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United States Department of Agriculture

# Upper Turtle River Dam 10 Public Scoping Meeting


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Rita Sveen (Watershed Planner)

Tom Schanandore (Geotechnical Engineer)


March 8, 2022

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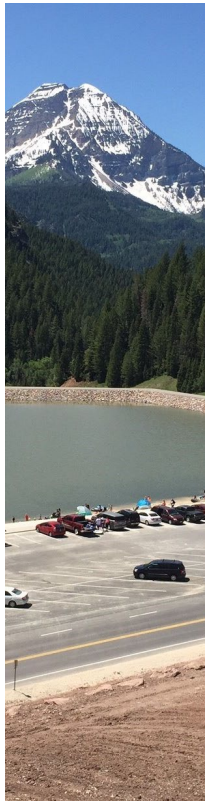
# Agenda

- NRCS Watershed Program Overview
- Upper Turtle 10 Project Background
- Design Alternatives
- Natural Resource Concerns
- Theoretical Funding Scenario
- **Public Input**

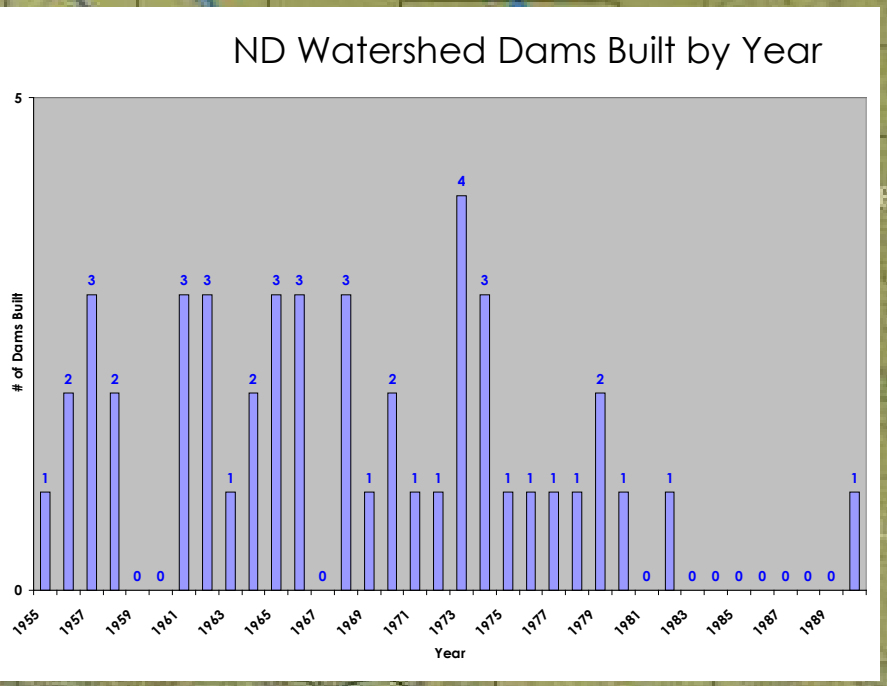
# Watershed and Flood Prevention Operations

## Program Benefits

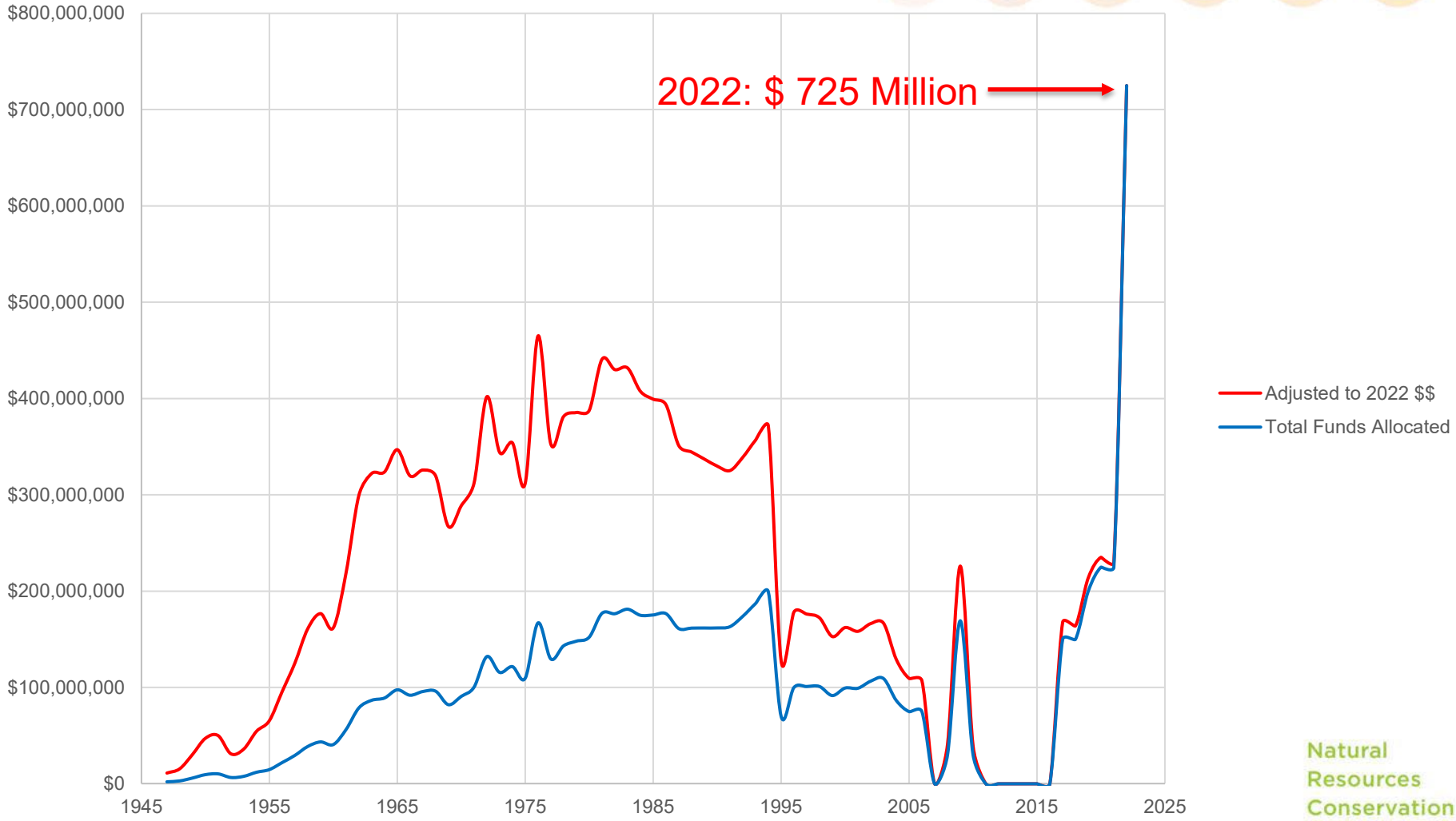
- Rural communities
- Agricultural, Environmental, and Social benefits
  - Flood Prevention
  - Watershed Protection
  - Public Recreation
  - Public Fish and Wildlife
  - Agricultural Water Management- Irrigation, Drainage
  - Municipal and Industrial Water Supply
  - Water Quality Management
  - Watershed Structure Rehabilitation



# PL-566 Watershed Program Dams in North Dakota



# Watershed & Flood Protection Act Public Law 83-566 Funding

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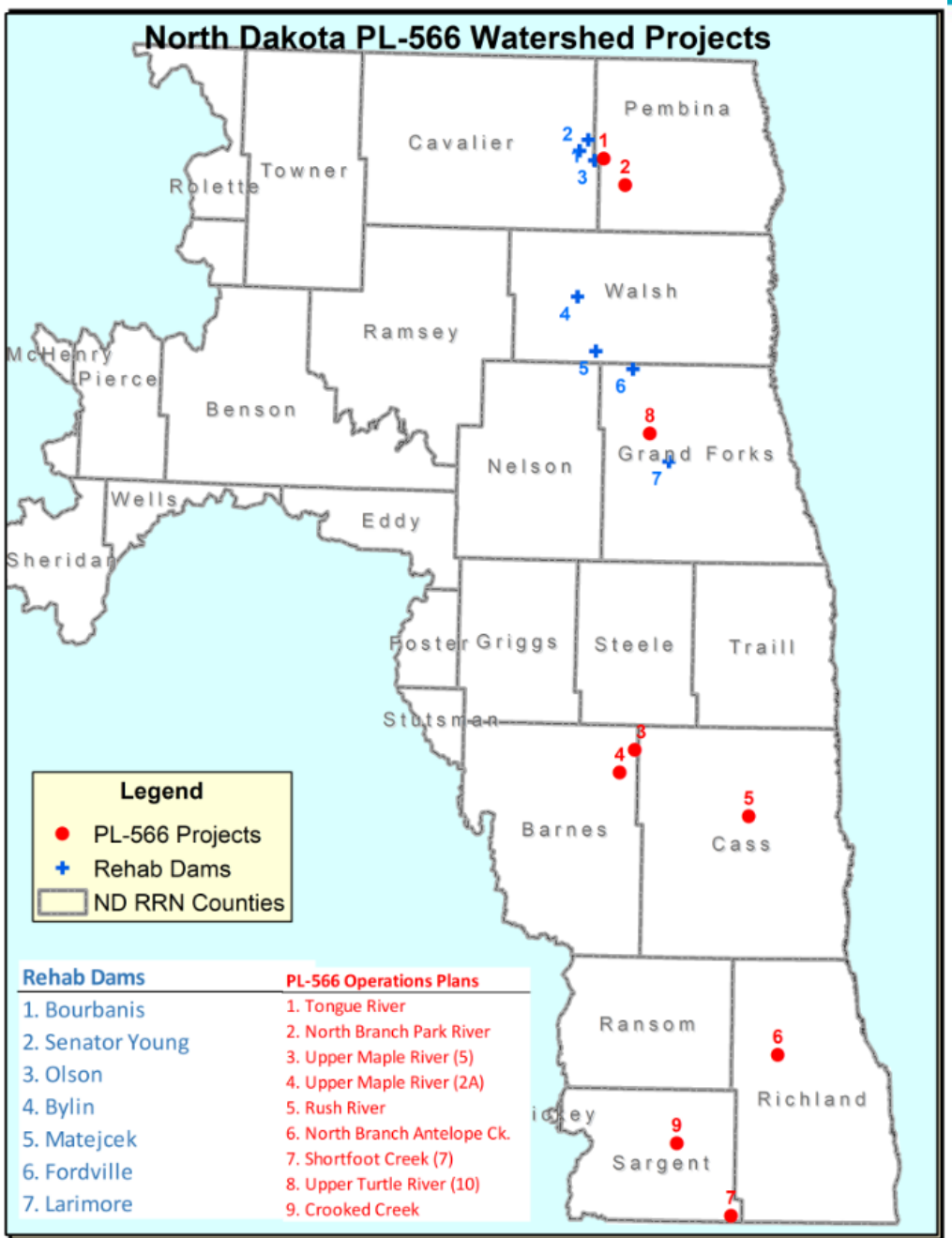


## Current ND Watershed Projects:

- Rush River- Amenia Levee in final design to be completed 2022
- Tongue River Channel Stabilization Plan to be finished this spring. Final design work to be completed 2022. Construction 2023-24
- NB Park River (Cart Creek) Dry Dam Plan to be finished this spring. Final design work 2022-23
- Upper Maple, Shortfoot Creek, NB Antelope Creek Dry Dam Plans to be finished 2022
- Crooked Creek and Upper Turtle 10 Plans just in initial planning stages
- 7 high hazard dam rehabilitation plans to be completed 2022-23

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# NRCS PL-566 Watershed Planning Process- Locally Led

**Purpose and Need for Action**

**Data Collection and Resource Inventory**

**Development of Alternatives**

**Evaluation of Alternatives**

- Environmental
- Economic
- Social

**Preliminary Supplemental Watershed Plan (EA/EIS)**

**NWMC Review & Resulting Edits**

**NHQ Prelim Review & Resulting Edits**

**Formal Section 106 Consultation / 45-day Public Comment Period**

**FONSI, 30-day Comment Period (EA) or Fed Register (EIS)**

**NHQ Authorization, Final Supplemental Watershed Plan**

**Final Design** **1-2 Years**

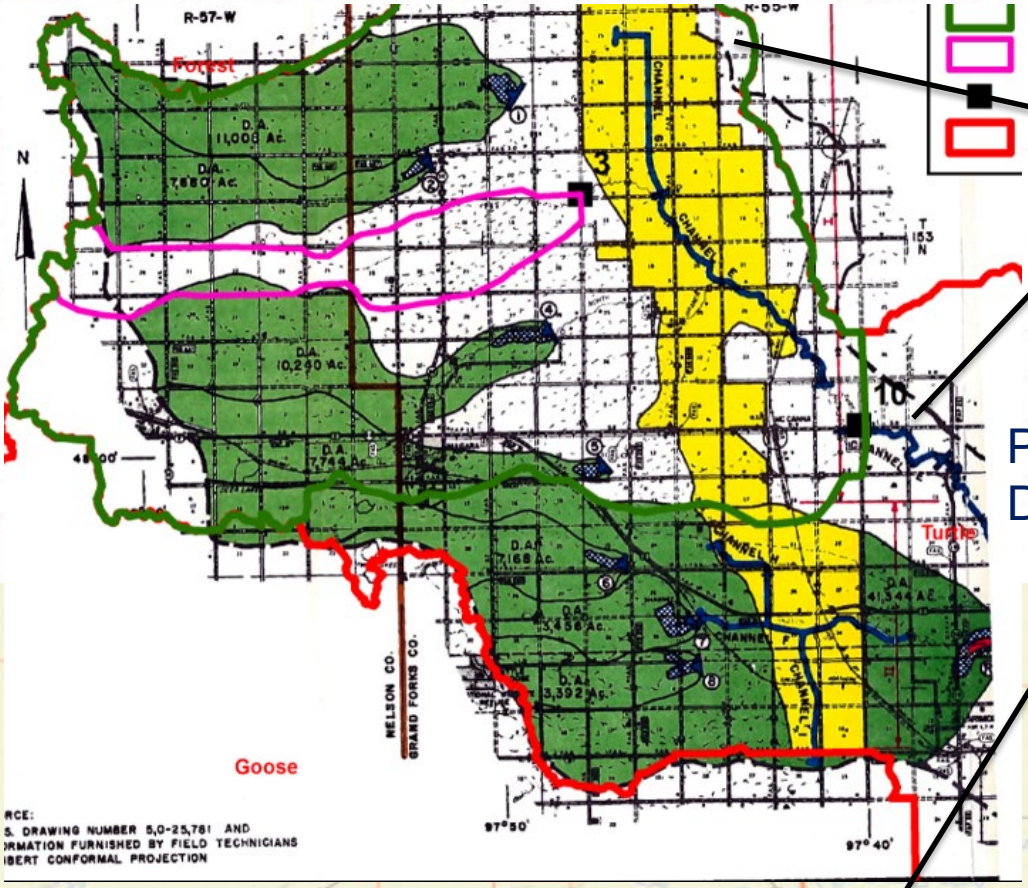
**Construction** **1-2 Years**

**Projects Require Local Sponsor**

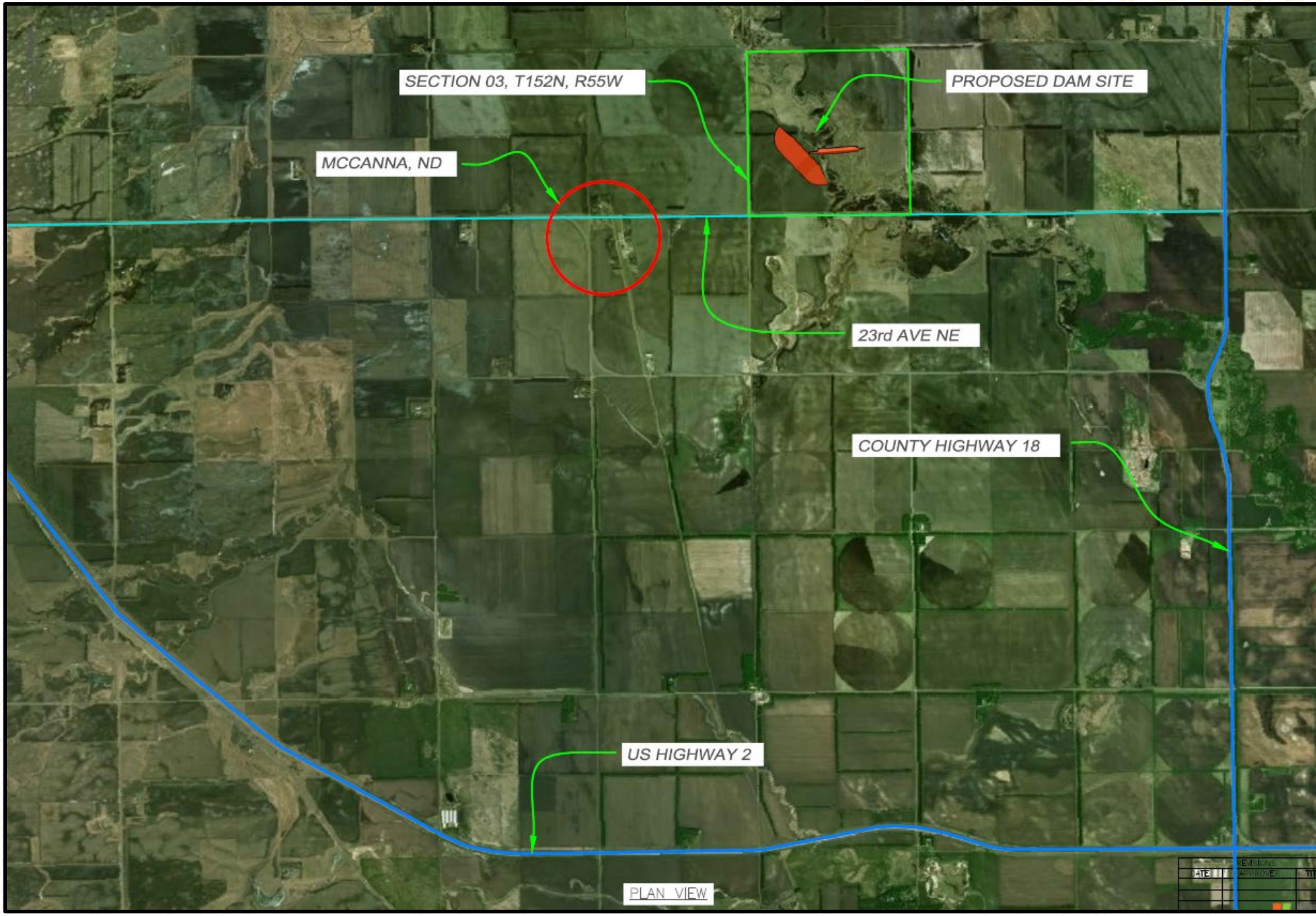
**3-5 Years**

## Upper Turtle Watershed Planning History

- **Original watershed plan developed late 1960s- WRD & SCD**
- **8 dams, 1 recreation site, and channels built 1972-1980.**
- **14.6 miles of channel, originally part of the plan, never built, due to wetland issues.**
- **Planning started for UTR10 in the 1980s, to essentially make up for the flood damage reduction benefits lost from channels not being constructed.**
- **Planning work on UTR10 stopped in 1996. No plan was ever completed or authorized.**
  - Environmental concerns related to downstream water temperatures, riparian corridor impacts.
  - Disagreement on value of proposed wildlife habitat.
  - Flood control $$ benefits < project cost, at the time


Channels not built
Flood control no longer provided in this area
Proposed Dam 10
Forest
Turtle
Goose
Minto
Forest River
Ardoch
Inkster
Gilby
Manvel
Petersburg
Niagara
Emerado
Larimore
Grand Forks
81
18
2

# Upper Turtle River Dam 10 Location



## 2020-21 Upper Turtle Dam 10 (UTR10) Planning Work

- Topographic and land survey work near dam, downstream crossings
- Field wetland delineation
- River gauge (40th St NE bridge), piezometer installation (dam site), water quality sampling
- Compilation of geologic investigation data already collected at the site
- Initial resource assessment
- Development of very prelim hydrologic and hydraulic models
- Feasibility Report, Public Participation Plan


**Need input from landowners, public, agencies and guidance from Sponsors in order to proceed further.**

# Possible UTR10 Project Purposes

- **Flood Prevention / Flood Damage Reduction ($)**
  - Reduce frequency, depth, and duration of downstream flooding…where? Cropland? City of Manvel? City of Mekinock? Somewhere else?

- **Agricultural Water Management ($)**
  - Irrigation- recharge, surface water

- **Public Recreation ($)**
  - Boat launch, picnic area, ??

**$ Benefits > $Costs**

- **Watershed Protection**
  - Wildlife habitat improvement, wetland and/or river restoration
  - Nutrient or sediment reduction

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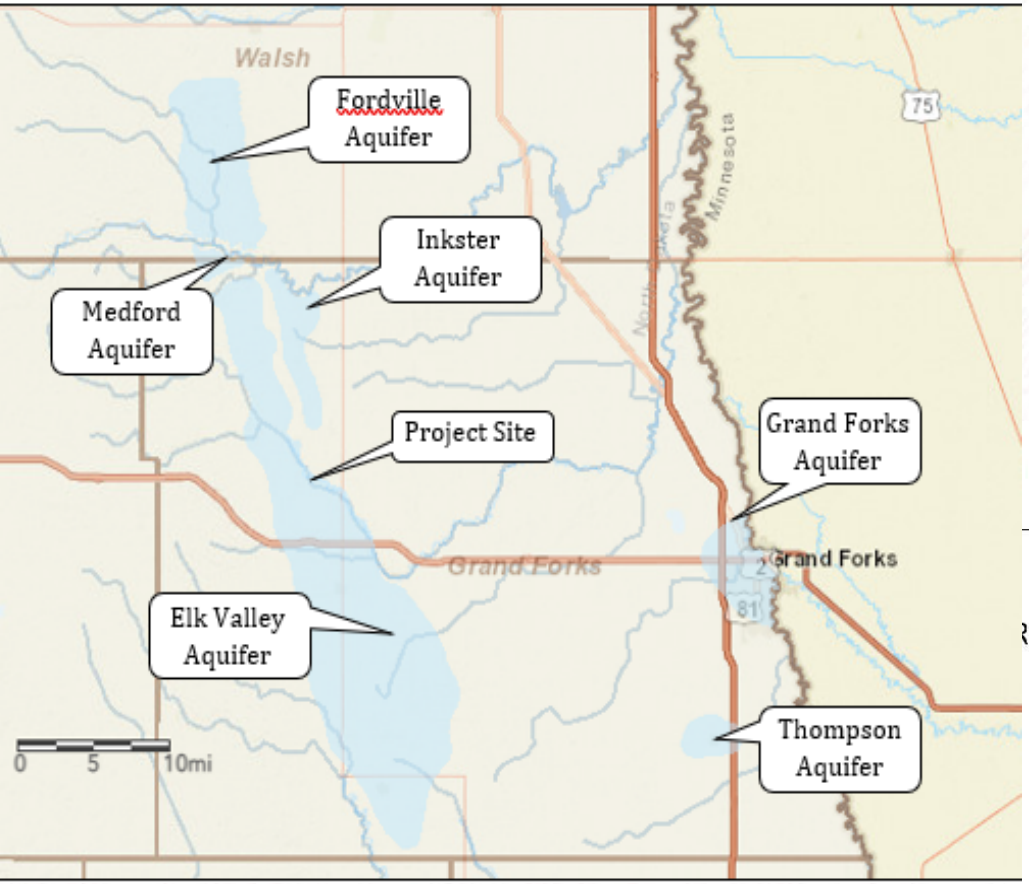
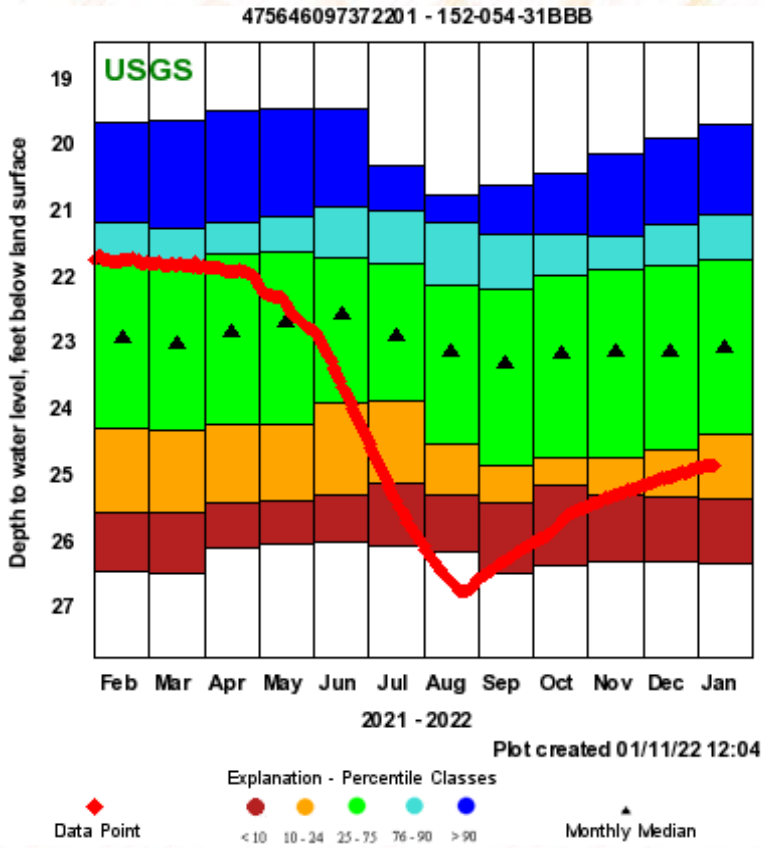
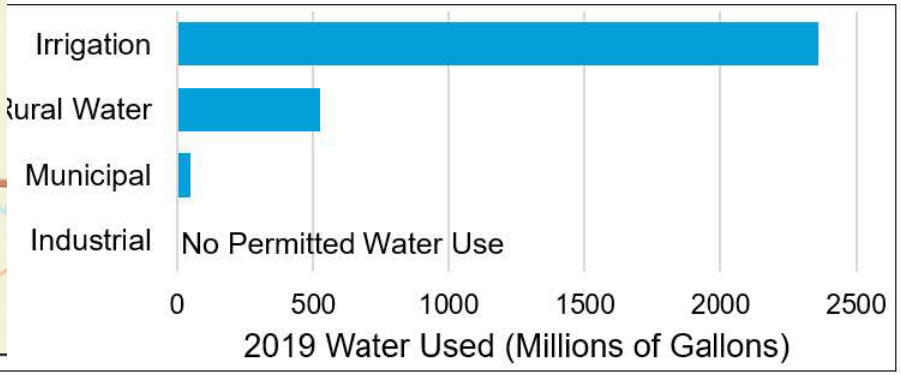
# Elk Valley Aquifer

- Predominately permitted for irrigation
- High variability with climate, 2021 went below historic range
- Fully Allocated

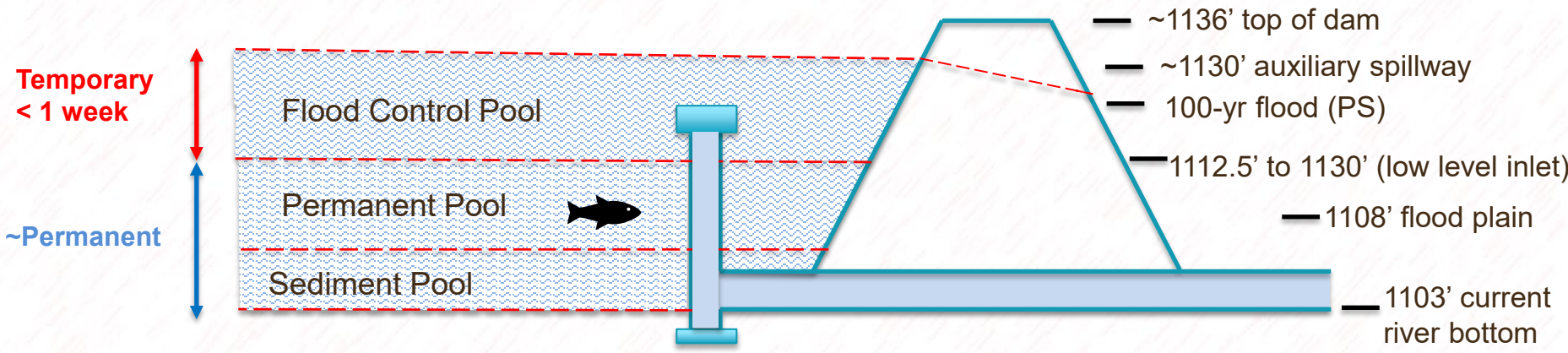


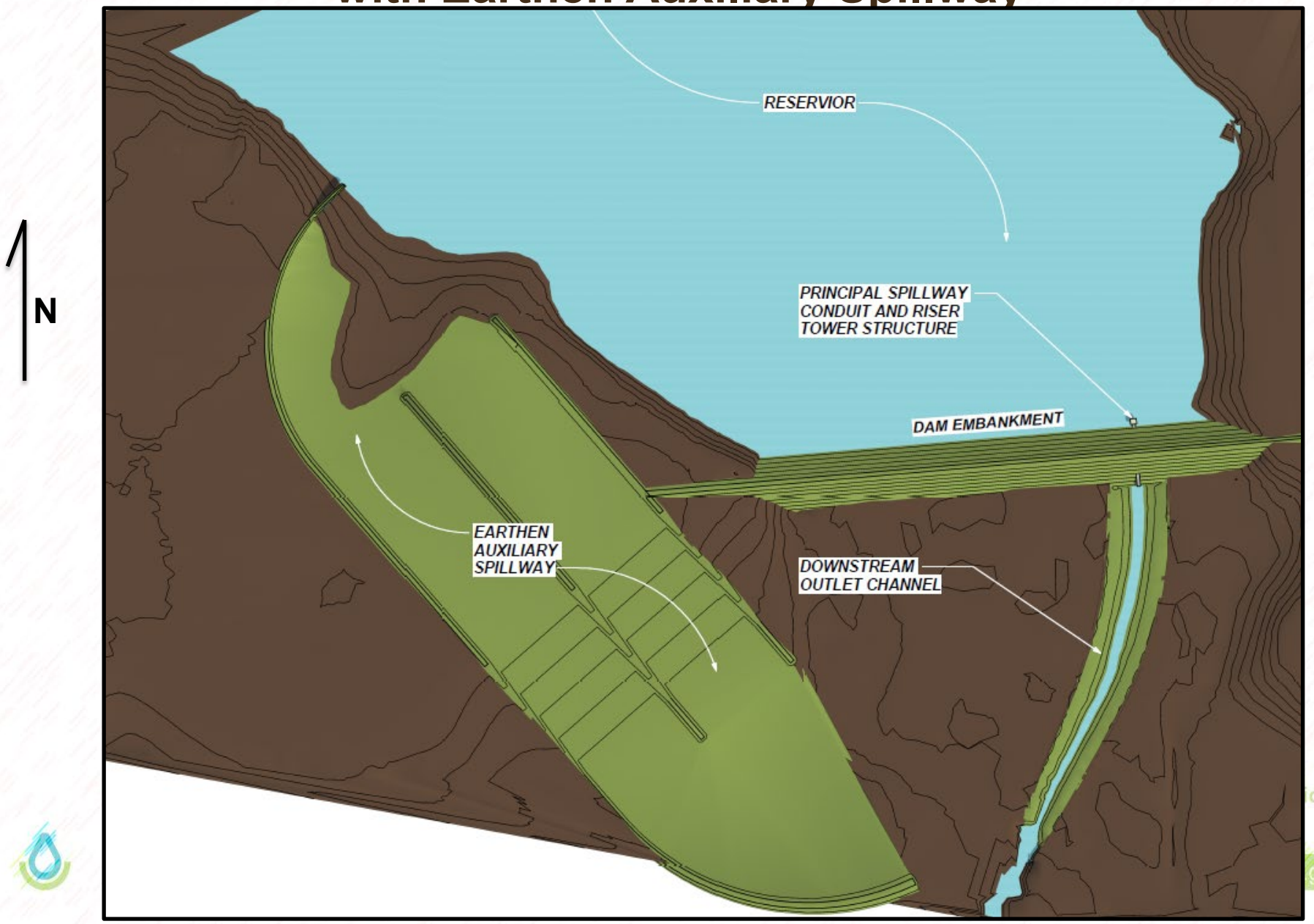

*2019 Elk Valley aquifer permitted water use (from North Dakota State Water Commission (swc.nd.gov))*



# Alternative 1: Principal Spillway Riser (Permanent Pool)




# Alternative 1A: Principal Spillway Riser (Permanent Pool) with Earthen Auxiliary Spillway



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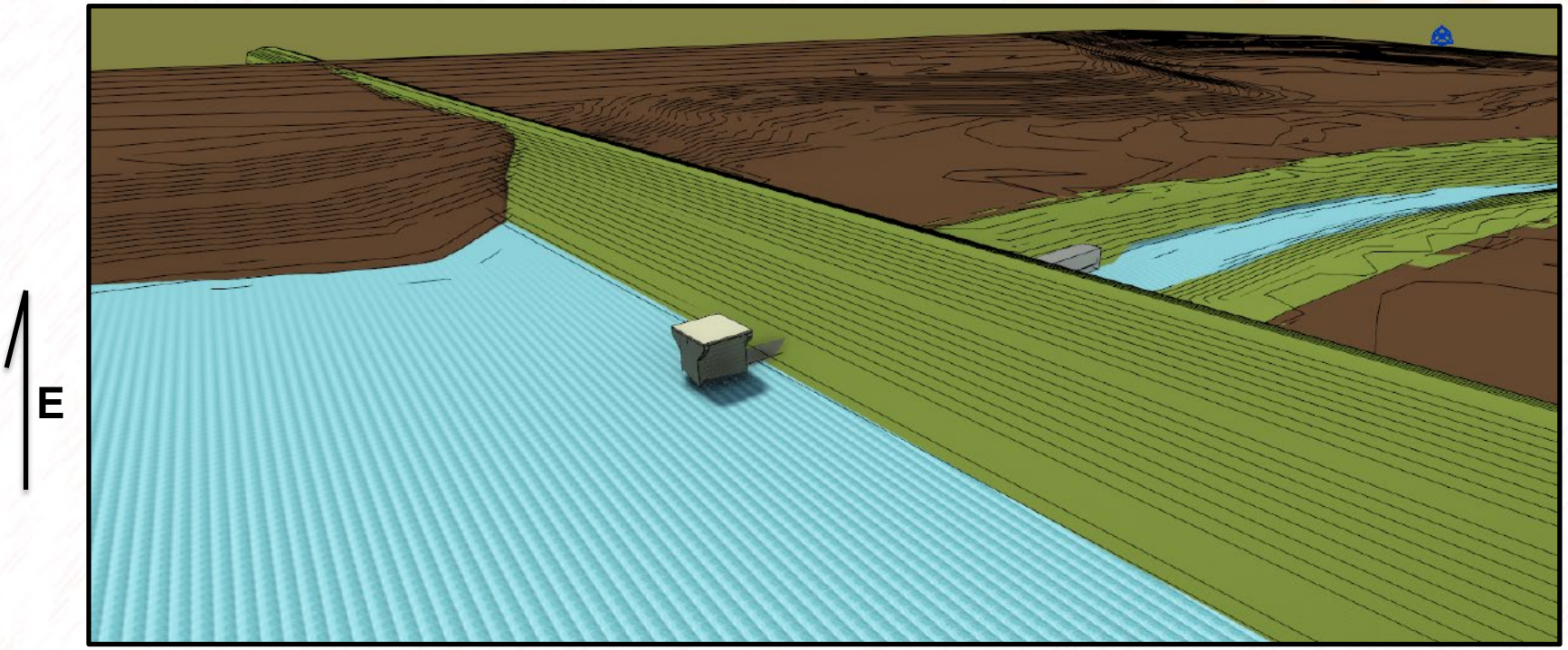


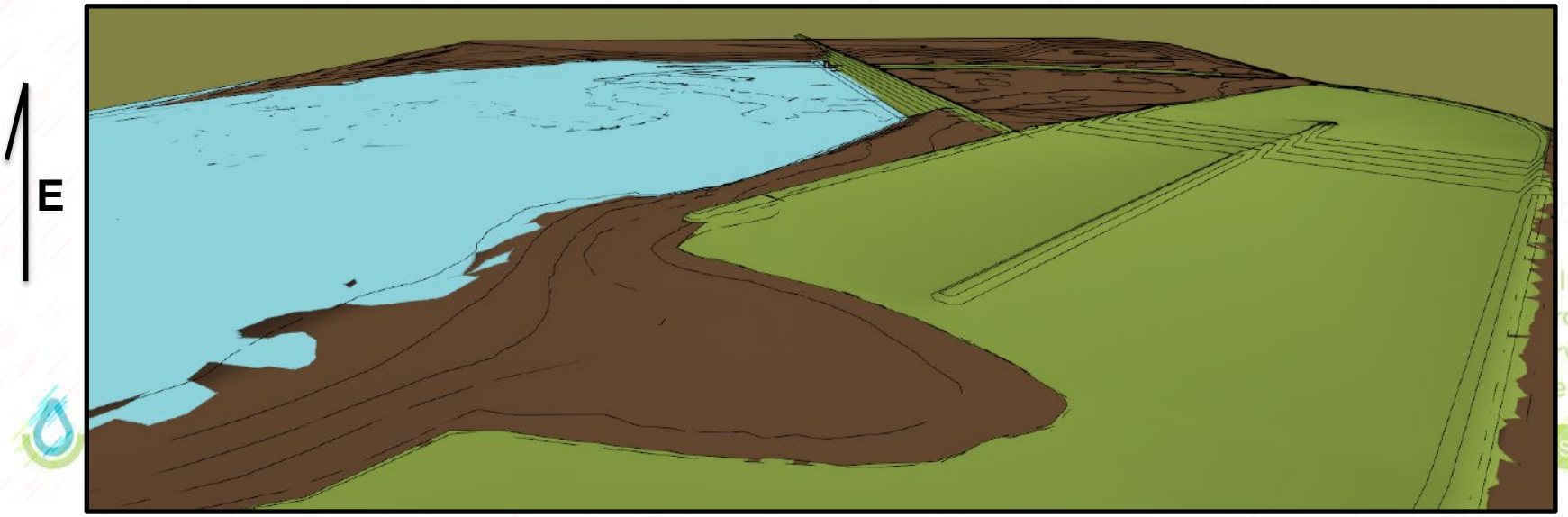

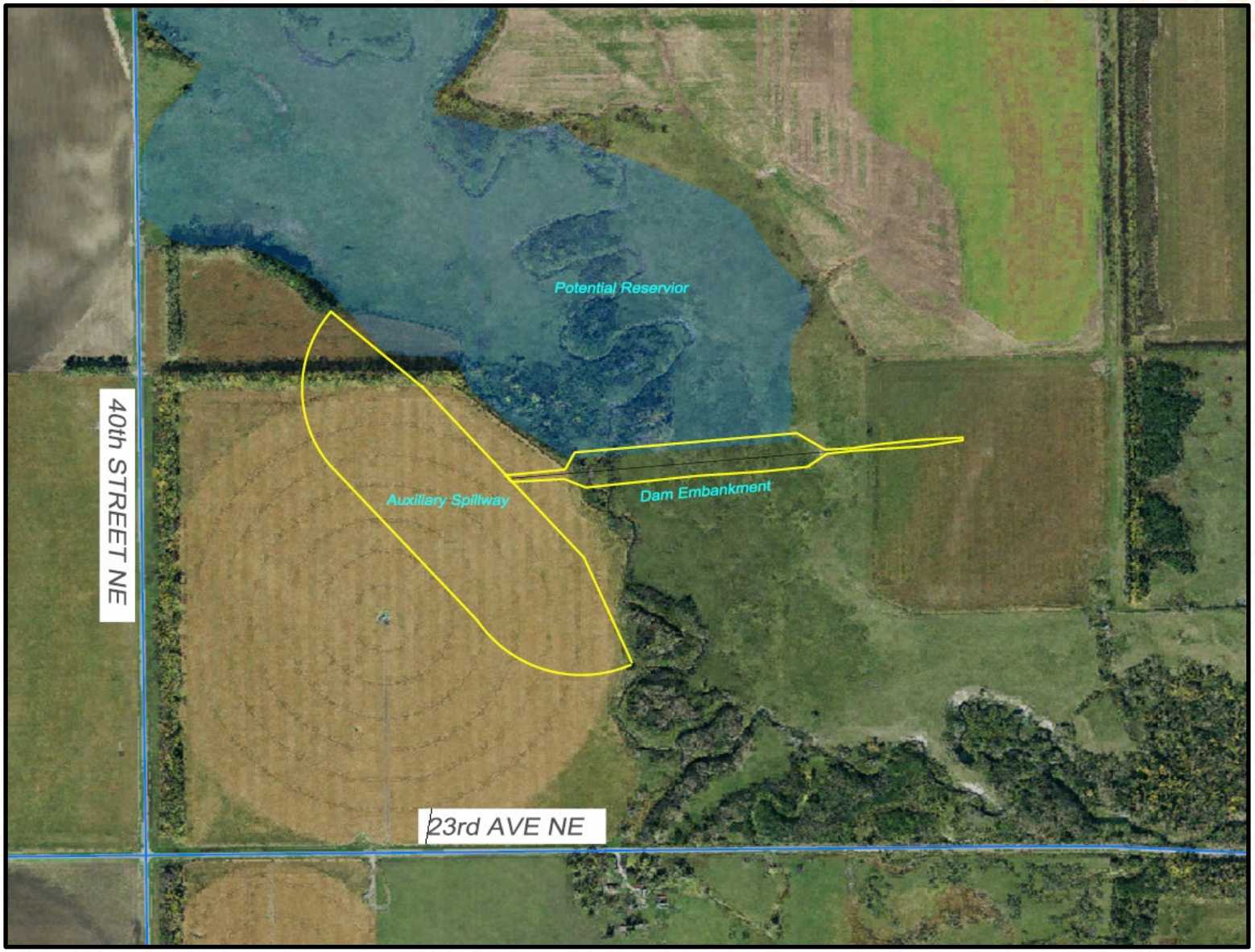


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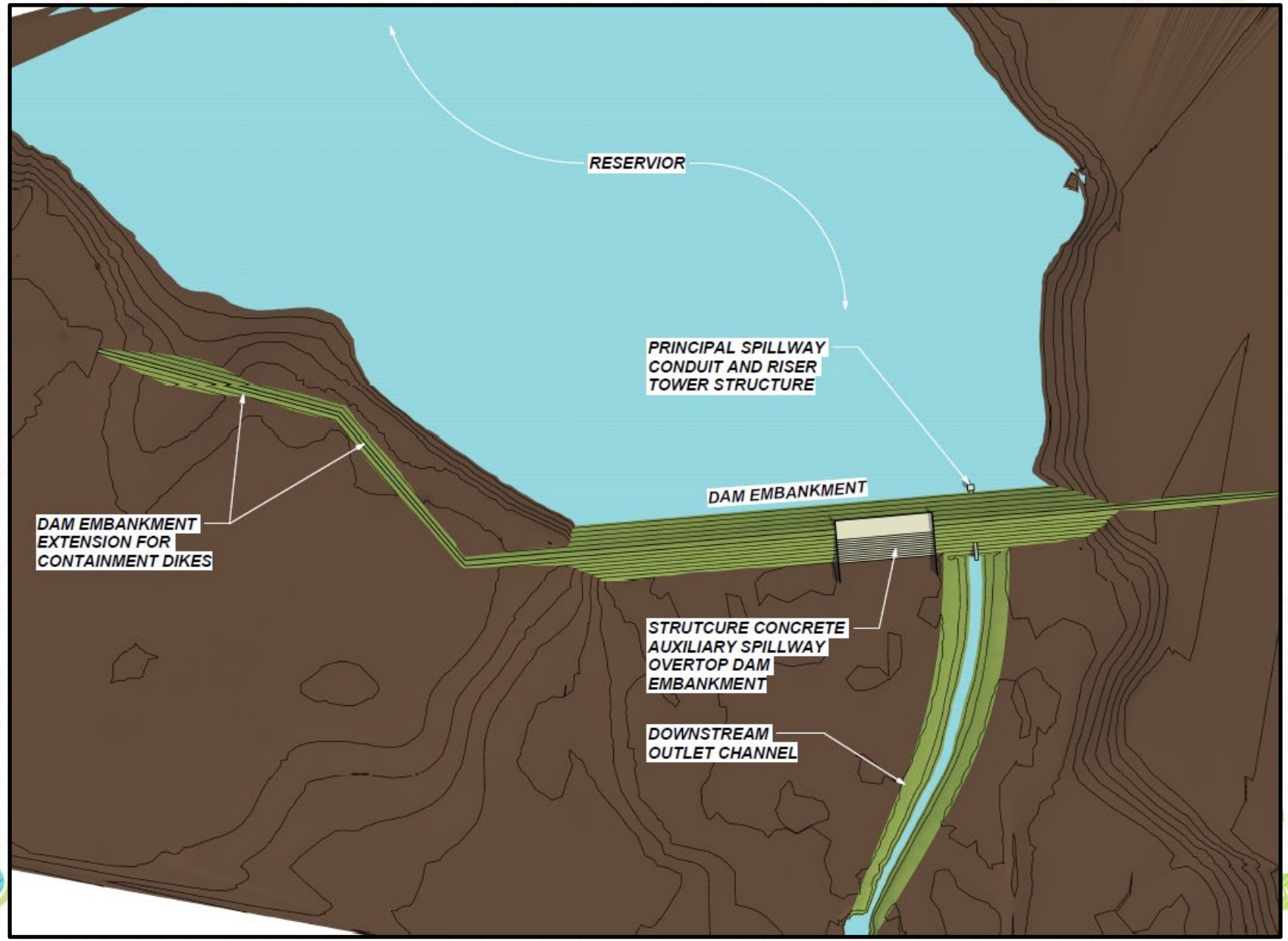
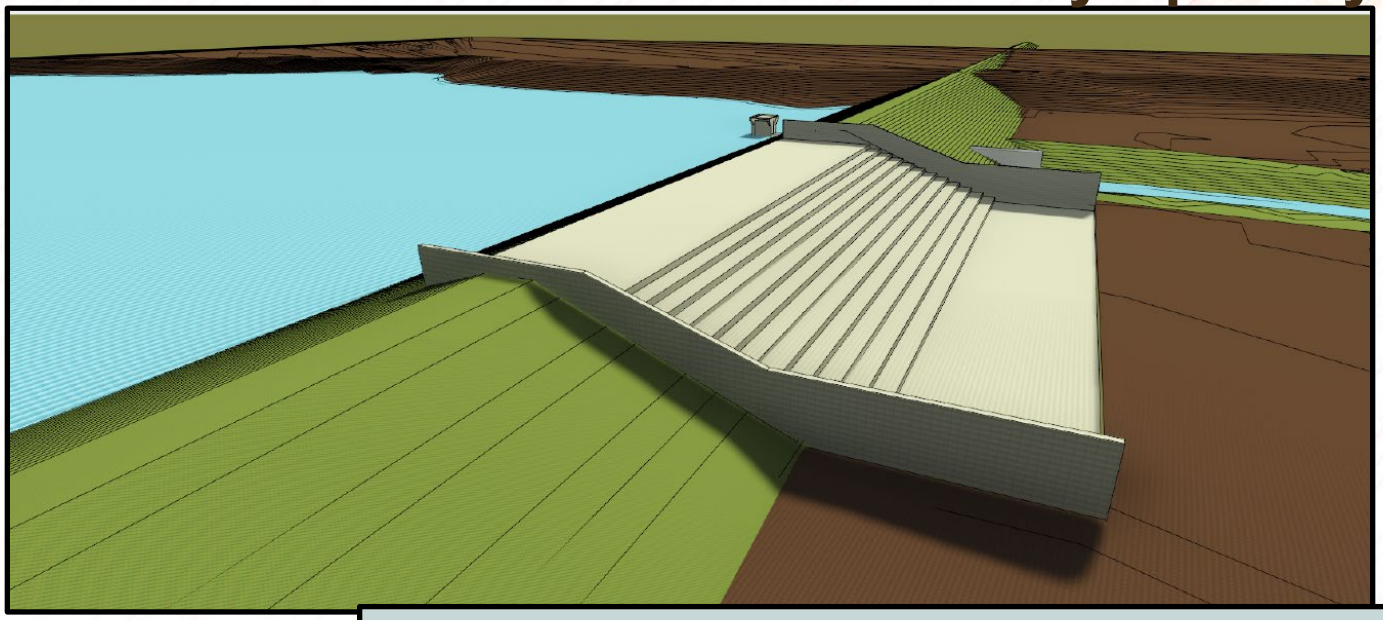
# Alternative 1B: Principal Spillway Riser (Permanent Pool) with Structural Auxiliary Spillway



# Alternative 1B: Principal Spillway Riser (Permanent Pool) with Structural Auxiliary Spillway



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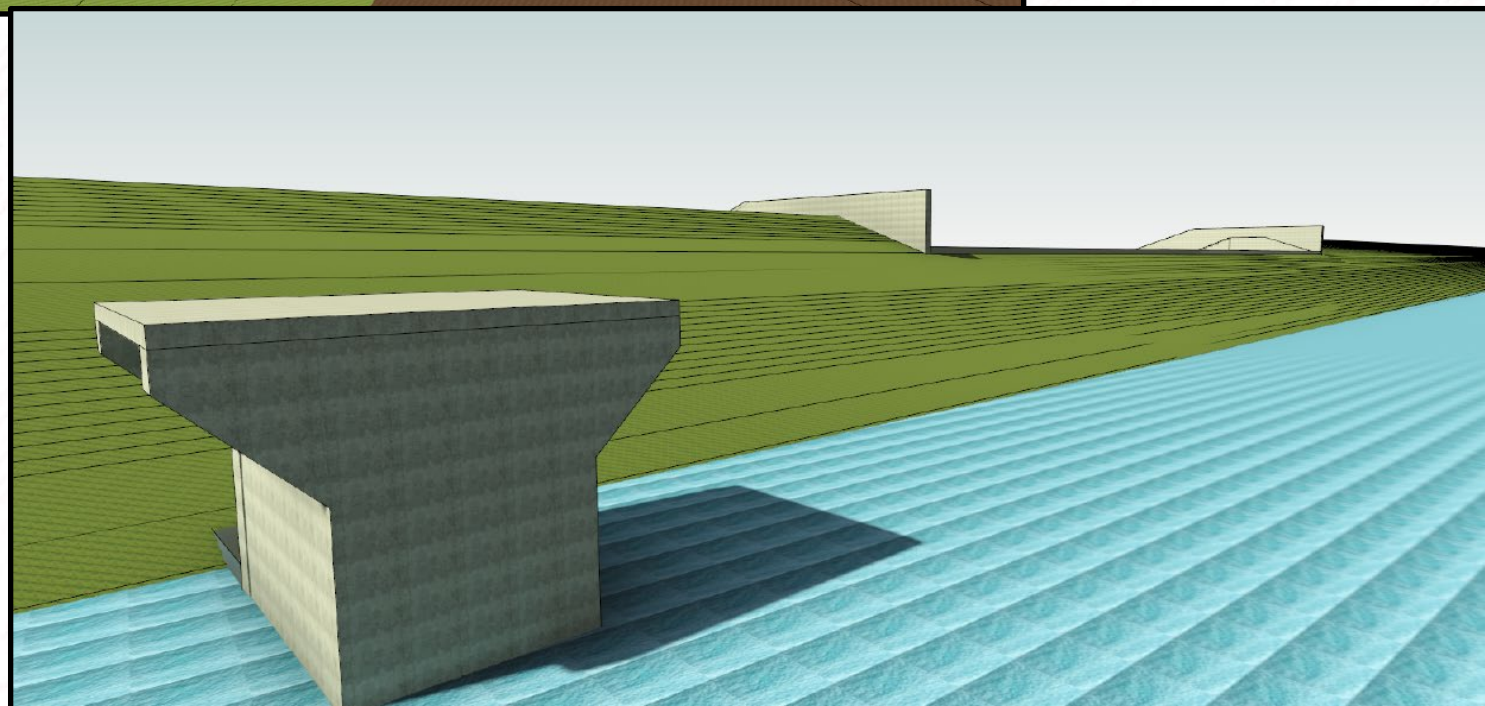

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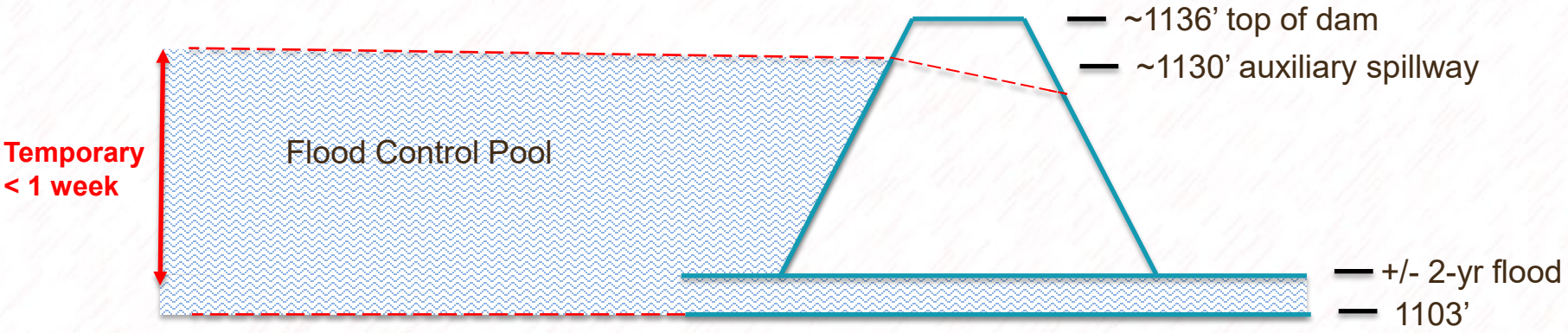
# Alternative 2: Dry Dam, On Grade Spillway





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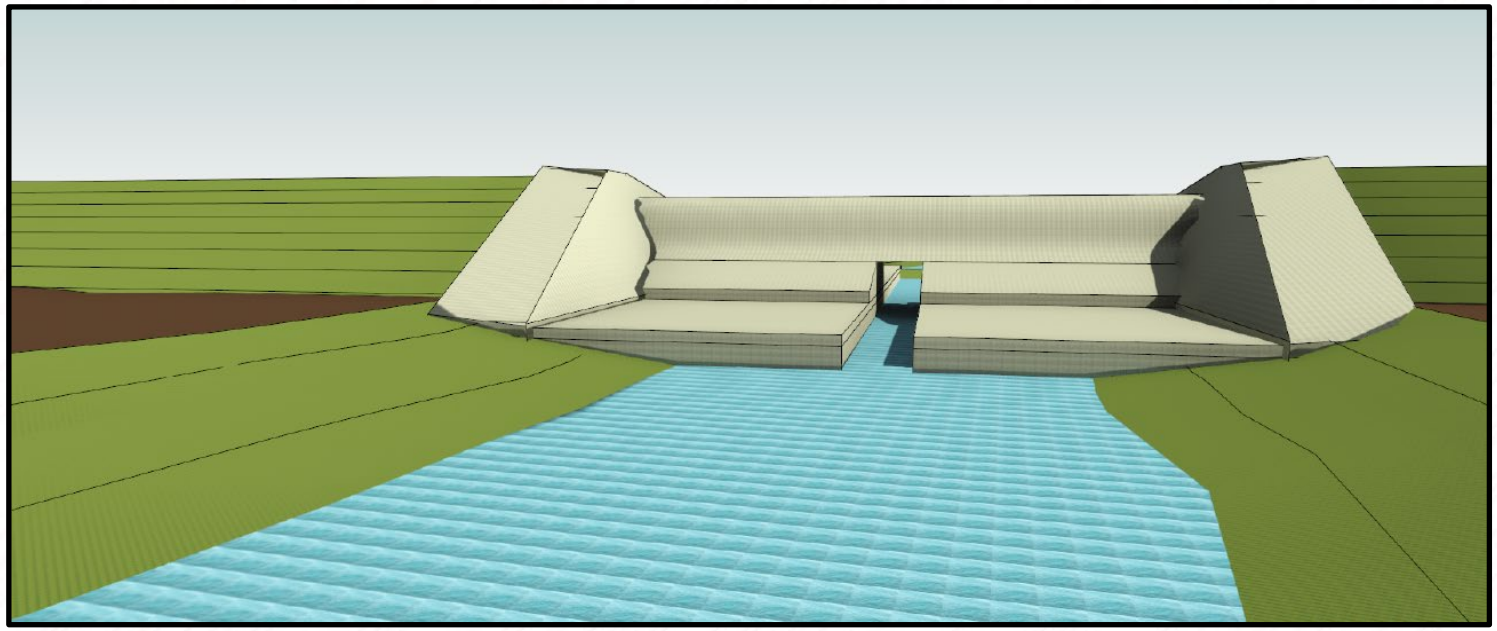

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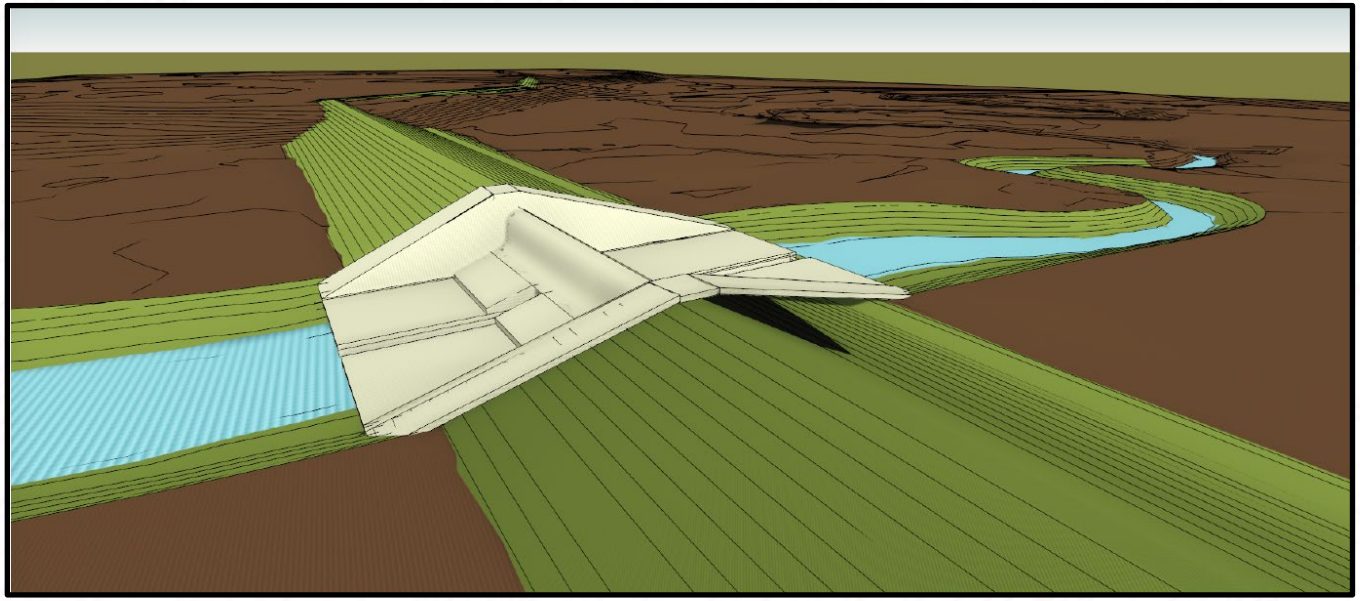

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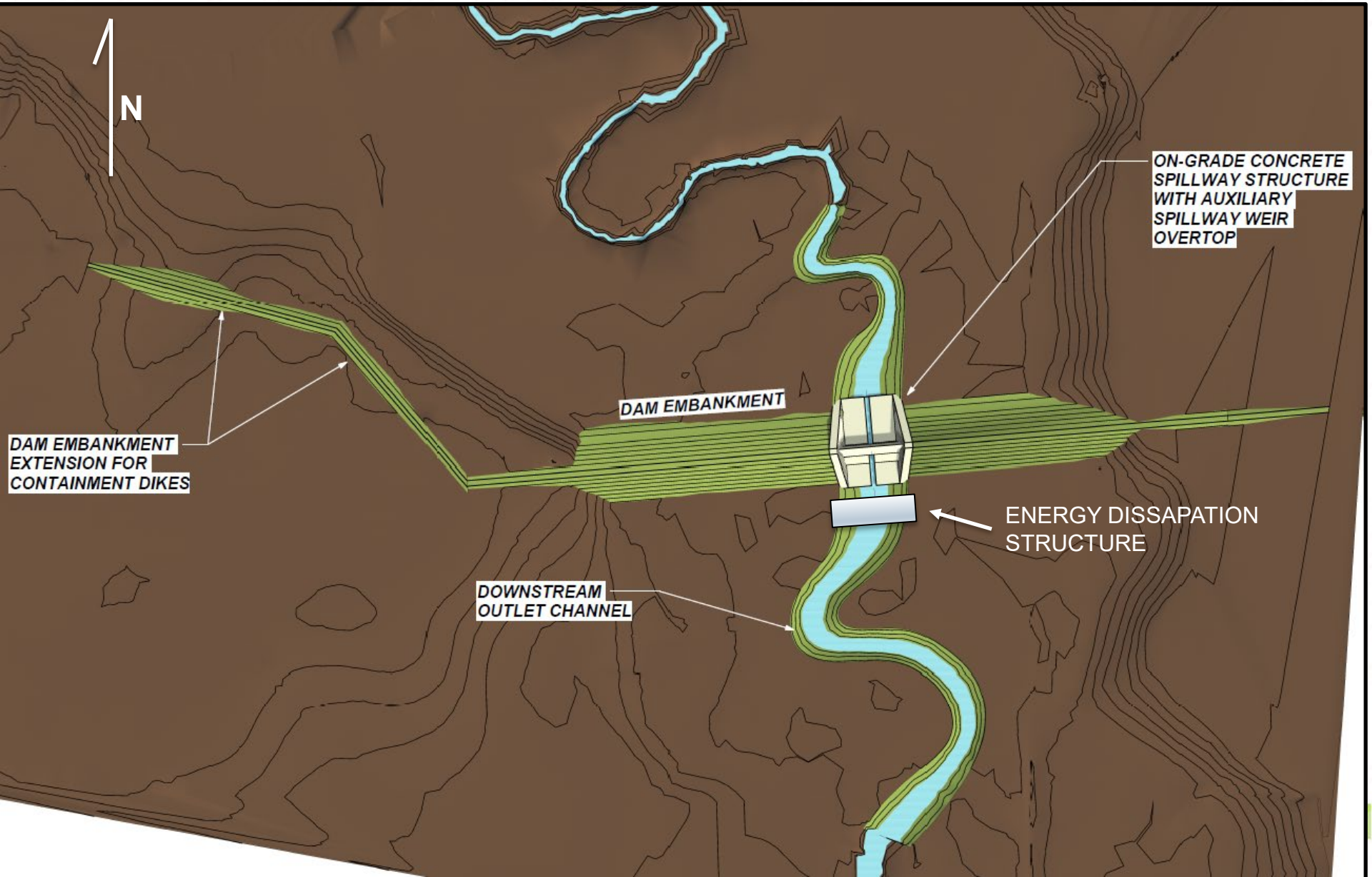
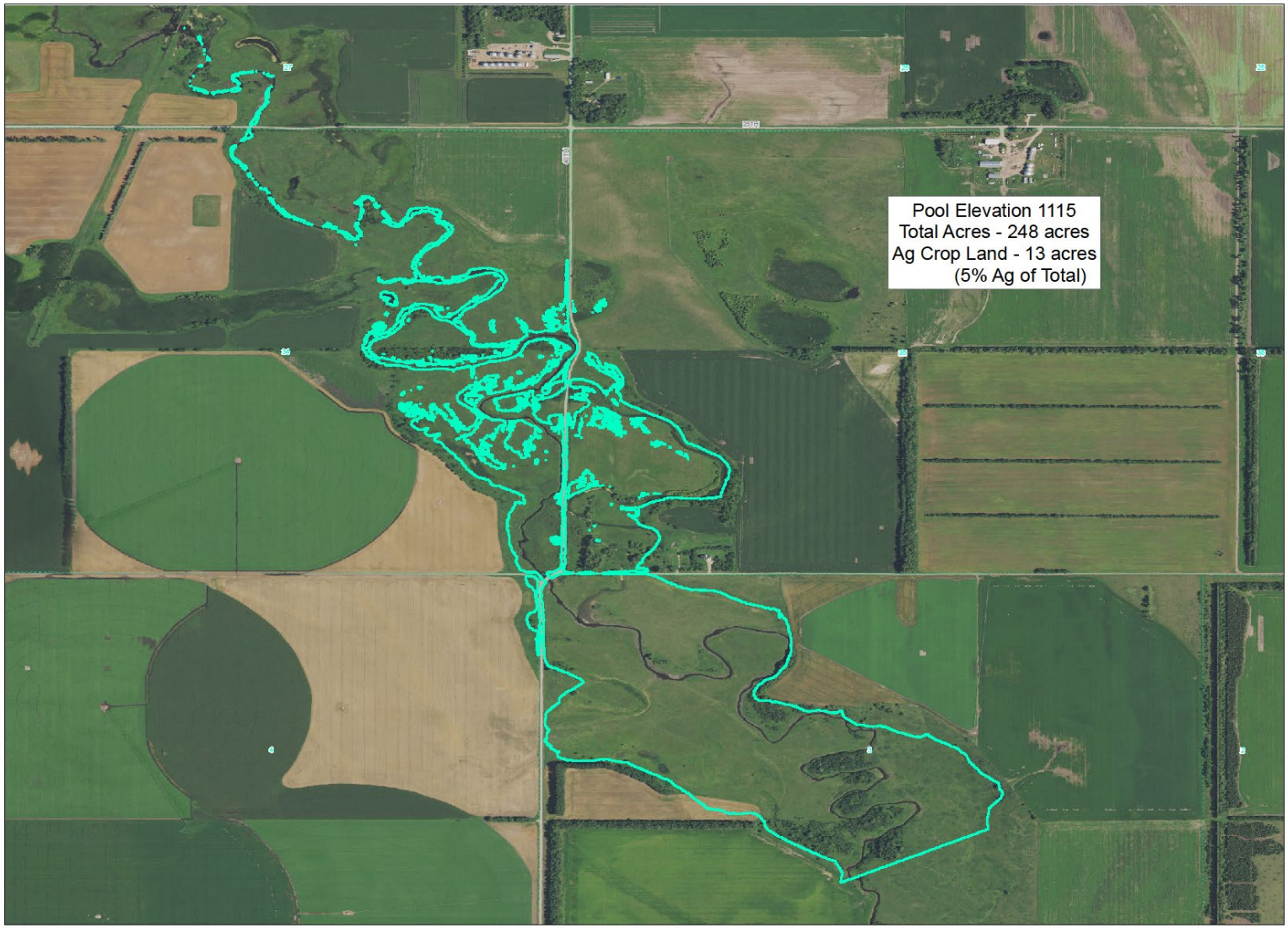


# Alternative 1 Versus 2…Permanent Pool or Not?

| | Alt 1A & 1B= Riser Tower & Permanent Pool | Alt 2 = On Grade Spillway & Dry Dam |
|---|---|---|
| Purpose | ▪ Flood Control<br>--and--<br>▪ Irrigation and/or Recreation | Flood Control Only |
| Cost | ▪ Higher | ▪ Lower |
| Advantages | ▪ Aquifer recharge<br>▪ Possible recreation<br>▪ Possible irrigation<br>▪ Reduce downstream flood damages | ▪ Max flood control<br>▪ Sediment transport maintained<br>▪ Aquatic habitat connectivity<br>▪ Minimal wetland impacts<br>▪ Minimal upstream land impacts<br>▪ Reduce downstream flood damages |
| Disadvantages | ▪ Takes land out of ag production<br>▪ Will create margin areas of cattails, standing water, mosquitos<br>▪ Up to 700 acres of wetlands impacted<br>▪ Increases downstream water temperatures, decreases water quality<br>▪ Traps sediment behind the dam, which can increase downstream bank erosion | ▪ Minimal aquifer recharge |

# 1115 Water Surface

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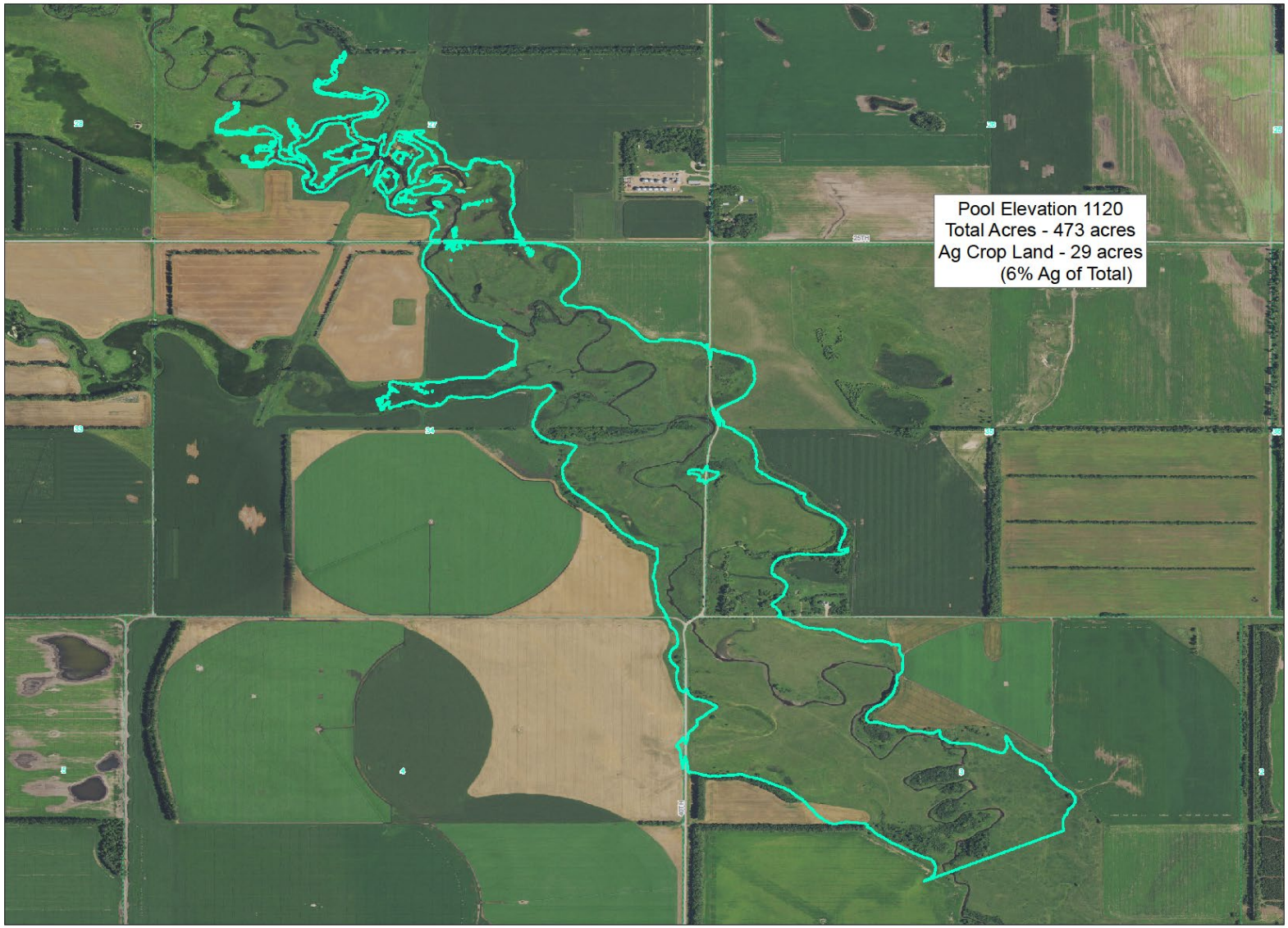
# 1120 Water Surface

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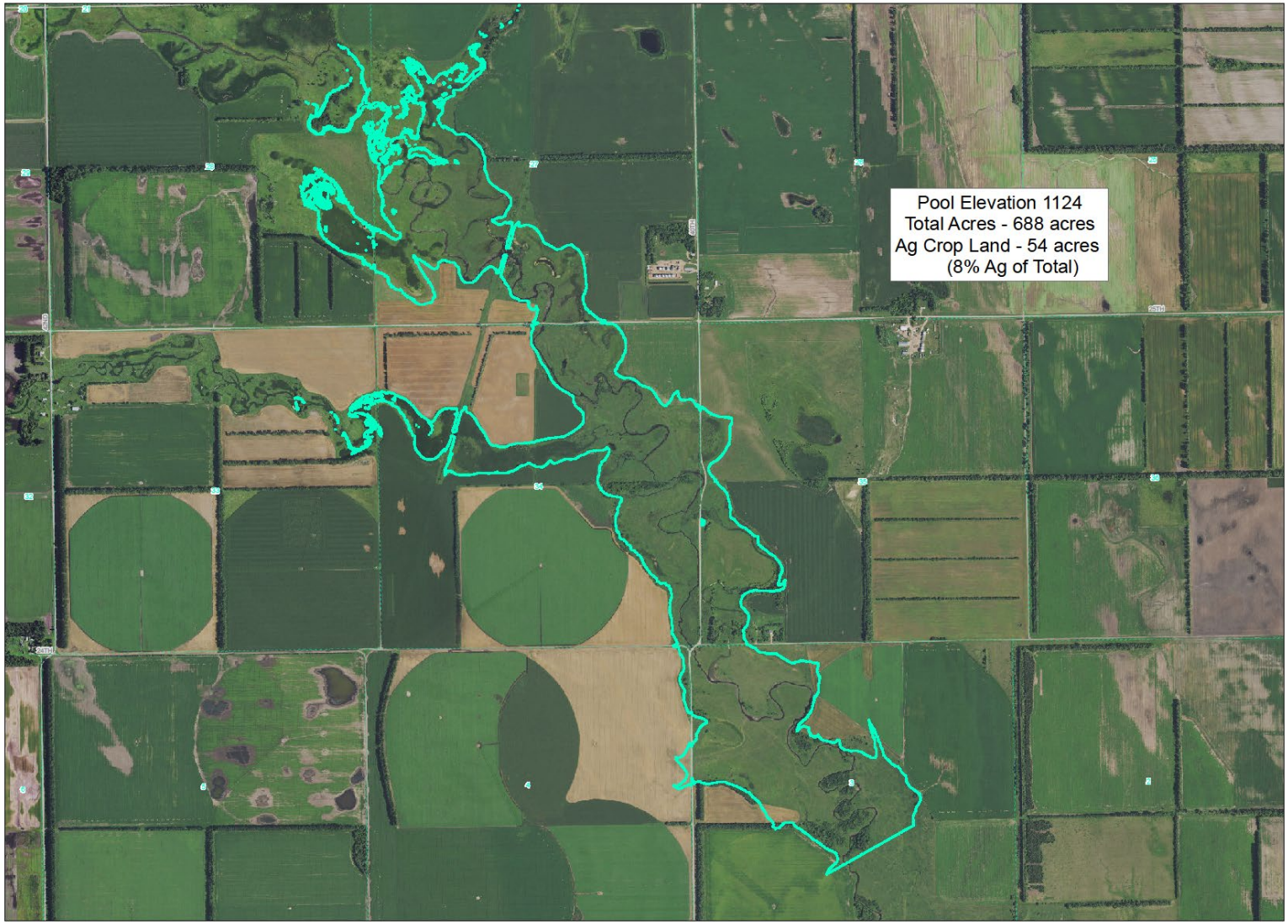
# 1124 Water Surface

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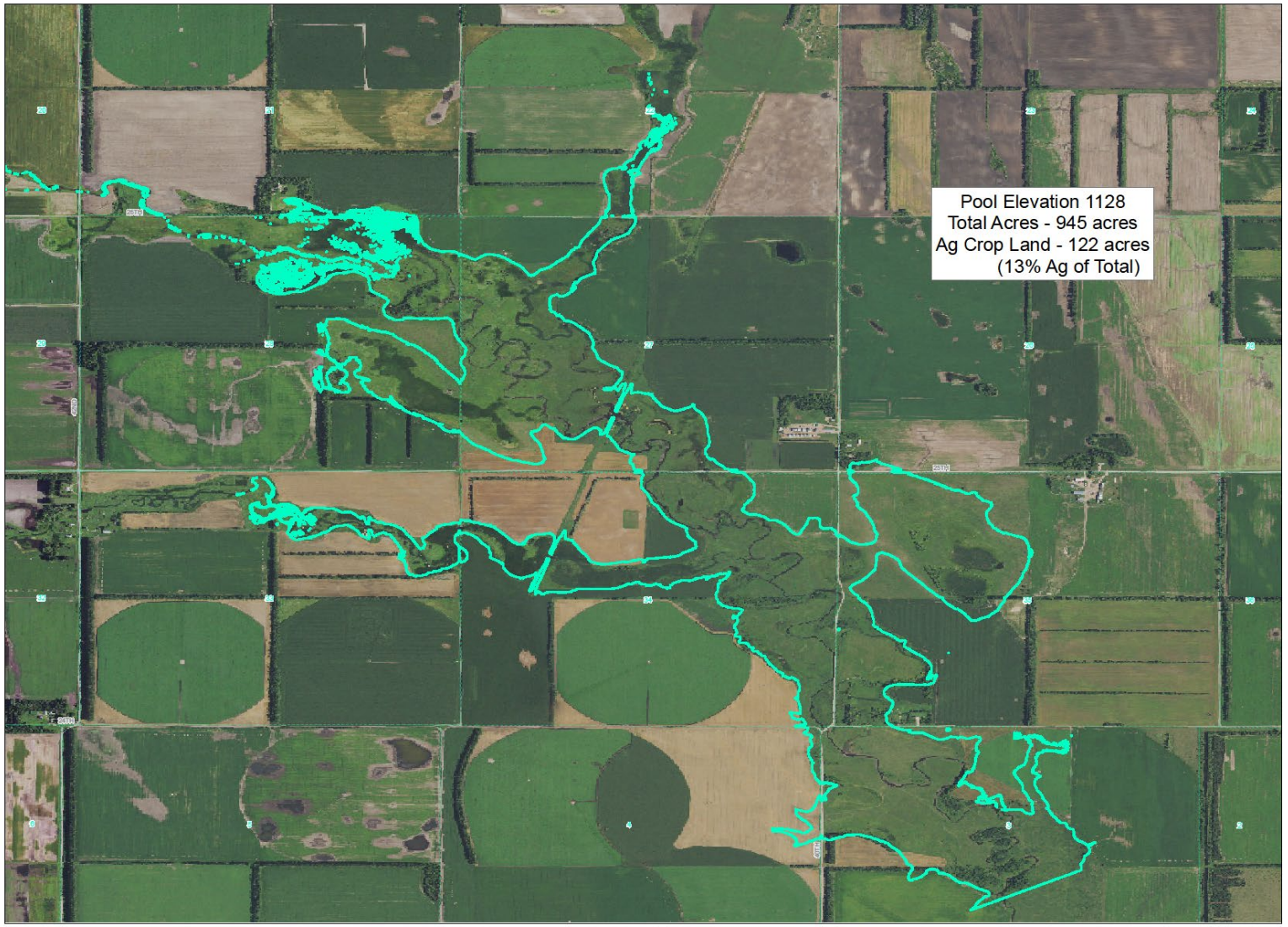
# 1128 Water Surface

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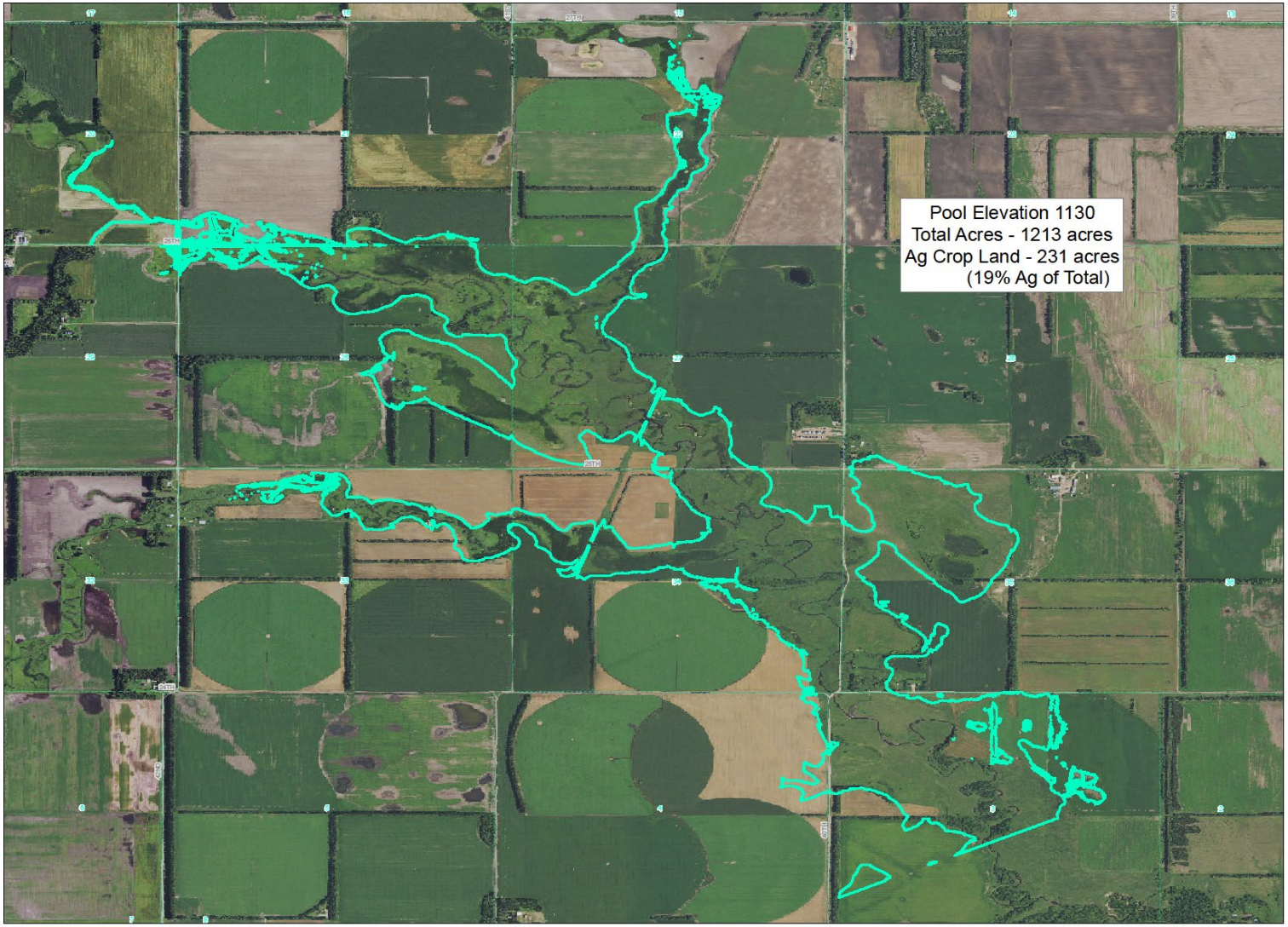
# 1130 Water Surface- Highest Potential Permanent Pool

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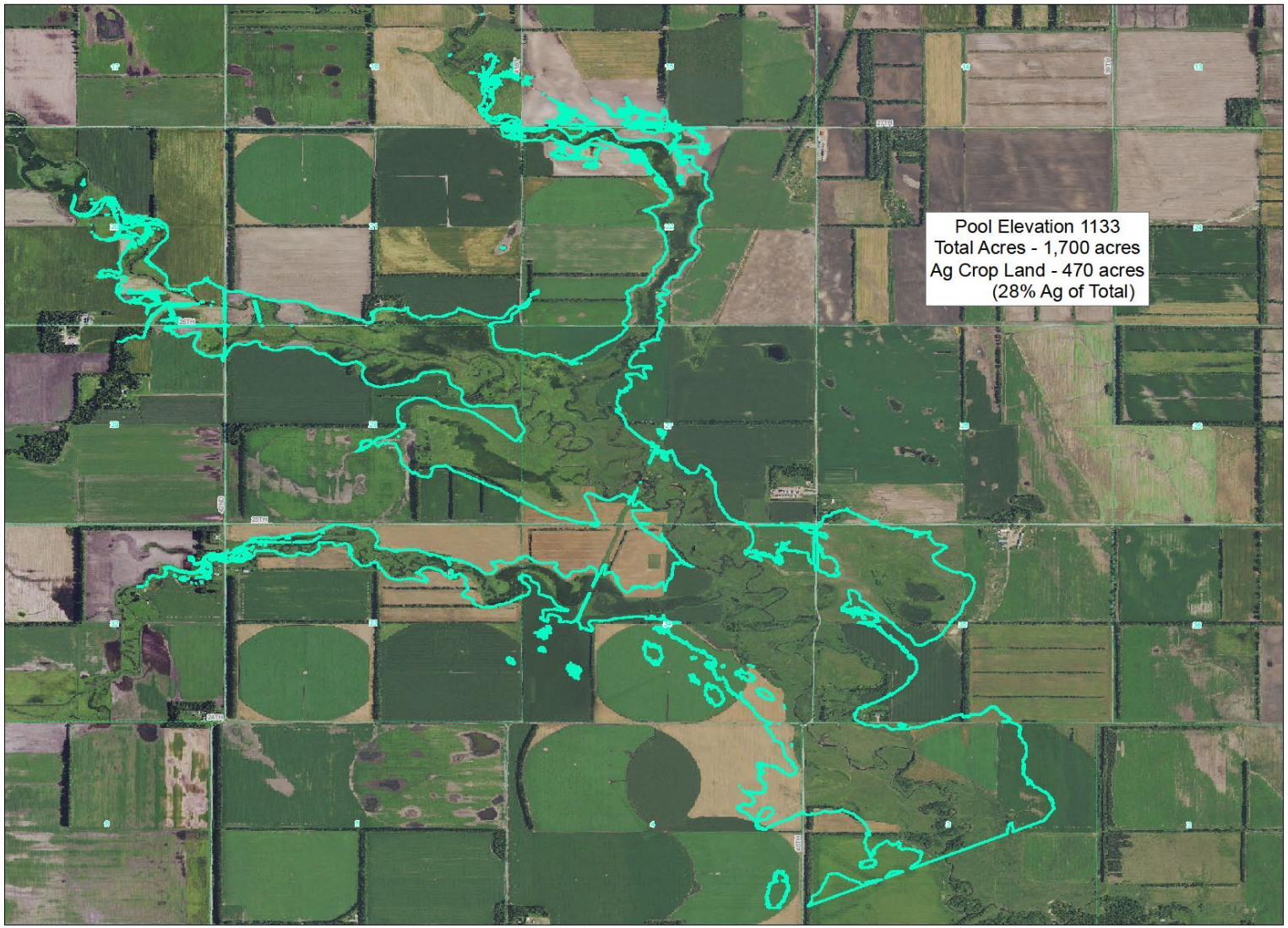
# 1133 Water Surface – Temporary Impacts

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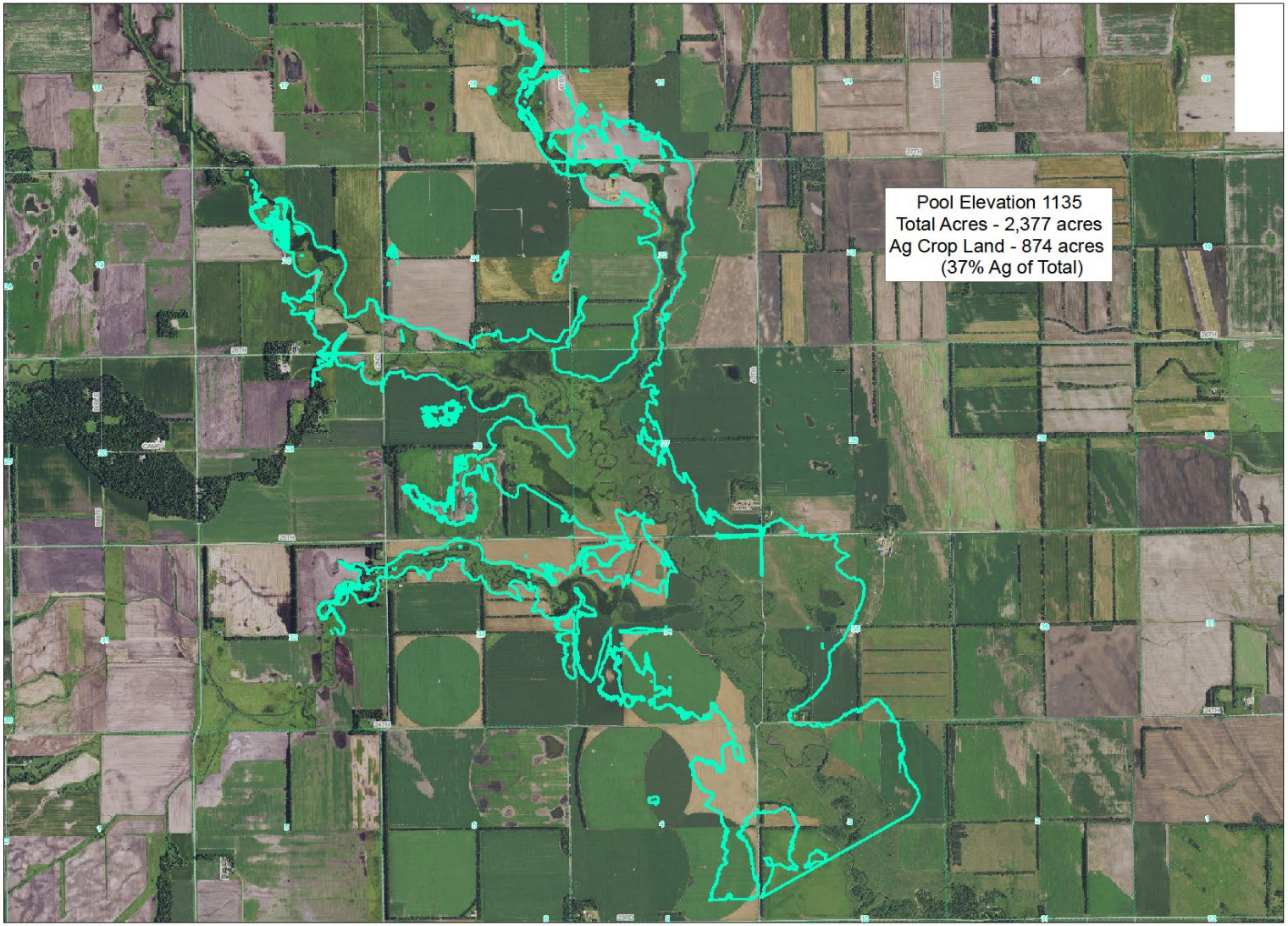
# 1135 Water Surface – Temporary Impacts

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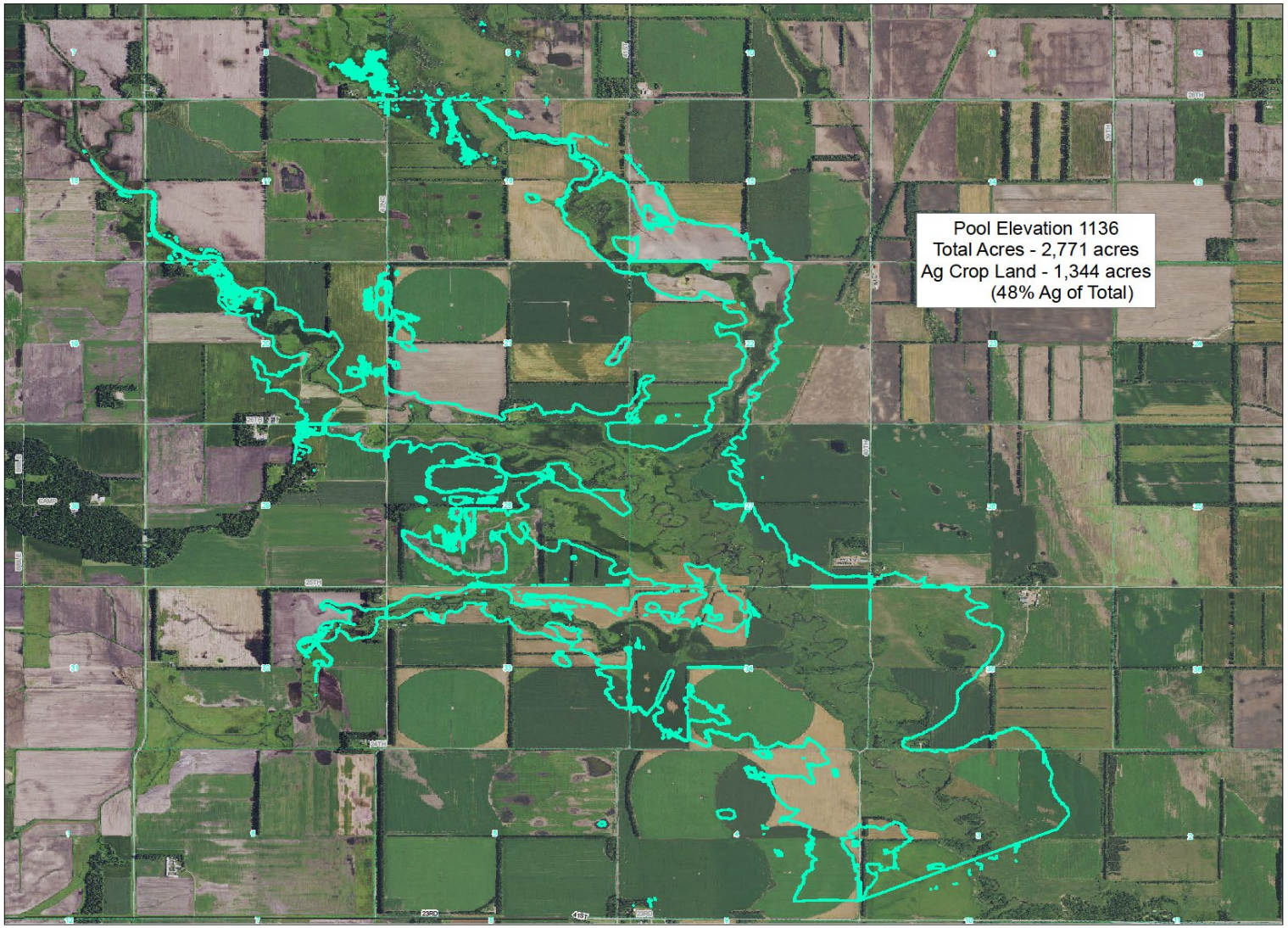
# 1136 Water Surface- Temporary Impacts

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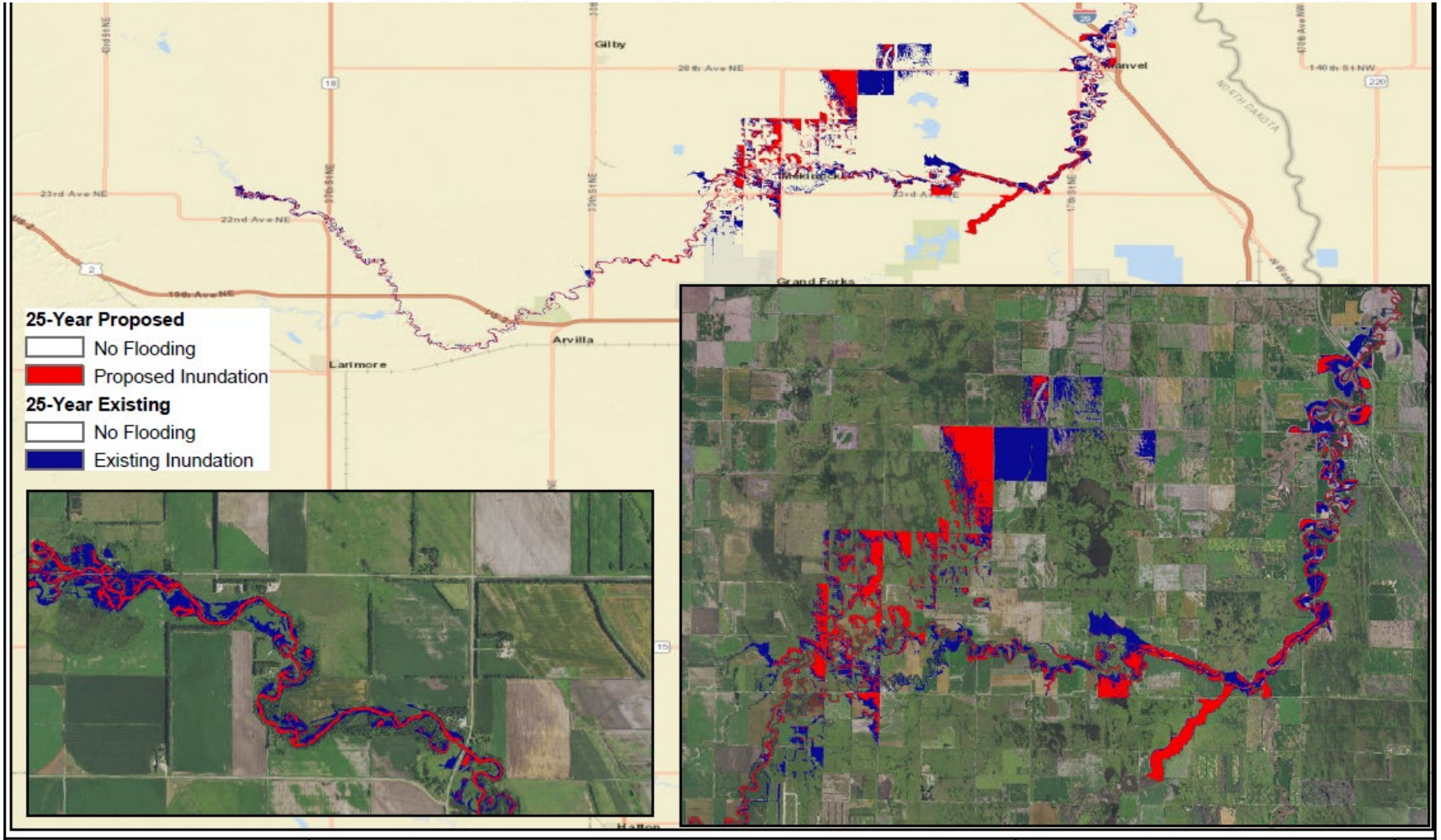
# WSE Summaries

| Water Surface Elevation (Ft) | Size (Ac) | Storage (Ac-Ft) | Cropland Inundated (Ac) | Percentage Cropland (%) |
|---|---|---|---|---|
| 1112.5 | 128 | 250 | 4 | 3% |
| 1115 | 263 | 500 | 14 | 5% |
| 1120 | 488 | 2000 | 30 | 6% |
| 1124 | 710 | 4200 | 55 | 8% |
| 1128 | 989 | 7400 | 128 | 13% |
| 1130 | 1229 | 9500 | 234 | 19% |
| 1133 | 1760 | 14400 | 486 | 28% |
| 1135 | 2453 | 18100 | 902 | 37% |
| 1136 | 2838 | 20300 | 1377 | 48% |

# Preliminary- Flood Damage Reduction

- **Inundation Reductions for 25-year Flood/Precipitation**
  - Preliminary extents (two existing RAS models), need expansion and details added.
  - Blue - current inundation, no longer with Dam 10 at 25-yr
  - Red – remains inundated with Dam 10 at 25-yr



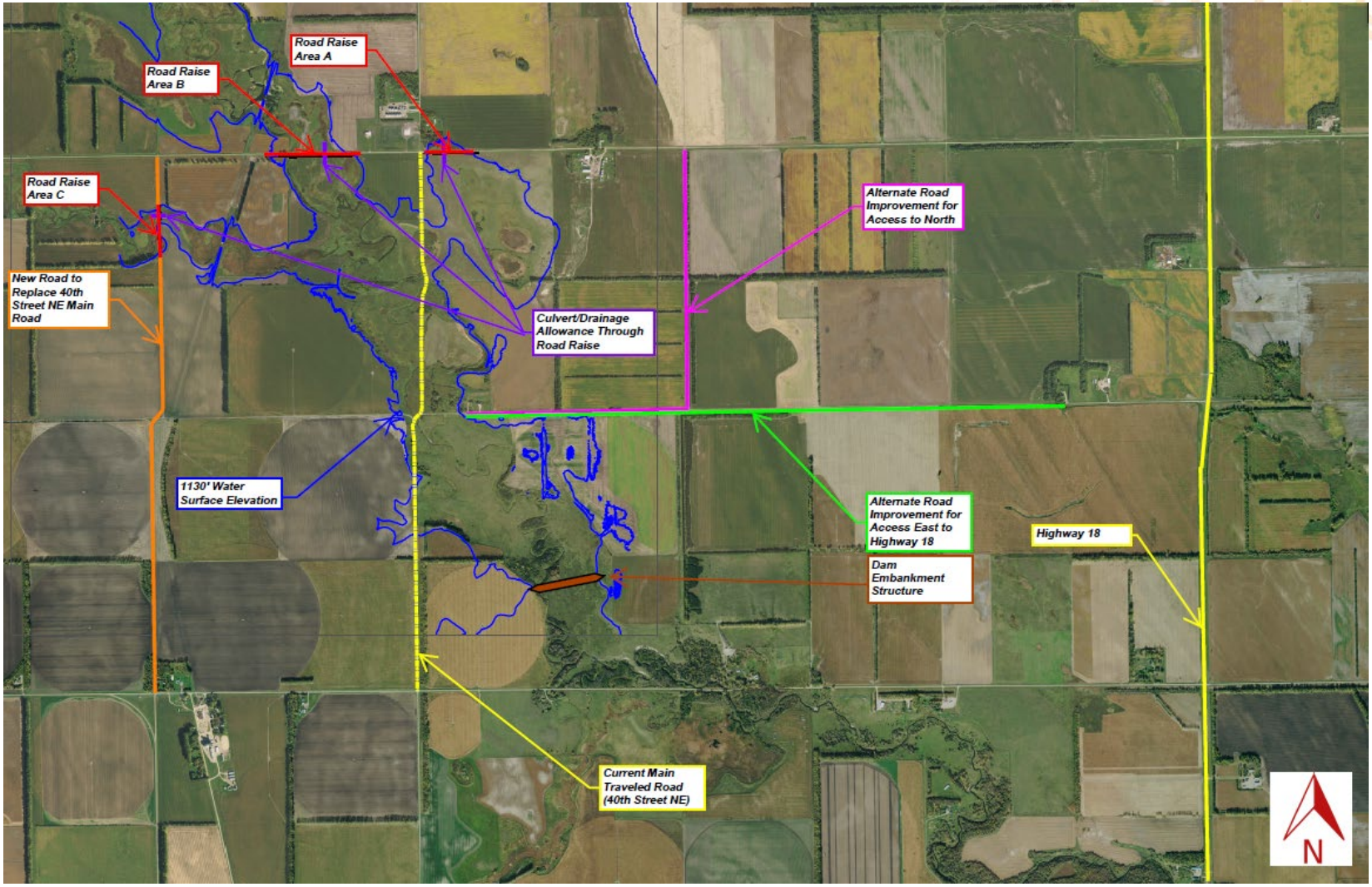
# Preliminary- Flood Damage Reduction

- **Inundation Reductions for 25-year Flood/Precipitation**
  - Peak flow reductions up to 60%
  - Inundation area reduction total ~50% and cropland ~60%

| Location | Existing Conditions | Preliminary Alternative (Dam 10) | |
|---|---|---|---|
| | Flow (cfs) | Flow (cfs) | % Change |
| North Branch Turtle River D/S Dam 10, Near McCanna | 2,070 | 830 | 60% |
| North Branch Turtle River at Hwy 18 | 2,060 | 830 | 60% |
| North Branch Turtle River at Hwy 2 | 2,055 | 830 | 60% |
| Turtle River below SB confluence | 2,290 | 1,060 | 54% |
| Turtle River below at Hwy 2/State Park | 2,290 | 1,060 | 54% |
| Turtle River Near Mekinock | 730 | 560 | 23% |

| Scenario | Duration (hours) | 25-year Area (Acres) | |
|---|---|---|---|
| | | Cropland | Total |
| Existing Conditions | 0-24 | 500 | 1,000 |
| | 24-48 | 420 | 1,220 |
| | 48-72 | 610 | 1,510 |
| | 72-96 | 550 | 1,580 |
| | 96-120 | 550 | 1,350 |
| | >120 | 380 | 1,890 |
| | Total | 3,010 | 8,550 |
| | | | |
| Preliminary Alternative (Dam 10) | 0-24 | 200 | 500 |
| | 24-48 | 160 | 550 |
| | 48-72 | 240 | 710 |
| | 72-96 | 330 | 830 |
| | 96-120 | 90 | 440 |
| | >120 | 190 | 1,120 |
| | Total | 1,210 | 4,150 |
| | | | |
| Preliminary Alternative % Change | 0-24 | -60% | -50% |
| | 24-48 | -62% | -55% |
| | 48-72 | -61% | -53% |
| | 72-96 | -40% | -47% |
| | 96-120 | -84% | -67% |
| | >120 | -50% | -41% |
| | Total | -60% | -51% |

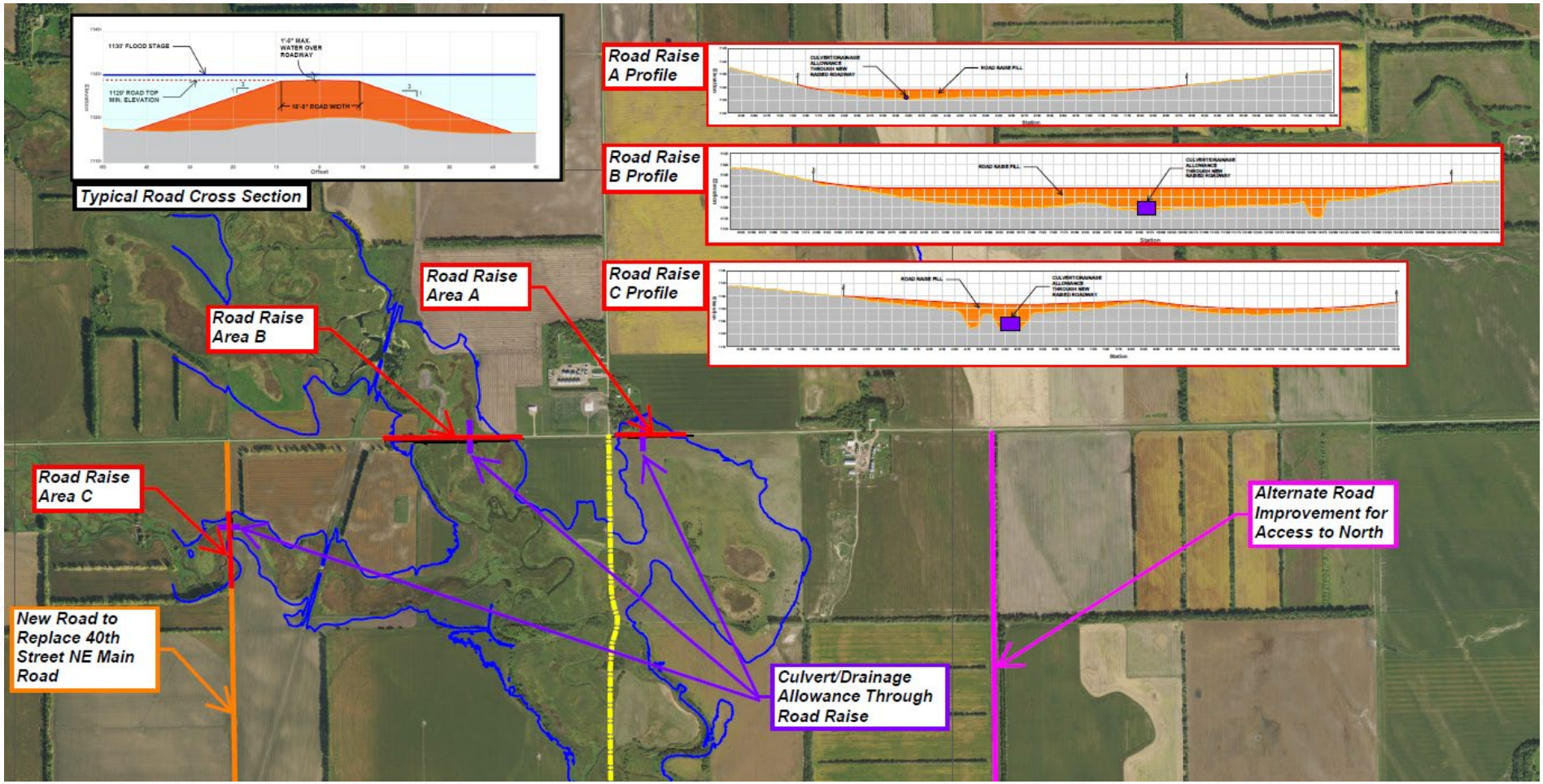
# Road Raises and Road Access Considerations




Approximately 3,400 feet of road raise with adequate hydraulic structures.

Approximately 23,400 feet of new road construction

# Road Raises and Road Access Considerations




Approximately 3,400 feet of road raise with adequate hydraulic structures.

Approximately 23,400 feet of new road construction

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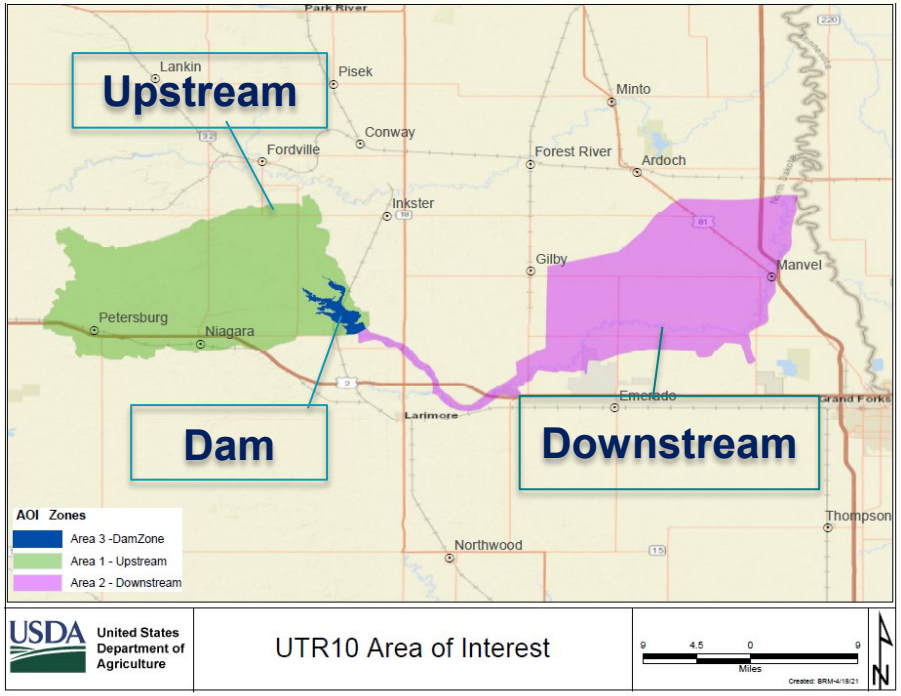
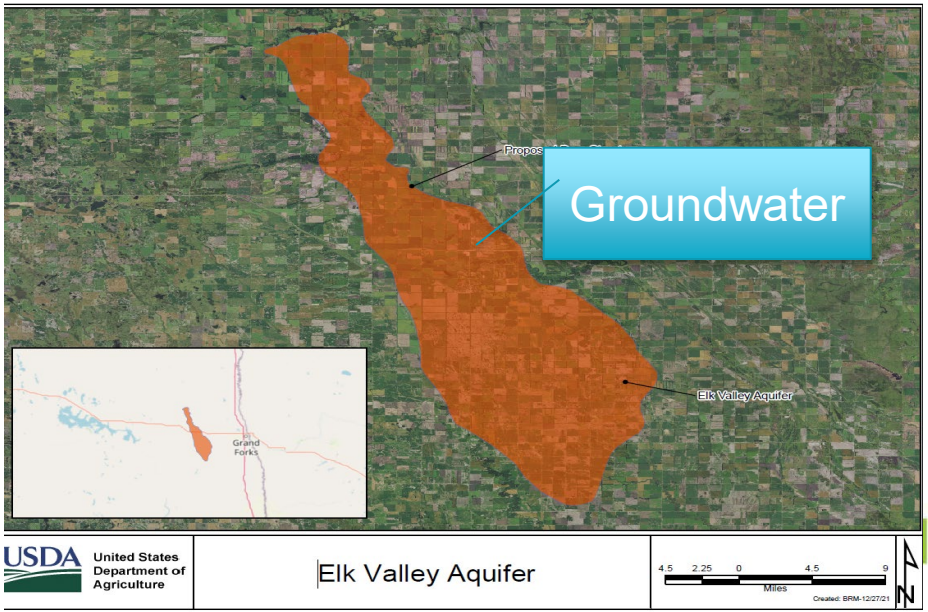
# Resource Information

- Identifying Resource Concerns is a requirement for PL-566 Planning and NEPA

- NRCS Staff collected preliminary data to help identify the most applicable resource concerns in Four Zones
  - *Upstream of Dam*
  - *Zone of Dam Inundation*
  - *Downstream of Dam*
  - *Groundwater zone (Elk Valley Aquifer*



# Resource Information

- Geology, Soil, Land Use and Agricultural Production
- Water Quality and Water Quantity – Ground and Surface
- Fish and Wildlife, Plants, Species of Concern, Threatened and Endangered Species
- Social Concerns – Public Lands, Cultural Resources, Economics

# Upland Treatment

- The Sponsor must obtain agreements from landowners to implement conservation plans on not less than 50% of land above the project
- Existing conservation plans (HEL, CRP, EQIP, CTA, CSP) meet this requirement
- Requirement presents an opportunity to work with landowners and operators on *new* plans with a focus on soil health and ground and surface water quality

# Resource Information

## Resource concerns may be ranked on the Participation Survey

| Please rate the following resource concerns: | Low/None | Medium | High |
|---|---|---|---|
| Agricultural Flood Damages | | | |
| Road/Bridge/Culvert Damages | | | |
| Groundwater Quality | | | |
| Surface Water Quality | | | |
| Wildlife Habitat | | | |
| Fish and Aquatic Habitat | | | |
| Lack of Recreational Opportunities | | | |
| Cultural Resources | | | |

Include detail here!

Other Comments: _____

_____

_____

_____

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# Project Preference Participation Survey

**My Preference for a project at Upper Turtle Dam 10:**

_____ Flood Control, recreation, irrigation - standard riser with large permanent pool, boat launch

_____ Flood Control, irrigation - standard riser tower with smaller permanent pool

_____ Flood Control Only - dry dam with flow through spillway at current river grade

_____ Opposed to any project

_____ Undecided until additional analysis work such as economics and environmental impacts is completed

May Select More than one Option

# Project Information:

https://www.nrcs.usda.gov/wps/portal/nrcs/main/nd/technical/engineering/

Stay Connected

Technical Resources

- Conservation Planning
- Data, Maps, & Analysis
- Ecological Science
- Engineering
- Land Use
- State Technical Committee

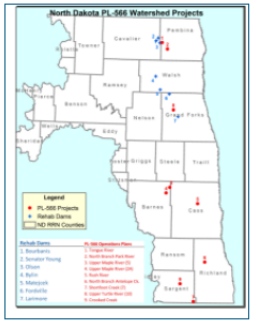
Red River RCPP Watershed Planning

## Engineering

North Dakota engineering staff provide a blend of structural and biological measure to solve resource concerns related to soil erosion, water quality, agricultural waste management and wetland restoration while meeting the land use objectives. Engineering staff provide planning, design and construction services to support agency programs and activities.

*Documents designated (PDF) require Adobe Reader*

### Watershed Programs




> ND Watershed Operations Projects

> ND Watershed Rehabilitation Projects

> Emergency Watershed Protection

***Current/Recent North Dakota PL-566 Watershed Projects***

| Watershed Project Name | Sponsor | Year Started | Status (January 2022) |
|---|---|---|---|
| Rush River | Cass County Joint WRD | 2015 | Plan/EA Final. Final engineering design is in progress. |
| North Branch Park River | Park River Joint WRD | 2015 | NWMC comments returned May 2021. Edits to draft in progress. |
| Upper Maple River | Cass County Joint WRD | 2015 | Draft Plan/EA in development |
| Shortfoot Creek | Sargent County WRD | 2016 | Draft Plan/EA in development |
| Tongue River | Pembina County WRD | 2016 | Pending NWMC review |
| North Branch Antelope Creek | Richland County WRD | 2016 | Draft Plan/EA in development |
| Forest River | Walsh County WRD | 2015 | Planning ceased, final report complete |
| Swan Creek | Cass County Joint WRD | 2015 | Planning ceased, final report complete |
| Upper Turtle River Dam 10 | Grand Forks County WRD | 2020 | Planning in progress |
| Crooked Creek | Sargent County WRD | 2021 | Planning in progress |

### Resources

Public Meeting Notice- March 8, 2022
March 8 Meeting Questionnaire
Feasibility Report
Public Participation Plan

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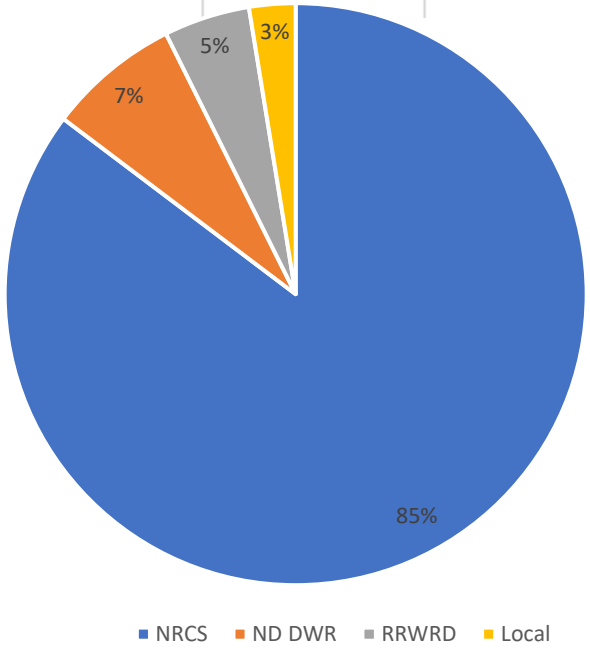
| Upper Turtle Dam 10 Theoretical Funding Scenario = Not Real Numbers!! | | | | | |
|---|---|---|---|---|---|
| **Item** | **Total** | **NRCS** | **ND DWR** | **RRJWRD** | **Local** |
| Design/ConstructionEngineering | $1,000,000 | $1,000,000 | $0 | $0 | $0 |
| Dam Construction | $10,000,000 | $10,000,000 | $0 | $0 | $0 |
| Road Reconstruction | $2,000,000 | $2,000,000 | $0 | $0 | $0 |
| Flow Easement | $1,500,000 | $0 | $750,000 | $487,500 | $262,500 |
| Wetland Mitigation Fee Title | $100,000 | $50,000 | $25,000 | $16,250 | $8,750 |
| Dam Fee Title | $500,000 | $0 | $250,000 | $162,500 | $87,500 |
| Admin | $200,000 | $0 | $100,000 | $65,000 | $35,000 |
| | **$15,300,000** | **$13,050,000** | **$1,125,000** | **$731,250** | **$393,750** |

*Subject to available agency funds and future priorities

*ND DWR policy may preclude flowage easement cost share

*Dam would be owned by Sponsor, so all future O&M local

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# Questions & Comments

- Should the Local Sponsors (Grand Forks WRD/SCD) tell NRCS to move forward with analyzing alternatives?
- If so, what alternatives do you think should be considered?
- What concerns do you have over a potential dam project at this site?