RCWD
RICE CREEK WATERSHED DISTRICT

AUGUST

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SEPTEMBER

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RCWD BOARD OF MANAGERS WORKSHOP

Monday, August 12, 2024, 9:00 a.m.

Rice Creek Watershed District Conference Room
4325 Pheasant Ridge Drive NE, Suite 611, Blaine, Minnesota
or via Zoom Meeting:
https://us06web.zoom.us/j/85739426364?pwd=bNqoV3d4bEzKWYi9svEx7KCXniPjtI.1
Meeting ID: 857 3942 6364
Passcode: 125460
+1 312 626 6799 US (Chicago)
Meeting ID: 857 3942 6364
Passcode: 125460

Agenda

ITEMS FOR DISCUSSION

1. Anoka Washington Judicial Ditch #3/Clearwater Creek Stabilization Feasibility Study (Tom Schmidt)

Administrator Updates (If Any)

ITEMS FOR DISCUSSION

1. Anoka Washington Judicial Ditch #3/Clearwater Creek Stabilization Feasibility Study (Tom Schmidt)

MEMORANDUM
Rice Creek Watershed District

Date: August 2, 2024
To: RCWD Board of Managers
From: Tom Schmidt, Drainage & Facilities Manager
Subject: Clearwater Creek Stabilization Feasibility Study

Introduction
This agenda item provides an update for discussion of the Clearwater Creek Stabilization Feasibility study.

Background
HEI, along with staff, has been working on developing alternatives to stabilize Clearwater Creek/Anoka Washington Judicial Ditch #3 (AWJD #3) downstream of 35E. Stabilization in these areas will reduce further stream channel degradation and associated loss of land due to channel migration, as well as additional damage to AWJD #3. Stabilization will also reduce sediment load and provide water quality benefits to Peltier Lake. The contemplated alternatives require significant multiple landowner engagements, including the procurement of easements; the current rough estimate of a project consistent with the alternatives is roughly $1 million.

The reach of AWJD #3 downstream (West) of 35E was not included in Phase #1 (2020) main trunk repair because the nature of the repairs was so different than those of the other areas of the main trunk. It was thought best to combine these repairs with a channel restoration project on the creek section. This feasibility study work is partly funded through a 2023 Metro Watershed-Based Implementation Fund (WBIF) grant. The study is complete and is being presented to the Board for consideration and discussion of the alternatives and next steps.

Several external funding sources (grants) are potential funding sources to be utilized in the continuation of work on this project; currently, WBIF 2024-25 is slated for the development of construction plans to include Board input.

Staff Recommendation
This item provides information, and staff seek Board consensus direction on the next steps forward with project development.

Attachment
Draft HEI Technical Memo: Clearwater Creek Stabilization Feasibility and Presentation

Technical Memorandum

To: Nick Tomczik, District Administrator
Rice Creek Watershed District

From: Adam N. Nies PE, CFM

Through: Chris Otterness, PE
Houston Engineering, Inc.

Subject: Clearwater Creek Stabilization Feasibility

Date: August 6, 2024

Project: 5555-0354

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am duly Licensed Professional Engineer under the laws of the State of Minnesota.

DRAFT

Adam N. Nies Date: 8/06/2024
Reg. No. 53358

INTRODUCTION AND EXECUTIVE SUMMARY

The portion of the Main Trunk of Anoka Washington Judicial Ditch 3 (JD 3, also known as Clearwater Creek) downstream of I-35E has a relatively steep grade with minor accumulated sediment. It exhibits heavily scoured and sloughing banks due to high peak flows and channel velocities and less stable (sandy) soils. Because that portion of Clearwater Creek has been straightened and channelized through the construction of JD 3, it is less stable than the naturally meandering portion of Clearwater Creek from the outlet of JD 3 (approximately 0.25 miles north of Main Street in Centerville) to Peltier Lake. However, bank instability and erosion has been noted within the naturally meandering portion of Clearwater Creek as well. The stability of the watercourse has been further diminished by changing hydrology due to both land development pressures and climatic effects. The purpose of this feasibility study is to provide a detailed analysis of the extent and severity of the issues; recommend Best Management Practices (BMPs) and engineered solutions to reduce erosion, limit channel velocity and improve in-stream habitat; and estimate the associated probable costs for feasible alternatives.

Several BMPs were considered for implementation and through discussions with District staff as well as technical analysis, the alternatives have been whittled down to those considered most feasible. There are three main alternatives considered feasible that correspond to three main segments of Clearwater Creek, and they are a re-meandered ditch, two-stage ditch, and channel cleanout. These alternatives were modeled within XPSWMM (**Appendix A**), and the results are shown throughout the report. The velocity reductions realized through modeling of the BMPs will help to stabilize the stream banks and benefit Clearwater Creek to Lake Peltier. Other alternatives were considered but ruled out throughout the design process and are documented herein. Based on the preliminary assessment of

the site, we recommend including alternatives for re-meander of the straightened channel downstream of Main St. (0+00 to 14+00), constructing a two-stage ditch (or partial two-stage ditch) between 20th Ave and I-35E (50+00 to 76+00), and repairing the ditch in the middle section between 20th Ave and Main St. (16+00 to 49+00). We recommend the District investing external funding opportunities such as the Clean Water Fund (CWF) Projects and Practices grant, the Multi-purpose Drainage Management Grant, and the Watershed-Based Implementation Fund (WBIF), each of which is appropriate for this project.

ALTERNATIVES CONSIDERED

Houston Engineering, Inc. (HEI) and the Rice Creek Watershed District (RCWD) completed a site visit in December 2023 which provided a first-hand look at the conditions currently exhibited by the ditch (photos in **Appendix E**). Erosion and bank sloughing was prevalent for the entire portion walked, from I-35E to the outlet at Peltier Lake. Although the study reach downstream of I-35E is relatively short (1.4 miles), the ditch/creek has several distinct segments, each having unique characteristics that impose design constraints for the potential applicable BMPs that can feasibly be implemented. Much of the study reach is constrained on one or both sides by residential and commercial structures in close proximity to the ditch. Likewise, several existing stormwater BMPs such as ponds adjacent to the ditch limit the available space. The following describes each of the alternatives considered, where various BMP's could be located, and some of the limitations or challenges associated with each. The alternatives are shown on the overall site map in **Figure 11.** The alternatives have been analyzed within the RCWD District Wide Modeling for JD 3 which is an XPSWMM (v. 2018.1) model. Complete modeling details of existing and proposed conditions are contained within **Appendix A**.

RE-MEANDER (STA 0+00 TO 14+00)

Clearwater Creek was historically a natural meandering stream prior to a portion being straightened through the construction of JD 3. Straightening of the stream into a ditch was completed at that time for several purposes: 1) it increased the efficiency/capacity of the ditch; 2) it decreased the length of ditch to construct and maintain; and 3) it reduced the footprint of the ditch (enabling the potential to use more of the land).

Straightening of these streams in the Rice Creek watershed had drawbacks, however. With greater efficiency came higher velocities, which increased sediment transport capacity and destabilized the channel. Subsequent downcutting contributed to the instability by confining flow into a narrow channel with no floodplain access. In locations with erodible soils and/or steeper gradients, this velocity increase resulted in chronic erosion and channel instability. Reconstructing the JD 3 channel downstream of Main Street to restore the meanders and reduce channel velocities through a flatter gradient has the potential to stabilize the stream, reducing erosion and sediment delivery to Peltier Lake, and minimizing the frequency of required maintenance. The proposed re-meander alternative

design was initially set to match conditions that existed prior to the construction of JD 3, based on historical imagery from 1947 and on ditch signatures indicated via LiDAR elevation models. The historic alignment is shown in **Figure 14**. The meander alignment was then further refined to stay within the current valley extents and to avoid impacting existing structures and property (see **Figure 15**). The re-meander alternative will lengthen the channel and reduced the grade, thus reducing velocity and bank erosion. The slope of the proposed re-meandered channel would tie-in to the As Constructed and Subsequently Improved Condition (ACSIC) channel inverts at Main Street upstream and at the downstream legal terminus of JD 3. **Appendix B Sheet 1** displays the preliminary design plan and profile for the re-meandered section. Formal sinuosity design of the meander alignment was not considered at this time but may be incorporated during final design. Landowner coordination will be critical in the success of this alternative, as the design has the potential to impact backyard areas on several properties.

The model output hydrographs for the elevation, flow, and velocity show the potential changes from adding in the re-meandered section displayed in **Figures 1-3**. The existing modeled channel bottom was changed to match the meandered section and the lengths of the channel were updated to reflect the increased re-meandered length. The channel length increases approximately 700 feet and reduces the slope from 0.1% to 0.06% in the re-meandered section. There are some minor increases in the peak flow for the 2-, and 10-year events at the re-meandered section, but they attenuate to match existing peak flow conditions at Peltier Lake. Due to the presence of the FEMA floodway, special consideration was given to ensuring that there is no increase to the 100-year elevation. This alternative maintains the current flow capacity by minor widening of the remeandered channel combined with flatter grade, which reduces the channel velocity through increased length of the stream. This will minimize channel and bank erosion and decrease sediment transport to Peltier Lake. Due to the presence of a FEMA defined floodway, it is important to maintain capacity so the 100-year water surface elevations remain unchanged. The results are shown in **Table 1** and **Figures 1-3.**

Table 1: Re-meander Hydraulic Characteristics

Elevation (ft)			
Event	***100-year***	***10-year***	***2-year***
Existing	895.90	895.00	894.12
Re-meander	895.90	894.99	894.13
Change	0.0	-0.01	0.01
Flow (cfs)			
Event	***100-year***	***10-year***	***2-year***
Existing	526.7	352.6	232.6
Re-meander	532.6	352.0	233.0
Change	5.9	-0.6	0.4
Velocity (fps)			
Event	***100-year***	***10-year***	***2-year***
Existing	3.0	3.0	2.9
Re-meander	2.5	2.5	2.3
Change	-0.5	-0.5	-0.7

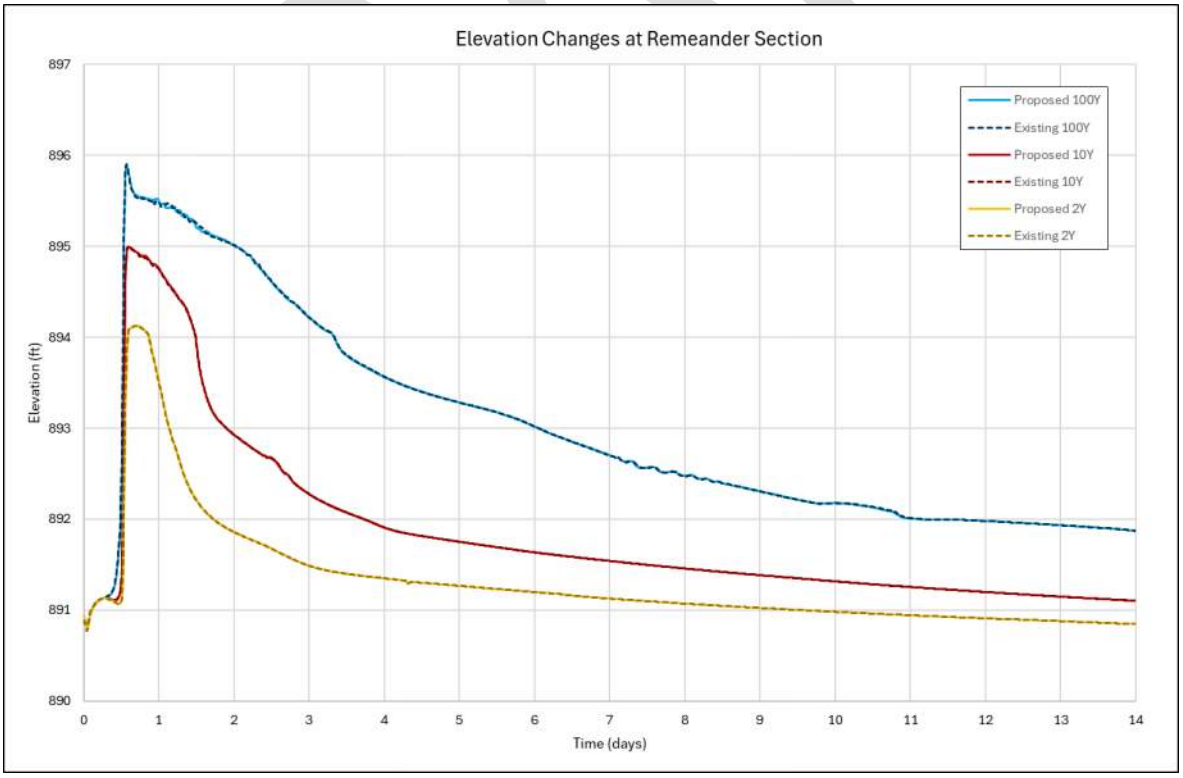


Figure 1: Re-meandered Elevation Comparison

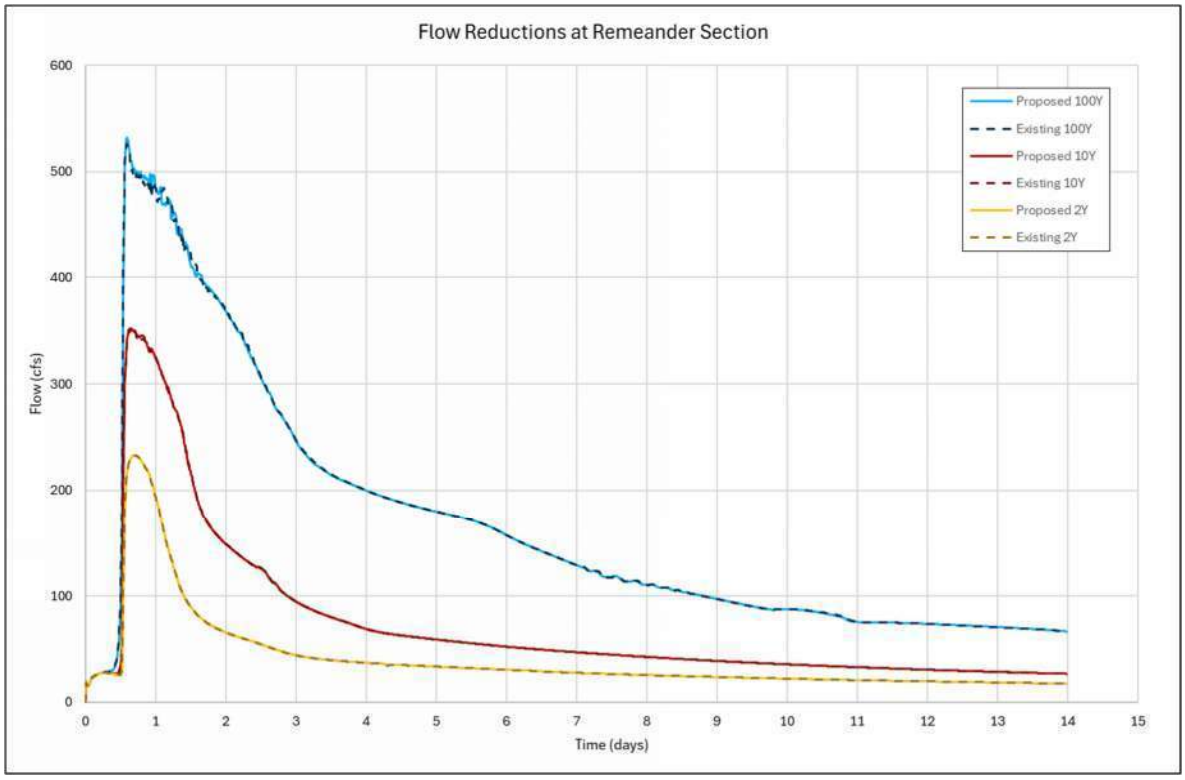


Figure 2: Re-meandered Flow Comparison

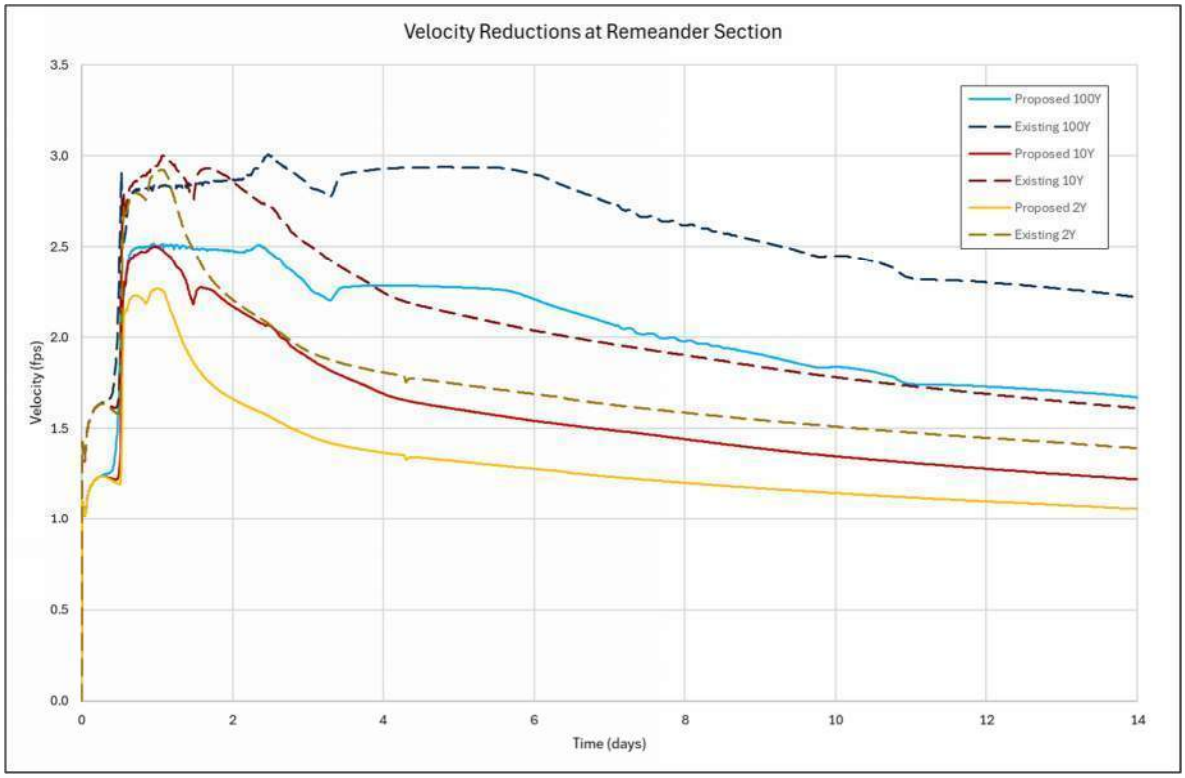


Figure 3: Re-meandered Velocity Comparison

ROCK-REVETMENTS FOR OUTSIDE MEANDER BANKS (STA 0+00 TO 14+00)

Clearwater Creek downstream of Main St. to the outlet at Peltier Lake is susceptible to erosion on outside meander banks. The re-meander alternative reduces stream velocity by increasing the distance that the water travels and reducing the slope. However, during the site walk, even the natural meandering section downstream of the JD 3 outlet shows excessive erosion of the banks in many locations. To combat the erosion, rock-revetments could be placed around the outer meandered banks both in the natural meandering portion and the proposed re-meander alternative section. The type of rock-revetments to most benefit the channel will be decided during final design of the alternatives. Typical examples include rock benches, and angled rock columns that point into the channel in the upstream direction to reduce velocity and catch sediment.

The preliminary re-meandered section design has 17 total outer bends.[1] The Class III rip rap quantities have been preliminarily estimated using an assumed minimum depth of 24 inches and a 10-foot width along outer bends resulting in approximately 1,000 cubic yards of rip rap needed to armor the banks.

ROCK-RIFFLE DROP STRUCTURE (STA 16+00 TO 49+00)

The middle portion of the ditch from Main St. to 20th Ave. is tightly constrained by the residential and commercial buildings in close proximity to the ditch. This alternative considered flattening the ditch bottom by making it deeper on the upstream end, utilizing a rock-riffle type drop structure for ditch stability at 20th Ave., and then matching the ACSIC grade at Main Street. Existing ditch side slopes through this reach are approximately 3:1 and would either remain the same or would be made flatter for added stability. The combination of deepening the ditch and flattening the side slopes produces a much wider footprint than exists today, which would cause the ditch to encroach on business structures or their properties and residential sheds and land as well as several stormwater ponds and outlet structures. This encroachment would require buy-outs of property, likely via eminent domain proceedings, and mitigation of impacts to stormwater infrastructure. Due to the associated cost, which would be much greater than the benefit received, this alternative does not appear feasible.

DITCH REPAIR AND VEGETATION MANAGEMENT (STA 16+00 TO 49+00)

As an alternative to more expansive reshaping of the channel envisioned by the prior alternative, in the reach from Main St. to 20th Ave. one viable alternative to add stability while staying within the constrained footprint, is completing a more traditional ditch cleaning repair. This would involve tree and woody vegetation removal from channel banks, establishing an access corridor for maintenance, minor re-shaping of the banks back to their originally constructed cross section, removal of sediment to the ACSIC profile, and seeding the banks and access corridor with deep-rooted grass vegetation. The modeling shows channel velocities in this area as approximately 2-5 fps. With the appropriate

[1] The number of outer bends in the proposed re-meandered section may change dependent on several final design considerations including landowner input.

seed mix, such a repair should provide reasonably stable channel banks when seeded down to the normal water level of the ditch, and given time to establish deep rooted grassed vegetation on the banks. The extents of the channel repair are shown in **Appendix B Sheets 3-4.** Model output results are not presented for this alternative as the hydraulic change between existing and proposed conditions is minor.

RETENTION/ STORAGE (STA 43+00 TO 74+00)

Constructing storage along or adjacent to the public drainage system has the potential to attenuate peak flows and temporarily retain water during runoff events, which could improve system performance, decrease erosive in-channel velocities, and decrease sediment delivery to Peltier Lake. The feasibility of constructing off-channel storage north of the JD 3 channel from Station 43+00 to 75+00 between 20th Ave. and I-35E was evaluated. The available storage volume was calculated from LiDAR data and elevation-volume curves were generated. From a preliminary estimation based on peak water surface elevations for each event, the storage areas would provide approximately 5 acre-feet of storage for a 2-year event, 30 acre-feet for a 10-year event, and 75 acre-feet for the 100-year event, depending on design. This amount of storage volume was compared against the hydrograph volumes for each event. Due to the large size of the JD 3 watershed at this location (7,961 acres), this available amount of storage volume is insufficient to provide substantial benefit to the system. In addition, this location is in a developing commercial district with elevated land values, and as such land acquisition costs would be significant and it is unlikely there will be willing landowners where the potential storage sites would be located. The amazon facility supplied a proposed conservation easement from approximately station 64+00 to 74+00 that does provide potential wider footprint for various alternatives, however does not provide sufficient space for valuable storage volume. Therefore, this alternative is likely not feasible. However, if the District does identify an opportunity for land acquisition near the JD 3 channel in the future, a more robust design may be considered with active storage to enhance the function and operation of the sites.

TWO-STAGE DITCH (STA 50+00 TO 76+00)

Many natural streams consist of a low flow channel that meanders with a wider floodplain valley. Streams with these characteristics tend to be relatively stable as larger flows come out of the banks and spread out over the floodplain, dissipating their energy. A two-stage ditch attempts to replicate this type of function along a constructed ditch, The two-stage ditch approach provides improved physical and ecological performance and is designed using the National Engineering Handbook Part 654 Stream Restoration Design, Chapter 10 Two-Stage Channel Design and the guiding principles from the MN BWSR fact sheet. The two-stage ditch increases conveyance capacity, which must be considered when designing the ditch. The first stage of the ditch is a low flow channel designed to contain the 2-year storm event, and the second stage is a flatter wider floodplain for larger storm events to spill out onto.

The portion of JD 3 immediately downstream (west) of I-35E has begun to show signs of attempting to re-meander. A two-stage ditch design alternative was evaluated from 21st Ave to I-35E which would accelerate the creation of a staged channel that the ditch would eventually form on its own if left unmaintained (over a substantial period of time and with substantial deposition of sediment into Peltier Lake). The proposed alternative would also include cleaning out the existing ditch bottom and deadfall blocking the channel. The existing channel has accumulated sediment approximately 2-3 feet above the ASCIC elevation. Designing the two-stage ditch to the ASCIC elevation would align the channel better with the existing structures through the roads and increase the flow area throughout this portion of JD 3. Existing stormwater ponds and structures limit the available footprint for this alternative. The plan and profile for the two-stage ditch is shown in **Appendix B Sheet 5**. From I-35E to 21st Ave, the proposed ditch is located within FEMA Floodway (Figure 13), and design constraints of this alternative included no impacts to the 100-year elevations on the system.
The main benefits from the two-stage ditch are the reductions in the velocity due to increased channel area. The reductions in velocity will help to minimize erosion of the channel banks and minimize sediment deposition downstream. This in turn has the opportunity to reduce the frequency of necessary drainage system maintenance . When maintenance work is required, the two-stage channel configuration of the ditch will have implications for how the ditch is cleaned. For contractors having a long-reach excavator, maintenance work may be able to be completed from one side. Otherwise there may be a need to have the ability to work from both sides of the ditch, which has maintenance obligations to consider such as continual mowing schedule along both sides of the ditch corridor. We have analyzed two versions of a two-stage ditch alternative that conform to the project goals of bank stabilization. The first option includes a large extent two-stage ditch that is designed to the BWSR conveyance specifications, but has a large associated cost. To maximize value, a second option was analyzed as a partial two-stage ditch that still accomplishes the goals of bank stabilization, but represents a much smaller excavation footprint thus is lower cost. This second option is not designed to fully meet the BWSR conveyance specifications and creates a lesser amount of capacity. The two-stage ditch alternative primarily involves earthwork excavation volume, which typically has a large associated cost of moving earth and thus the two alternative sizes are provided. During final design, the two-stage ditch extents can be set based on the available funding.

Option 1: Full Build Out Two-Stage Ditch

Option one provides the full recommended conveyance design guidance as provided by BWSR, but has a larger potential cost. The low flow channel is approximately 50 feet wide and 4 feet deep. The floodplain bench widths are approximately 40-60 feet in width and are 2-8 feet deep. The benches are focused on the north side of the channel due to limiting features such as stormwater ponds predominantly on the south side of the existing channel. The cross sections for the full build out two-stage ditch are shown in **Appendix B Sheet 6**. During large events, water will break out of the main channel and flow overland similar to pre-ditch conditions.

The peak flow slightly increases for the 2-, and 10-year events due to increased capacity in the two-stage ditch. The modeled results are displayed in **Table 2** and **Figures 4-6.** The floodway bench can be designed to enable equipment access for maintenance of the low flow channel.

Table 2: Two-Stage Ditch Hydraulic Characteristics

Elevation (ft)			
Event	***100-year***	***10-year***	***2-year***
Existing	901.32	899.77	898.23
Two-Stage Ditch	901.30	899.75	898.23
Change	-0.02	-0.02	0.00
Flow (cfs)			
Event	**100-year**	**10-year**	**2-year**
Existing	479.4	309.3	192.8
Two-Stage Ditch	472.0	310.6	195.1
Change	-7.4	1.3	2.3
Velocity (fps)			
Event	**100-year**	**10-year**	**2-year**
Existing	2.3	2.1	2.1
Two-Stage Ditch	0.9	0.9	0.8
Change	-1.4	-1.2	-1.3

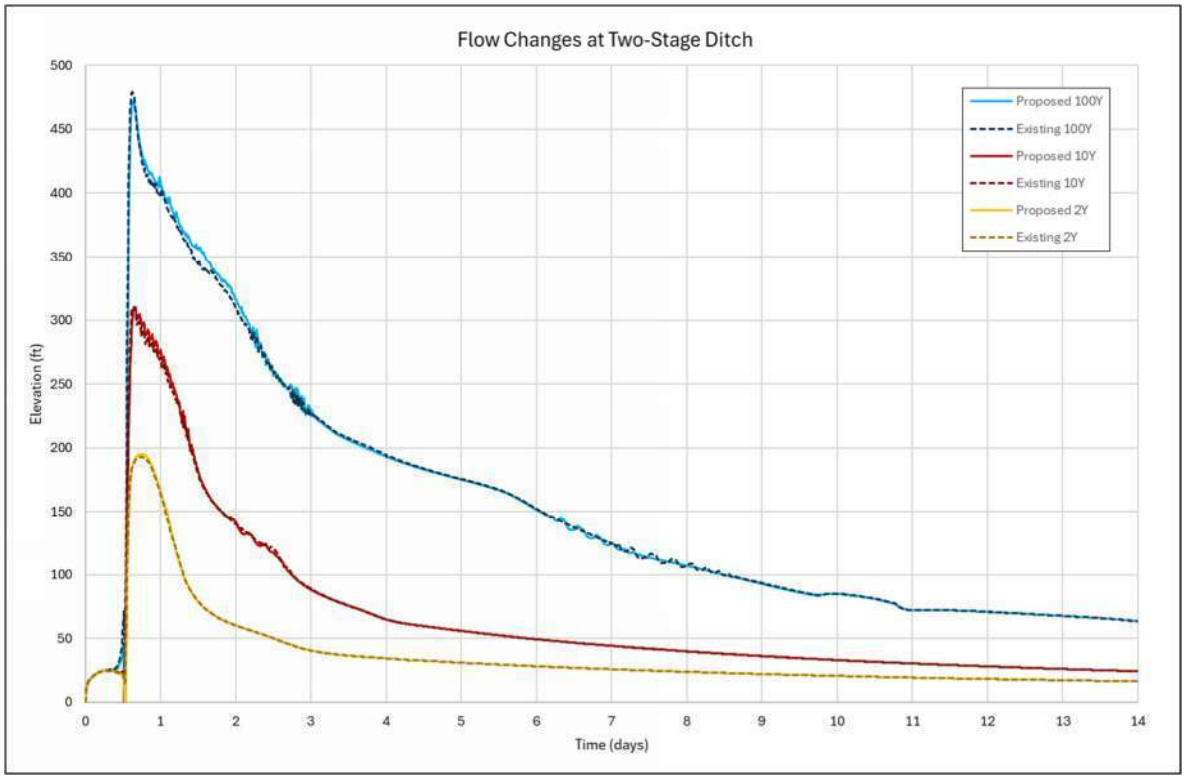


Figure 5: Two-Stage Ditch Flow Comparison

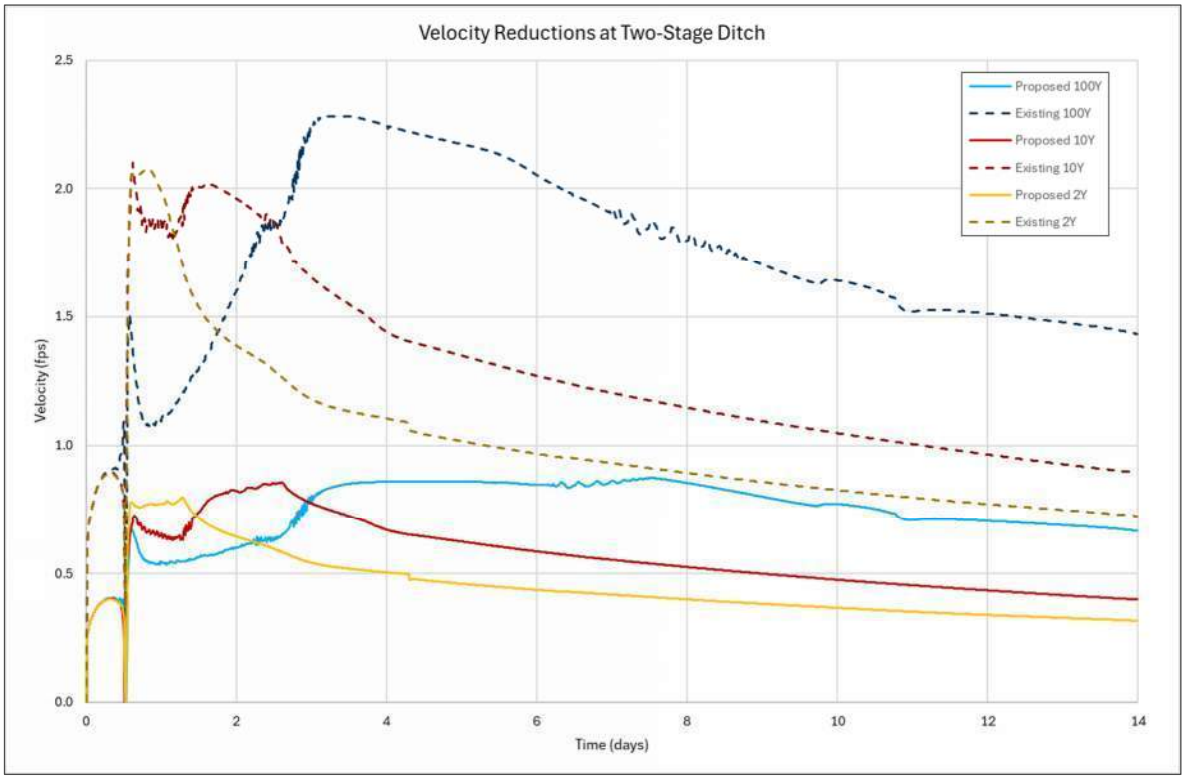


Figure 6: Two-Stage Ditch Velocity Comparison

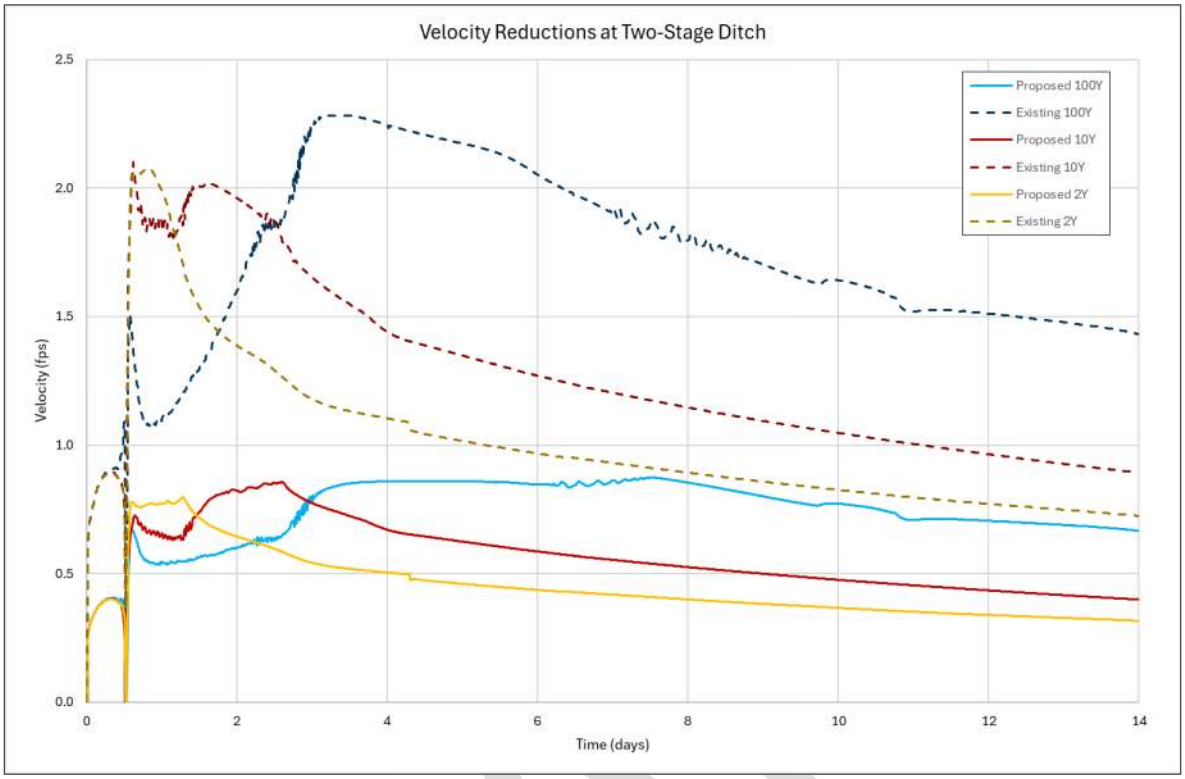


Figure 6: Two-Stage Ditch Velocity Comparison

Option 2: Partial Two-Stage Ditch

The partial two-stage option two incorporates flattening the ditch side slopes and provides a floodplain bench mid-way up in the channel, and thus will show similar trends as the full design such as velocity reductions, just to a lesser extent. The channel is designed to have a 10-foot bottom width approximately 4 feet deep and slopes are 4:1 up to existing ground. On the northern side, there is a 20' bench between 1-5 feet deep to provide additional capacity and velocity reductions. This option does not clean out to the ACSIC grade line but approximately matches existing conditions to provide a lower cost alternative. The plans are shown in **Appendix B: Sheets 7-8**. At roughly between 1/2 to 1/3 of the estimated cost of the full design, we believe this presents a good range of project designs that could be pursued, and pending the amount of funding secured through grants or other means, a final design can be accommodated to fit the budget with consideration for optimization of the cost/benefit or the final design. The modeled results are displayed in **Table 3** and **Figures 7-9**.

Table 3: Partial Two-Stage Ditch Hydraulic Characteristics

Elevation (ft)			
Event	***100-year***	***10-year***	***2-year***
Existing	901.32	899.77	898.23
Two-Stage Ditch	901.29	899.76	898.25
Change	-0.03	0.00	-0.02
Flow (cfs)			
Event	**100-year**	**10-year**	**2-year**
Existing	479.4	309.3	192.8
Two-Stage Ditch	460.2	312.1	195.1
Change	-19.2	2.8	2.3
Velocity (fps)			
Event	**100-year**	**10-year**	**2-year**
Existing	2.3	2.1	2.1
Two-Stage Ditch	1.4	1.3	1.2
Change	-0.9	-0.8	-0.8

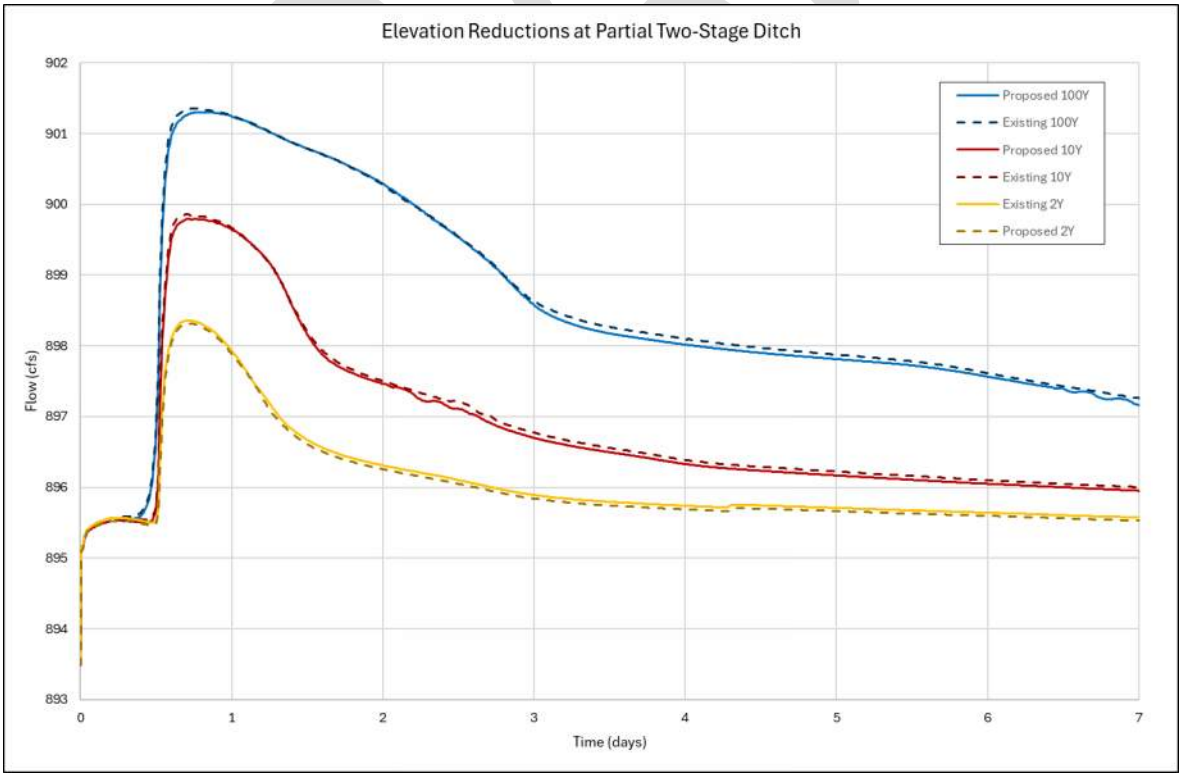


Figure 7: Partial Two-Stage Ditch Elevation Comparison

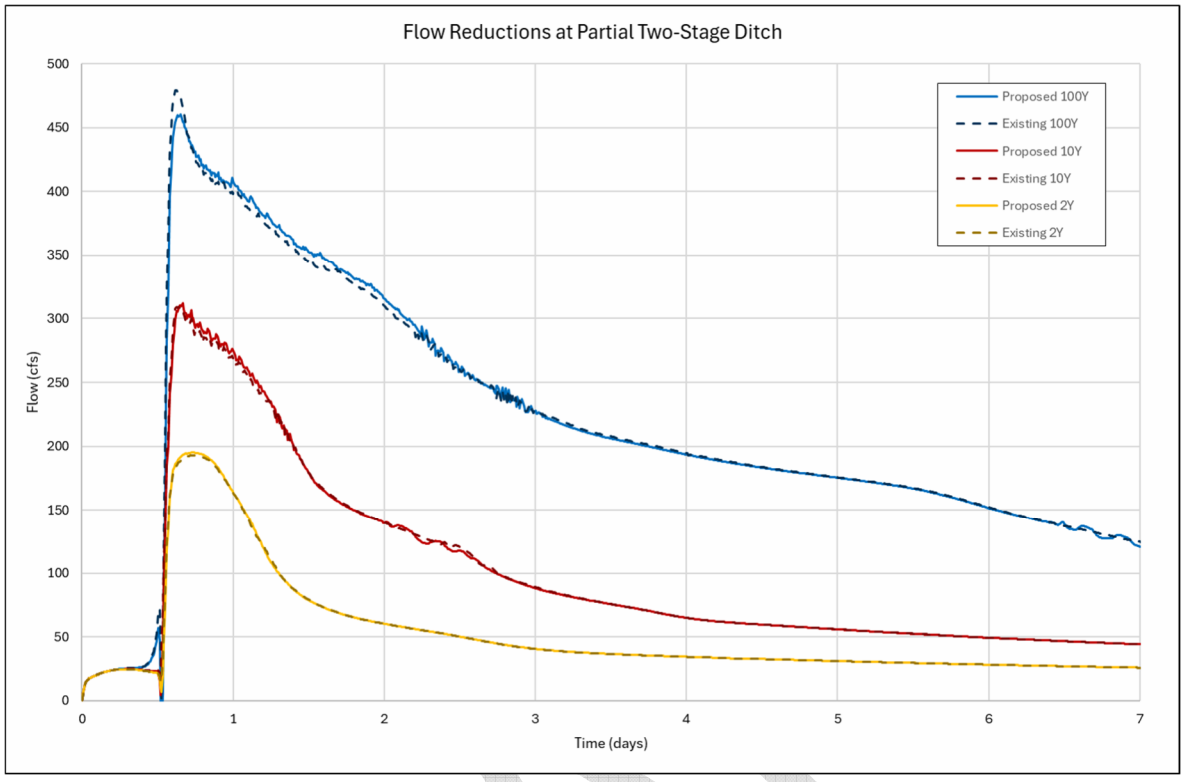


Figure 8: Partial Two-Stage Ditch Flow Comparison

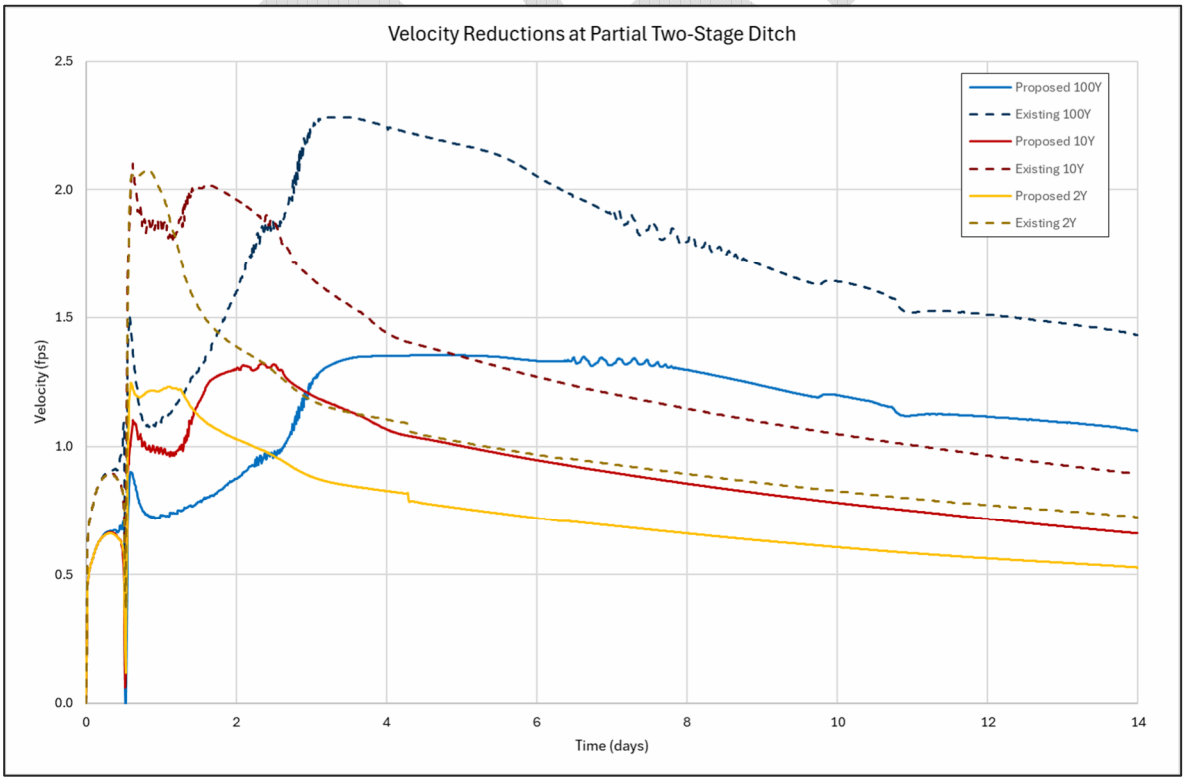


Figure 9: Partial Two-Stage Ditch Velocity Comparison

REGULATORY AND ENVIRONMENTAL CONSIDERATIONS

There are three regulatory programs that may be triggered by a drainage system repair/improvement project, including the Minnesota Department of Natural Resources (MnDNR) Public Waters Permitting Program, the federal Clean Water Act (CWA) implemented by the US Army Corps of Engineers (USACE), and the state Wetland Conservation Act (WCA) administered by local government units (LGUs). The RCWD is the LGU within the project corridor.

Other regulatory considerations include compliance with MS103E (a.k.a. "drainage law"), state and federal threatened and endangered species laws, and the National Flood Insurance Program (NFIP). Environmental effects include water quality and flooding. The following discussion describes how the alternatives reviewed are regulated and the impacts they have on environmental factors.

MS 103E CONSIDERATIONS

Minnesota drainage law (M.S. 103E) considers a two-stage ditch design to be a "repair" so long as the low-flow channel is at the same grade and width as the ACSIC condition. Similarly, resloping of the ditch banks and minor realignment of the channel (i.e. re-meander) is also consistent with the statutory definition of "repair." Therefore, the recommended activities have considered the requirements of M.S. 103E and may be executed consistent with the provisions of M.S. 103E.701.

PUBLIC WATERS

The JD 3 open channel downstream from I-35E is not located in proximity of a public water basin or wetland or watercourse. Upstream of I-35E, the portion of JD 3 within Washington County is identified as a Public Watercourse by the DNR's Public Waters Inventory (PWI). However, DNR staff indicated in a letter dated May 20, 2024 that the project study area is not considered a public watercourse (see **Appendix D**). As such, the proposed alternatives appear unlikely to trigger DNR public waters regulatory requirements.

WETLANDS

The Minnesota Wetland Conservation Act (WCA) requires that any impact to wetlands must be avoided if possible. If not, the impacts should be minimal, and the impacted area replaced with another wetland of equal function and value. Within this project there would be minimal impacts that would alter the function or size of the existing wetlands.

Clearwater Creek drainage system intersects wetlands identified in the National Wetland Inventory (NWI) as shown in **Appendix C Figure 1.** Under the two wetland regulatory programs (Minnesota WCA and Federal CWA), activities related to repair of a public drainage system are generally exempt from permitting and mitigation requirements. These activities are related to public drainage system maintenance and repair, and include:

- Excavation in wetlands limited to removal of accumulated sediment or debris such as trees, logs, stumps, beaver dams, blockage of culverts, and trash, provided the removal does not result in alteration of the original cross-section of the wetland or watercourse;
- Removing those materials placed by beaver;
- Removing or moving materials blocking installed roadway culverts and related drainage structures; and
- Temporary or seasonal water level management activities done for the purpose of performing maintenance.

Under the federal CWA, drainage system maintenance or repair is exempt from regulation. Under the state WCA, activities related to maintenance or repair of a public drainage system that are exempt from replacement, include:

- Maintenance or repair of a public drainage system which drains Type 1,2,6,7 or 8 wetlands; and
- Maintenance or repair of a public drainage system which drains Type 3,4, or 5 wetlands that have existed for 25 years or less.[2]

The NWI and a series of aerial photography and LiDAR were reviewed to understand potential wetland types within the area. Based on desktop review of the NWI data, LiDAR, and aerial photography, there appears to be five locations along the ditch system where wetlands have the potential to be impacted by the project. **Appendix C: Figure 2** shows a map of these sites and locations where work has the potential for wetland impacts. Approximately 20.7 acres of wetlands are within the project footprint and may potentially be impacted by the proposed work. Further investigation including a wetland delineation and evaluation of potential exemptions needs to be reviewed when preliminary and final plans are developed.

The wetlands within and surrounding the project extents are shown on **Appendix C: Figure 2.**

FEMA FLOODPLAIN AND FLOODWAY

The JD 3 project corridor is within a designated FEMA floodway and floodplain as shown in **Figure 13**. Communities participating in the NFIP (including the Cities of Centerville and Lino Lake, through which the JD 3 project corridor is located) are required to enforce floodplain ordinances that place limitations on placement of fill within a designated floodplain. The proposed alternatives have been designed for no increase to the 100-year flood elevations throughout the project reach and would therefore have no adverse impacts on the floodplain water surface elevations. The changes in elevations are shown in **Tables 1-4**.

[2] Recent and proposed changes to state statute and rules may affect these exemptions once statute and rule come into effect.

THREATENED AND ENDANGERED SPECIES

An NHIS review request and report was created using the Minnesota Conservation Explorer and is included in **Appendix D.** There are Blanding's turtles in the area and wetland and aquatic impacts need to be avoided during hibernation season from September 15th to April 15th. Avoidance measures to protect the Blanding's turtles must be implemented include; filling in voids in the permanent riprap with gravel, soil, or other material between large stones to avoid entrapping turtles, limiting erosion and sediment control, and avoiding hydro-mulch products with synthetic fiber additives. Tree and shrub removal from May 15th to August 15th must be avoided due to Bell's vireo nesting and active season of northern long-eared bats. More detailed information can be found in **Appendix D**.

FLOODING AT ROADWAY CROSSINGS

The proposed changes will affect five different roadway crossings throughout the project extents. The 100-year elevation at each crossing was analyzed to confirm whether there is the potential for adverse impact. In 2017, 21st avenue was realigned, replacing a private drive to a residential home. An arch pipe culvert was added under the newly aligned road. Brian Dr. is the only street that the water surface elevation overtops for both the existing and proposed conditions by approximately 0.3 feet. The proposed alternatives do not make this flooding worse. The overtopping and water surface elevations for the existing and proposed alternatives are shown in **Table 4.**

Table 4: Roadway Overtopping Elevations

Road Name	Station	Road Overtopping Elevation	Existing 100-year	Proposed 100-year
Main Street	15+25	902.57	897.73	897.57
Brian Drive	36+00	901.00	901.38	901.32
20th Ave S	49+25	903.32	901.32	901.29
21st Ave S	63+75	904.00	903.31	902.86
Interstate 35E	77+00	909.10	904.92	904.42

WATER QUALITY BENEFITS/TMDL REQUIREMENTS

A TMDL is the maximum amount of a pollutant a body of water can receive without violating water quality standards, and an allocation of that amount to the pollutant's sources. The TMDL process identifies all sources of a pollutant and determines how much each source must reduce its contribution in order to meet the standard. Clearwater Creek is classified as impaired under Section 303(d) of the Federal Clean Water Act. JD 3 and Clearwater Creek flow into Peltier Lake, which is an impaired water for nutrients Hg-F. "The stressor identification process for these two impairments has

been initiated by the RCWD, with plans to complete the TMDL in the near future. A preliminary stressor identification was prepared by the RCWD in February 2008 and found that suspended solids, phosphorus, nitrogen and dissolved oxygen are likely stressors leading to the impairment. RCWD will continue to make an effort to complete this TMDL and address the water quality impairments within Clearwater Creek, which drains directly to Peltier Lake." (Peltier Lake and Centerville Lake TMDL Implementation Plan, Aug 2013)

The Board of Water and Soil Resources (BWSR) has available an estimator tool for calculating the amount of TSS and TP contributing to downstream water bodies based on existing site conditions observed or recorded. The intent of this tool is for use during online reporting, and for submitting requests for state funding applications. For this project the "Stream&Ditch" calculator has been utilized. Inputs for this online tool include soil type, volume voided, and number of years to erode the bank to its current position. The Soil type has been generalized as silt for the calculation. The Volume Voided is a measure of how much material has been removed from the ditch banks through the project reach. Volume voided has been estimated by comparing the surveyed cross sections compared to the ACSIC cross section of JD 3. The volume voided was estimated to be approximately 50,000 cubic feet. Determining the number of years the stream has taken to erode is challenging to pinpoint without extensive historical survey and limited historical imagery. Therefore, an assumption of 30 years for the erosion to develop was used, based off of the BWSR guidance of 10 to 30 years typical range for a stream. Based on these assumptions, the tool calculates the instable banks along JD 3 have contributed approximately 70 Tons of sediment annually and 70 pounds of phosphorus annually to the downstream receiving water Peltier Lake under existing conditions. Although this stabilization work is anticipated to eliminate the vast majority of the sediment contribution from this portion of Clearwater Creek, it is likely that real conditions may still be observed showing some contribution of sediment and phosphorus load downstream, due in part to imperfect vegetation establishment.

PRELIMINARY OPINION OF PROBABLE COST

A preliminary opinion of probable cost for the proposed alternatives was calculated using anticipated project quantities and unit costs based on bids from past projects involving similar work and project scale. The estimated cost is subject to change with the final design. The opinion of cost incorporates all portions of the project determined to be feasible (two-stage ditch, partial two-stage ditch, re-meander with rock bank revetments, ditch repair and channel cleanout) but does not include those alternatives deemed infeasible (rock-riffle drop structures and storage). A more in-depth cost breakdown can be found in **Appendix E.**

Table 5: Preliminary Cost Estimate

Alternative	Cost
Re-Meander	$412,000
Cleanout	$160,000
Two-Stage Ditch	
Full Build Out Two-Stage Ditch	$1,282,000
Partial Two-Stage Ditch	$526,000
Total Project Cost	$1,098,000 - $1,854,000

The proposed alternatives will likely require easement acquisition for the increased ditch footprint. The two-stage ditch will increase from approximately 50 to 140 foot width increasing the area approximately 5.3 acres. The partial two-stage ditch will increase to a width of approximately 95 feet, increasing the area by approximately 2.7 acres. The ditch width of the re-meandered channel will stay the same size, however, the length of the channel increases by 780 feet which would add approximately an additional 0.7 acres of disturbance.

Engineering fees to finalize the design and complete permitting is estimated to be approximately $225,000. The fees include survey, final design and construction plans, permitting, project meetings, bidding, construction management, and staking and inspection. Prior to final design, a detailed cost estimate will be developed for engineering fees.

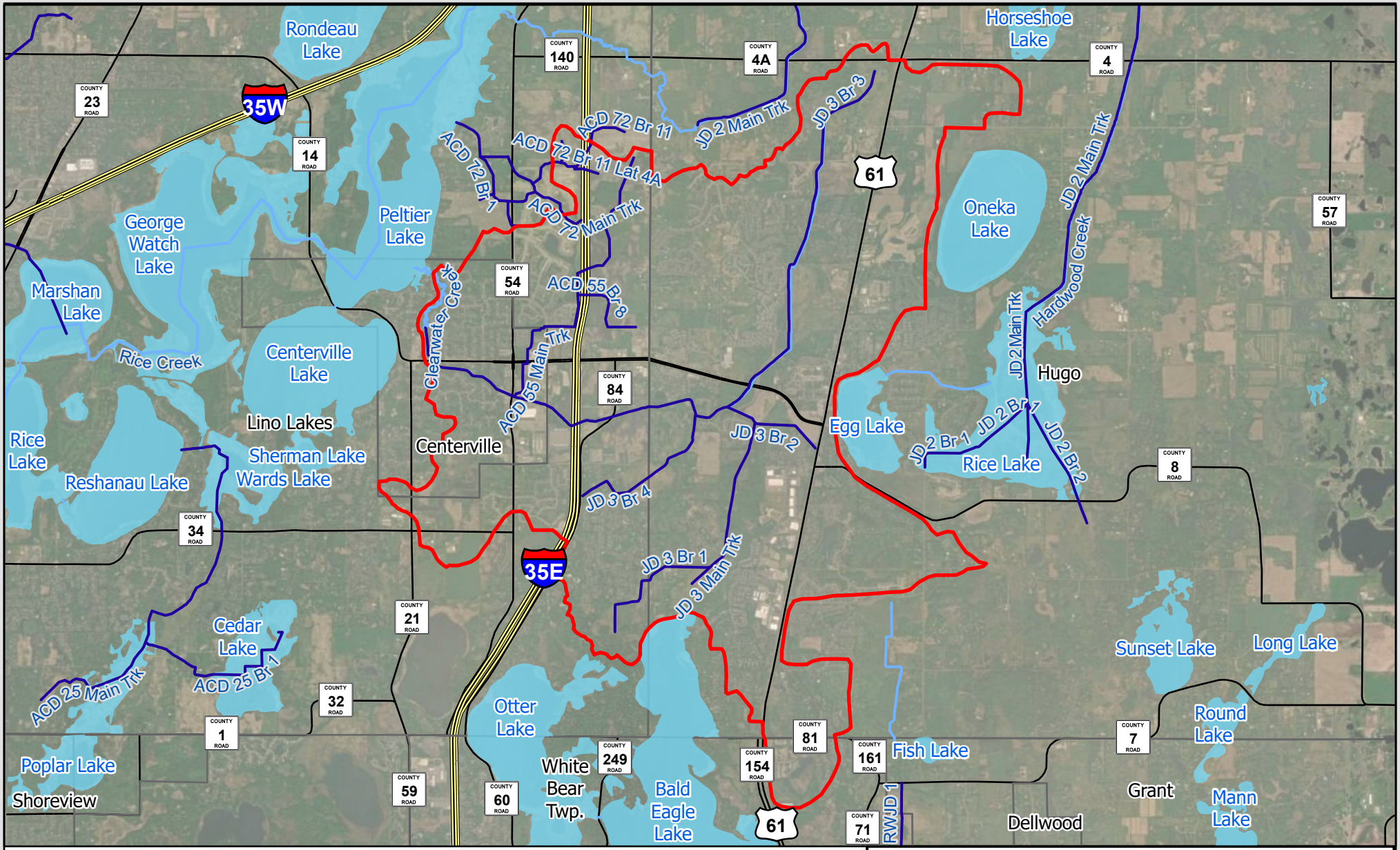
RECOMMENDATION

The purpose of the proposed alternative is to add stability to Clearwater Creek / JD 3 by reducing velocities and attenuating peak flows, where practicable. Based on the preliminary assessment of the site, we recommend including alternatives for re-meander of the straightened channel downstream of Main St. (0+00 to 14+00), constructing a two-stage ditch (or partial two-stage ditch) between 20th Ave and I-35E (50+00 to 76+00), and repairing the ditch in the middle section between 20th Ave and Main St. (16+00 to 49+00). As part of this work, it will be necessary to clear out trees within the JD 3 right-of-way and armor banks that have been eroding. The analysis has shown that this combination of the alternatives will reduce velocities and peak flows throughout the project corridor and increase stability, thereby reducing erosion and sediment delivery in the ditch and decreasing the frequency of required future maintenance.

FUTURE FUNDING

Since the proposed project includes a water quality improvement component, there are several potential external funding sources that may be available. There are generally competitive grant

opportunities, including the Clean Water Fund (CWF) Projects and Practices grant and the Multi-purpose Drainage Management Grant. A non-competitive potential funding source is the Watershed-Based Implementation Fund (WBIF). We recommend further consideration of one or all of these potential funding sources for this project.



Legend

- JD 3 Drainage Area
- Public Drainage Systems
- Public Watercourses
- Lakes
- City Boundaires

N

0 3,000 6,000 12,000 Feet

Figure 10: Judicial Ditch 3 Extent

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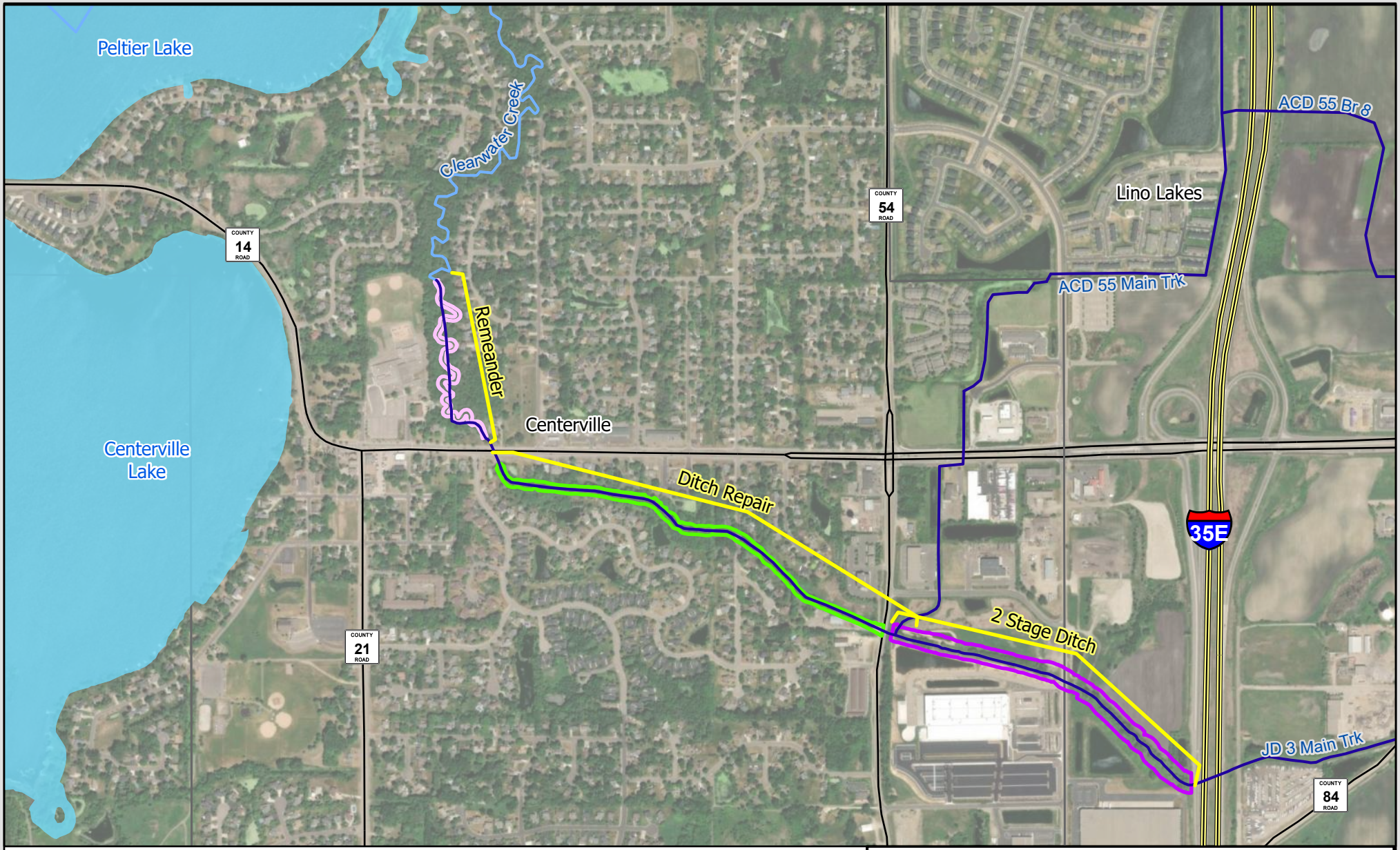

Legend

- Public Drainage Systems
- Public Watercourses
- Lakes
- City Boundaires

Proposed BMPs

- Ditch Repair
- Remeander
- Two Stage Ditch

N

0 500 1,000 2,000 Feet

Figure 11: Clearwater Creek Stabilization Overview

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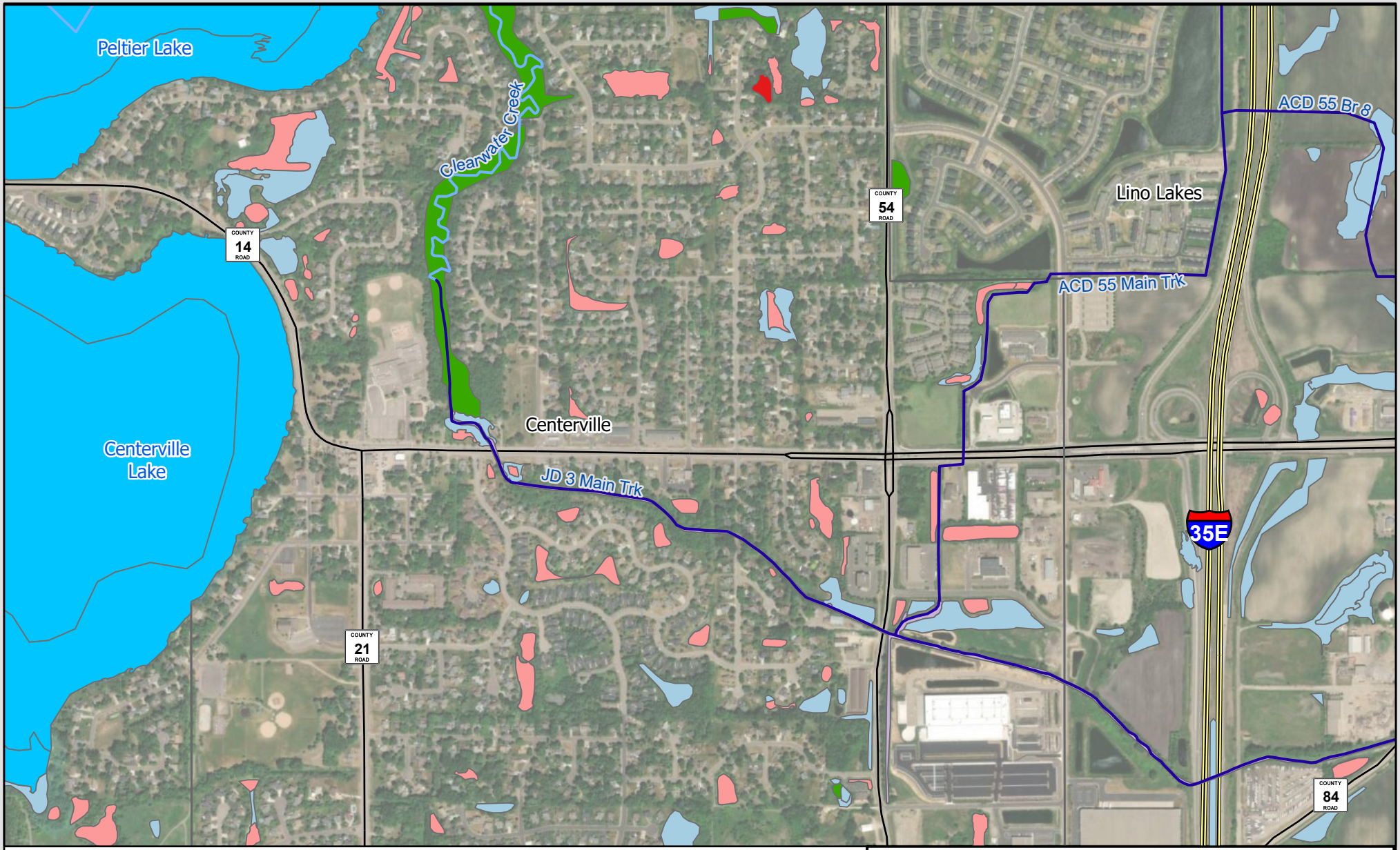

Legend

Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested Wetland
- Freshwater Pond
- Freshwater Shrub Wetland
- Lake
- Riverine
- Public Drainage Systems
- Public Watercourses
- City Boundaires

N

0 500 1,000 2,000 Feet

Figure 12: National Wetland Inventory

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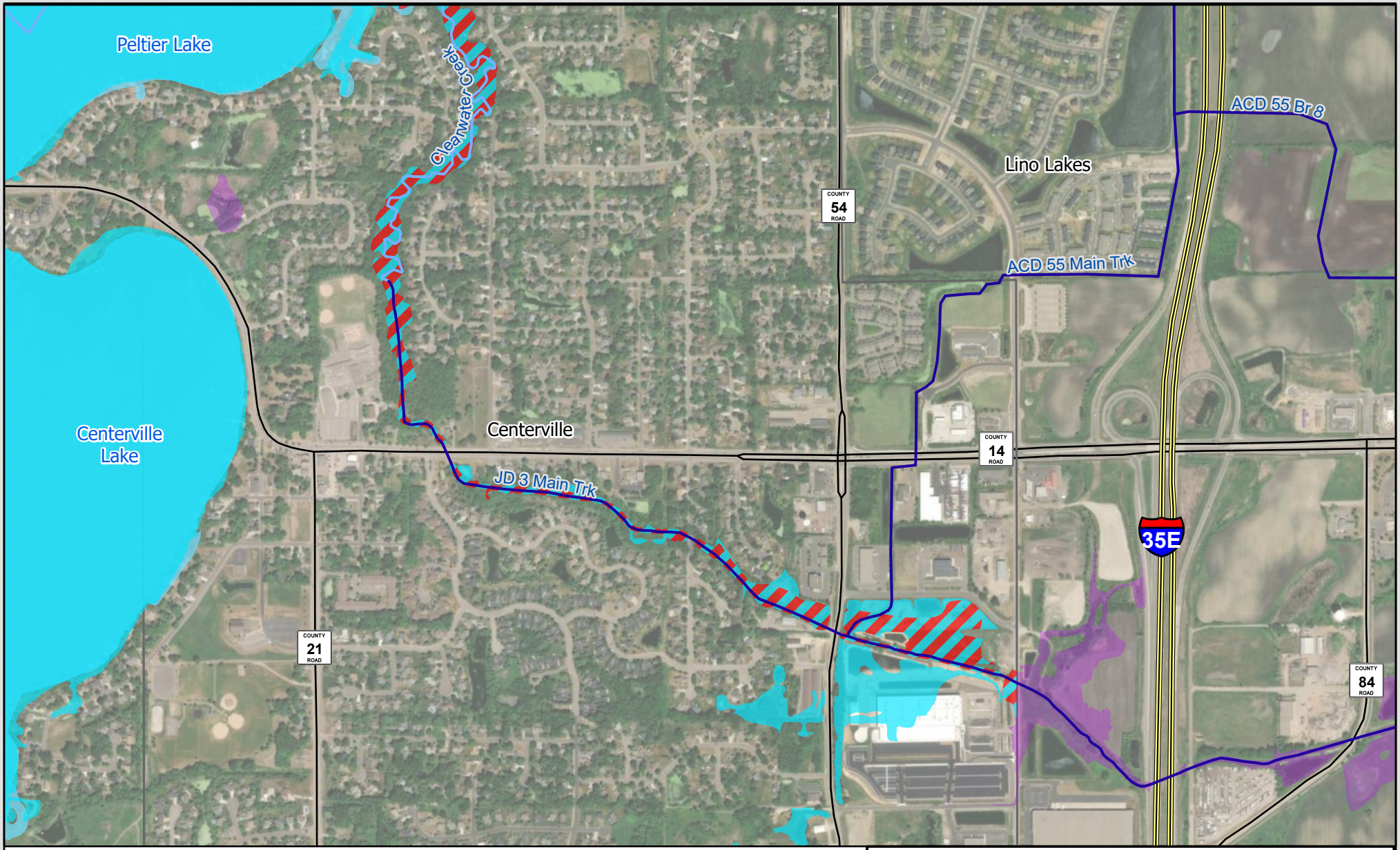

Legend

- Public Drainage Systems
- Public Watercourses
- City Boundaires

FEMA Flood Zones

- A
- AE
- Floodway

N

0 500 1,000 2,000 Feet

Figure 13: FEMA Designated Floodplains

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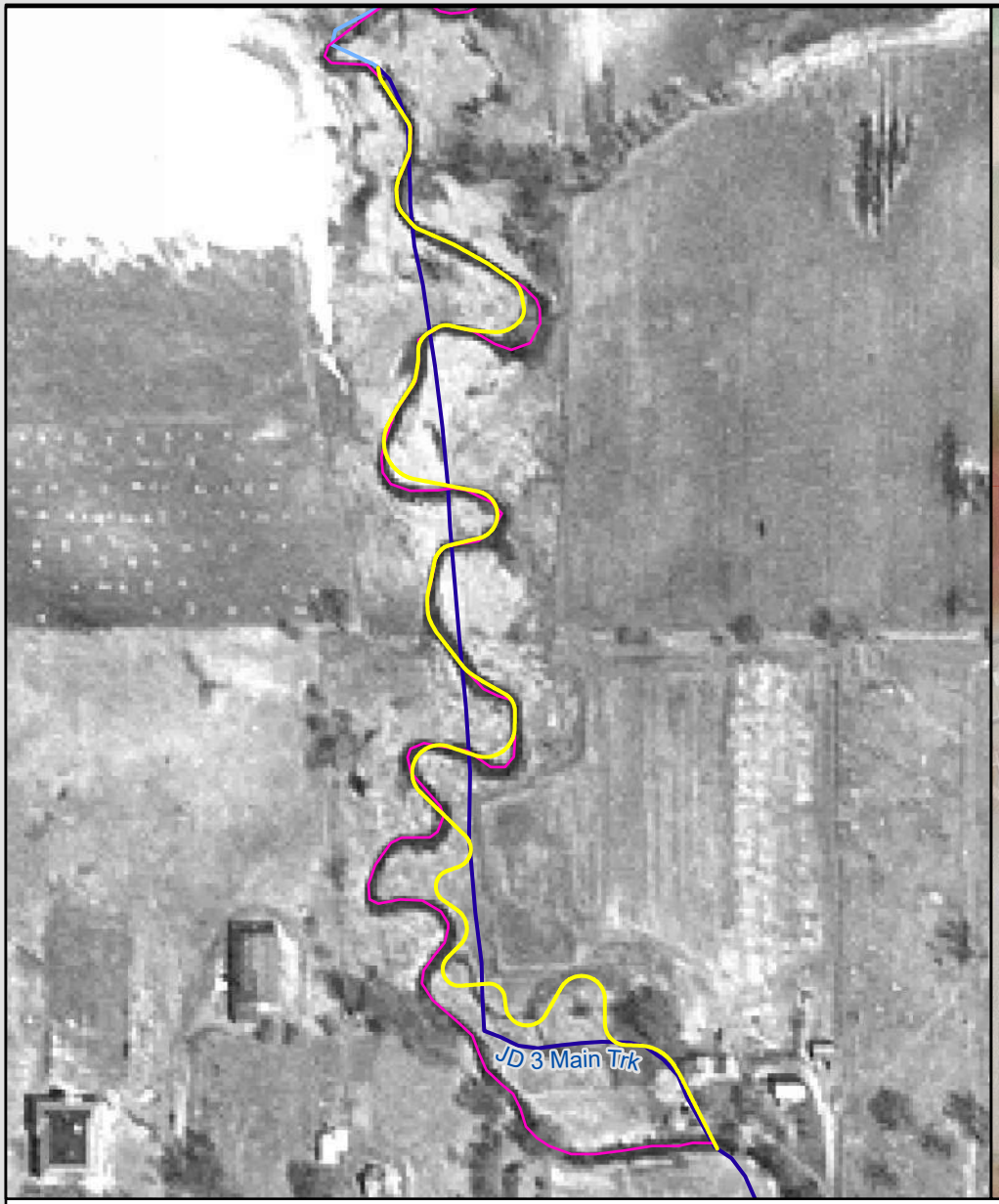

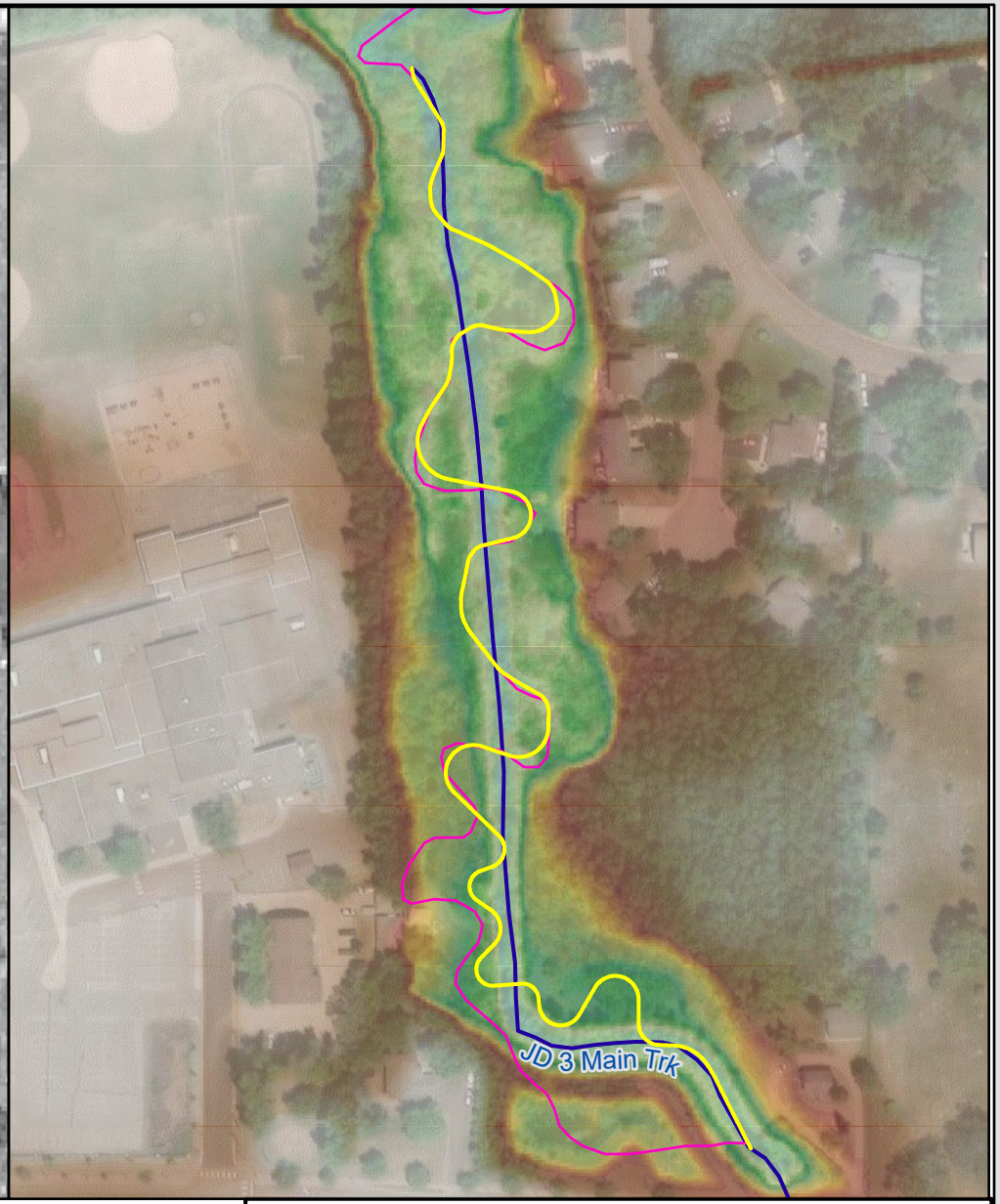

Legend

- Current JD 3 Alignment
- Proposed Re-meander Alignment
- Historic Clearwater Creek Alignment
- 1947 Aerial (University of Minnesota)
- Anoka County Lidar
  - High : 1136.66
  - Low : 797.564

N

0 125 250 500 Feet

Figure 14: Re-meander Historic Aerial Imagery and Lidar

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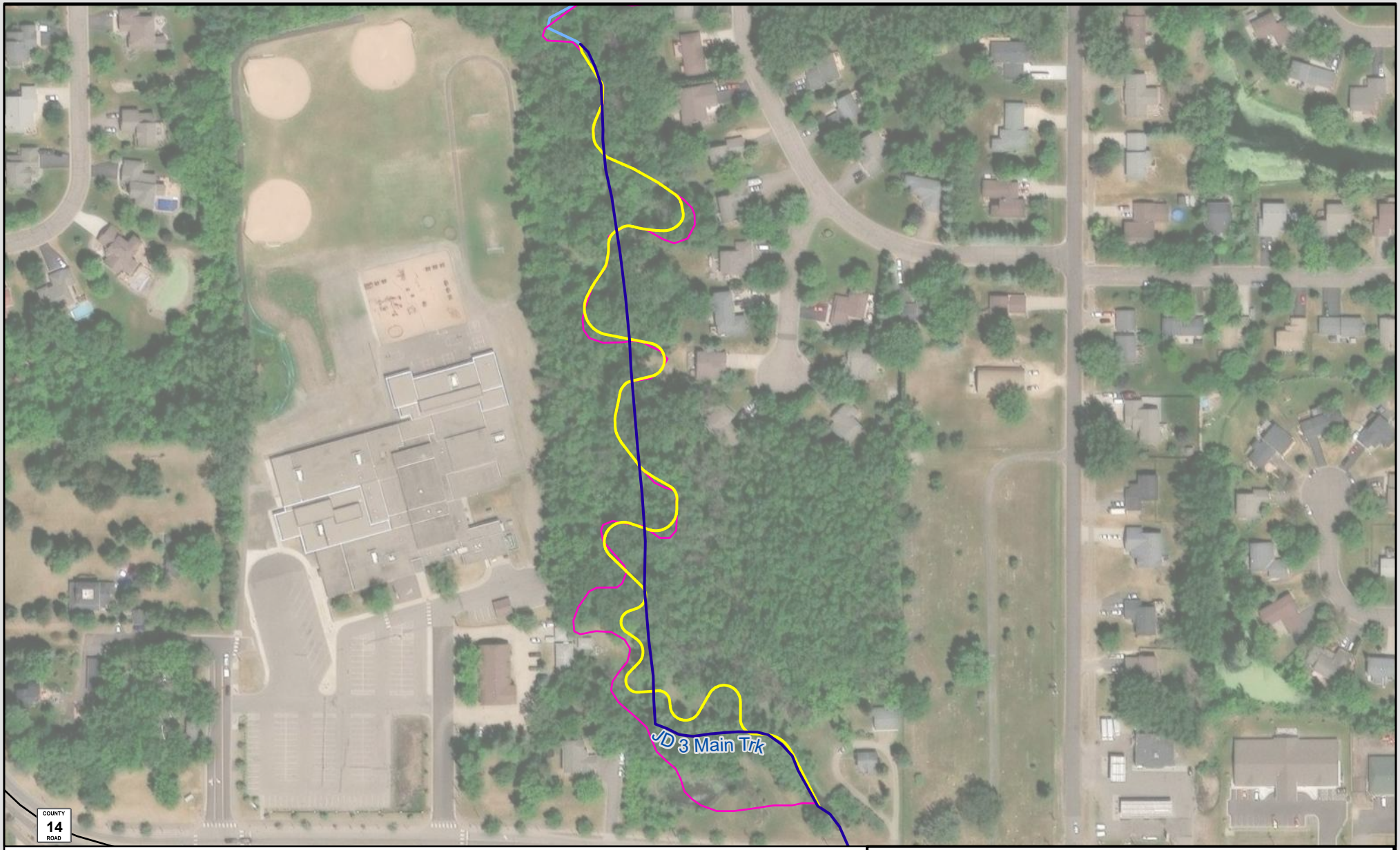

Legend

- Historic Clearwater Creek Alignment
- Proposed Re-meander Alignment
- Current JD 3 Alignment

N

0 125 250 500 Feet

Figure 15: Clearwater Creek Re-meander

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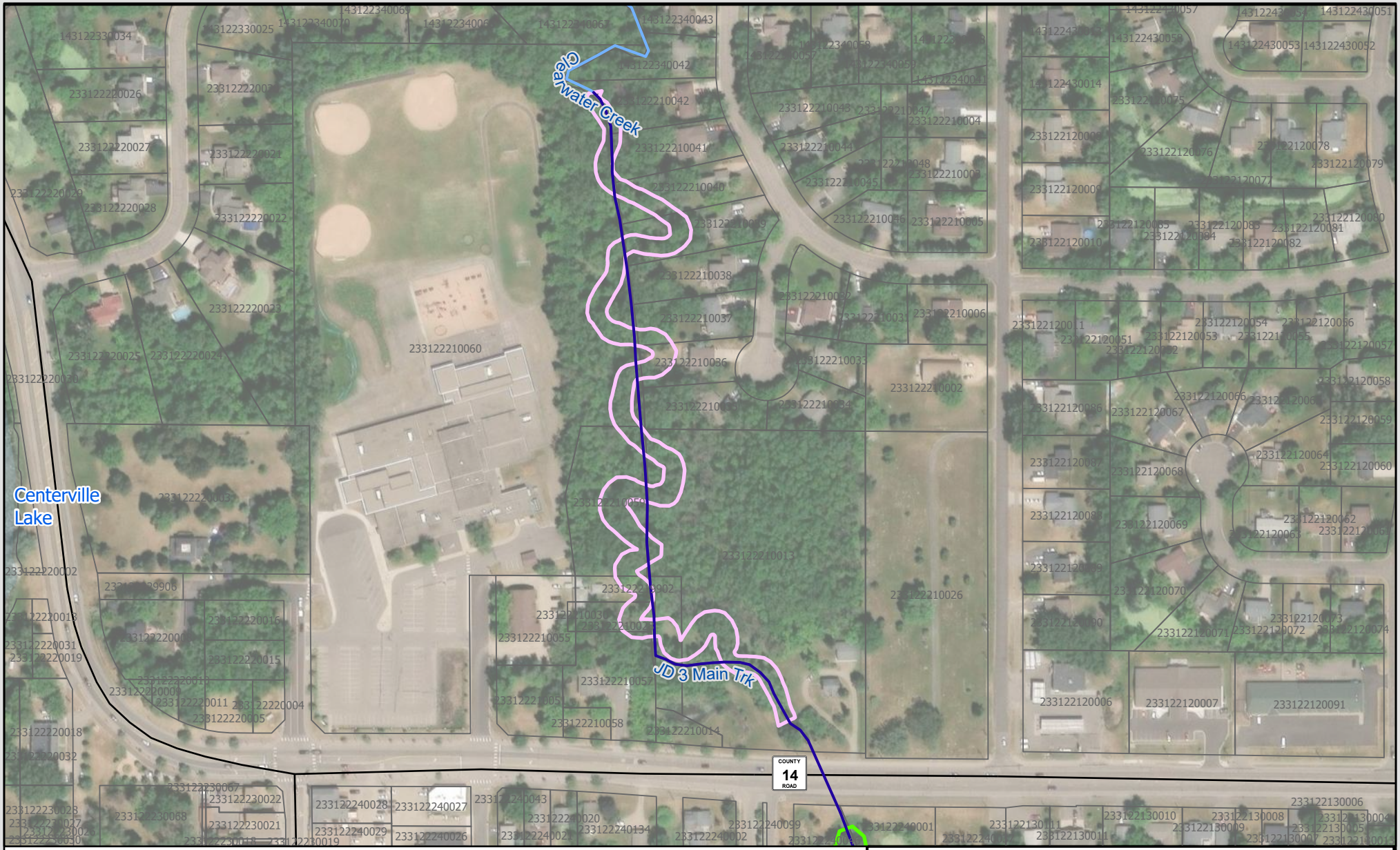

Legend

- Public Drainage Systems
- Public Watercourses
- Parcels

Proposed BMPs

- Ditch Repair
- Remeander
- Two Stage Ditch

N

0 150 300 600 Feet

Figure 16: Parcel Map

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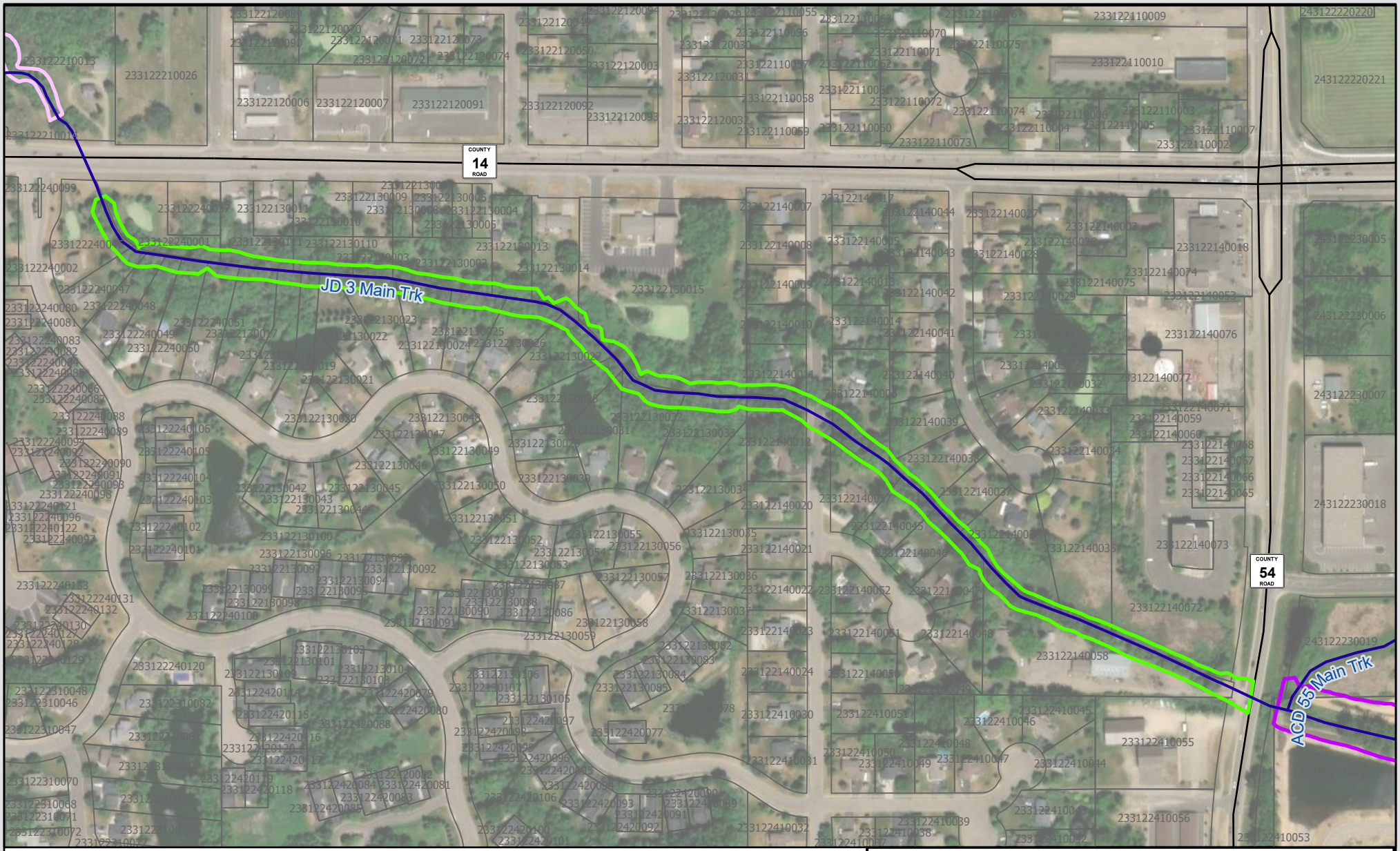

Legend

- Public Drainage Systems
- Public Watercourses
- Parcels

Proposed BMPs

- Ditch Repair
- Remeander
- Two Stage Ditch

N

0 200 400 800 Feet

Figure 17: Parcel Map

Scale:	Drawn by:	Checked by:	Project No.:	Date:	Sheet:
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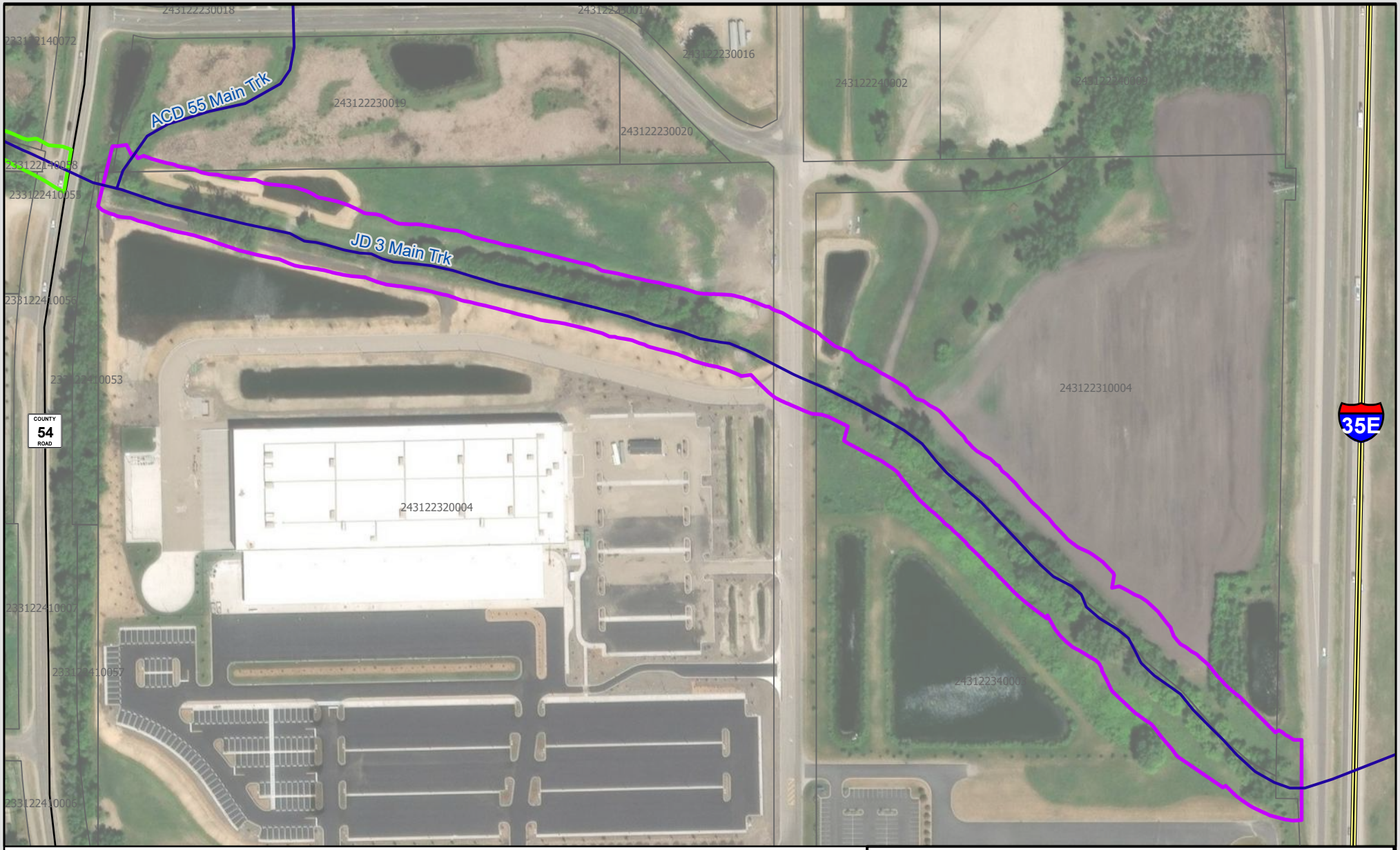

Legend

- Public Drainage Systems
- Public Watercourses
- Parcels

Proposed BMPs

- Ditch Repair
- Remeander
- Two Stage Ditch

N

0 150 300 600 Feet

Figure 18: Parcel Map

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APPENDIX A: MODELING

MODELING SETUP

The RCWD District Wide Modeling for JD3 was utilized to model the existing conditions and proposed stabilization alternative BMPs. This XPSWMM 2018.1 model simulates runoff from a variety of rainfall events routed through pipes and natural channels as shown in **Figure 1 and Figure 2**. The program uses reach lengths and cross sections with data from survey and LiDAR to represent natural channel, overland, or subsurface pipe flow throughout the system. The model represents the entire JD3 system that outlets to Peltier Lake and is updated on an annual basis to reflect projects completed throughout the system. Within the project extents, minor modifications were made to the existing conditions model either through updated survey data, or additional model detail such as nodes or links. Following existing conditions updates, the input data were altered to represent the proposed conditions such as cross sections, reach lengths, slopes, and conveyance area. The model results are compared between existing and proposed conditions using the outputs of the flow hydrographs, velocity, and elevation data throughout a specified storm event. The storm events modeled are the 2-, 10-, and 100-year events with NOAA Atlas 14 rainfall depths as displayed in **Table 1**, and an MSE 3 rainfall distribution.

Table 1: NOAA Atlas 14 Rainfall Depth

Rainfall Event	Rainfall Depth (inches)
2-year	2.79
10-year	4.16
100-year	7.18

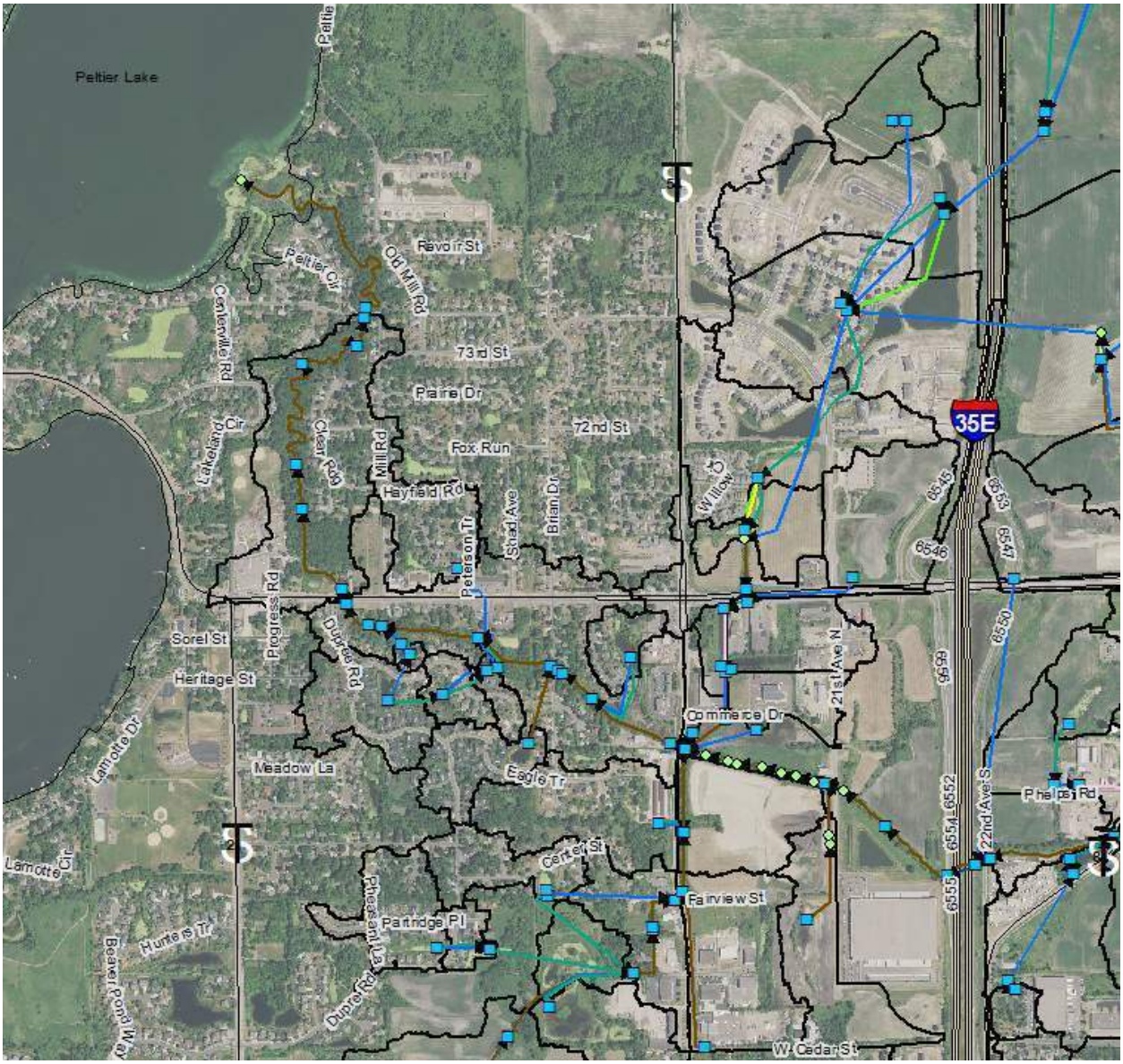


Figure 1: XPSWMM modeling

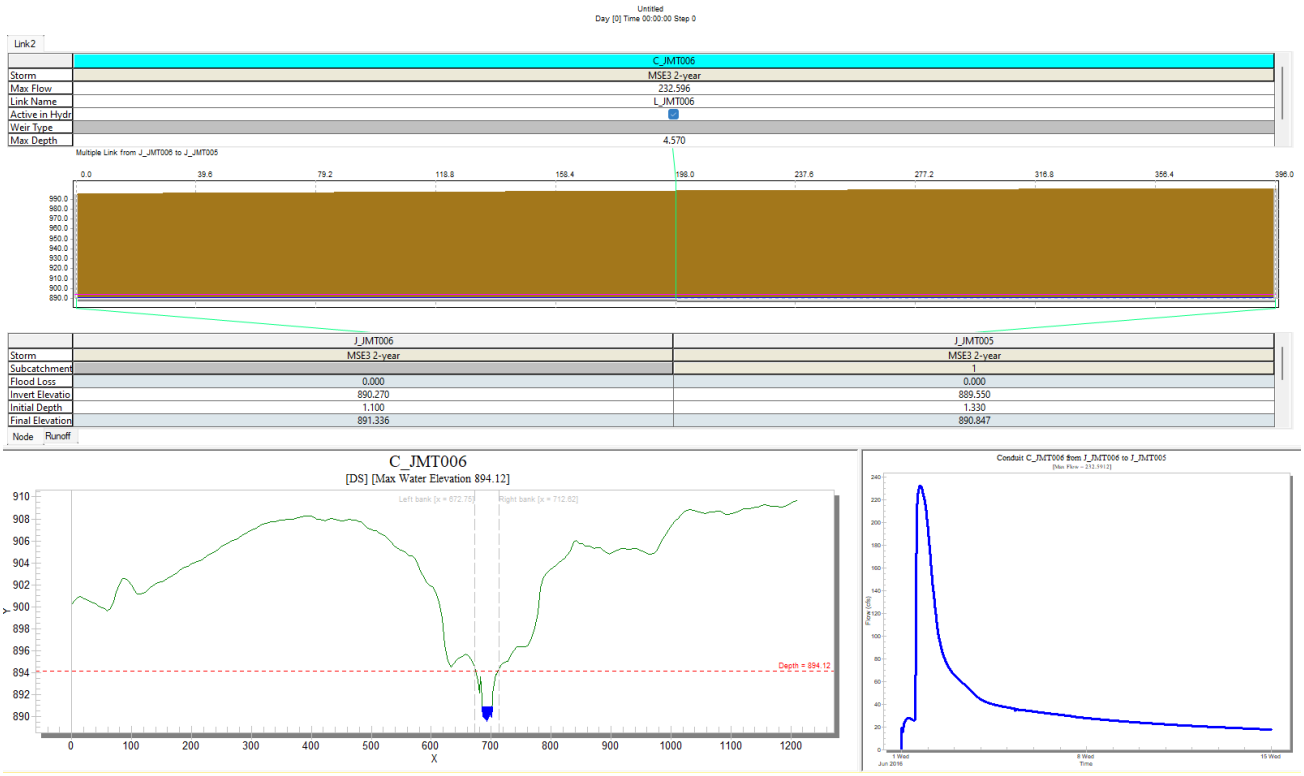
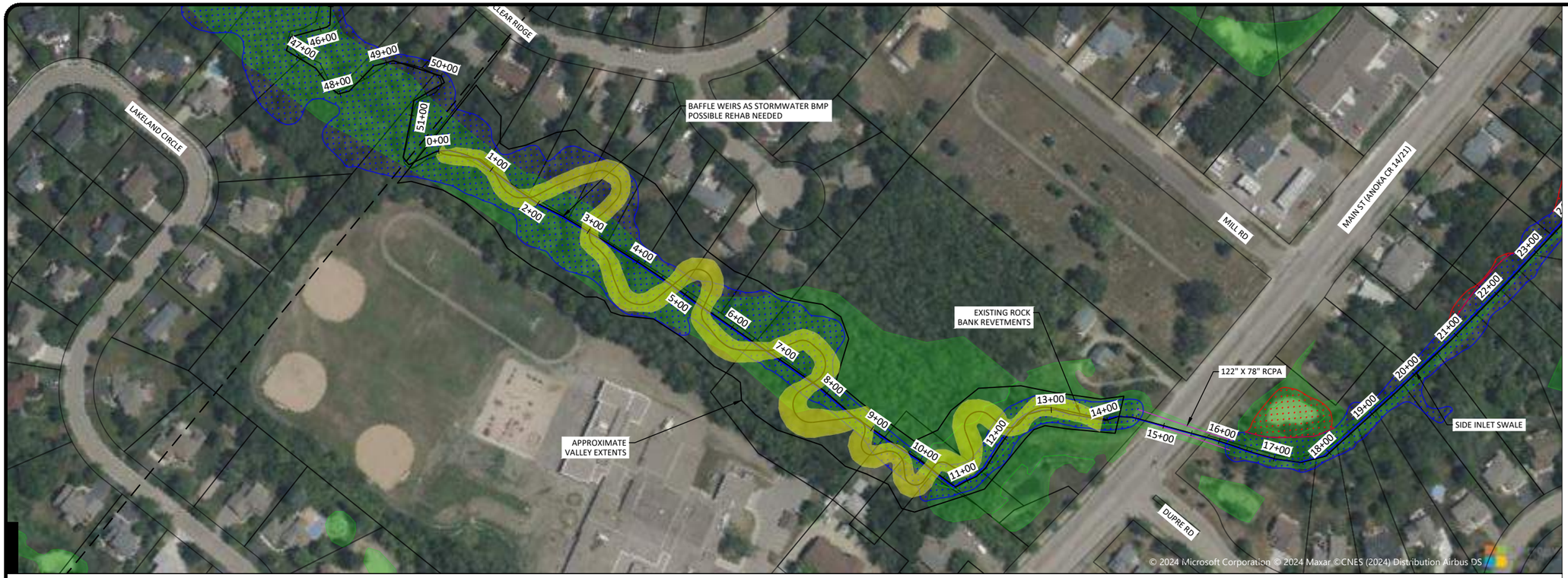
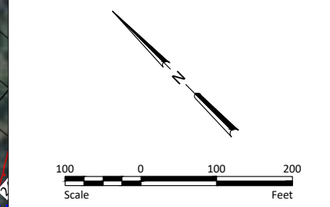


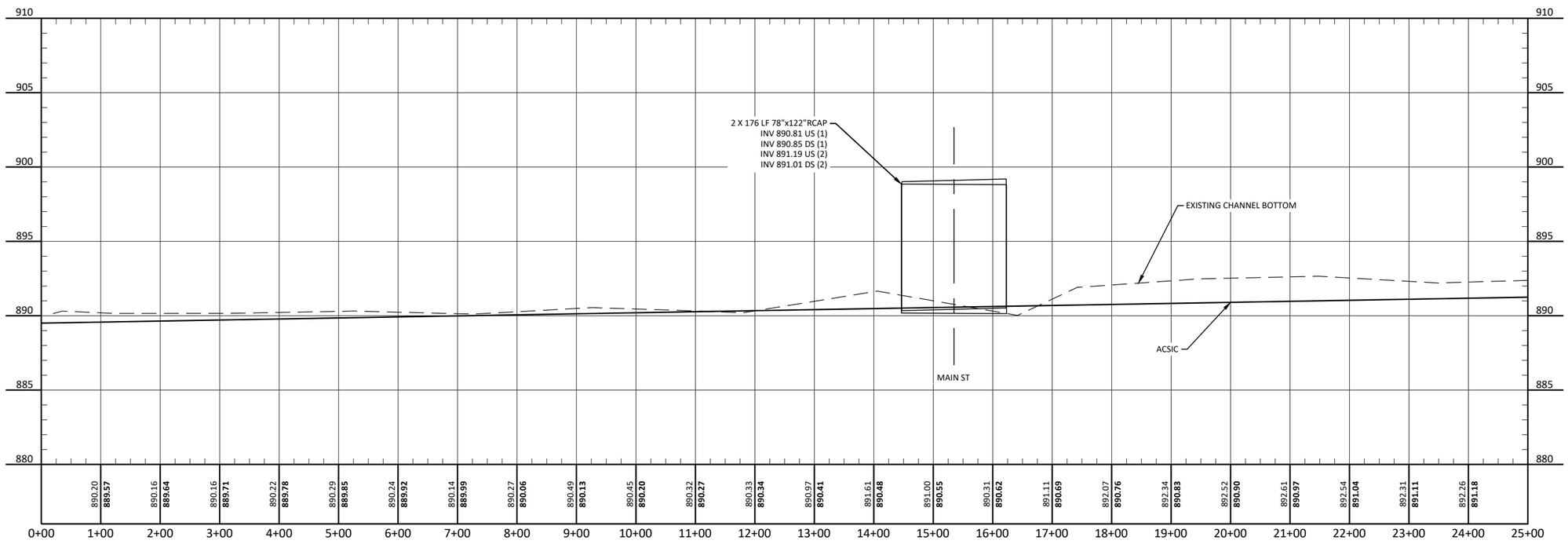
Figure 2: XPSWMM Cross Section

APPENDIX B: PLANS





- NATIONAL WETLAND INVENTORY
- FEMA FLOODPLAIN AE
- FEMA FLOODWAY
- REMEANDER



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CLEARWATER CREEK STABILIZATION
ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

REMEANDER
PLAN AND PROFILE
PROJECT NO. 5555-0349

SHEET
1 37

HEI NO. 5555-0349

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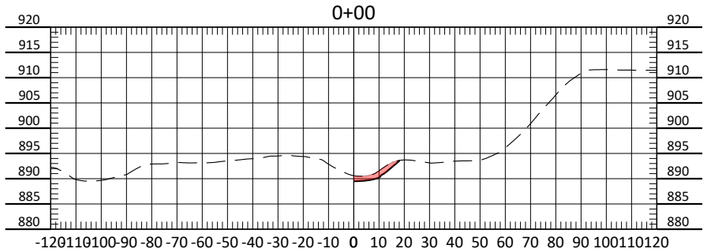

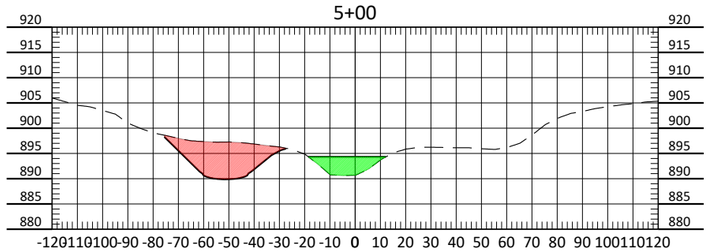

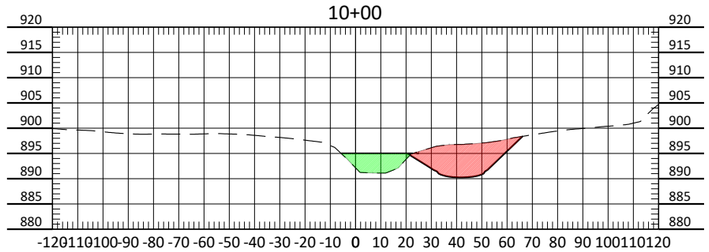

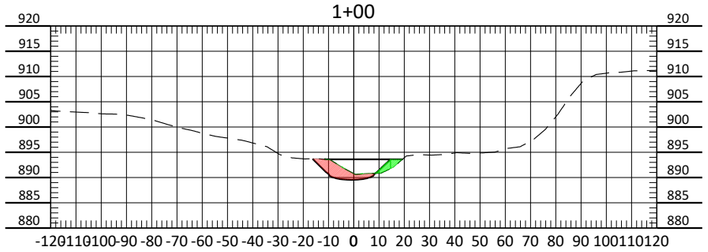

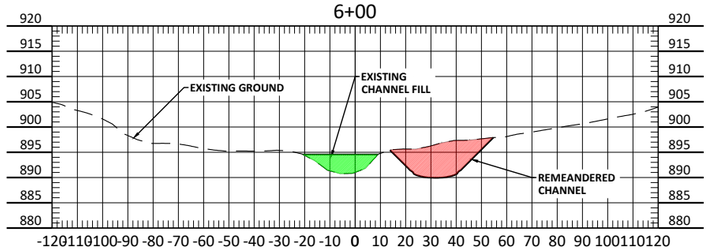

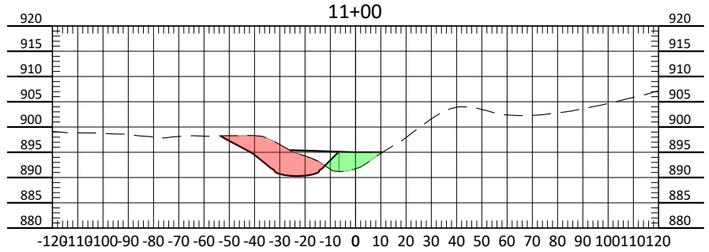

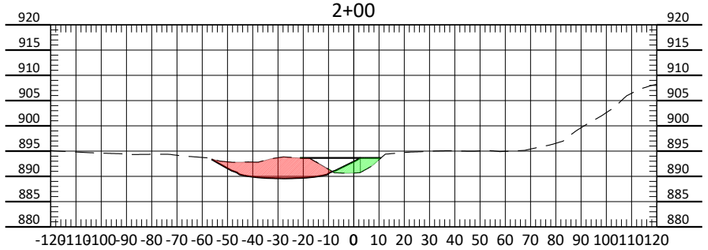

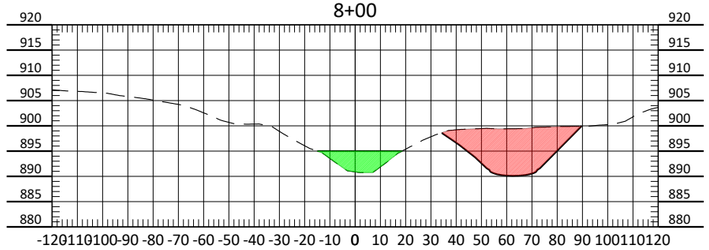

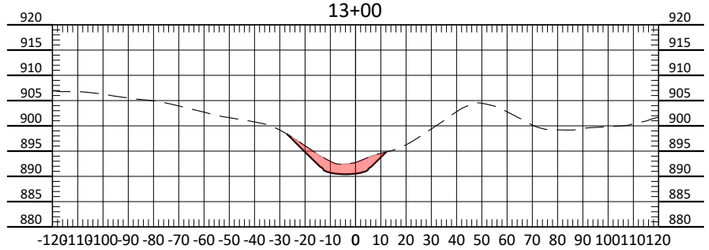

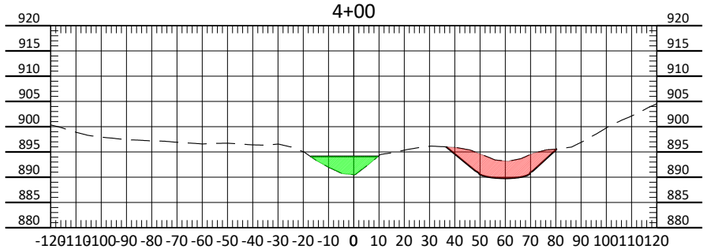

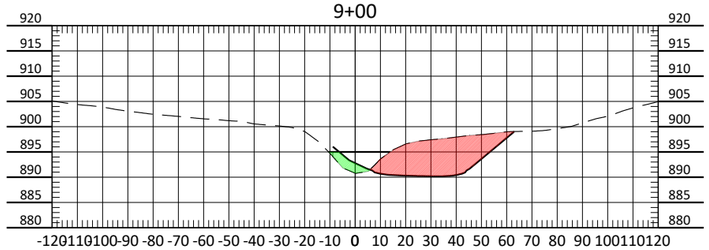

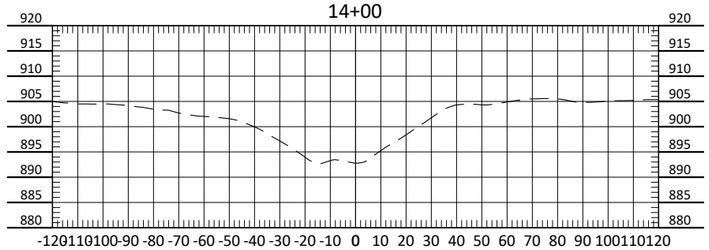

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CLEARWATER CREEK STABILIZATION
ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

REMEANDER
CROSS SECTIONS
PROJECT NO. 5555-0349

SHEET
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HEI NO. 5555-0349

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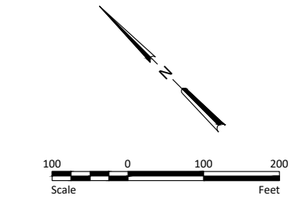

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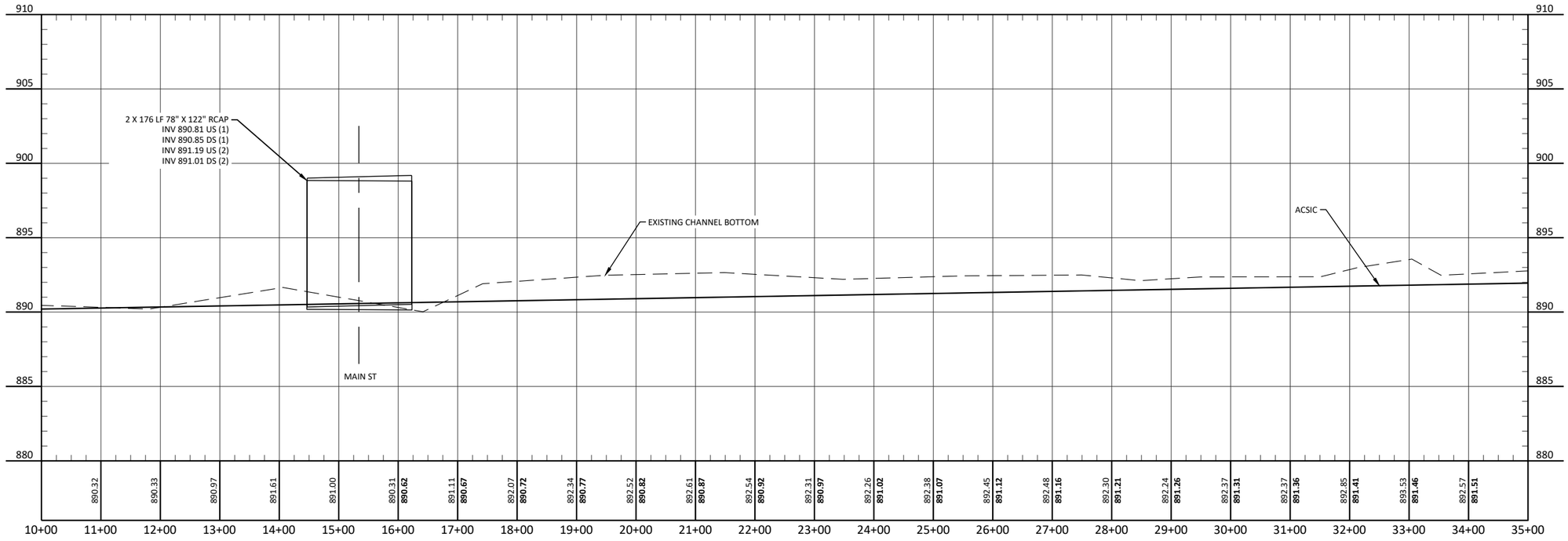
- FEMA FLOODPLAIN
- FEMA FLOODWAY
- DITCH REPAIR



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ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

DITCH REPAIR
PLAN AND PROFILE
PROJECT NO. 5555-0349

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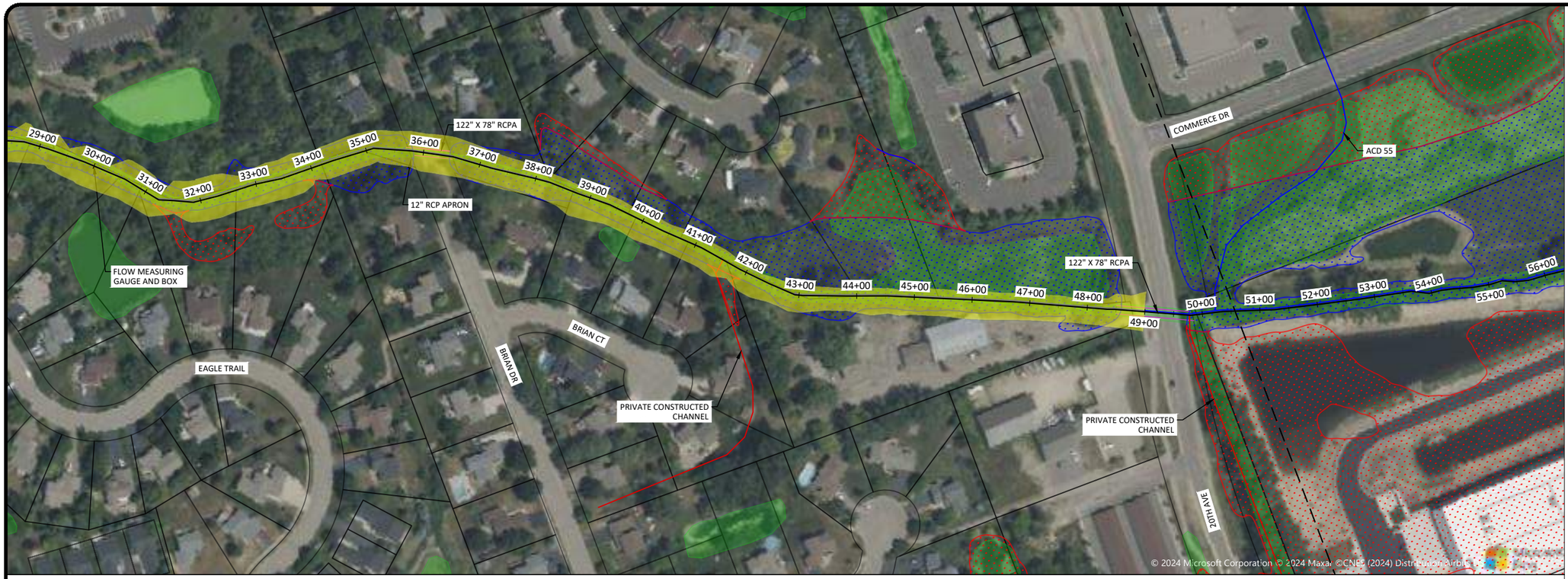
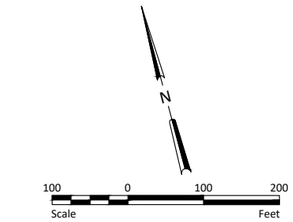
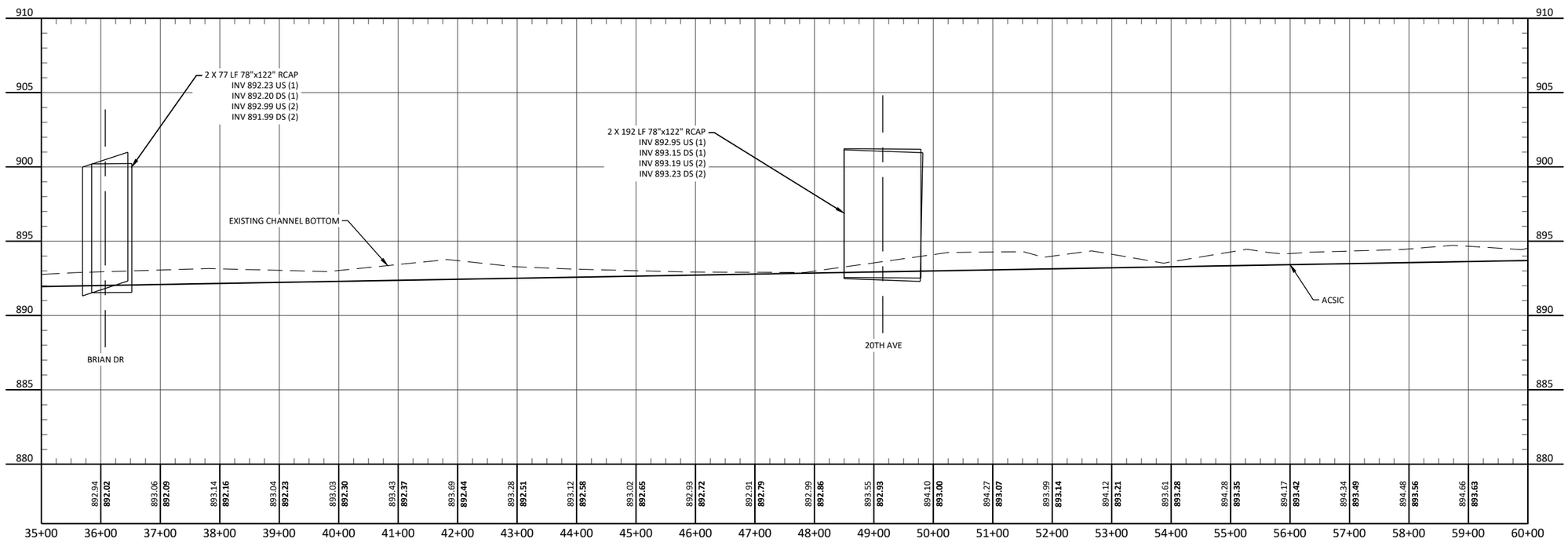




- NATIONAL WETLAND INVENTORY
- FEMA FLOODPLAIN
- FEMA FLOODWAY
- DITCH REPAIR



PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

HOUSTON engineering, inc.

Drawn by	Date
RCG	5/29/2024
Checked by	Scale
ANN	AS SHOWN

CLEARWATER CREEK STABILIZATION
ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

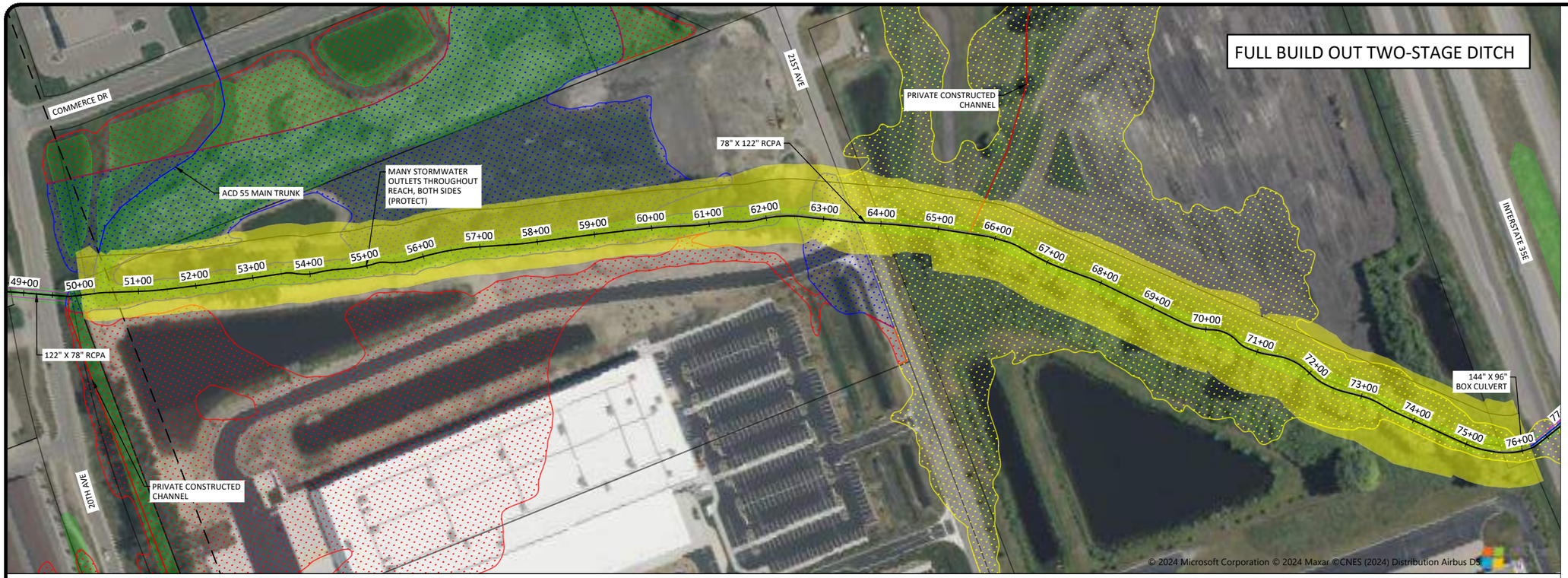
DITCH REPAIR
PLAN AND PROFILE
PROJECT NO. 5555-0349

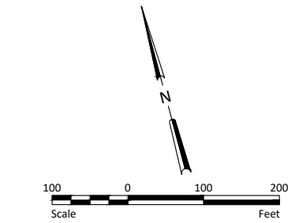
SHEET
4 40

HEI NO. 5555-0349

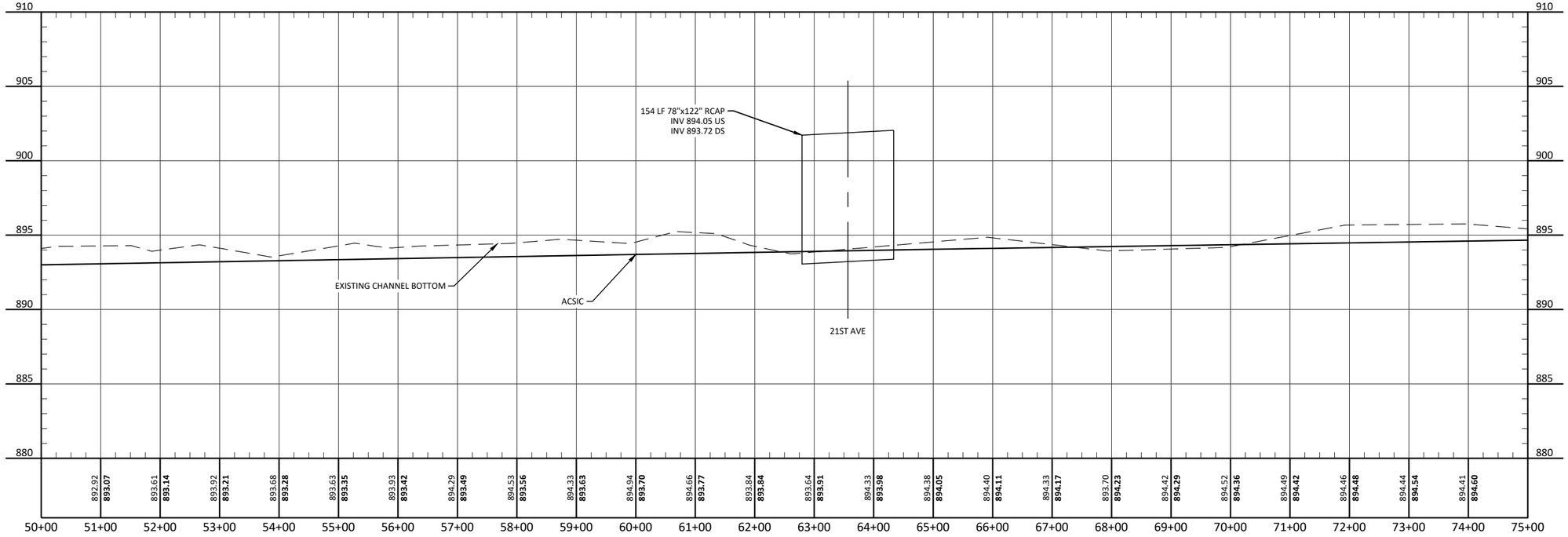
H:\JBN\5500\5555\5555_0349 Clearwater Creek Stablztn\CAD\Eng\Alternative_DropStructure.dwg-MAINTRUNK-2-5/31/2024 3:59 PM-(rglatt)

FULL BUILD OUT TWO-STAGE DITCH





- NATIONAL WETLAND INVENTORY
- FEMA FLOODPLAIN A
- FEMA FLOODPLAIN AE
- FEMA FLOODWAY
- TWO-STAGE DITCH EXTENTS



PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

HOUSTON engineering, inc.

Drawn by	Date
RCG	6/5/2024
Checked by	Scale
ANN	AS SHOWN

CLEARWATER CREEK STABILIZATION
ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

TWO-STAGE DITCH
PLAN AND PROFILE
PROJECT NO. 5555-0349

SHEET
5 41

HEI NO. 5555-0349

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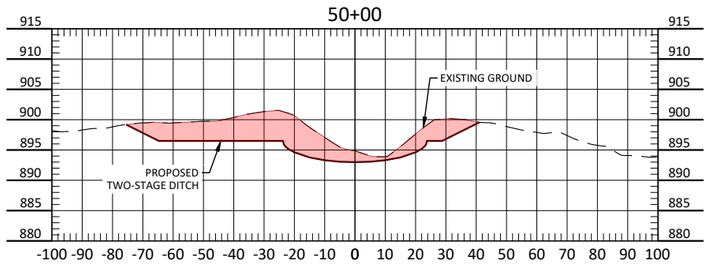

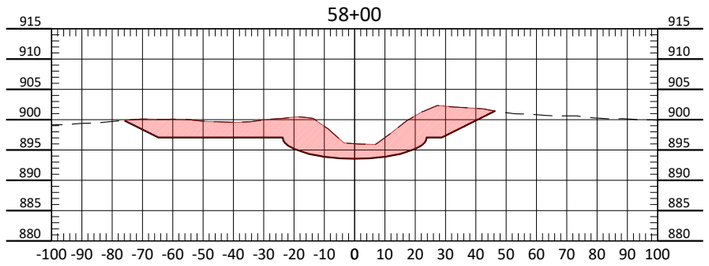

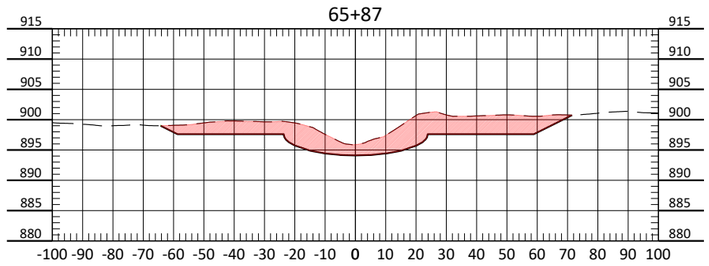

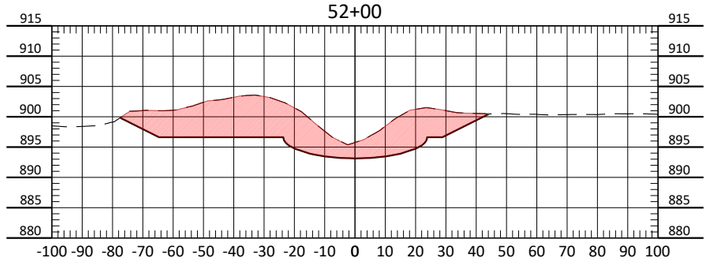

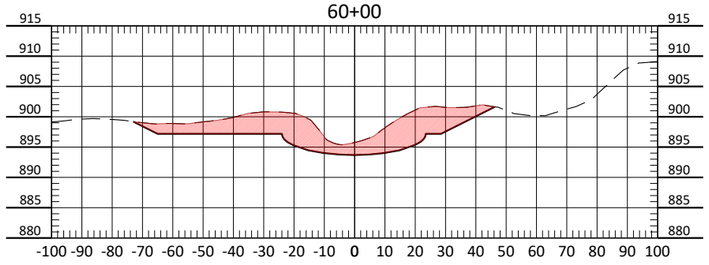

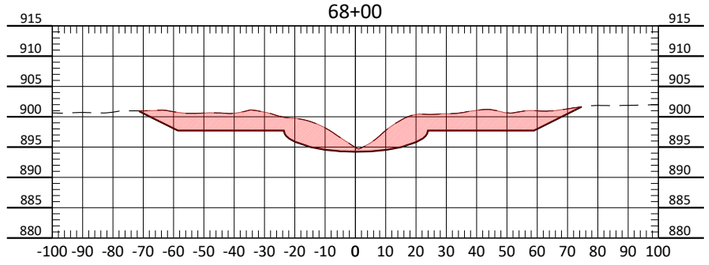

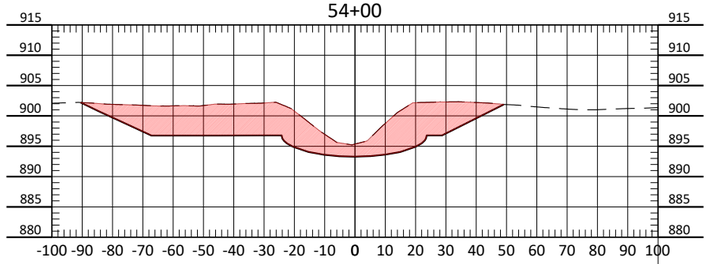

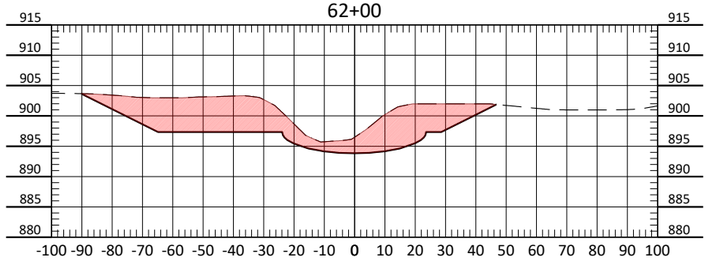

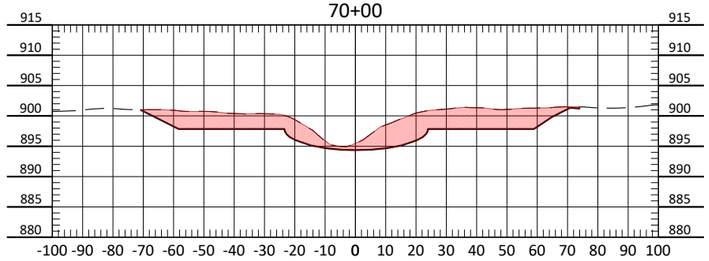

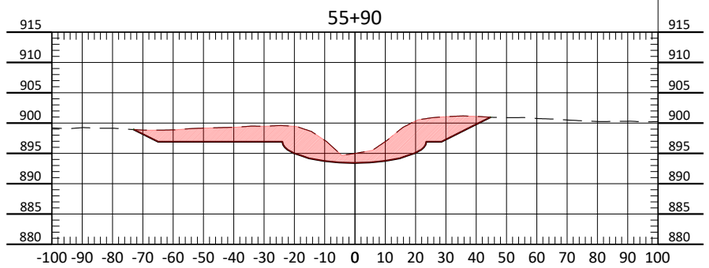

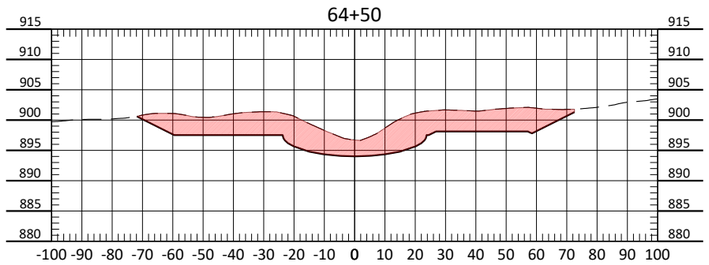

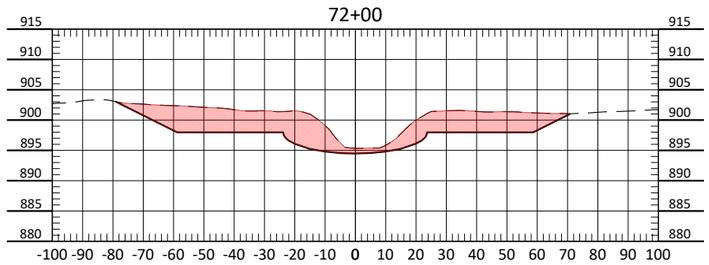

No.	Revision	Date	By

HOUSTON engineering, inc.

Drawn by	Date
RCG	5/31/2024
Checked by	Scale
ANN	AS SHOWN

CLEARWATER CREEK STABILIZATION
ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

TWO-STAGE DITCH
CROSS SECTIONS
PROJECT NO. 5555-0349

SHEET
6 42

HEI NO. 5555-0349

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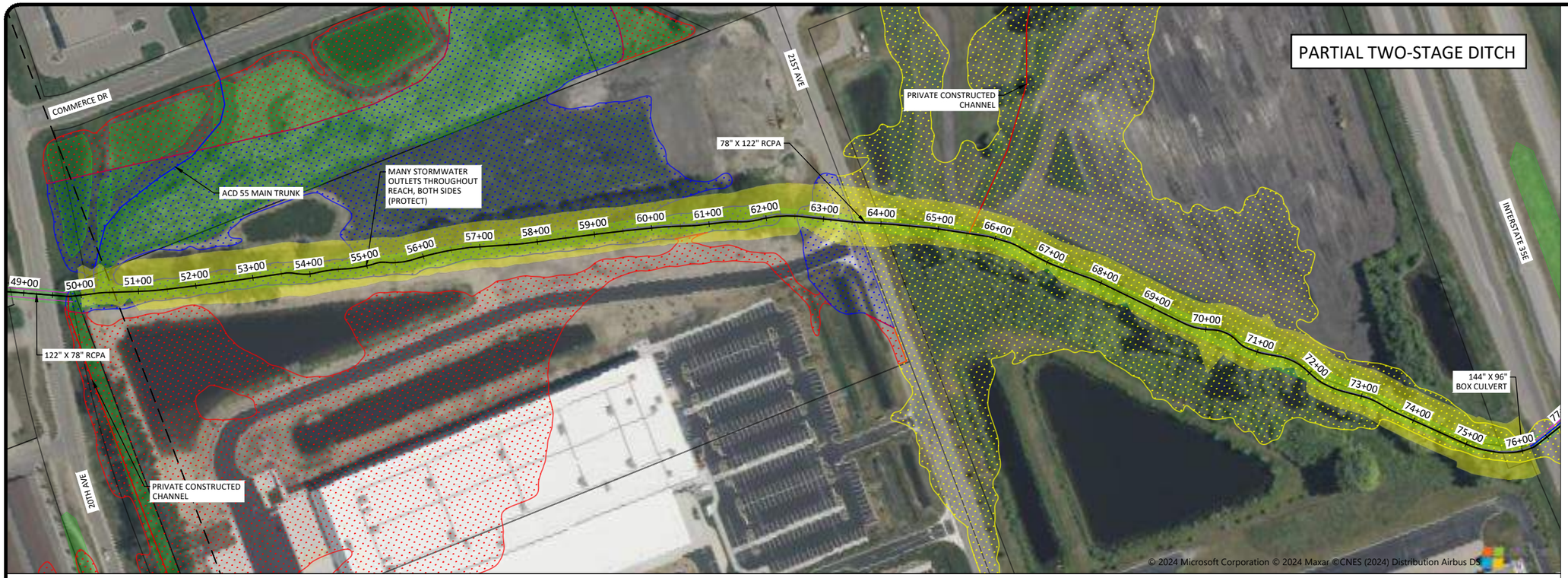
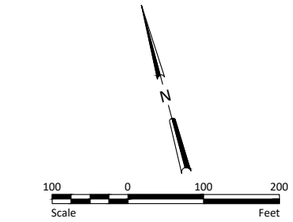
PARTIAL TWO-STAGE DITCH





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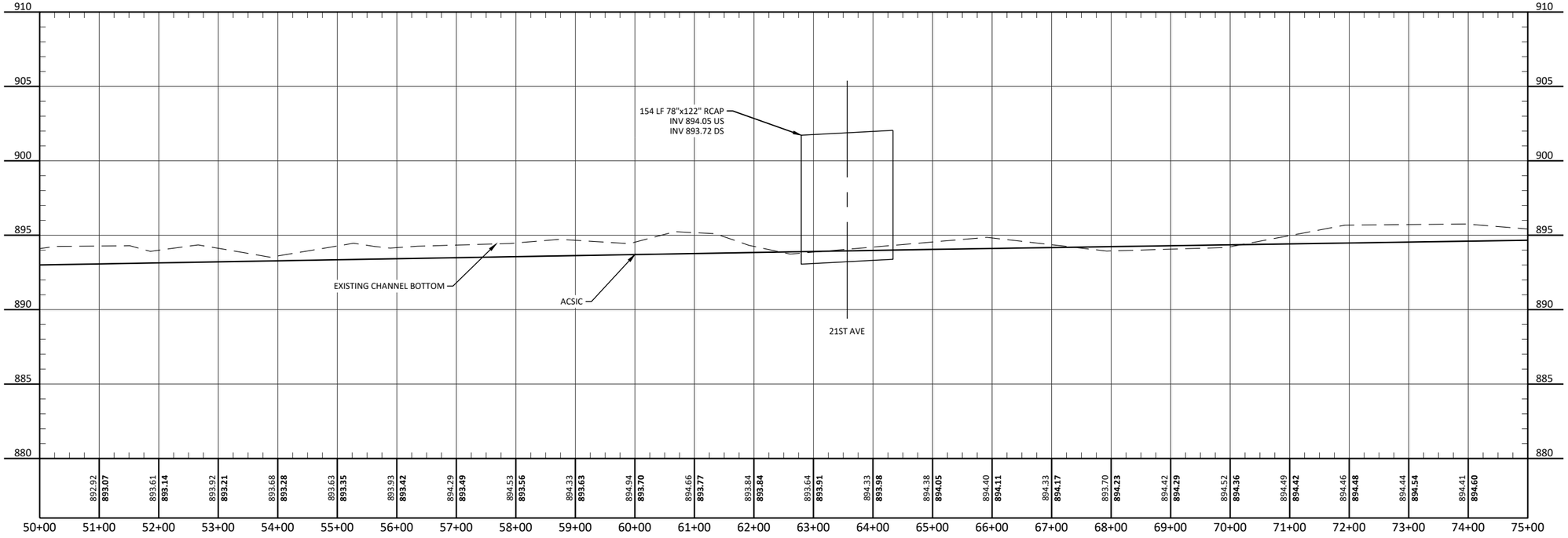
- FEMA FLOODPLAIN A
- FEMA FLOODPLAIN AE
- FEMA FLOODWAY
- TWO-STAGE DITCH EXTENTS



PRELIMINARY
NOT FOR CONSTRUCTION

No.	Revision	Date	By

HOUSTON engineering, inc.

Drawn by	Date
RCG	6/20/2024
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CLEARWATER CREEK STABILIZATION
ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

PARTIAL TWO-STAGE DITCH
PLAN AND PROFILE
PROJECT NO. 5555-0349

SHEET 7 43

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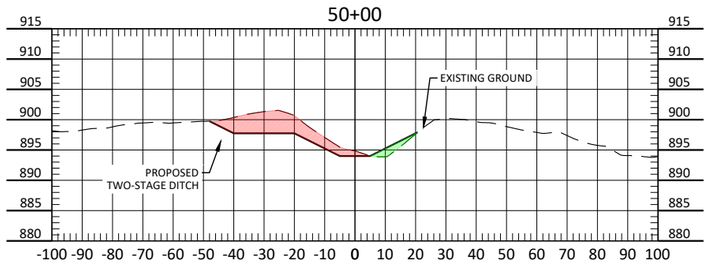
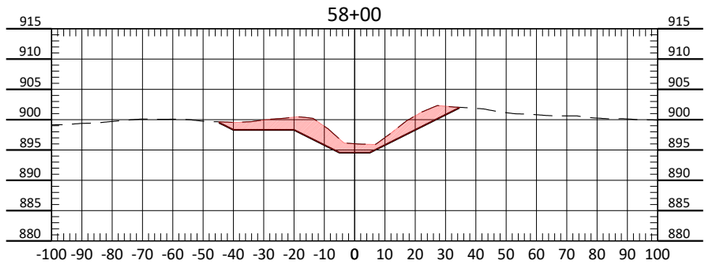
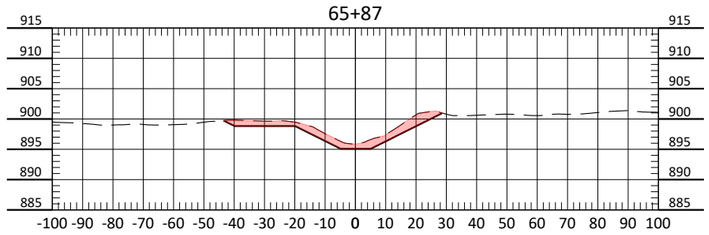
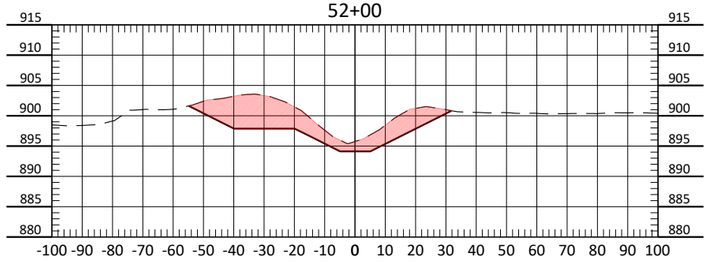
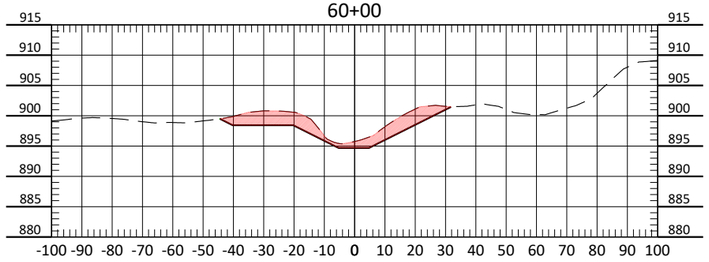
PARTIAL TWO-STAGE DITCH

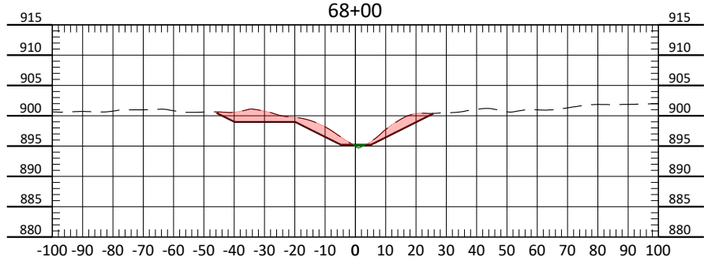


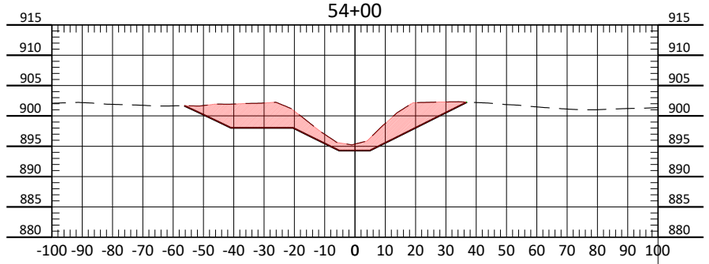


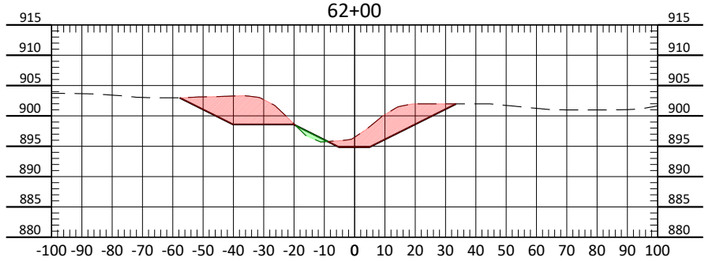


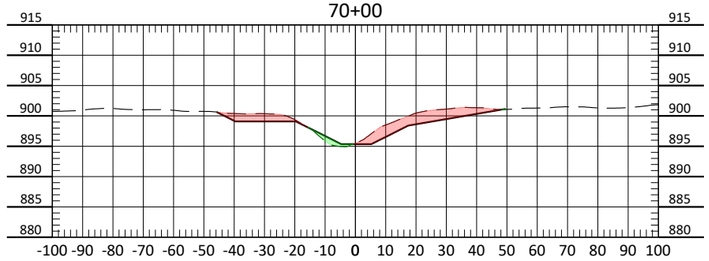


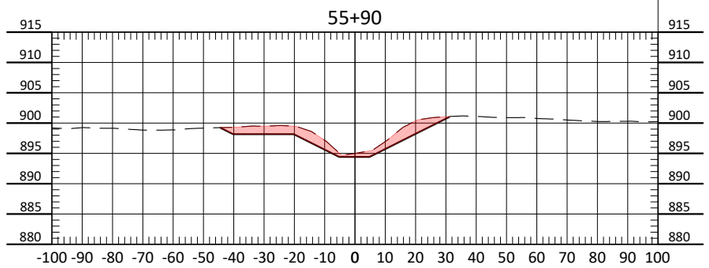


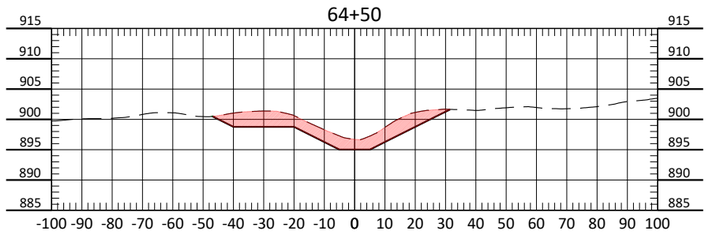


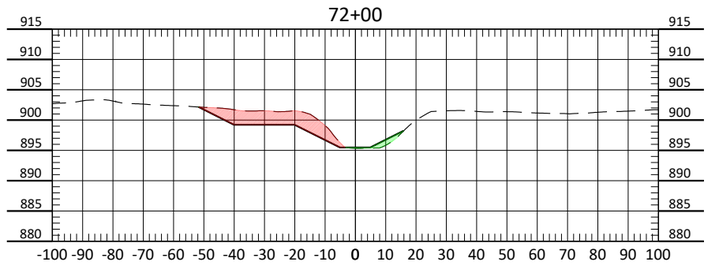












No.	Revision	Date	By

HOUSTON engineering, inc.

Drawn by	Date
RCG	6/20/2024
Checked by	Scale
ANN	AS SHOWN

CLEARWATER CREEK STABILIZATION
ANOKA/WASHINGTON JD3
RICE CREEK WATERSHED DISTRICT

PARTIAL TWO-STAGE DITCH
CROSS SECTIONS
PROJECT NO. 5555-0349

SHEET
8 44

HEI NO. 5555-0349

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APPENDIX C: WETLAND REVIEW

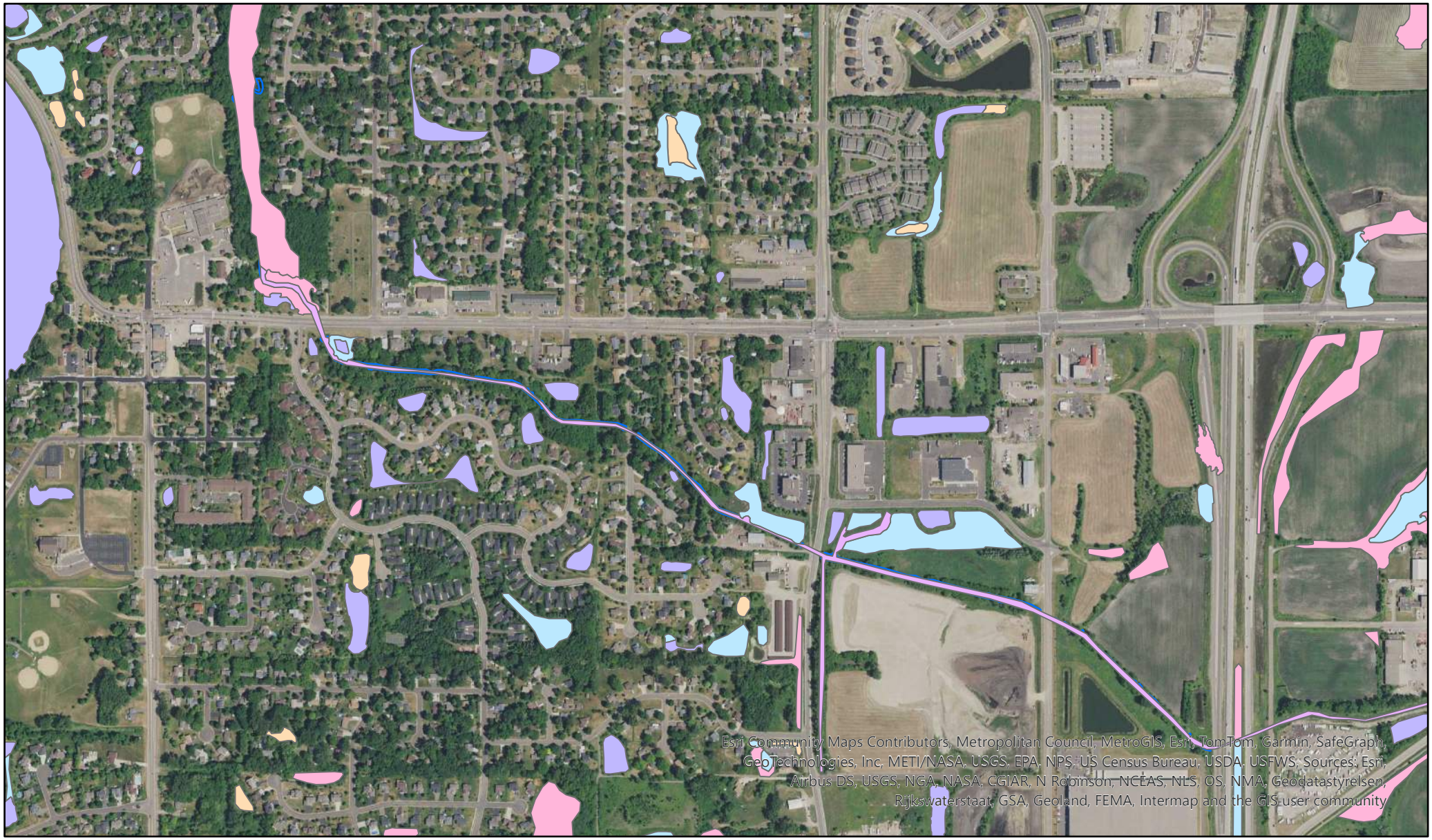


Figure 1: PWI along Clearwater Creek

Drawn by:	Checked by:
CMT	HP
Date:	Project No:
5/30/2024	5555-0349

HOUSTON engineering, inc.

Legend

ACD 52-63

MN State NWI-CIRC39

- 1- Seasonally Flooded Basin or Flat
- 2- Wet Meadow
- 3- Shallow Marsh
- 4-Deep Marsh
- 5-Shallow Open Water
- 6-Shrub Swamp
- 7-Wooded Swamp
- 8-Bog
- Municipal and Industrial Activities
- 90
- <all other values>

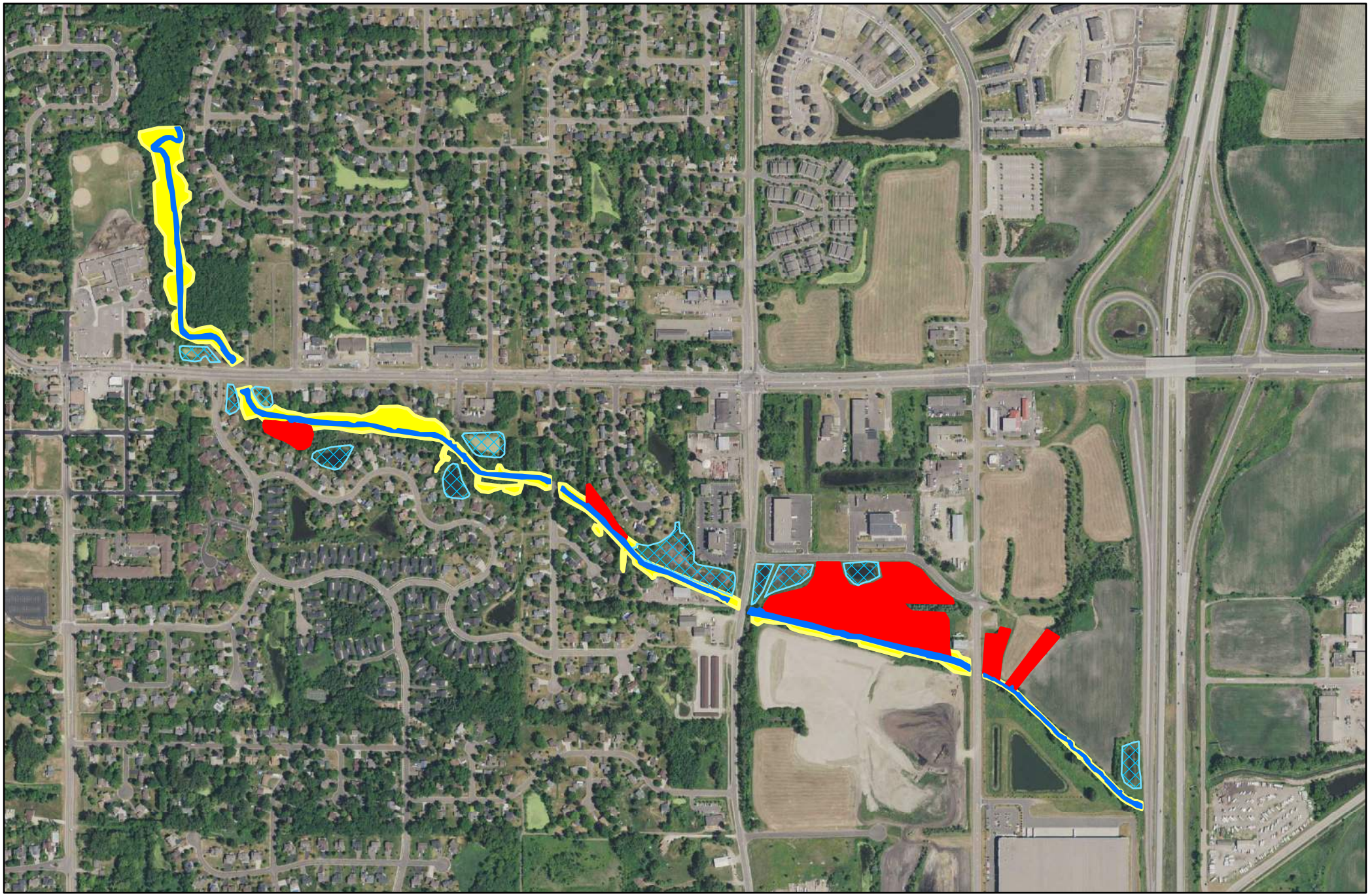


Figure 2: Desktop Delineated Wetlands Adjacent to Clearwater Creek

Drawn by:	Checked by:	Project No:
CMT	HP	5555-0349

Date: 5/30/2024

0 0.1 0.2 Miles

HOUSTON engineering, inc.

N

Legend

- ACD 52-63
- Stormwater Ponds
- Type 3,4,5 Wetlands
- Type 1,2,6,7 Wetlands

APPENDIX D: CORRESPONDENCE

Formal Natural Heritage Review - Cover Page

See next page for results of review. A draft watermark means the project details have not been finalized and the results are not official.

Project Name: Clearwater Creek Stabilization Study

Project Proposer: Houston Engineering, Inc.

Project Type: Natural Resource Management, Drainage & Flood Control

Project Type Activities: Tree Removal;Groundwater Impacts (e.g., contamination, dewatering, change in hydrology, potential for aquifer breach);Waterbody or watercourse impacts (e.g., dewatering, discharge, excavation, fill, runoff, sedimentation, changes in hydrology))

TRS: T31 R22 S14, T31 R22 S23, T31 R22 S24

County(s): Anoka

DNR Admin Region(s): Central

Reason Requested: Other

Project Description: Stabilize existing channel by reducing velocity and flow. Reducing sediment being transported into Lake Peltier.

Existing Land Uses: Judicial Ditch 3. Land use will not change.

Landcover / Habitat Impacted: Minimal impacts. The project will stay mostly within the extent of the existing channel. Could potentially impact some landowners in the remeander section. ...

Waterbodies Affected: Clearwater Creek/ JD3. Lake Peltier will receive less sediment due to the channel updates. All other wetlands and ponds will be avoided.

Groundwater Resources Affected: No change to groundwater resources

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	Comments	Tree Removal - Recommendations
Ecologically Significant Area	No Comments	No Further Review Required
State-Listed Endangered or Threatened Species	Needs Further Review	State-protected Species in Vicinity
State-Listed Species of Special Concern	Comments	Recommendations
Federally Listed Species	No Records	Visit IPaC For Federal Review

DEPARTMENT OF NATURAL RESOURCES

May 13, 2024

Project Name: Clearwater Creek Stabilization Study
Project Proposer: Houston Engineering, Inc.
Project Type: Natural Resource Management, Drainage & Flood Control
Project ID: MCE #2024-00448

AUTOMATED RESULTS: FURTHER REVIEW IS NEEDED
As requested, the above project has undergone an automated review for potential impacts to rare features. Based on this review, one or more rare features may be impacted by the proposed project and further review by the Natural Heritage Review Team is needed. You will receive a separate notification email when the review process is complete and the Natural Heritage Review letter has been posted.

Please refer to the table on the cover page of this report for a summary of potential impacts to rare features. For additional information or planning purposes, use the Explore Page in Minnesota Conservation Explorer to view the potentially impacted rare features or to create a Conservation Planning Report for the proposed project.

If you have additional information to help resolve the potential impacts listed in the summary results, please attach related project documentation in the Edit Details tab of the Project page. Relevant information includes, but is not limited to, additional project details, completed habitat assessments, or survey results. This additional information will be considered during the project review.

Clearwater Creek Stabilization Study

Aerial Imagery With Locator Map

N
W E
S

0 0.17 0.35 0.7 1.05 1.4
Miles

Project_Boundary

Project Type: Natural Resource Management, Drainage & Flood Control

Project Size (acres): 31.09

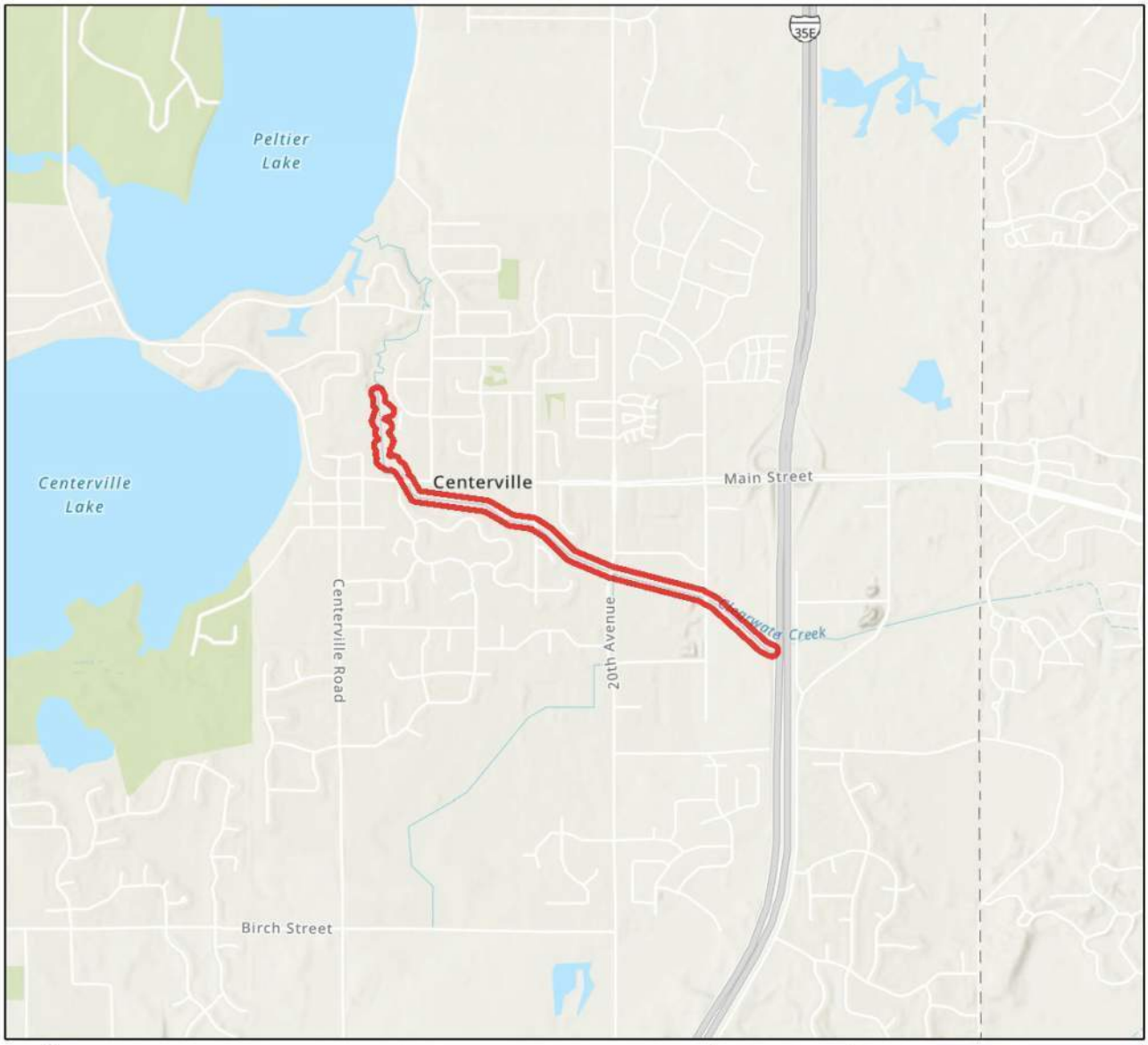
County(s): Anoka

TRS: T31 R22 S14, T31 R22 S23, T31 R22 S24

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Earthstar Geographics
Metropolitan Council, MetroGIS, Esri, TomTom, Garmin, SafeGraph,

Clearwater Creek Stabilization Study

USA Topo Basemap With Locator Map



N
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0 0.17 0.35 0.7 1.05 1.4 Miles

Project_Boundary

Project Type: Natural Resource Management, Drainage & Flood Control

Project Size (acres): 31.09

County(s): Anoka

TRS: T31 R22 S14, T31 R22 S23, T31 R22 S24

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Esri, NASA, NGA, USGS, FEMA
Metropolitan Council, MetroGIS, Esri, TomTom, Garmin, SafeGraph,

Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

June 20, 2024

Rachel Glatt
Houston Engineering

RE: Natural Heritage Review of the proposed Clearwater Creek Stabilization Study,
T31N R22W Sections 14, 23-24; Anoka County

Dear Rachel Glatt,

For all correspondence regarding the Natural Heritage Review of this project please include the project ID **MCE-2024-00448** in the email subject line.

As requested, the Minnesota Natural Heritage Information System has been reviewed to determine if the proposed project has the potential to impact any rare species or other significant natural features. Based on the project details provided with the request, the following rare features may be impacted by the proposed project:

State-listed Species

- Blanding's turtles (*Emydoidea blandingii*), a state-listed threatened species, have been documented in the vicinity of the proposed project. Blanding's turtles use upland areas up to and over a mile distant from wetlands, waterbodies, and watercourses. Uplands are used for nesting, basking, periods of dormancy, and traveling between wetlands. Factors believed to contribute to the decline of this species include collisions with vehicles, wetland drainage and degradation, and the development of upland habitat. Any added mortality can be detrimental to populations of Blanding's turtles, as these turtles have a low reproduction rate that depends upon a high survival rate to maintain population levels.

  This project has the potential to impact this rare turtle through direct fatalities and habitat disturbance/destruction due to excavation, fill, and other construction activities associated with the project. Minnesota's Endangered Species Statute (Minnesota Statutes, section 84.0895) and associated Rules (Minnesota Rules, part 6212.1800 to 6212.2300 and 6134) prohibit the take of threatened or endangered species without a permit. As such, **the following avoidance measures are required**:

- Avoid wetland and aquatic impacts during hibernation season, between September 15 and April 15, if the area is suitable for hibernation. Undercut and eroding banks provide overwintering habitat for these turtles.
- Permanent riprap must have voids filled with gravel, soil, or other material between large stones to avoid entrapping turtles and to maintain connectivity between aquatic and upland habitat. For an example, reference vegetation riprap as described in Best Practices for Meeting DNR General Public Waters Work Permit GP 2004-0001 (state.mn.us) Chapter 1, Page 33
- Limit erosion and sediment control to wildlife friendly erosion control to avoid the inadvertent take of Blanding's turtles.
- Avoid hydro-mulch products that contain any materials with synthetic (plastic) fiber additives, as the fibers can re-suspend and flow into waterbodies.
- The Blanding's turtle flyer must be given to all contractors working in the area.
- Check bare ground within construction areas for turtles before the use of heavy equipment or any ground disturbance.
- Please report any sightings using the Quick Species Observation Form.
- If turtles are in imminent danger, move them by hand out of harm's way; otherwise, they are to be left undisturbed. Directions on how to move turtles safely can be found at Helping Turtles Across the Road.

Please refer to the Blanding's turtle fact sheet for additional recommendations (both lists) that may be relevant to your project.

Please contact Review.NHIS@state.mn.us **to confirm that the above avoidance measures will be implemented or to inform us that they are not feasible.** If the measures are not feasible, a project-specific avoidance plan will likely be needed.

- The Bell's vireo (*Vireo bellii*), a state-listed bird species of special concern, has been documented in the vicinity of the project. In Minnesota, Bell's vireo prefers shrub thickets within or bordering open habitats such as grasslands or wetlands. This bird suspends its nests from forks of low branches of small trees or shrubs. If feasible, avoid tree & shrub removal from May 15th through August 15th to avoid disturbance of nesting birds.

- The Natural Heritage Information System (NHIS) tracks bat roost trees and hibernacula plus some acoustic data, but this information is not exhaustive. Even if there are no bat records listed nearby, all of Minnesota's bats, including the federally endangered northern long-eared bat (*Myotis septentrionalis*), can be found throughout Minnesota. During the active season (approximately April-November) bats roost underneath bark, in cavities, or in crevices of both live and dead trees. Tree removal can negatively impact bats by destroying roosting habitat, especially during the pup rearing season when females are forming maternity roosting colonies

and the pups cannot yet fly. To minimize these impacts, **the DNR recommends that tree removal be avoided from June 1 through August 15.**

- Please visit the DNR Rare Species Guide for more information on the habitat use of these species and recommended measures to avoid or minimize impacts.

Federally Protected Species

- To ensure compliance with federal law, conduct a federal regulatory review using the U.S. Fish and Wildlife Service's (USFWS) online Information for Planning and Consultation (IPaC) tool.

Environmental Review and Permitting

- Please include a copy of this letter and the MCE-generated Final Project Report in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location and project description provided with the request. If project details change or the project has not occurred within one year, please resubmit the project for review within one year of initiating project activities.

The Natural Heritage Review does not constitute project approval by the Department of Natural Resources. Instead, it identifies issues regarding known occurrences of rare features and potential impacts to these rare features. Visit the Natural Heritage Review website for additional information regarding this process, survey guidance, and other related information. For information on the environmental review process or other natural resource concerns, you may contact your DNR Regional Environmental Assessment Ecologist.

Thank you for consulting us on this matter and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

James Drake

Digitally signed by James Drake
Date: 2024.06.20 12:19:44 -05'00'

Natural Heritage Review Specialist
James.F.Drake@state.mn.us

Cc: Melissa Collins

DEPARTMENT OF NATURAL RESOURCES

CENTRAL REGION
1200 WARNER ROAD
SAINT PAUL, MN 55106
651-259-5800

May 20, 2024 SENT VIA EMAIL

Chris Otterness
Houston Engineering, Inc.
District Engineer, Rice Creek Watershed District
4325 Pheasant Ridge Dr. NE
Blaine, MN 55449

Re: DNR Comments on Proposed Work to Anoka-Washington Judicial Ditch 3, Main Trunk

Dear Mr. Otterness:

Thank you for initiating review of the Rice Creek Watershed District's proposed work to Anoka-Washington Judicial Ditch 3 (JD3) Main Trunk. DNR staff met with your team on April 29, 2024 to discuss work contemplated on the JD3 Main Trunk in Anoka County, from the crossing at I-35E to the JD3 terminus adjacent to Centerville elementary school.

We understand the work involves ditch cleaning throughout the approximately 7,500 foot segment, as well as concepts such as establishing a two-stage channel in the upper segment and re-meandering the ditch in the lower segment. The categorization of this work as repair or project per M.S. 103E was not established during our early coordination meeting.

A review of our public waters inventory information indicates there are no public waters that intersect the proposed work area. The proposed work does not appear to affect or potentially affect a public water basin, wetland or watercourse.

DNR staff recommended that a DNR public waters work permit, or a DNR Letter of Permission, is not required for the proposed work. DNR Ecological and Water Resources division's senior manager concurred with this recommendation. The proposed work to JD3 Main Trunk, as described herein, requires no DNR public waters work authorization.

We appreciate the opportunity to review and comment on the proposed work to Judicial Ditch 3 Main Trunk. Please contact me directly at wes.saunders-pearce@state.mn.us if you have any additional questions.

Sincerely,

Wes Saunders-Pearce
North Metro Area Hydrologist

ec. Nick Tomczik, RCWD District Administrator
Adam Nies, Houston Engineering
Dan Lais, Regional Manager
Jack Gleason, Hydrologist Supervisor

Record ID 3955307

2150438.005

When Recorded Return to L.Terry
First American Title Insurance Company
National Commercial Services
801 Nicollet Mall, Suite 1900
Minneapolis, MN 55402
File No. NCS - 773837-MPLS
(5)

_____ (Above Space is Reserved for Recording Information) _____

CONSERVATION EASEMENT

1. For the sum of one dollar and other valuable consideration, United Properties Development LLC, a limited liability company organized under the laws of Minnesota ("Grantor"), hereby conveys to the City of Lino Lakes, a municipal corporation organized under the laws of the State of Minnesota (City) an easement on and under the parcel lying in Anoka County, Minnesota, and legally described as follows:

Lot 1, Block 1, Clearwater Creek Business Park

("Burdened Property").

2. Exhibit "A", appended hereto and incorporated herein, delineates the area subject to this easement ("Easement Area"). This easement grants the City and its authorized representatives the right in perpetuity to enter the Easement Area to monitor, modify and maintain hydrological and vegetative conditions, including the right to:

a. Alter land contours and realign channels within the Easement Area.

b. Direct and redirect surface water flows; flood or drain lands, wholly or partly; and otherwise preserve surface flows through the Easement Area. This does not include the right to increase flood elevation, or drain or redirect surface flows on or across any lands outside of the Easement Area.

c. Install, operate, maintain and remove structures to manage water flow and water elevation.

d. Plant, remove and otherwise manage vegetation through means including but not limited to mowing, weeding, use of approved herbicides and controlled burns.

e. Install, maintain and remove sign or markers identifying Easement Area boundaries or describing terms applicable to the Easement Area.

f. Install, operate, maintain and remove equipment to sample or monitor soils, surface water or groundwater, including appurtenances such as power supply for the equipment.

g. Ingress and egress, equipment staging and use, material stockpiling and other actions as reasonably necessary or convenient for the work described.

3. Grantor also conveys to the City and its authorized representatives the right to cross and recross the Burdened Property to reach the Easement Area. The route will be determined through mutual consultation, but will provide a reasonable means of access. If a route cannot be mutually determined after reasonable effort, the City may cross and recross in a manner that minimizes disruption and damage to the Burdened Property. The City will repair or compensate Grantor for any damage to the Burdened Property.

4. Grantor reserves all rights and privileges associated with ownership of the Burdened Property except as specifically provided in this Easement. Grantor will not place any structure or improvement within, on or under the Easement Area; remove, destroy, cut, mow or otherwise alter vegetation within the Easement Area, or apply fertilizers, herbicides or pesticides on or to the Easement Area; fill, excavate or otherwise alter land contours within the Easement Area; or place waste material, including waste vegetation, permanently or temporarily within the Easement Area. Notwithstanding, Grantor may:

a. With prior written approval of City staff (not to be unreasonably withheld, conditioned or delayed), construct or install and maintain a structure or improvement for passive use of or recreation within the Easement Area, including bituminous trail and boardwalk no more than 8 feet in width with a surface area not to exceed 10,000 square feet, which may not be subject to motorized vehicle use by Grantor or anyone operating under Grantor's permission;

b. Build, maintain and replace typical agricultural fences on and over the Easement Area if surface flows are not restricted;

c. With prior written approval of City staff (not to be unreasonably withheld, conditioned or delayed), install and maintain utility system components including, without limitation, water, sanitary sewer, storm sewer, power, fuel, and communications lines and related facilities;

d. With prior written approval of City staff (not to be unreasonably withheld, conditioned or delayed), manage vegetation to prevent or control infestation, noxious weeds, disease, fire, personal injury or property damage, or to improve the hydrological function and value of the water resources within or associated with the Easement Area;

e. With prior written approval of City staff (not to be unreasonably withheld, conditioned or delayed), locate stormwater management facilities within the Easement Area.

5. No one other than Grantor holds any right, title or interest in the Easement Area or any part thereof.

6. This Easement extends only to the City, its successors and assigns, and their authorized representatives, and grants no right of access to the Burdened Property to any other party or member of the public.

7. This Easement is unlimited in duration without being re-recorded, and will run with and burden the Burdened Property and bind Grantor, Grantor's successors and assigns, and all those who use the Burdened Property by right of the Grantor. This easement is appurtenant to the surface waters and related water resources lying on and proximate to the Burdened Property and the protection of which lies within the mandate and authority of the Rice Creek Watershed District pursuant to Minnesota state statutes.

IN WITNESS WHEREOF, this 29 day of September, 2016.

UNITED PROPERTIES DEVELOPMENT LLC,
a Minnesota limited liability company

By: _____

Its: VP

STATE OF MINNESOTA

COUNTY OF Hennepin

The foregoing instrument was acknowledged before me this 29 day of September, 2016, by Brandon Champeau, the VP of United Properties Development LLC, a Minnesota limited liability company, on behalf of the Company.

_____
Notary Public

MARISSA J. ULSTAD
Notary Public
State of Minnesota
My Commission Expires
January 31, 2019

This Document was Drafted By:

City of Lino Lakes
600 Town Center Parkway
Lino Lakes, MN 55014

EXHIBIT "A"
(Delineation of Easement Area)

EASEMENT SKETCH FOR:

UNITED PROPERTIES

DESCRIPTION FOR CONSERVATION EASEMENT

An easement over and across that part of Lot 1, Block 1 and Outlot A, CLEARWATER CREEK BUSINESS PARK, according to the recorded plat thereof, Anoka County, Minnesota, lying southwesterly of a line drawn 70.00 feet northeasterly of the southwesterly line of said Outlot A and lying northeasterly of a line described as commencing at the northwest corner of said Lot 1; thence South 00 degrees 29 minutes 43 seconds West, assumed bearing, along the west line of said Lot 1 a distance of 191.39 feet to the point of beginning of the line to be described; thence South 61 degrees 29 minutes 43 seconds East 70.08 feet; thence South 47 degrees 27 minutes 50 seconds East 383.13 feet; thence South 43 degrees 29 minutes 10 seconds East 112.90 feet; thence South 46 degrees 50 minutes 59 seconds East 149.97 feet; thence South 43 degrees 12 minutes 18 seconds East 58.78 feet; thence North 89 degrees 46 minutes 52 seconds East 143.44 feet; thence South 61 degrees 53 minutes 12 seconds East 151.31 feet; thence South 89 degrees 18 minutes 38 seconds East 21.08 feet to an angle point in the east line of said Lot 1, said angle point being 42.01 feet south of the northeast corner of said Lot 1 and said line there terminating.

I hereby certify that this sketch, plan, or report was prepared by me or under my direct supervision and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

Dated this 9th day of August, 2016

SUNDE LAND SURVEYING, LLC.

By: Mark S. Hanson

Mark S. Hanson, P.L.S. Minn. Lic. No. 15480

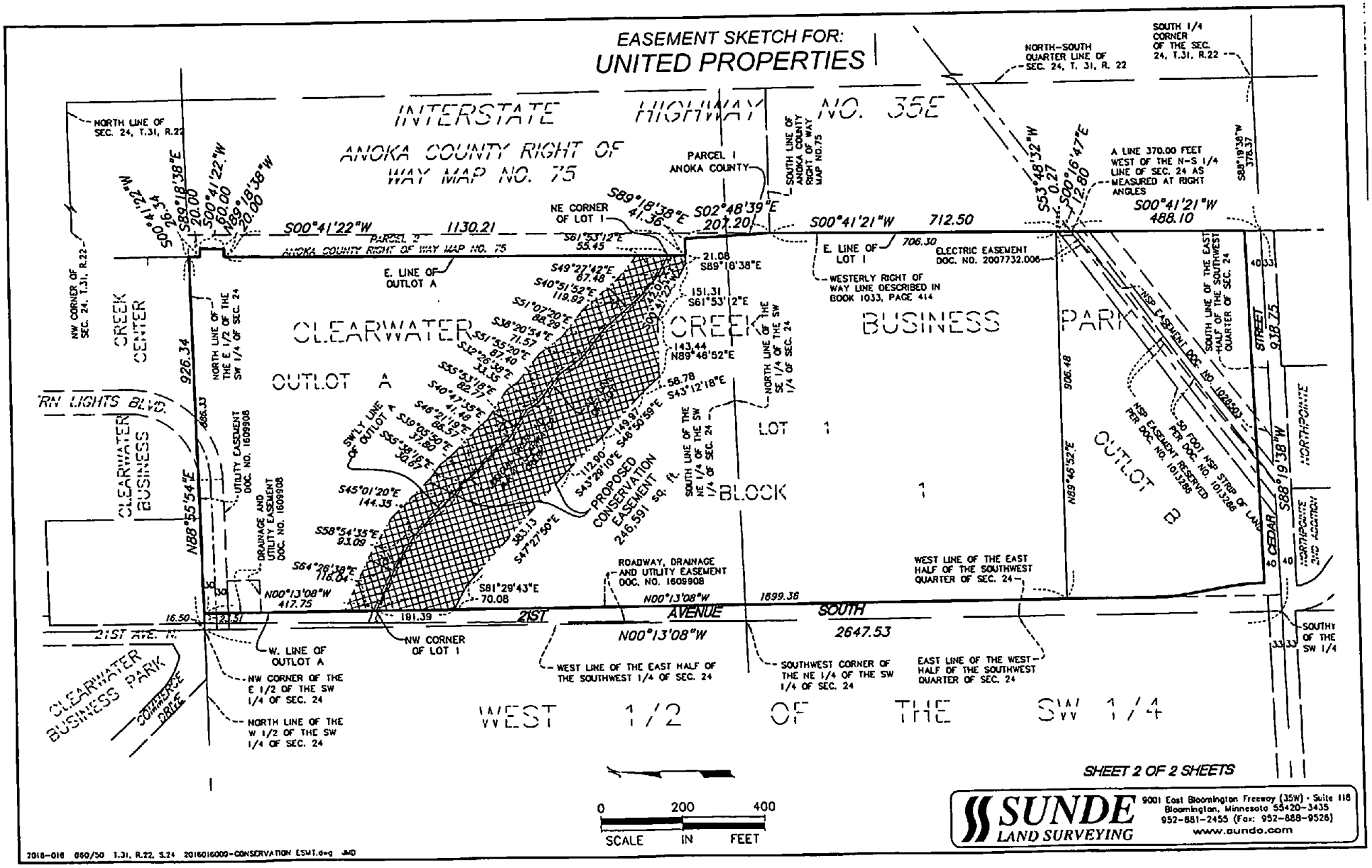
GENERAL NOTE

1.) The plat of Creekwater Business Park has not been recorded as of the date of this sketch.

SHEET 1 OF 2 SHEETS

SUNDE LAND SURVEYING
9001 East Bloomington Freeway (35W) - Suite 118
Bloomington, Minnesota 55420-3435
952-881-2455 (Fax: 952-888-9526)
www.sunde.com

2016-016 660/56 T.31, R.22, S.24 2016016000-CONSERVATION ESMT.dwg JMD


EASEMENT SKETCH FOR:
UNITED PROPERTIES
INTERSTATE HIGHWAY NO. 35E
ANOKA COUNTY RIGHT OF WAY MAP NO. 75
PARCEL 1 ANOKA COUNTY
SOUTH LINE OF ANOKA COUNTY RIGHT OF WAY MAP NO.75
NORTH-SOUTH QUARTER LINE OF SEC. 24, T. 31, R. 22
SOUTH 1/4 CORNER OF THE SEC. 24, T.31, R.22
NORTH LINE OF SEC. 24, T.31, R.22
NW CORNER OF SEC. 24, T.31, R.22
NE CORNER OF LOT 1
PARCEL 2
ANOKA COUNTY RIGHT OF WAY MAP NO. 75
E. LINE OF OUTLOT A
E. LINE OF LOT 1
WESTERLY RIGHT OF WAY LINE DESCRIBED IN BOOK 1033, PAGE 414
ELECTRIC EASEMENT DOC. NO. 2007732.006
A LINE 370.00 FEET WEST OF THE N-S 1/4 LINE OF SEC. 24 AS MEASURED AT RIGHT ANGLES
CREEK CENTER
CLEARWATER CREEK BUSINESS PARK
OUTLOT A
LOT 1
BLOCK 1
OUTLOT B
NORTHPOINTE
NORTHPOINTE 2ND ADDITION
CEDAR STREET
RIVER LIGHTS BLVD.
CLEARWATER BUSINESS PARK
COMMERCE DRIVE
21ST AVE. N.
21ST AVENUE SOUTH
NORTH LINE OF THE E 1/2 OF THE SW 1/4 OF SEC. 24
SOUTH LINE OF THE NE 1/4 OF THE SW 1/4 OF SEC. 24
NORTH LINE OF THE SE 1/4 OF THE SW 1/4 OF SEC. 24
SOUTH LINE OF THE EAST HALF OF THE SOUTHWEST QUARTER OF SEC. 24
UTILITY EASEMENT DOC. NO. 1609908
DRAINAGE AND UTILITY EASEMENT DOC. NO. 1609908
ROADWAY, DRAINAGE AND UTILITY EASEMENT DOC. NO. 1609908
50 FOOT NSP STRIP OF LAND PER DOC. NO. 1013288
NSP EASEMENT RESERVED PER DOC. NO. 1013289
NSP EASEMENT DOC. NO. 1026503
PROPOSED CONSERVATION EASEMENT 246,591 sq. ft.
W. LINE OF OUTLOT A
NW CORNER OF LOT 1
NW CORNER OF THE E 1/2 OF THE SW 1/4 OF SEC. 24
NORTH LINE OF THE W 1/2 OF THE SW 1/4 OF SEC. 24
WEST LINE OF THE EAST HALF OF THE SOUTHWEST 1/4 OF SEC. 24
SOUTHWEST CORNER OF THE NE 1/4 OF THE SW 1/4 OF SEC. 24
EAST LINE OF THE WEST HALF OF THE SOUTHWEST QUARTER OF SEC. 24
SOUTH OF THE SW 1/4
WEST 1/2 OF THE SW 1/4
S00°41'22"W 1130.21
S89°18'38"E 41.36
S02°48'39"E 207.20
S00°41'21"W 712.50
S53°48'32"W 0.27
S00°16'47"E 12.80
S00°41'21"W 488.10
S88°19'38"W 378.37
S88°19'38"W 938.75
N88°55'54"E 926.34
N00°13'08"W 417.75
N00°13'08"W 1699.36
N00°13'08"W 2647.53
S81°29'43"E 70.08
191.39
16.50
12.37
706.30
906.48
N89°46'52"E
143.44
151.31
S61°53'12"E
55.45
21.08
S89°18'38"E
S43°12'18"E 58.78
S45°01'20"E 144.35
S58°54'35"E 93.09
S64°26'38"E 116.04
S47°27'50"E 383.13
S46°30'59"E 149.97
S43°28'10"E 112.90
S49°27'42"E 67.48
S40°51'52"E 119.92
S51°07'20"E 88.29
S38°20'54"E 71.57
S51°55'50"E 67.40
S32°26'39"E 34.35
S55°53'18"E 82.71
S40°47'39"E 41.48
S46°21'19"E 86.57
S39°05'50"E 97.80
S55°38'16"E 30.67
SW'LY LINE OF OUTLOT A
SCALE 0 200 400 IN FEET
SHEET 2 OF 2 SHEETS
SUNDE LAND SURVEYING
9001 East Bloomington Freeway (35W) - Suite 118
Bloomington, Minnesota 55420-3435
952-881-2455 (Fax: 952-888-9526)
www.sunde.com
2018-016 660/50 T.31, R.22, S.24 20180160000-CONSERVATION ESMT.dwg JMD

ANOKA COUNTY MINNESOTA
Document No.: 2150438.005 ABSTRACT
I hereby certify that the within instrument was filed in this office for record on: 10/03/2016 11:27:00 AM
Fees/Taxes In the Amount of $46.00
JONELL M. SAWYER
Anoka County Property Tax Administrator/Recorder/Registrar of Titles
MEW, Deputy

Record ID: 3955307

APPENDIX E: COST

				Re-Meander		Cleanout		Full Build Out Two-Stage Ditch		Partial Two-Stage Ditch	
No.	**Item Description**	**Units**	***Unit Price***	**Quantity**	***Extension***	**Quantity**	***Extension***	**Quantity**	***Extension***	**Quantity**	***Extension***
1	Mobilization	Lump Sum			*$20,000.00*		*$20,000*		*$20,000*	0.33	*$20,000*
2	Common Excavation	Cubic Yard	*$6.00*	6100	*$36,600.00*	500	*$3,000*	42600	*$256,000*	15000	*$90,000*
3	Spoil Management	Cubic Yard	*$10.00*	0	*$0.00*	500	*$5,000*	0	*$0*	0	*$0*
4	Haul Away	Cubic Yard	*$12.00*	7420	*$89,100.00*	0	*$0*	59640	*$716,000*	21000	*$252,000*
5	Tree Clearing, and Removal	Acre	*$20,000.00*	2.0	*$40,000.00*	3.0	*$60,000*	2.0	*$40,000*	2.0	*$40,000*
6	Water Control	Lump Sum			*$10,000.00*		*$10,000*		*$10,000*		*$10,000*
7	Hydro-Seeding	Acre	*$5,000.00*	2.0	*$10,000.00*	3.0	*$15,000*	2.0	*$10,000*	2.0	*$10,000*
8	Silt Fence; Type PA	Linear Foot	*$5.00*	2900	*$14,500.00*	3300	*$17,000*	2600	*$13,000*	2600.0	*$13,000*
9	SWPPP Documentation and Management	Lump Sum			*$3,000.00*		*$3,000*		*$3,000*		*$3,000*
10	Random Riprap Class III	Cubic Yard	*$120.00*	1000	*$120,000.00*	0	*$0*	0	*$0*	0	*$0*
	Subtotal				$343,200.00		$133,000.00		$1,068,000.00		$438,000.00
	20% contingency				*$68,700.00*		*$26,600.00*		*$213,600.00*		*$87,600.00*
	Total:				***$411,900.00***		***$159,600.00***		***$1,281,600.00***		***$525,600.00***

Engineering / Legal / Administrative Costs have not been considered within this opinion of cost and will vary depending on alternative(s) chosen.

APPENDIX F: PHOTOS

Figure 1: Between I-35E and 21st Ave

Figure 2: Between 21st Ave and 20th Ave

Figure 3: Between 20th Ave and Brian Dr

Figure 4: Between Brian Dr and Main St

Figure 5: Straightened Channel near the school

Figure 6: Meandered Section near Clearwater Rd

Figure 7: Steep Bank by Old Mill Rd

Figure 8: Meandered section before Peltier

Clearwater Creek Stabilization Feasibility Study

August 12th 2024
Board Workshop

Rice Creek
Watershed District

1

What We'll Discuss

SUMMARIZE OUR TECHNICAL ANALYSIS COMPLETED TO DETERMINE FEASIBILITY OF ALTERNATIVES

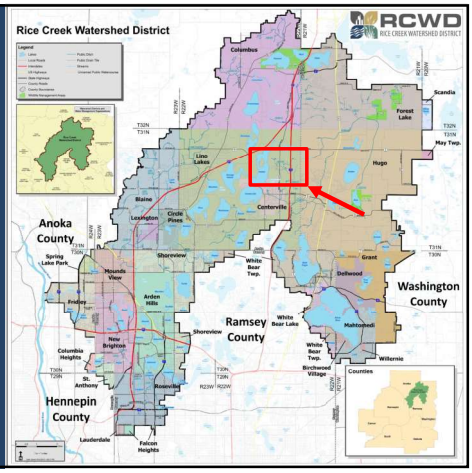
PHOTOGRAPHIC "WALK THROUGH" OF SITE CONDITIONS

DIALOGUE ON NEXT STEPS

2

Location/ Condition

- Downstream of I-35E
- Outlets to Peltier Lake
- Sediment plume
- Bank sloughing
- Residential/ commercial proximity
- Stormwater BMPs



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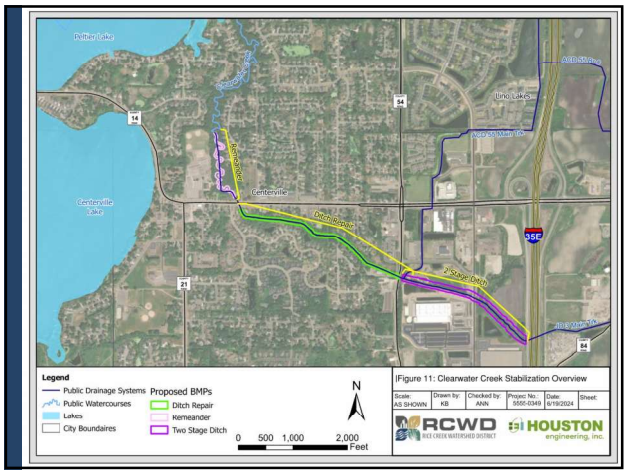


4

Bank Erosion Cottonwood in the ditch

5

Bank Sloughing Deadfall

6


Stormwater
Pond Outlets
and Structures
RCWD

7


Bank Sloughing
Trees in Ditch
RCWD

10


Bank
Sloughing
RCWD

8


More Oufalls
and Stream
Gage Devices
RCWD

11


Backyards
right up to
edge of ditch
RCWD

9

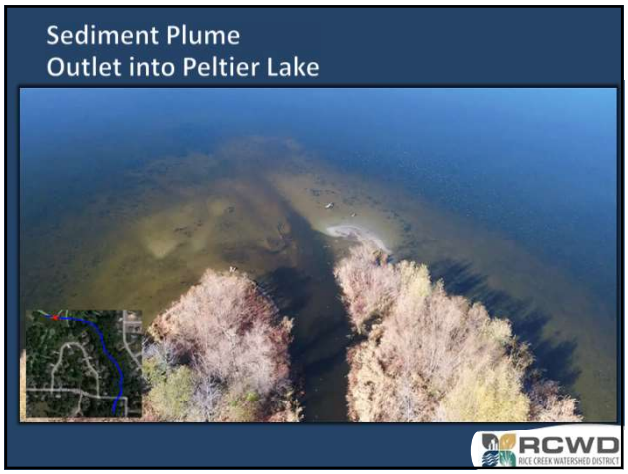

Rock
Revetments
RCWD

12

13

14

15



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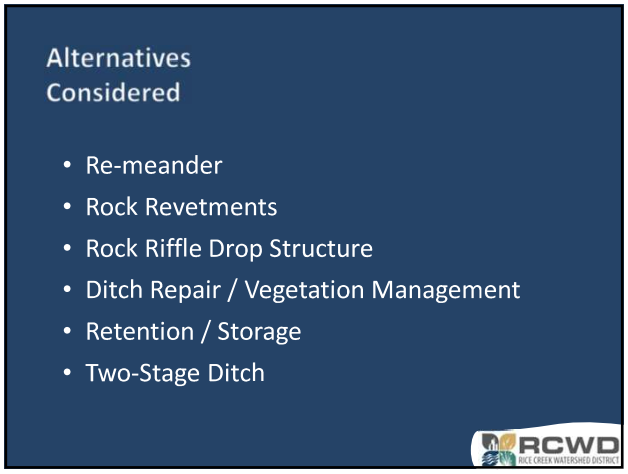
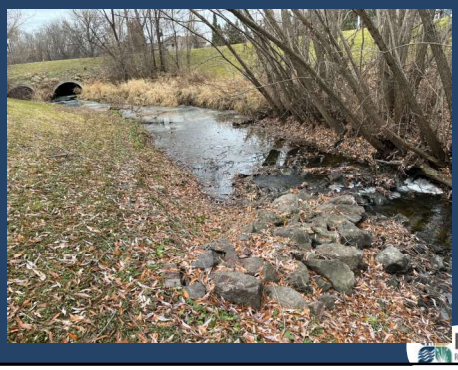


17

18

Rock Revetment



19

Channel Armoring

20

Rock Riffle Drop Structure

21

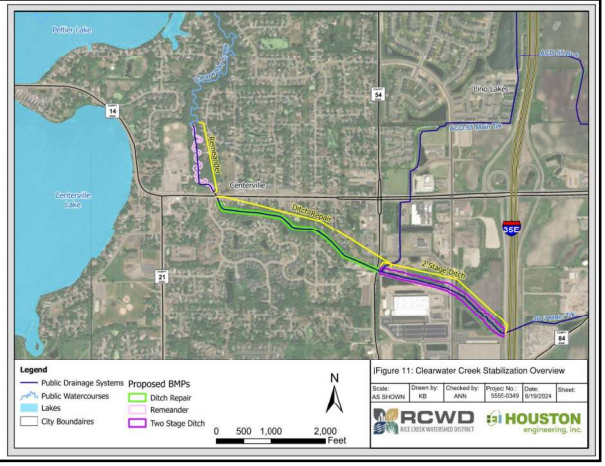
Two-Stage Ditch

22

Alternatives Considered

- Re-meander
- Rock Revetments
- Rock Riffle Drop Structure
- Ditch Repair / Vegetation Management
- Retention / Storage
- Two-Stage Ditch

23



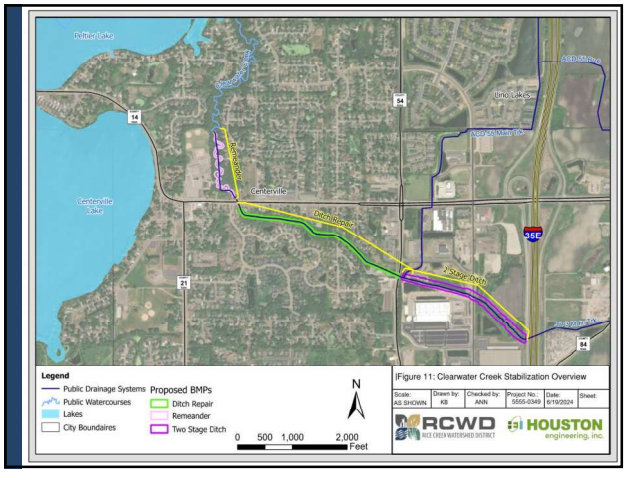
24

25

Two – Stage Ditch
Alternatives "Full" or "Partial"

- Earthwork is typically VERY expensive
- BWSR guidelines for two-stage ditch capacity
- Reduced footprint alternative cuts down on earthwork costs, and limits the amount of new land acquisition required
- Less benefit than full build, but still see good reductions in velocity

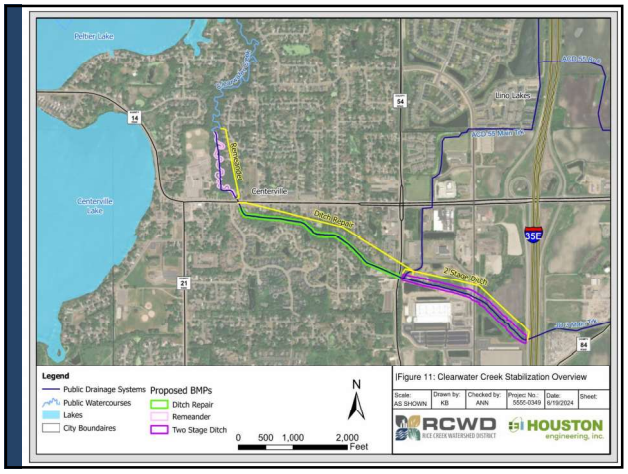
26



27

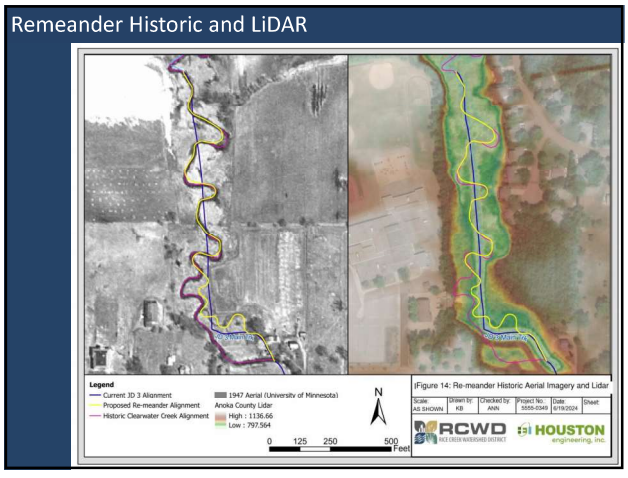
Ditch Repair

28



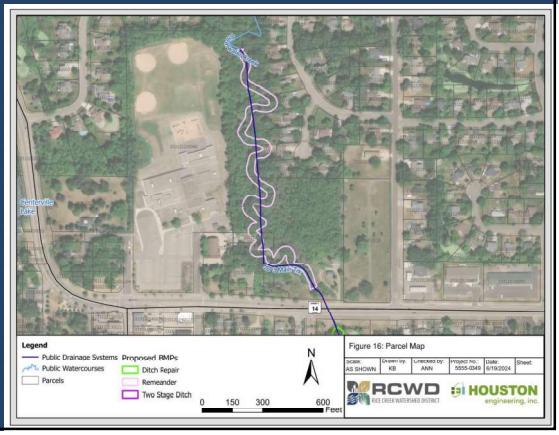
29

Remeander Historic and LiDAR



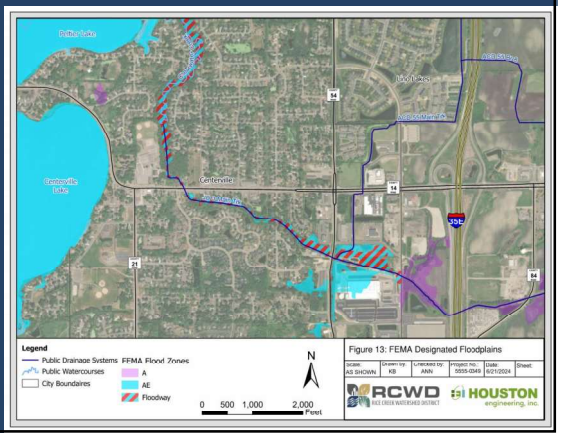
30

Parcels



31

FEMA Flood Zones



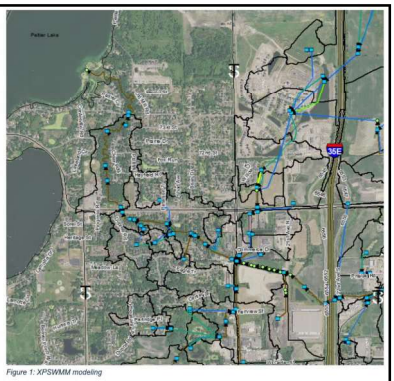
32

XPSWMM Modeling

District-wide model

Modifications to reach lengths, cross sections, storage curves

NOAA Atlas 14 rain 2-, 10-, 100-year events



RCWD

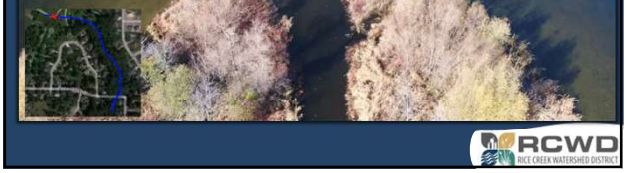
33

Project Benefits

Reduction in Sediment contributions downstream to Peltier Lake

Reduced maintenance obligation regarding ditch stability

Reduced frequency of flooding pressure along roadways



RCWD

34

Early Coordination

DEPARTMENT OF NATURAL RESOURCES

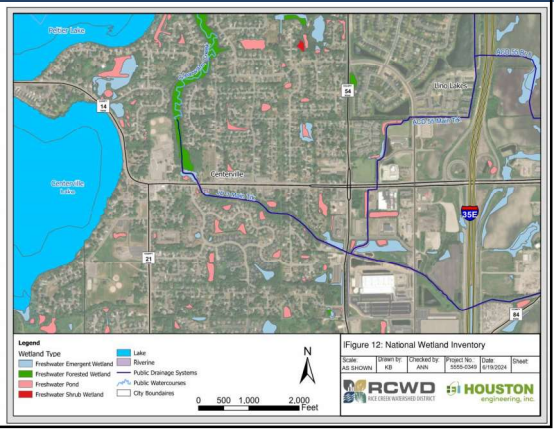
DNR staff recommended that a DNR public waters work permit, or a DNR Letter of Permission, is not required for the proposed work.

The proposed work to JD3 Main Trunk, as described herein, requires no DNR public waters work authorization.

RCWD

35

National Wetland Inventory



36

NHIS Review

DEPARTMENT OF NATURAL RESOURCES

- Blanding's Turtle
  - Avoid wetland disturbance during hibernation September 15 – April 15
  - Many construction best practices
- Bell's Vireo bird
  - Avoid tree & shrub removal May 15 – August 15
- Northern Long Eared Bat
  - Avoid tree removal June 1 – August 15

RCWD RICE CREEK WATERSHED DISTRICT

37

Preliminary Opinion of Probable Construction Cost

Alternative	Estimated Opinion of Cost
Re-meander	$412,000
Cleanout	$160,000
Two – Stage Ditch (Full)	$1,282,000
Two – Stage Ditch (Partial)	$526,000
Total Estimate Project Cost	$1.1M – $1.9M

Engineering / Legal / Administrative costs not included.
Estimated Engineering fees are likely $225,000 or more.
Easements are likely to be required and are not included.

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Potential Future Outside Funding Sources

- Clean Water Fund Grant (CWF)
- Multi-purpose Drainage Management Grant
- Watershed Based Implementation Funds (WBIF)

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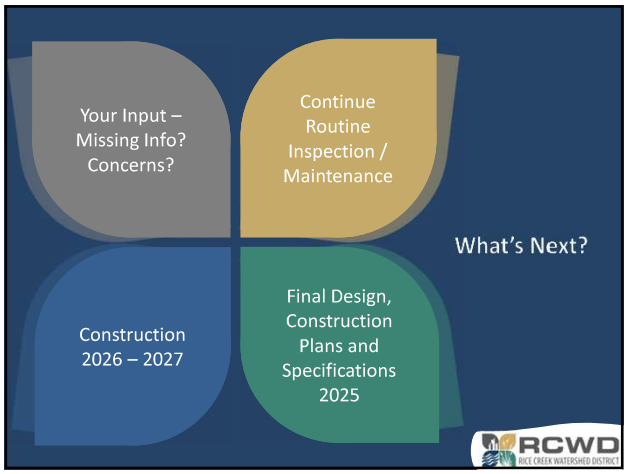

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