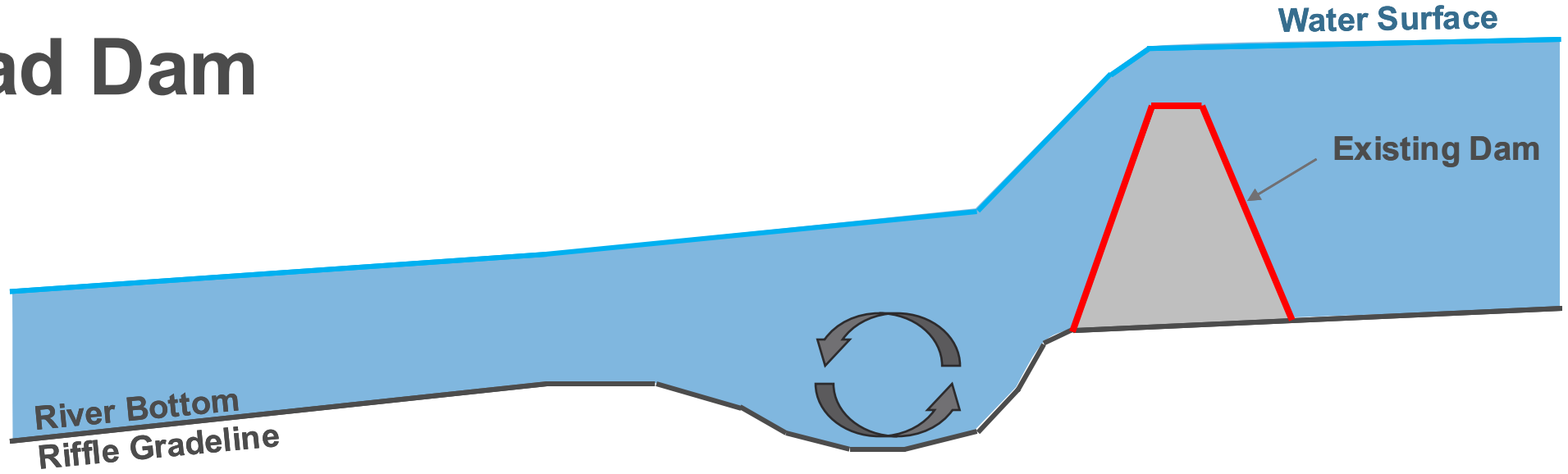
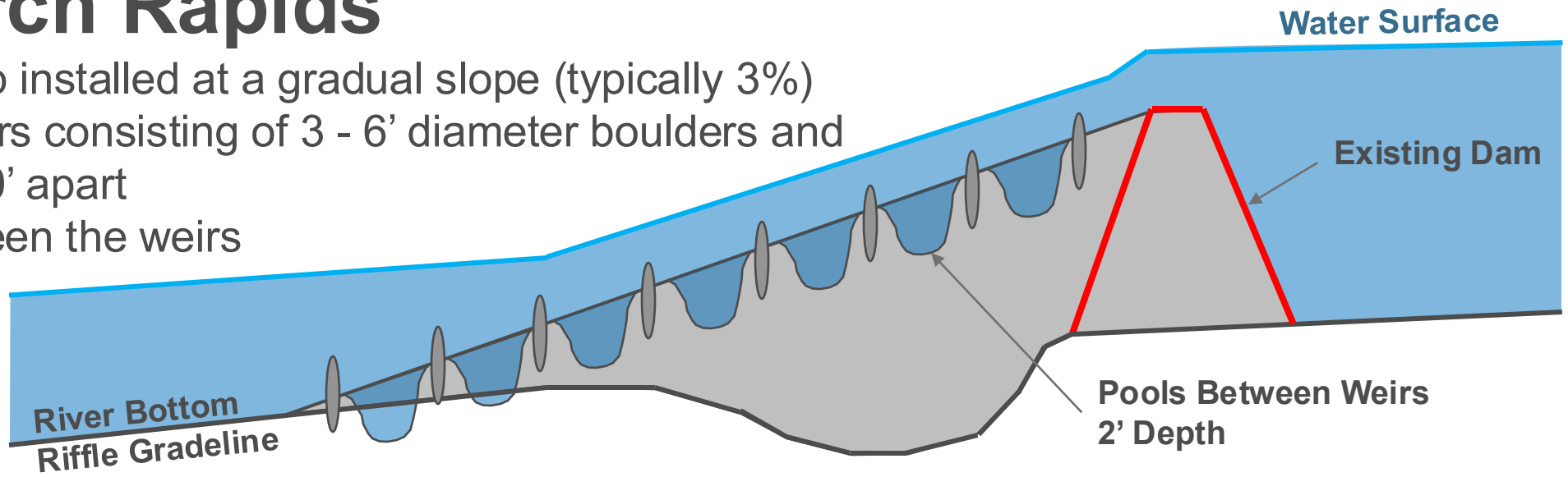

Lake Osakis Outlet Modification
May 17, 2025

Low Head Dam



Rock Arch Rapids

- Riprap ramp installed at a gradual slope (typically 3%)
- Boulder weirs consisting of 3 - 6’ diameter boulders and spaced ~ 20’ apart
- Pools between the weirs



Pelican River – Pelican Rapids, MN

Blue Eagle Lake – Barnesville, MN

Little Birch Lake – Melrose, MN

Osakis Lake Outlet - Background

- Existing dam: 2’ high fixed weir
- Location: Upstream side of the 12’x7’ box culvert under Todd CR 37
- Part of the Joint County Ditch 2 system
- Dam Owner: Todd County Hwy Dept.
- Constructed: 1996
- Weir Length: 22’
- Crest Elevation: 1322.2 (NAVD 88)
- OHW: 1324.2 (NAVD 88)

Minnesota Statutes 103G.005

1.the ordinary high water level is an elevation delineating the highest water level that has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial;

JCD 2 at CR 37 Bridge Looking Upstream (West)

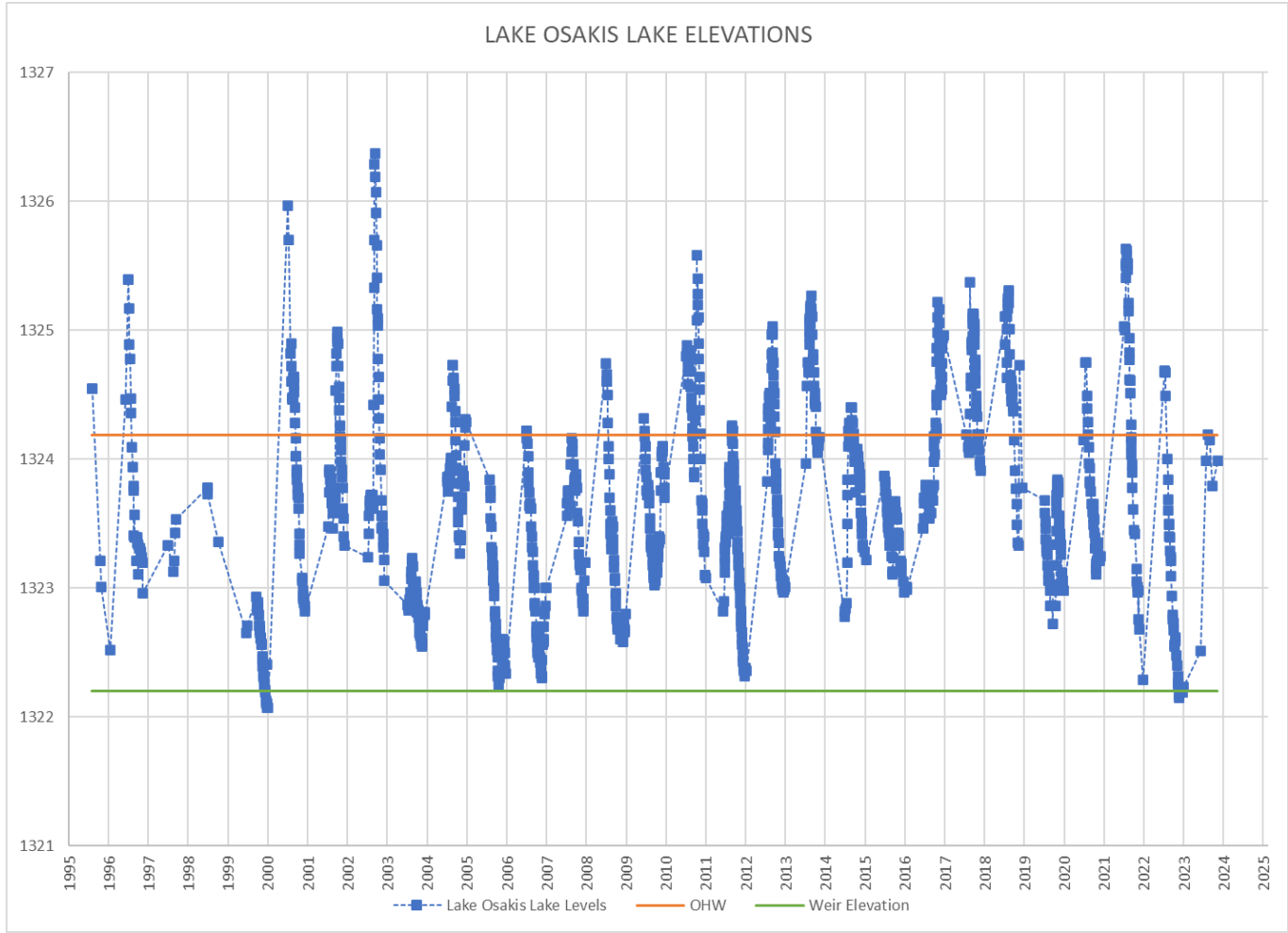
Existing Lake Osakis Outlet Weir

Downstream of CR 37 Culvert Looking Upstream (West)

Photo courtesy of WSB

Project Purpose

- Maintain existing runout elevation
- Equivalent hydraulic performance at the OHW
- Improve fish passage
- Stable outlet
- Low maintenance outlet
- Reduce lake level fluctuations



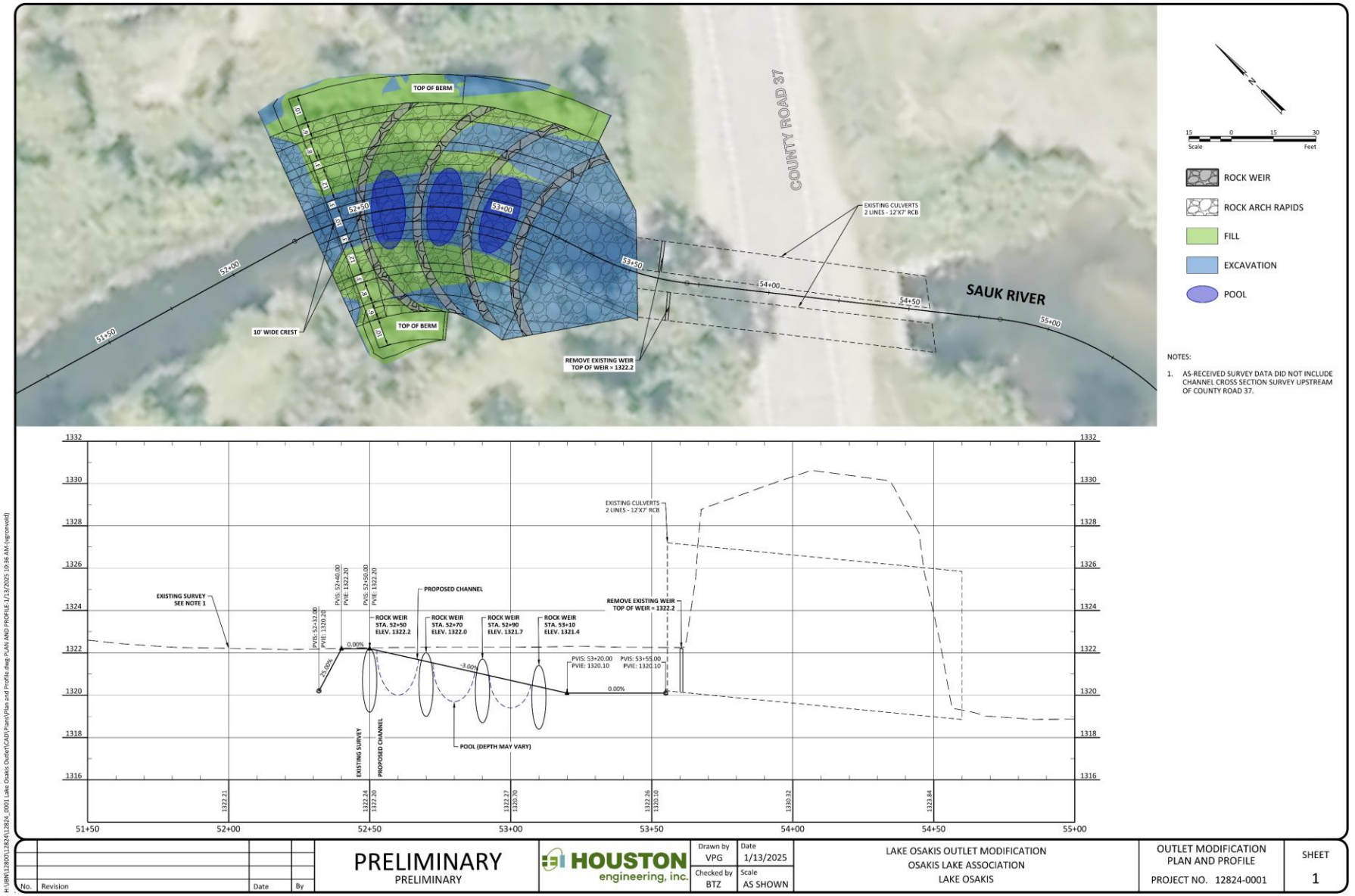
Project Timeline

- **Preliminary Design**
- Stakeholder Engagement
- Establish Dam Owner
- Funding
- Final Design
- Permitting
- Construction
- Operation and Maintenance

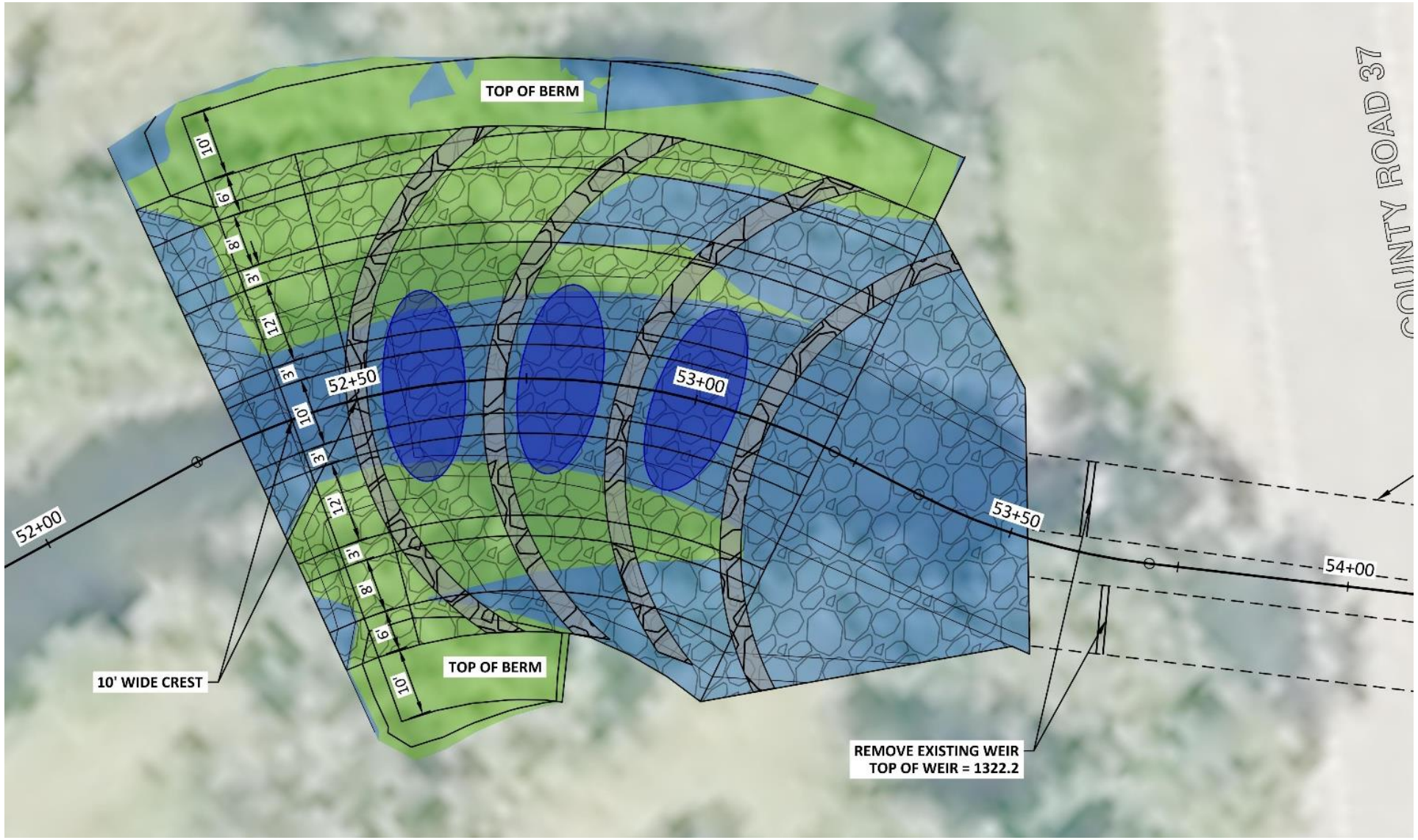
Preliminary Design Report
January 13, 2025

Funded by Osakis Lake Association

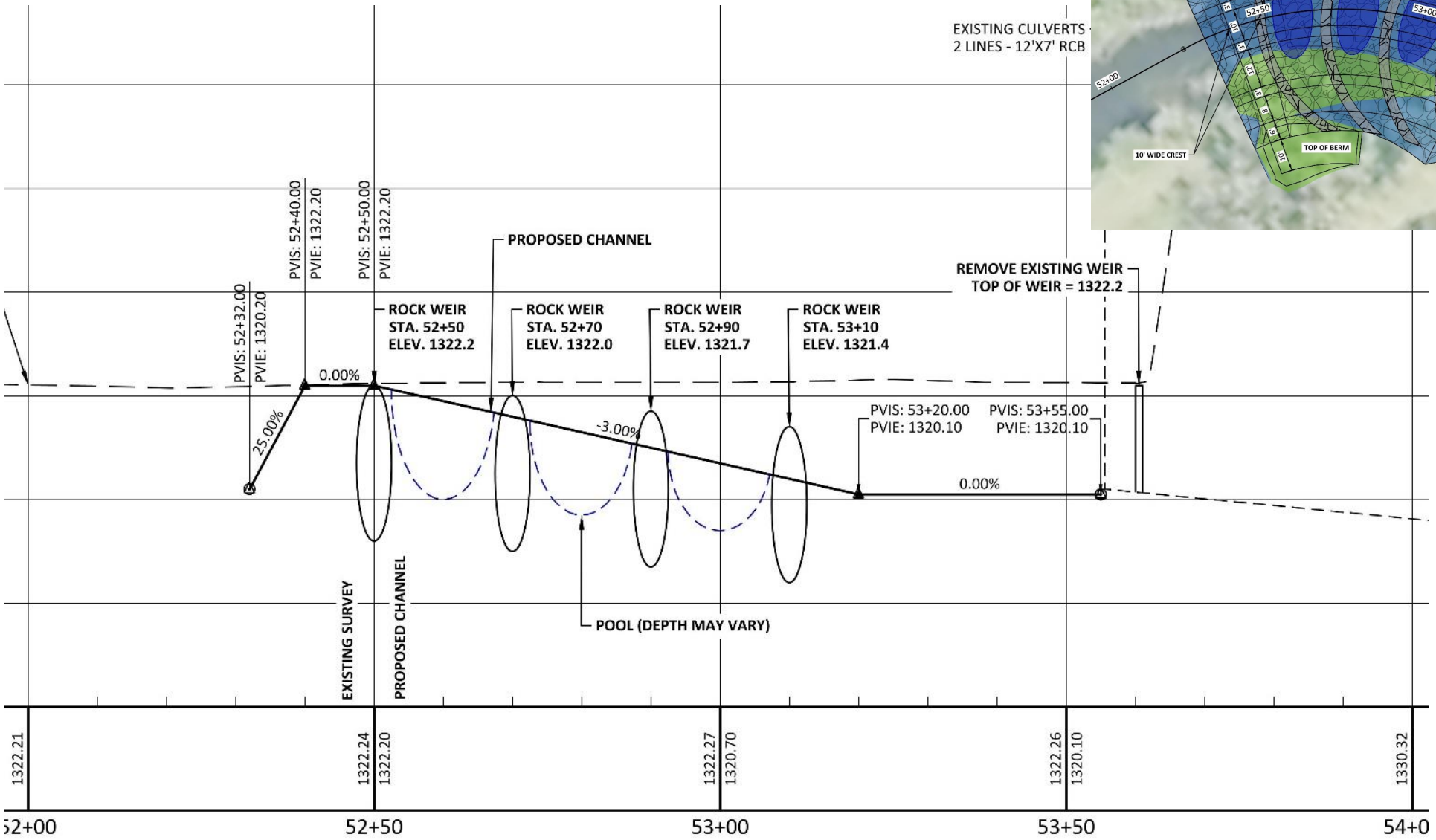
PRELIMINARY DESIGN

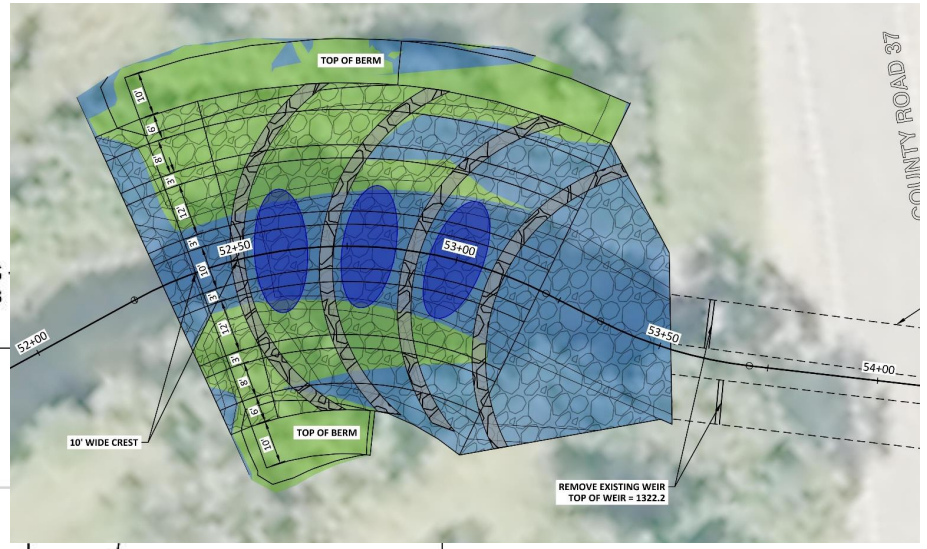


PRELIMINARY DESIGN

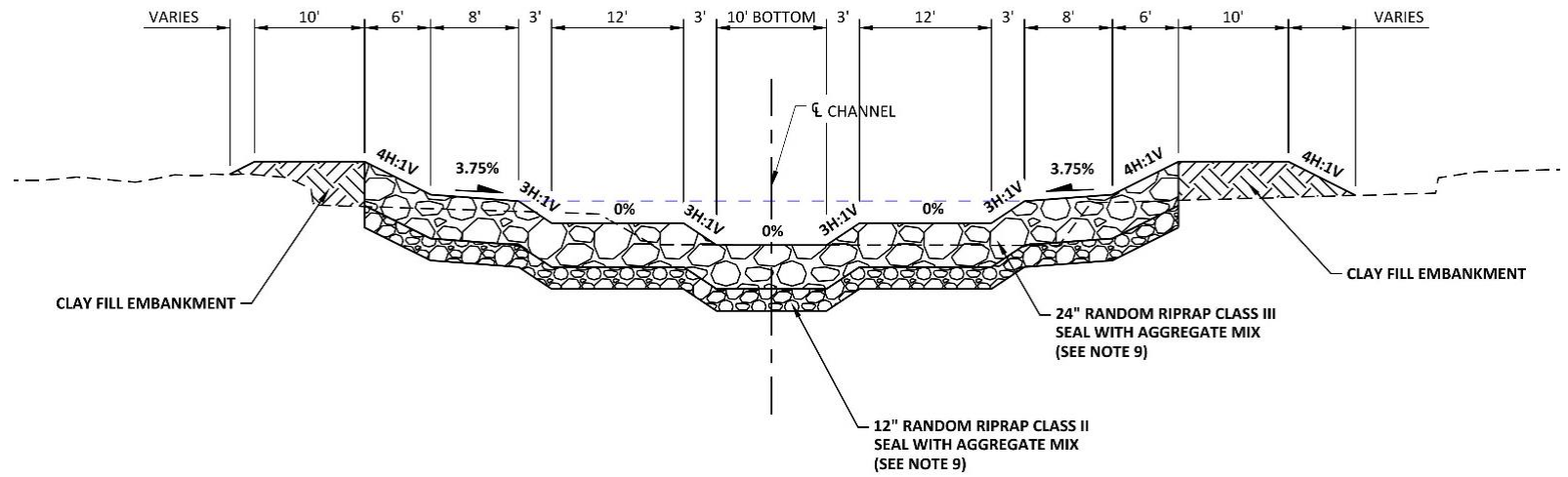


PRELIMINARY DESIGN



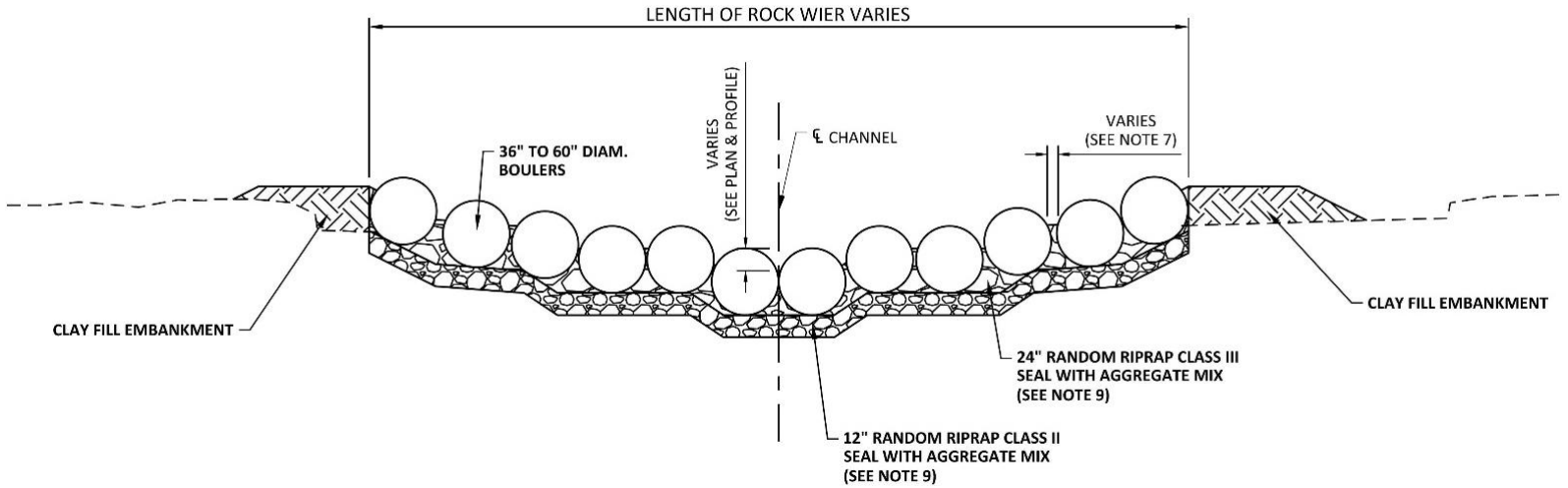


PRELIMINARY DESIGN

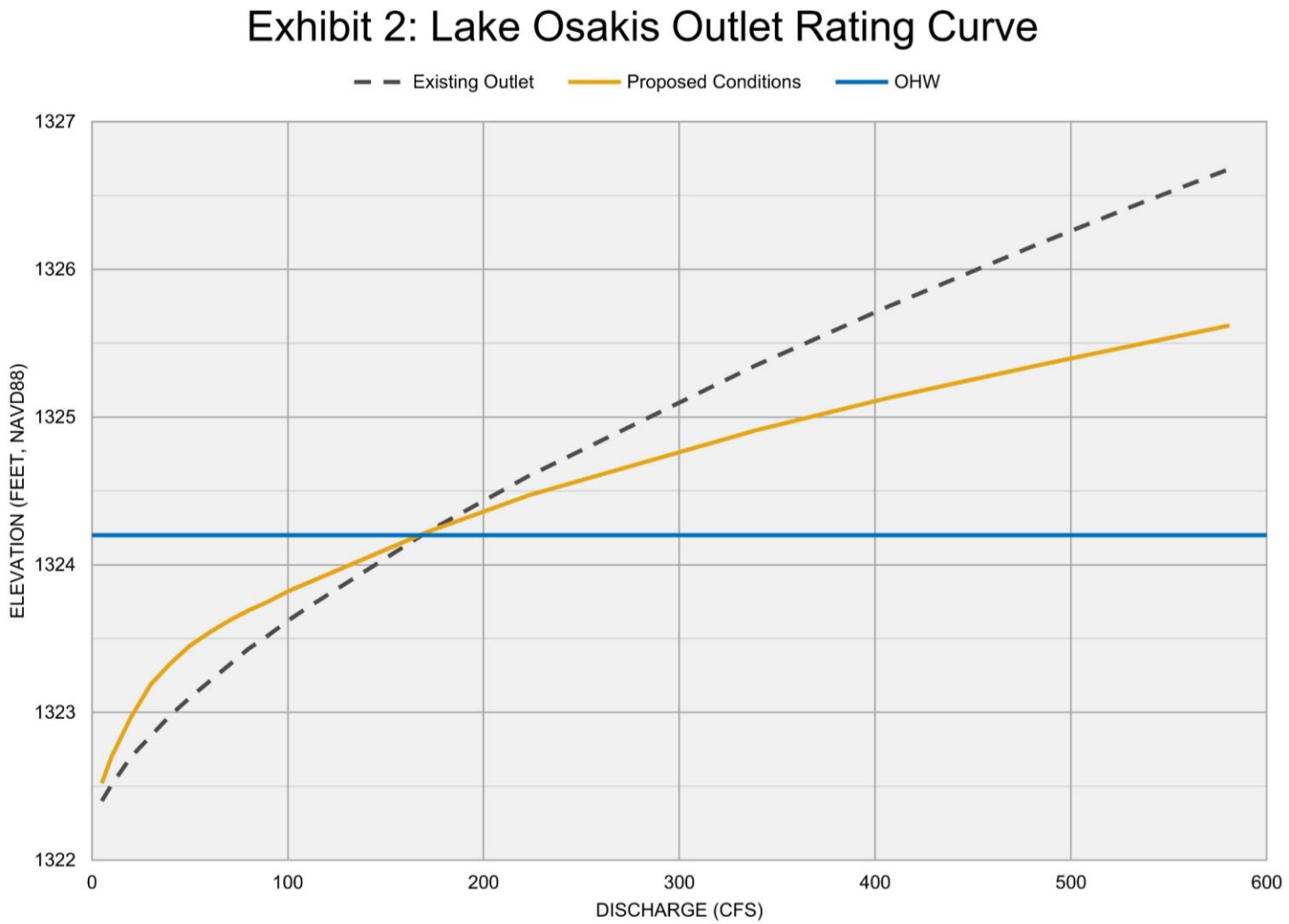


TYPICAL ROCK ARCH RAPIDS SECTION

NOT TO SCALE



PRELIMINARY DESIGN



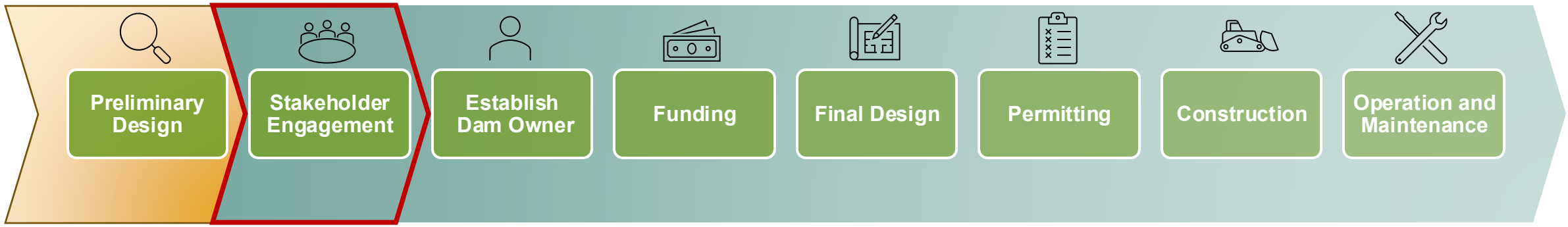
PRELIMINARY OPINION OF PROBABLE COST

- Total PRELIMINARY Estimated Project Cost: $423,800
- Includes Construction and Non-Construction Costs
- Non-Construction Costs:
  - Construction
  - Engineering
  - Legal and Administrative
  - Easement
  - Permitting

NO.	ITEM	UNIT	QUANTITY	UNIT PRICE	TOTAL COSTS
1	MOBILIZATION	LS	1	$ 15,000.00	$ 15,000.00
2	FLOTATION SILT CURTAIN	LF	120	$ 30.00	$ 3,600.00
3	REMOVE EXISTING WEIR	LS	1	$ 10,000.00	$ 10,000.00
4	STEEL SHEET PILE	SF	500	$ 60.00	$ 30,000.00
5	RANDOM RIPRAP CLASS II	CY	310	$ 120.00	$ 37,200.00
6	RANDOM RIPRAP CLASS III	CY	620	$ 130.00	$ 80,600.00
7	ROCK WEIR (36" TO 60" DIAMETER BOULDERS)	LF	345	$ 60.00	$ 20,700.00
8	ROCK BOULDERS (36" TO 60" DIAMETER BOULDERS)	EA	6	$ 450.00	$ 2,700.00
9	FLAT ROCK BOULDERS (48" TO 72" DIAMETER BOULDERS)	EA	4	$ 750.00	$ 3,000.00
10	CLAY FILL EMBANKMENT	CY	50	$ 60.00	$ 3,000.00
11	CLEARING AND GRUBBING	LS	1	$ 5,000.00	$ 5,000.00
12	SEEDING AND MULCHING	LS	1	$ 5,000.00	$ 5,000.00
TOTAL CONSTRUCTION COSTS					**$ 215,800.00**
CONTINGENCIES (30%)					$ 65,000.00
TOTAL CONSTRUCTION COSTS INCLUDING CONTINGENCIES					**$ 280,800.00**
ENGINEERING – PROJECT DEVELOPMENT AND DESIGN (PRIOR TO 1/15/2025) *					$ 40,000.00
ENGINEERING – FUTURE PROJECT DEVELOPMENT AND DESIGN *					$ 45,000.00
ENGINEERING – IMPLEMENTATION *					$ 45,000.00
LEGAL AND ADMIN FEES *					$ 5,000.00
PERMANENT EASEMENT ACQUISITION *					$ 5,000.00
PERMITTING APPLICATION FEES *					$ 3,000.00
TOTAL NON-CONSTRUCTION COSTS					**$ 143,000.00**
TOTAL PROJECT COST					**$ 423,800.00**

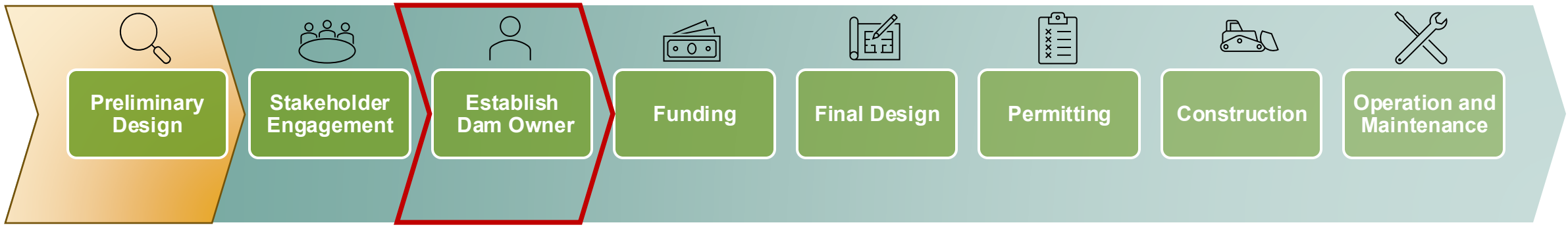
*ESTIMATED COSTS

Stakeholder Engagement



- January 21, 2025 – SRWD Board Meeting
- March 26, 2025 – Regulatory and Government Agencies Meeting
- April 7, 2025 – Landowner Meeting
- May 5, 2025 – JCD 2 Drainage Authority Board Meeting
- May 17, 2025 – Osakis Lake Association Annual Meeting

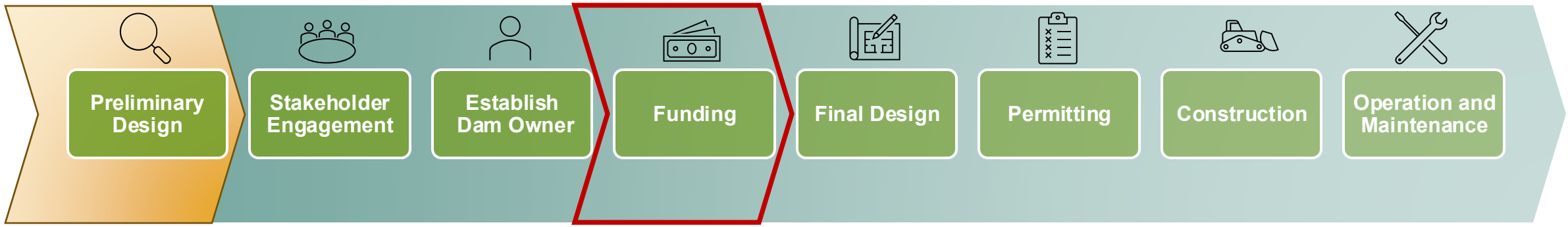
Establish Dam Owner



Three Potential Project Paths:

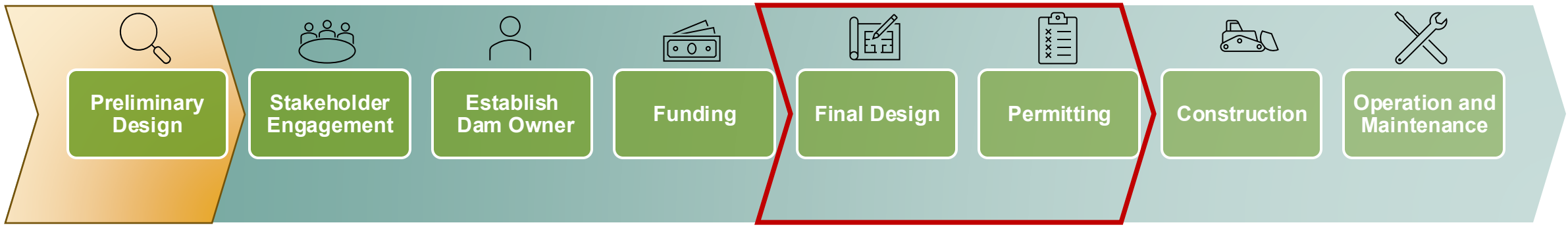
- 103D.701 – SRWD Leads Project Initiated by Board Resolution
- 103D.705 – SRWD Leads Project Initiated by Petition
- 103E.011 Subd. 4 – JCD 2 Leads Drainage Authority Powers

POTENTIAL NEXT STEPS…



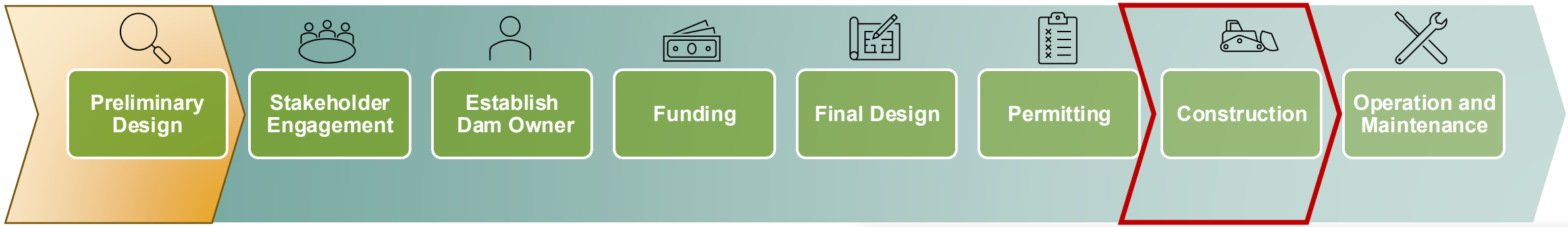
- Conservation Partners Legacy (CPL) Grant Program
  - Traditionally opens August 1st, closes mid September
  - Projects up to $500,000
  - 10% non-state match required
  - Pre-Award Match – Engineering and Design costs within 18-months of application deadline

POTENTIAL NEXT STEPS…



- Final Design:
  - Coordination with DNR REU
  - Stakeholder Coordination
  - Easements
- Permitting:
  - JCD 2 Drainage Authority
  - Sauk River Watershed District
  - DNR Public Waters Work Permit
  - USACE Section 404
  - Others…

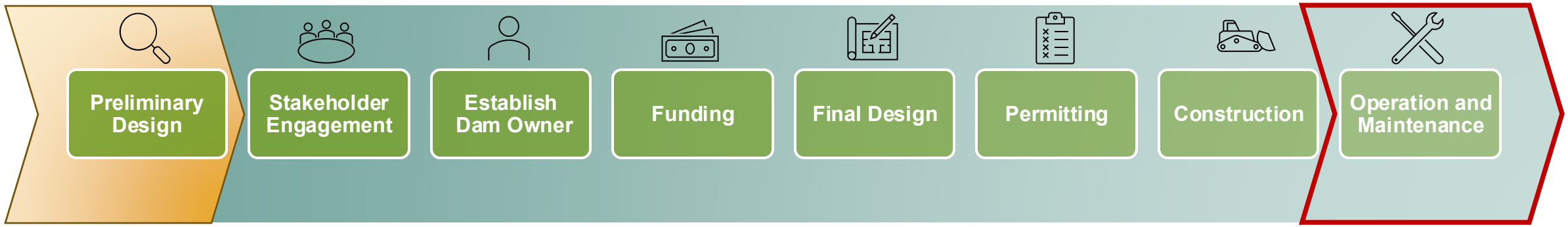
POTENTIAL NEXT STEPS…



- Typical timeframe, late fall / winter
- Work within the open channel (no cofferdams, diversions, etc.)
- Typical 1-year warranty period

Pelican Rapids, MN

POTENTIAL NEXT STEPS…

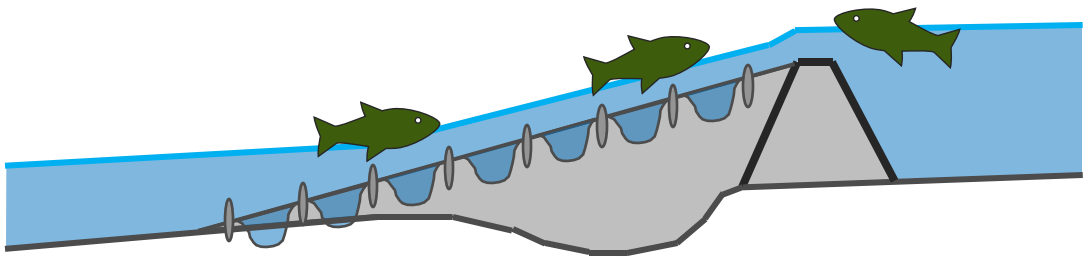


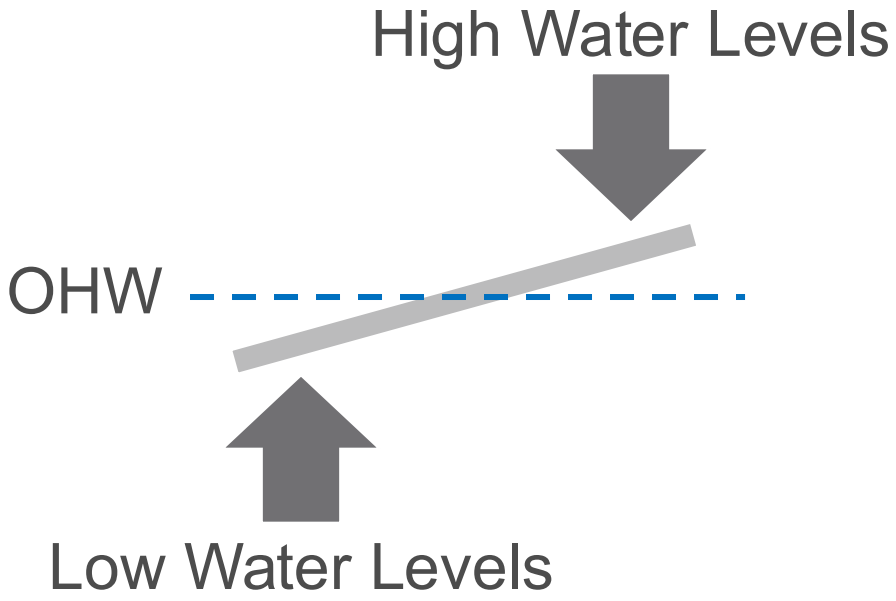
- Require no Operation
- Require minimal or no Maintenance
- High flows will clear any debris or materials that get caught in the rapids


Lake Lizzie – Otter Tail County

Summary

- Reduced public safety concerns
- Restores “natural” stream aesthetics
- Allows for fish passage and other ecological benefits
- Mitigated low water levels
  - Shoreline erosion, habitat loss
- Reduced flooding at high water levels
  - JCD 2 inlets, farmland, residential properties, septic systems
- Reduced long term maintenance costs





Questions

103E.011 Drainage Authority Powers

Subdivision 1.Generally. The drainage authority may make orders to:

(1) construct and maintain drainage systems;

(2) deepen, widen, straighten, or change the channel or bed of a natural waterway that is part of the drainage system or is located at the outlet of a drainage system;

(3) extend a drainage system into or through a municipality for a suitable outlet; and

(4) construct necessary dikes, dams, and control structures and power appliances, pumps, and pumping machinery as provided by law.

Subd. 4.Flood control. The drainage authority may construct necessary dams, structures, and improvements and maintain them to impound and release floodwater to prevent damage. The dams, structures, and improvements may be constructed with or without a drainage project. For a water body or watercourse that is not public waters the drainage authority may:

(1) lower or establish the level of water in the water body or watercourse to control floodwaters;

(2) build structures and improvements to maintain a water body or watercourse for flood control or other public purposes; and

(3) construct dikes or dams in a water body to maintain water at the level designated by the drainage authority and to drain part of the water body.

Subd. 5.Using external sources of funding. Notwithstanding other provisions of this chapter, a drainage authority may accept and use funds from sources other than, or in addition to, those derived from assessments based on the benefits of the drainage system for the purposes of wetland preservation or restoration or creation of water quality improvements or flood control. The sources of funding authorized under this subdivision may also be used outside the benefited area but must be within the watershed of the drainage system.

103D.701 Project Initiation

Projects may not be initiated until the board approves a watershed management plan for the watershed district. A project of the watershed district must be initiated:

(1) by a project petition filed with the managers;

(2) by resolution of a majority of the members of the board of managers; or

(3) as otherwise prescribed by this chapter.

January 21, 2025 – SRWD Board Meeting Minutes

Osakis Lake Outlet Modification – Present in the audience were several members of the OLA. It was noted that they recently completed a study and a feasibility report in regards to modifying the outlet of the lake, converting it from the current weir system at the crossing of County Road 37 to a rock arch rapids design just upstream of the county road. The feasibility report was provided to the board in the packet. Lake association members asked the board if they would consider establishing this as a Sauk River Watershed District project by resolution or if the board would be requesting a petition in order to establish it as a project. Discussion ensued and it was advised that the OLA would need to circulate a petition and get more than 26% of the affected landowners immediately adjacent to the lake and submit it to the Sauk River Watershed District board for their review and action. It was also noted that the OLA could go to the Todd County board inquiring if they would take it on as a project. The other option would be the JD 2 Drainage authority who has the authority to establish this as a project.

103D.705 Projects Initiated By Petition

Subdivision 1.Requirements.

(a) A project within the watershed district that generally conforms with the watershed management plan may be initiated by a project petition. A project petition must contain:

…

Subd. 2.Signatures. (a) The project petition must be signed by:

(1) at least 25 percent of the property owners or the owners of more than 25 percent of the property within the limits of the area proposed to be improved, unless the project consists of the establishment of a new drainage system as defined in section 103E.005, subdivision 12, or the improvement of an existing drainage system;

Subd. 3.Petitioner deposit or bond. (a) When a project petition is filed and before the managers take action on the project petition, one or more of the petitioners must deposit at least $2,000 with the managers. The deposit must be conditioned to pay all costs and expenses incurred if the project petitioned for is not constructed.

Subd. 5.Determination. If the managers determine that a proper project petition has been filed and that the proposed project promotes the public interest and welfare, is practicable, and conforms with the watershed management plan of the watershed district, the managers must:

(1) identify the project by name and number; and

(2) designate an engineer to make surveys, maps, and a report on the proposed project.