Total fall in Branch No. 4 is 4.3 Ft
 - Typical Grade 0.28%
 - 0.5' of sediment in majority of drain
 - Areas of standing and stagnant water

Branch No. 4 along Waldo Road



Survey Results

- Waldo Drain – Branch No. 5
 - Approximately 0.4 Mile in Length
 - Total fall in Branch No. 5 is 4.3 Ft
 - Average Grade 0.19%
 - 0.5' to 3' of sediment in drain
 - Obstructions and Sedimentation
 - Areas of standing and stagnant water

Branch No. 5 near outlet into Main Branch



Survey Results

- Waldo Drain – Branch No. 6
 - Approximately 0.4 Mile in Length
 - Total fall in Branch No. 6 is 4.4 Ft
 - Average Grade is 0.22%
 - 0.5' to 3' of sediment in drain
 - Obstructions and Sedimentation
 - Areas of standing and stagnant water

Branch No. 6 upstream of Monroe Road



Survey Results

- Waldo Drain – Branch No. 7
 - Approximately 0.3 Mile in Length
 - Total fall in Branch No. 7 is 1.8 Ft
 - Average Grade is 0.13%
 - 0.5' to 3' of sediment in drain
 - Heavy Obstructions and Sedimentation

Branch No. 7 upstream of Monroe Road



Survey Results

- Waldo Drain – Ott Drain Branch
 - Approximately 1.1 Miles in Length
 - Total fall in Ott Drain is 19 Ft
 - Average Grade is 0.38%
 - 0.5' to 2' of sediment in drain
 - Obstructions and Sedimentation
 - Areas of standing and stagnant water

Ott Drain along Bay Midland Co. Line Road



Survey Results

- Waldo Drain – Bennett Drain Branch
 - Approximately 0.3 Mile in Length
 - Total fall in Bennett Drain is 16 Ft
 - Typical Grade is 0.75%
 - 0.5' of sediment in majority of drain
 - Obstructions and Sedimentation

Bennett Drain along Monroe Road



Survey Results

- Waldo Drain – Beckman Drain Branch
 - Approximately 1 Mile in Length
 - Total fall in Beckman Drain is 15 Ft
 - Typical Grade 0.34%
 - 0.5' to 3' of sediment in drain
 - Contains two branches (Branch No. 1 and Branch No .2)
 - Obstructions and Sedimentation

Beckman Drain upstream of outlet into Waldo Drain



Beckman Drain along Bay Midland Co. Line Road



Hydrology/Design Flow Capacity

- 10-Year Design Storm
 - 1.6 inches of rainfall in 1 hour
 - 3.3 inches of rainfall in 24 hours

Summary - Open Drain Improvements

- Site Clearing
- Channel Excavation and Channel Cleanout
- Construction of Road Shoulders
- Spoil Leveling and Hauling
- Drain Crossings
- Erosion Control Measures
- Cleanup and Restoration

Site Clearing

- Obstructions and debris will be removed from drain including trees and brush
- Maintenance lane along drain cleared on one side or both sides of drain depending on work scope
- All trees, brush and stumps will be disposed of either by burning, burying, chipping or hauling from site

Channel Excavation and Cleanout

- Channel Cleanout
 - Select removal of trees and brush
 - Removal of sediment from drain bottom
 - Spot repair of erosion
 - Excavate from one or both sides of drain
- Channel Excavation
 - Sediment removed from drain bottom
 - Reconstruct original bottom width
 - One or both banks sloped to 2 hor. to 1 vert.
 - All trees and brush grubbed from banks being sloped
 - Excavate from one or both sides of drain

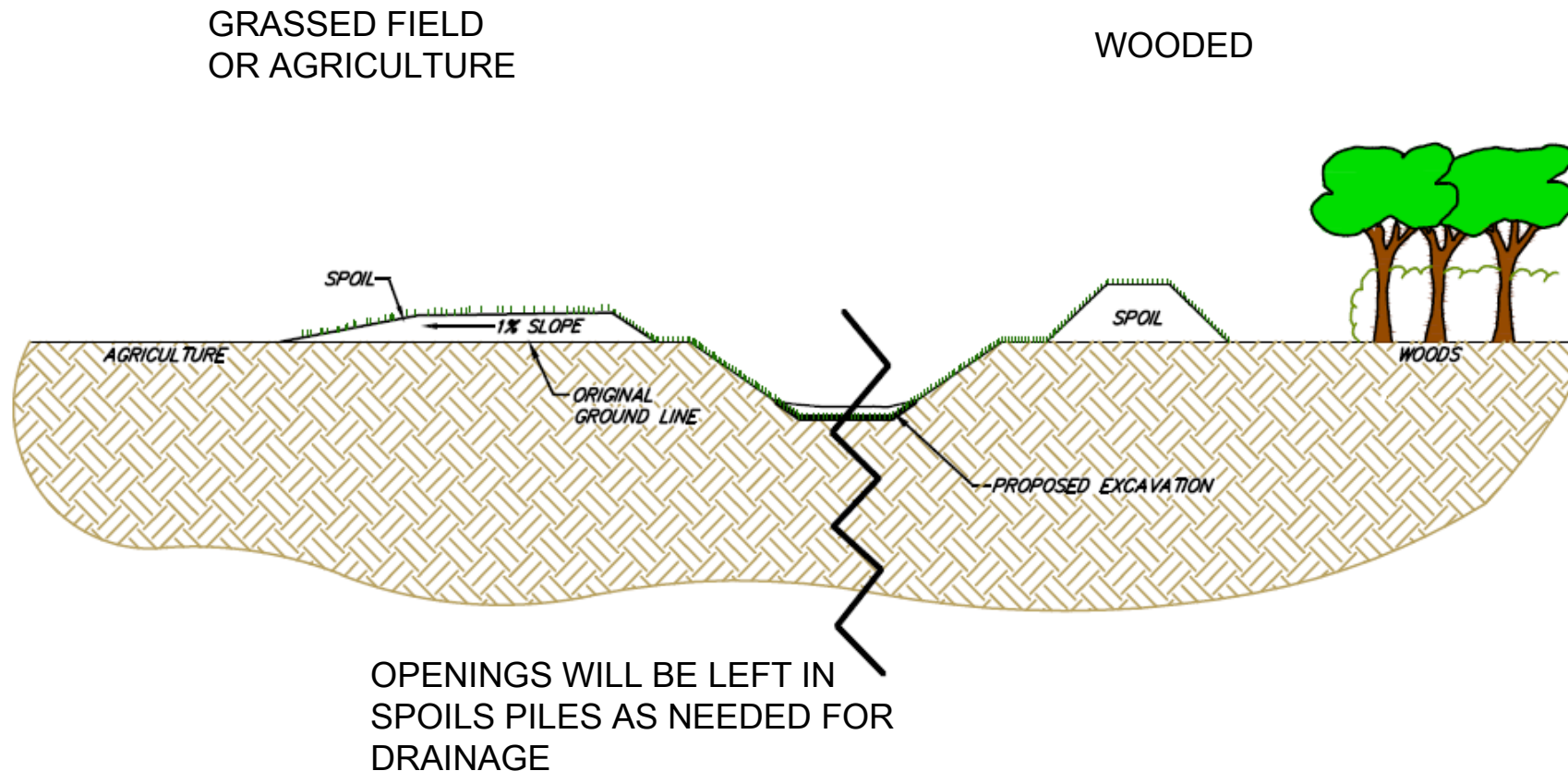
Channel Excavation and Cleanout

- Two-Stage Channel Excavation
 - Construct low flow channel in bottom
 - Construct high flow shelf a few feet above the bottom
 - Both banks sloped to 2 hor. to 1 vert.
 - All trees and brush grubbed from banks being sloped
 - Excavate both sides of drain in most cases

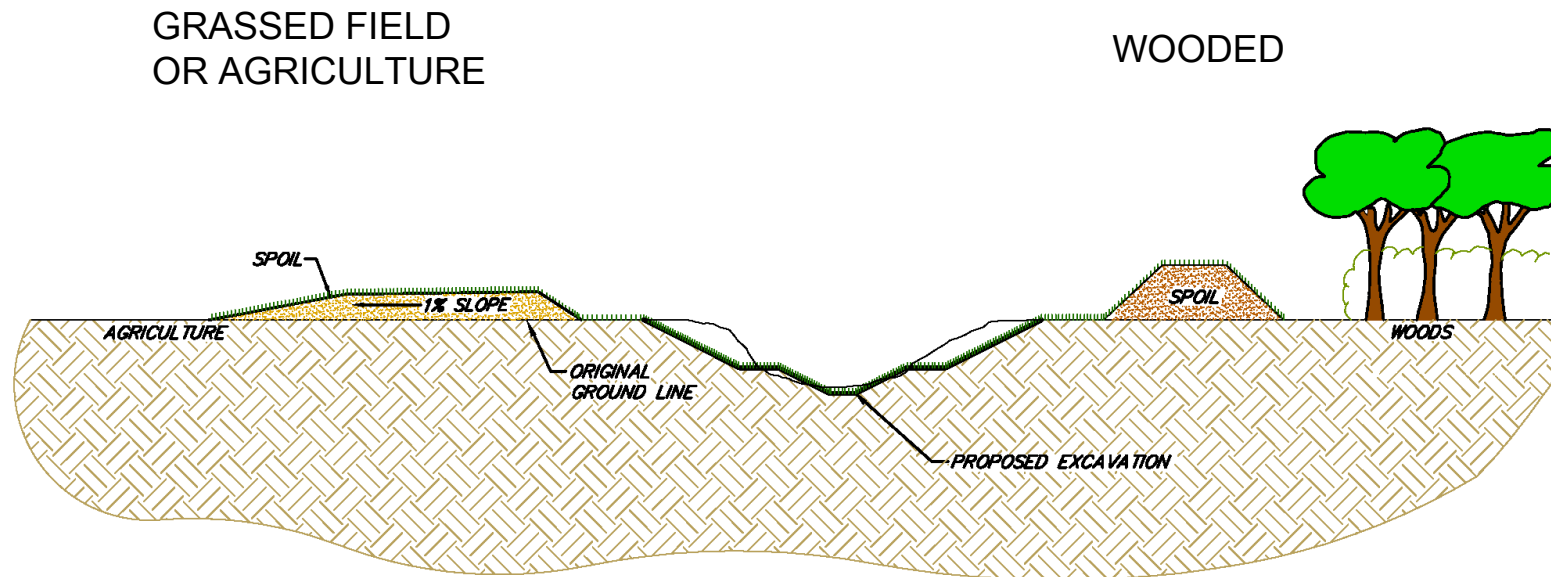
Spoil Leveling and Hauling

- Spoils will be leveled within the drain right of way in agricultural and wooded areas
- Spoils will be hauled in lawn areas
- Openings will be left in spoils to allow for drainage

TYPICAL OPEN CHANNEL DETAIL FOR WOOD & AGRICULTURAL AREAS



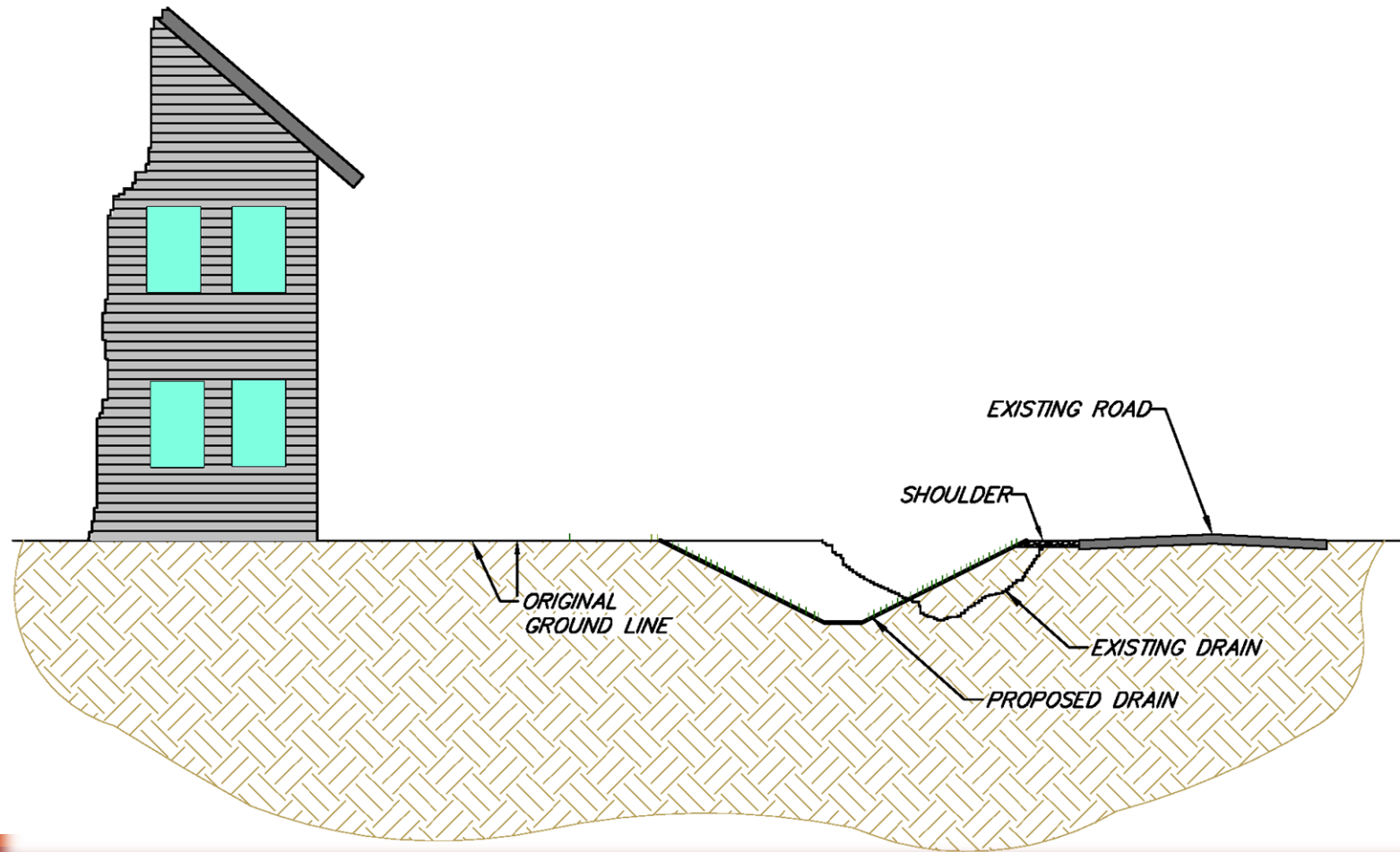
TYPICAL TWO STAGE CHANNEL DETAIL FOR WOOD & AGRICULTURAL AREAS



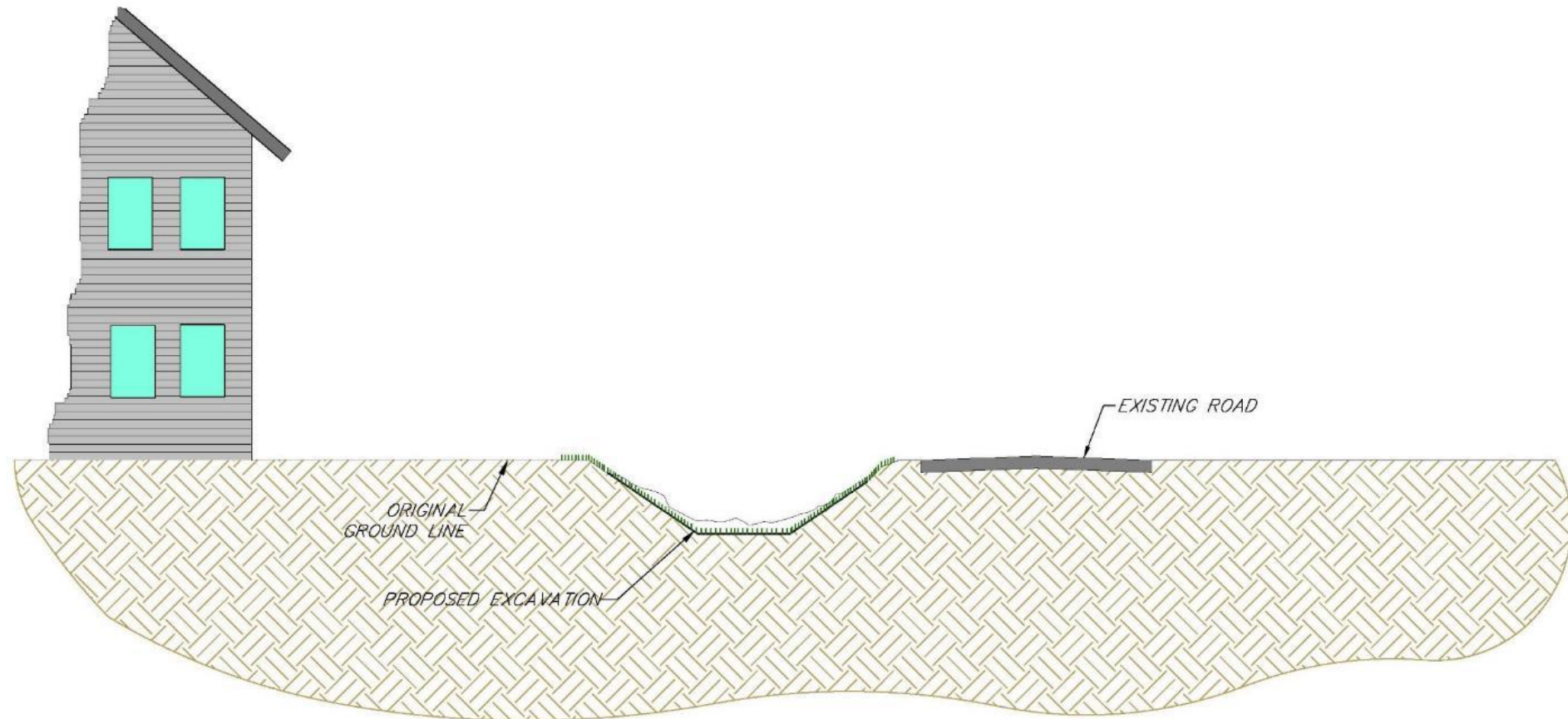
OPENINGS WILL BE LEFT IN SPOILS PILES AS NEEDED FOR DRAINAGE

SPOILS WILL BE HAULED AWAY IN MANICURED LAWN AREAS

TYPICAL OPEN CHANNEL DETAIL FOR ROAD/LAWN AREAS WITH SHOULDER WORK



TYPICAL OPEN CHANNEL DETAIL FOR ROAD/LAWN AREAS WITHOUT SHOULDER WORK



**CHANNEL EXCAVATION
12' BOTTOM**

**REMOVE LOG JAMS AND
SEDIMENT BARS**

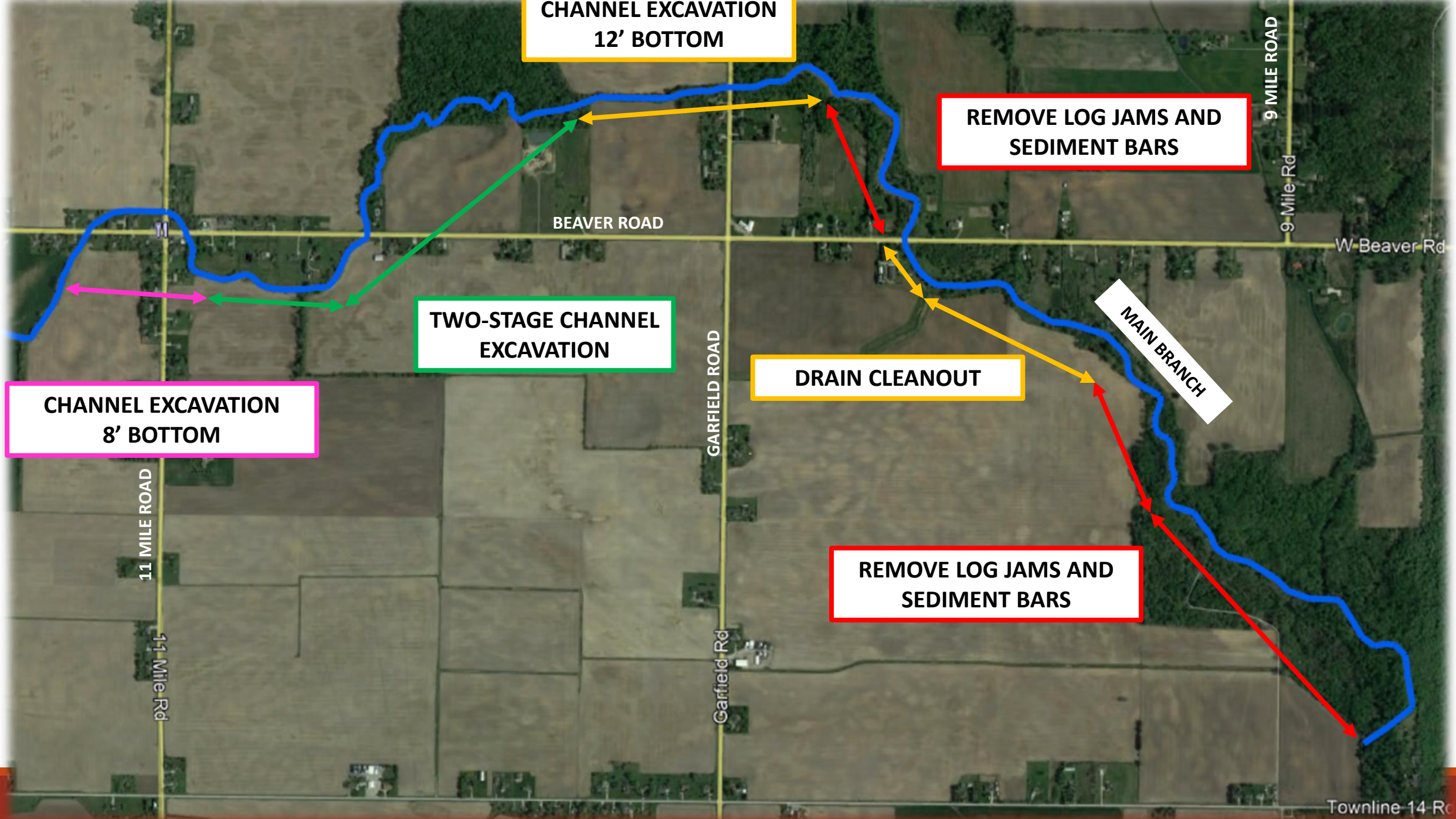
**TWO-STAGE CHANNEL
EXCAVATION**

DRAIN CLEANOUT

**CHANNEL EXCAVATION
8' BOTTOM**

**REMOVE LOG JAMS AND
SEDIMENT BARS**

MAIN BRANCH



11 MILE ROAD

11 Mile Rd

GARFIELD ROAD

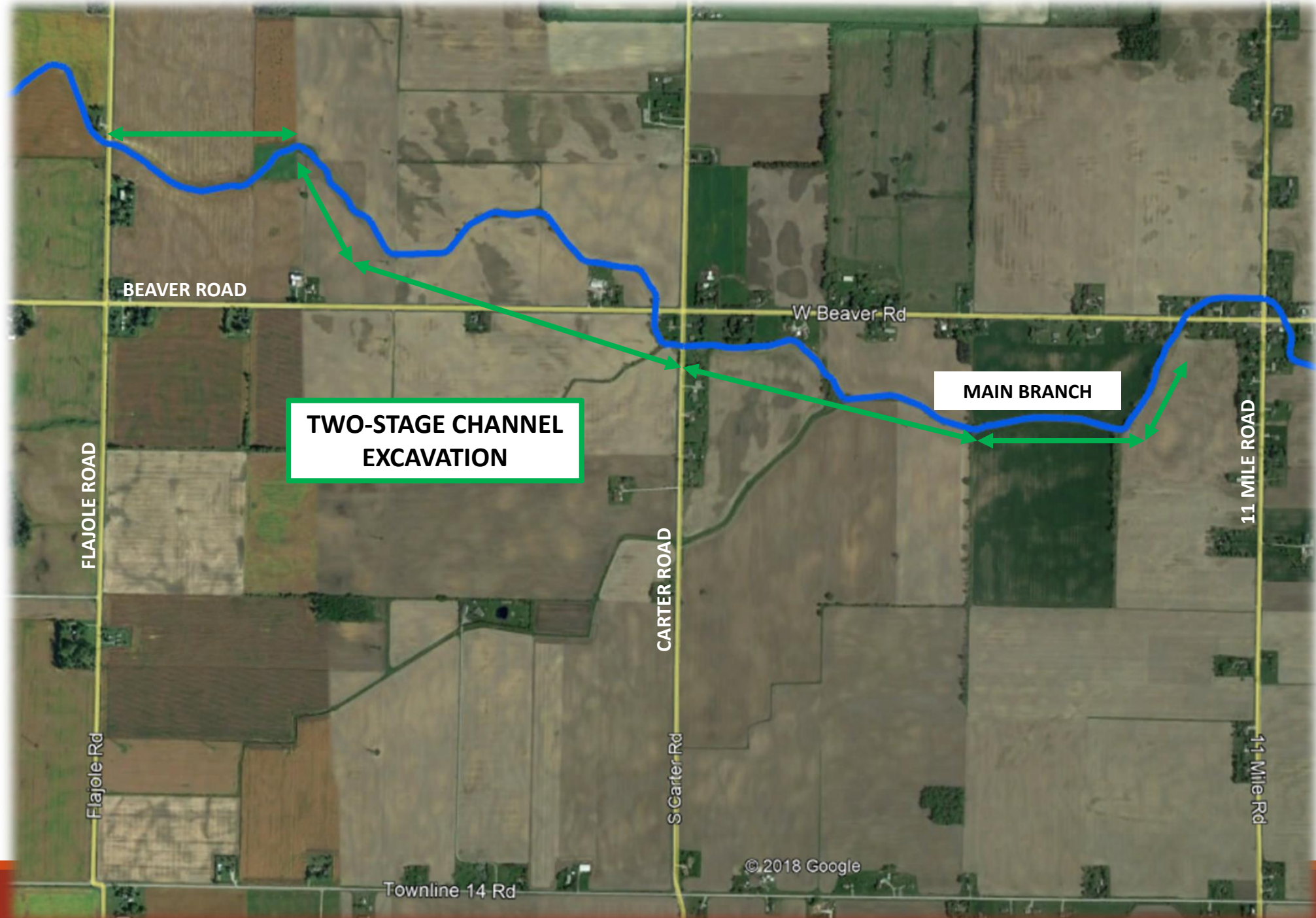
Garfield Rd

9 MILE ROAD

9 Mile Rd

W Beaver Rd

Townline 14 Rd



BEAVER ROAD

W Beaver Rd

TWO-STAGE CHANNEL EXCAVATION

MAIN BRANCH

FLAJOLE ROAD

CARTER ROAD

11 MILE ROAD

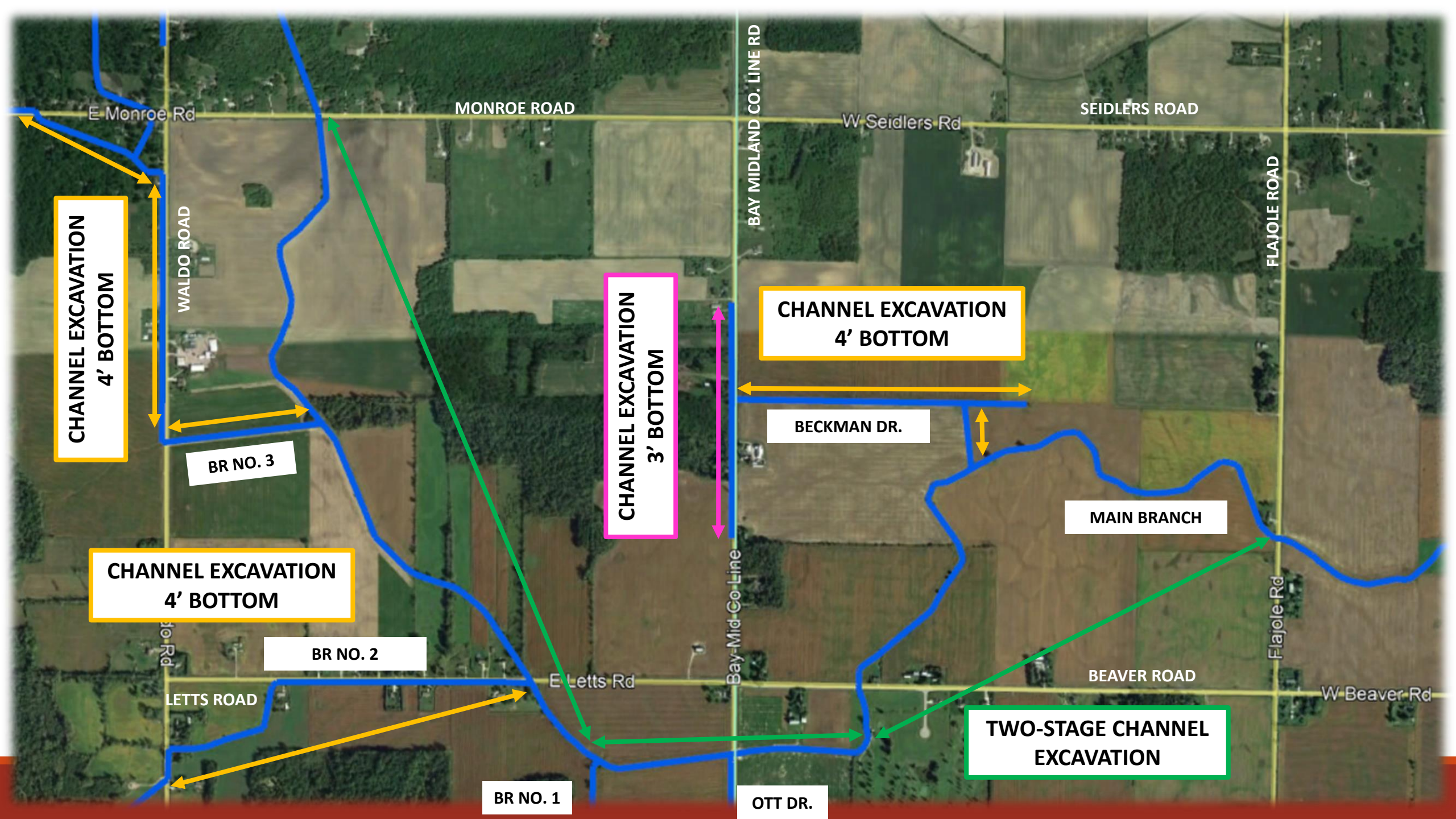
Flajole Rd

S Carter Rd

11 Mile Rd

Townline 14 Rd

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**CHANNEL EXCAVATION
4' BOTTOM**

**CHANNEL EXCAVATION
3' BOTTOM**

**CHANNEL EXCAVATION
4' BOTTOM**

**CHANNEL EXCAVATION
4' BOTTOM**

**TWO-STAGE CHANNEL
EXCAVATION**

BR NO. 3

BR NO. 2

BR NO. 1

MAIN BRANCH

BECKMAN DR.

OTT DR.

E Monroe Rd

MONROE ROAD

W Seidlers Rd

SEIDLERS ROAD

WALDO ROAD

BAY MIDLAND CO. LINE RD

FLAJOLE ROAD

Jo Rd

LETT'S ROAD

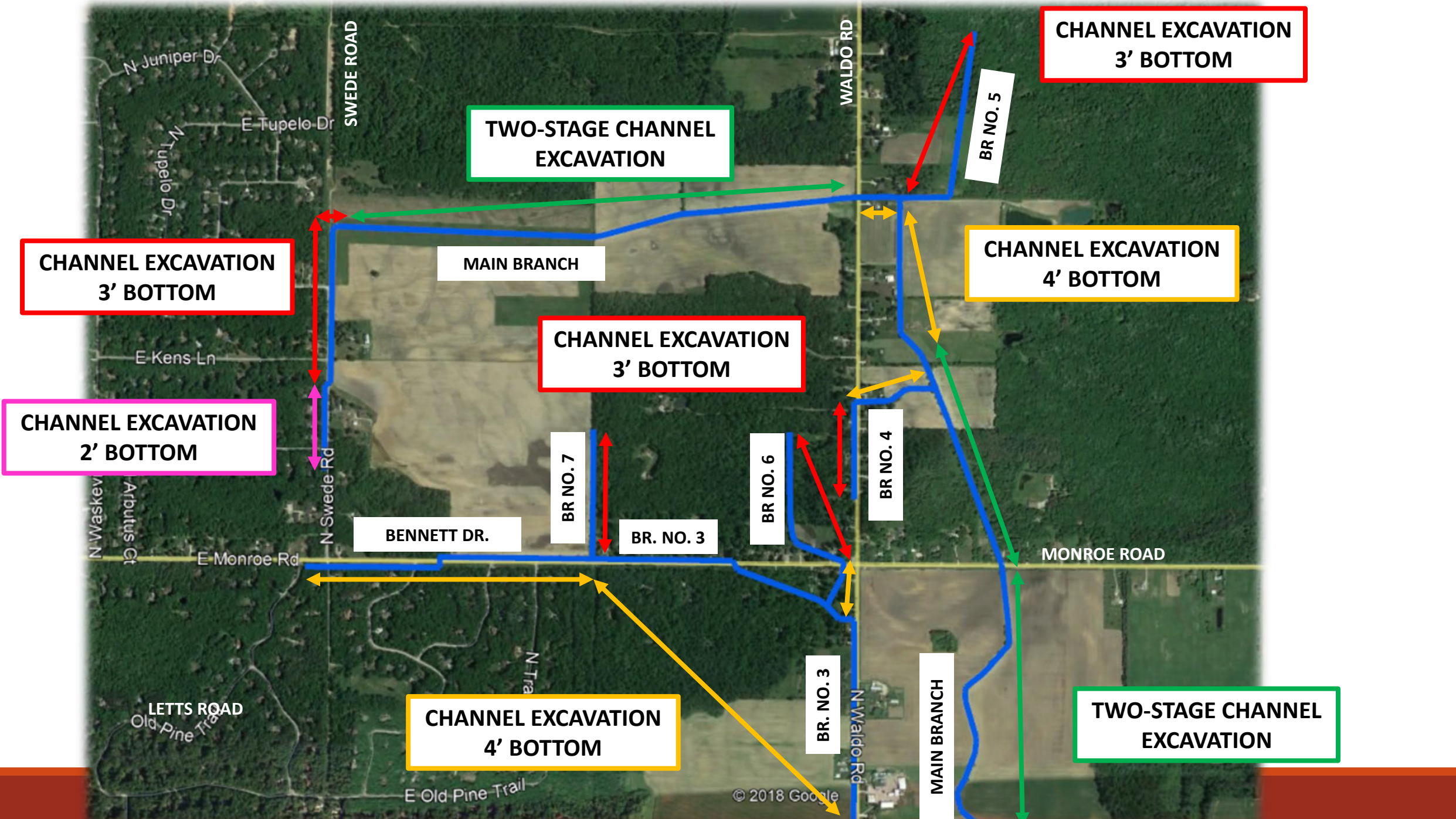
E Letts Rd

Bay-Mid-Co-Line

BEAVER ROAD

W Beaver Rd

Flajole Rd



**CHANNEL EXCAVATION
3' BOTTOM**

**TWO-STAGE CHANNEL
EXCAVATION**

**CHANNEL EXCAVATION
3' BOTTOM**

**CHANNEL EXCAVATION
4' BOTTOM**

**CHANNEL EXCAVATION
3' BOTTOM**

**CHANNEL EXCAVATION
2' BOTTOM**

BENNETT DR.

BR NO. 7

BR. NO. 3

BR NO. 6

BR NO. 4

MONROE ROAD

**CHANNEL EXCAVATION
4' BOTTOM**

BR. NO. 3

MAIN BRANCH

**TWO-STAGE CHANNEL
EXCAVATION**

N Juniper Dr
E Tupelo Dr
SWEDE ROAD
N Tupelo Dr

WALDO RD
BR NO. 5

N Waskev
Arbutus Ct
E Monroe Rd
N Swede Rd

LETTS ROAD
Old Pine Trail

E Old Pine Trail

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Survey and Inspection of Drain Crossings

- Measured length, elevation and size of drain crossing
 - Culverts and bridges
- Assessed condition of crossings and headwalls
- 130 existing crossings
- 104 crossings determined to be inadequate
 - Undersized hydraulically - waterway opening is too small
 - Poor structural condition
 - Improper elevation - set too high in relation to drain flow line

Drain Crossings

- Culvert and bridge design criteria
 - 0.5 ft. of head loss for design storm
 - Minimum of 1.5 ft. of cover on drive culverts
 - Minimum of 2 ft. of cover on road culverts
 - Farm crossings – 24 ft. drive width
 - Drive crossings – 20 ft. drive width
 - Private Culverts
 - Corrugated Metal Pipe Arches for Large Crossings
 - Polypropylene Pipe for smaller crossings
 - Drive surface to be replaced in-kind
 - County roads – meet county standards

Drain Crossing Summary

- Total of 130 existing drain crossings
 - 102 Private crossings
 - Driveway crossings
 - Farm crossings
 - Yard Enclosures
 - Footbridge crossings
 - 28 Road crossings

Drain Crossings

- The following slides are a general listing of the work being completed at each of the existing crossings.
- If you want to see details on your individual crossing such as size, length, or material please speak to us at the end of the meeting.

Drain Crossings – Main Branch

- Cleanout Existing
 - No. 1 – Bruzewski, J. & K.
 - No. 2 – Beaver Road
 - No. 3 – Garfield Road
 - No. 4 – Buechler, L. & D.
 - No. 5 – Beaver Road
 - No. 6 – Beaver Road
 - No. 7 – Eleven Mile Road (Possibly Being Replaced)
 - No. 8 – Beaver Road
 - No. 9 – Berg, R. & C.

Drain Crossings – Main Branch

- Cleanout Existing
 - No. 11 – Tomke, J.
 - No. 12 – Carter Road
 - No. 15 – Waskevich, J. & M.
 - No. 16 – Flajole Road
 - No. 18 – Zondlak, E. & J.
 - No. 19 – Beaver Road
 - No. 20 – Bay Midland County Line Road
 - No. 21 – Letts Road
 - No. 22 – Nagley, G. & A.

Drain Crossings – Main Branch

- Cleanout Existing
 - No. 44 – Draves, Todd & Mary
 - No. 45 – Archbold, Jeremy & Mandy
 - No. 46 – Rooney, Robbi

- Replace with New
 - No. 13 – Beaver Road
 - No. 14 – Koch, L. & K.
 - No. 17 – Filcek, M.
 - No. 23 – Waskevich, C.
 - No. 24 – Begin, L.

Drain Crossings – Main Branch

- Replace with New
 - No. 25 – Begin, L.
 - No. 26 – Matthews, K.
 - No. 27 – Gerstacker, E.
 - No. 28 – Servinski, B.
 - No. 29 – Monroe Road
 - No. 30 – Mieske, C.
 - No. 31 – Craig, R. & D.
 - No. 33 – Waskevich, J. & M.
 - No. 34 – Waskevich, J. & M.

Drain Crossings – Main Branch

- Replace with New
 - No. 35 – Waskevich, J. & M.
 - No. 36 – Waldo Road
 - No. 37 – Mieske, S. & M.
 - No. 38 – Mieske, S. & M.
 - No. 39 – Steger, E.
 - No. 40 – Steger, E.
 - No. 41 – Steger, E.
 - No. 42 – Steger, E.
 - No. 43 – Swede Road

Drain Crossings – Main Branch

- Replace with New
 - No. 47 – E. Johns Lane
 - No. 48 – Cobaugh, Conrad & Susan

- Remove Only
 - No. 10 – Berg, R. & C.

- New Footbridge
 - No. 32 – Waskevich, J. & M.

Drain Crossings – Branch No. 1

- Cleanout Existing
 - No. 52 – Wackerly Road
 - No. 54 – N. Texas Lane
 - No. 60 – City of Midland

- Replace with New
 - No. 49 – Gerstacker, S.
 - No. 50 – Hall, J.
 - No. 51 – Wolf, J. & A.
 - No. 53 – Williamson, R.

Drain Crossings – Branch No. 1

- Replace with New
 - No. 55 – Evans, S. & L.
 - No. 56 – Davis, Glen
 - No. 57 – Mazanec, J.
 - No. 58 – Rytlewski, H.
 - No. 59 – Waldo Road

Drain Crossings – Branch No. 2

- Replace with New
 - No. 61 – Martin, W. & J.
 - No. 62 – Gardner, M. & C.
 - No. 63 – Hall, L.
 - No. 64 – Zondlak, H.
 - No. 65 – Spittka, F.
 - No. 67 – Waldo Road
 - No. 68 – Sahasa Realty
 - No. 69 – Hoenicke, K
 - No. 70 – Hoenicke, M. & G.

Drain Crossings – Branch No. 2

- Remove Only
 - No. 66 – Anderson, D. & Mcgillen, S.

Drain Crossings – Branch No. 3

- Replace with New
 - No. 71 – Waldo Road
 - No. 72 – Gerstacker, E.
 - No. 73 – Gerstacker, S.
 - No. 74 – Berger, L. Jr. & B.
 - No. 75 – Gerstacker, C.
 - No. 76 – Gerstacker, E.
 - No. 77 – Gerstacker, E. & Servinski, B.
 - No. 78 – Gould, C. & M.
 - No. 79 – Sweet, R.

Drain Crossings – Branch No. 3

- Replace with New
 - No. 80 – Shauger, P.
 - No. 81 – Hitchcock, K.
 - No. 82 – Smith, P.
 - No. 83 – Swaney, J. & A.
 - No. 84 – Monroe Road
 - No. 85 – Dargie, T.
 - No. 86 – Eddy, D.
 - No. 87 – Cochran, S. & M.
 - No. 88 – Roberts, T.

Drain Crossings – Branch No. 3

- Replace with New
 - No. 89 – Caldwell, E.
 - No. 90 – Dehn, C. & P.
 - No. 91 – Vanmeter, S.
 - No. 92 – Box, B. & A.
 - No. 93 – Lawandowski, H.
 - No. 94 – Habscheid, J. & M.

Drain Crossings – Branch No. 4

- Cleanout Existing
 - No. 96 – Metcalf, K. & M
 - No. 97 – Waldo Road

- Replace with New
 - No. 95 – Mieske, C.
 - No. 98 – Keefer, Casey R. & Lisa D.
 - No. 99 – Parsons, Shirley
 - No. 100 – Duley, Jarod
 - No. 101 – Weckesser, Justin & Renee

Drain Crossings – Branch No. 4

- Replace with New
 - No. 102 – Dumont, David A. Et Ux
 - No. 103 – Dumont, David Marilyn
 - No. 104 – Pfund, Edward J.

Drain Crossings – Branch No. 5

- Cleanout Existing
 - No. 106 – Drummond, J. & S.
- Replace with New
 - No. 105 – Phillips, F.
 - No. 107 – Drummond, J. & S.

Drain Crossings – Branch No. 6

- Replace with New
 - No. 108 – Monroe Road
 - No. 109 – Pnacek, P.
 - No. 110 – Ellis, B. & M.
 - No. 111 – Weckesser, J. & R.

Drain Crossings – Ott Drain

- Cleanout Existing
 - No. 115 – Hall, Jay Et Ux & Szczepanski
- Replace with New
 - No. 112 – Gerstacker, S.
 - No. 113 – Gerstacker, S.
 - No. 114 – Gerstacker, S.
 - No. 116 – Szczepanski, D.
 - No. 117 – Szczepanski, D.
 - No. 118 – Mieske, M.
 - No. 119 – Mieske, M.

Drain Crossings – Bennett Drain

- Replace with New
 - No. 120 – Monroe Road
 - No. 121 – Deer Valley Road
 - No. 122 – Owen, J. & C.
 - No. 123 – Pangburn, T. & V.

Drain Crossings – Beckman Drain

- Cleanout Existing
 - No. 125 – Bay Midland Line Road
- Replace with New
 - No. 124 – Meyers, R.
 - No. 126 – Zondlak, H.
 - No. 127 – Lemieux, C. Living Trust

Drain Crossings – Beckman Drain Br. 2

- Cleanout Existing
 - No. 130 – Lund, J. Et Ux
- Replace with New
 - No. 128 – Miller, J. Jr.
 - No. 129 – Miller, J. Jr.



Erosion Control

- Vegetation re-establishment
 - Seed drain banks
- Bank erosion prevention
 - Riprap or grassed spillways
 - Riprap placed where high concentration of runoff
 - Riprap or erosion fabric placed at erosion prone areas
- Field tile outlets repaired with splash pads

Cleanup and Restoration

- Disturbed areas will be seeded
- All debris and spoils will be disposed of
- All disturbed lawn areas will be landscape graded and seeded with a minimum of 4” of in-kind topsoil
- Drain must be stabilized prior to final inspection

Planning Level Cost Estimate

- Channel improvements/maintenance to approximately 20 miles of drain
- Replacement of undersized, structurally deficient, and off grade crossings
- Estimated Cost: \$5.5 Million

Planning Level Cost Estimate

- Cost Estimate Includes:
 - Construction Costs
 - 10-15% Contingencies
 - Inspection, Survey, & Design
 - Bond and Interest
 - Easements (if necessary)
 - Permitting (if necessary)
 - Construction Administration
 - Utility Coordination
 - Legal
- Actual project cost will be based on contractor's bid

Distribution of Costs

- Spread onto Assessment District
- Individual assessments will vary based on benefits and acreage as determined by each county's individual drain commissioner
- Assessments will be provided at Day of Review
- Costs can be financed over multiple years

Next Steps, If Determined Necessary

- Final engineering and project scoping: July – August 2019
- Coordination and permitting with impacted utilities and governmental agencies: July 2019
 - MDEQ, Townships, Road Comm., Power, Gas, Phone, Cable
- Bid letting phase: December 2019
- Day of Review of Drainage District Boundary: September 2019
- Day of Review of Apportionments: January 2020
- Project financing and bonding: January - February 2020
- Proceed with construction: February 2020

Next Steps, If Determined Not Necessary

- No further action on current petition
- Subsequent petitions may be filed
- Cost incurred to date will be assessed

Public Testimony

- Fill out speaker cards
- State name and relation to proposed project
- Limit comment to 3 minutes
- Be specific, focus on necessity questions
- Leave copy of materials, if any, with Board

Board Deliberation and Necessity Decision

- Decide if it is necessary to move forward with a project on the Waldo Intercounty Drain

Appeal

- Any person feeling aggrieved by the determination of necessity or no necessity for the project may institute an action in County Circuit Court within **10 days** after the determination by the Board.