

BROWN'S CREEK WATERSHED DISTRICT

455 HAYWARD AVE N
OAKDALE, MN
55128

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651.330.7747 [FAX]
WWW.BCWD.ORG

BCWD Board/Citizen Advisory Committee Tour August 30th 5:30-8:00pm

A: Brown's Creek Park: 5:30-6:00pm

- Future Brown's Creek restoration project
- Presentation of award to Andy Weaver and Glen Boettcher

B: Mendel Wetland (Drive by, approx. 6:05pm)

- History of restoration planning

C: Brown's Creek Conservation Area: 6:10-6:40pm

- Restoration of site

D: Rice property (Drive by, approx. 6:40pm)

- Historic flooding project

E: Goggins and South School Section (Drive by, approx. 6:45pm)

- Hydrologic background and Curly Leaf Pondweed management

F: Liberty Classical Academy (Drive by, approx. 6:55pm)

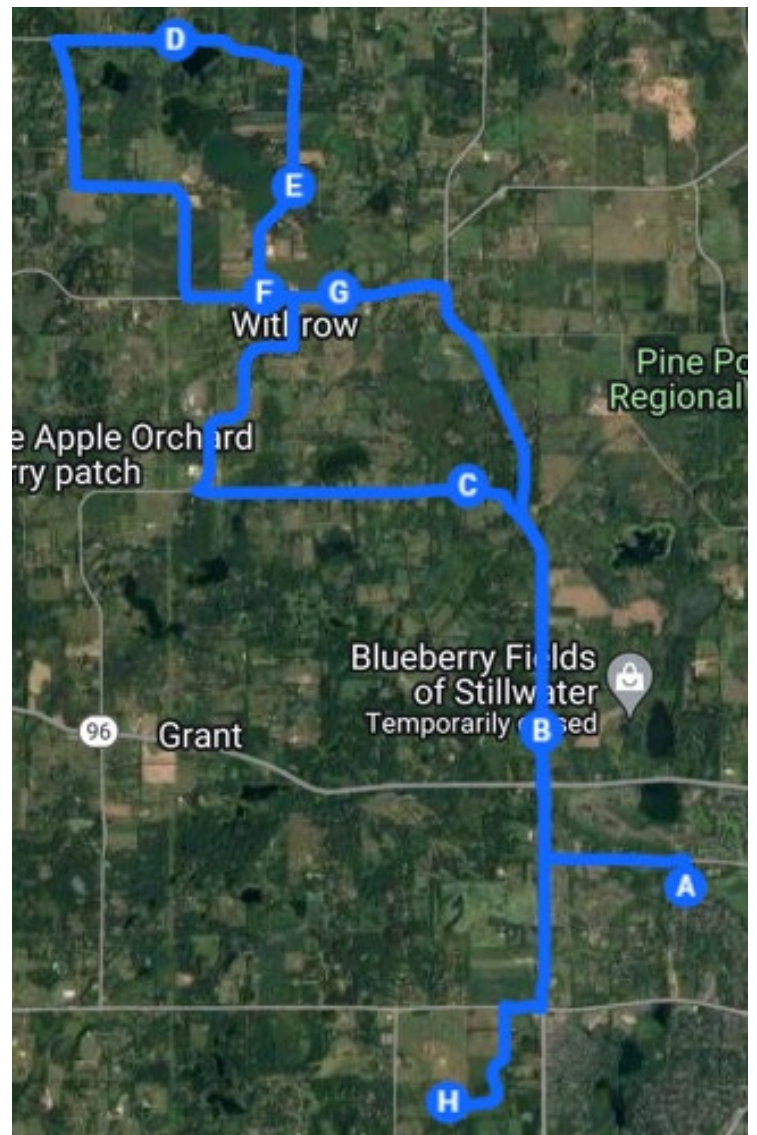
- Opportunity for future collaboration of school acquired property
- Permit #22-07 Raingarden

G: THPP outlet and DeWolf Wetland (Drive by and park, approx. 7:05pm)

- View THPP outlet and the DeWolf wetland which serves as pre-treatment for the THPP project

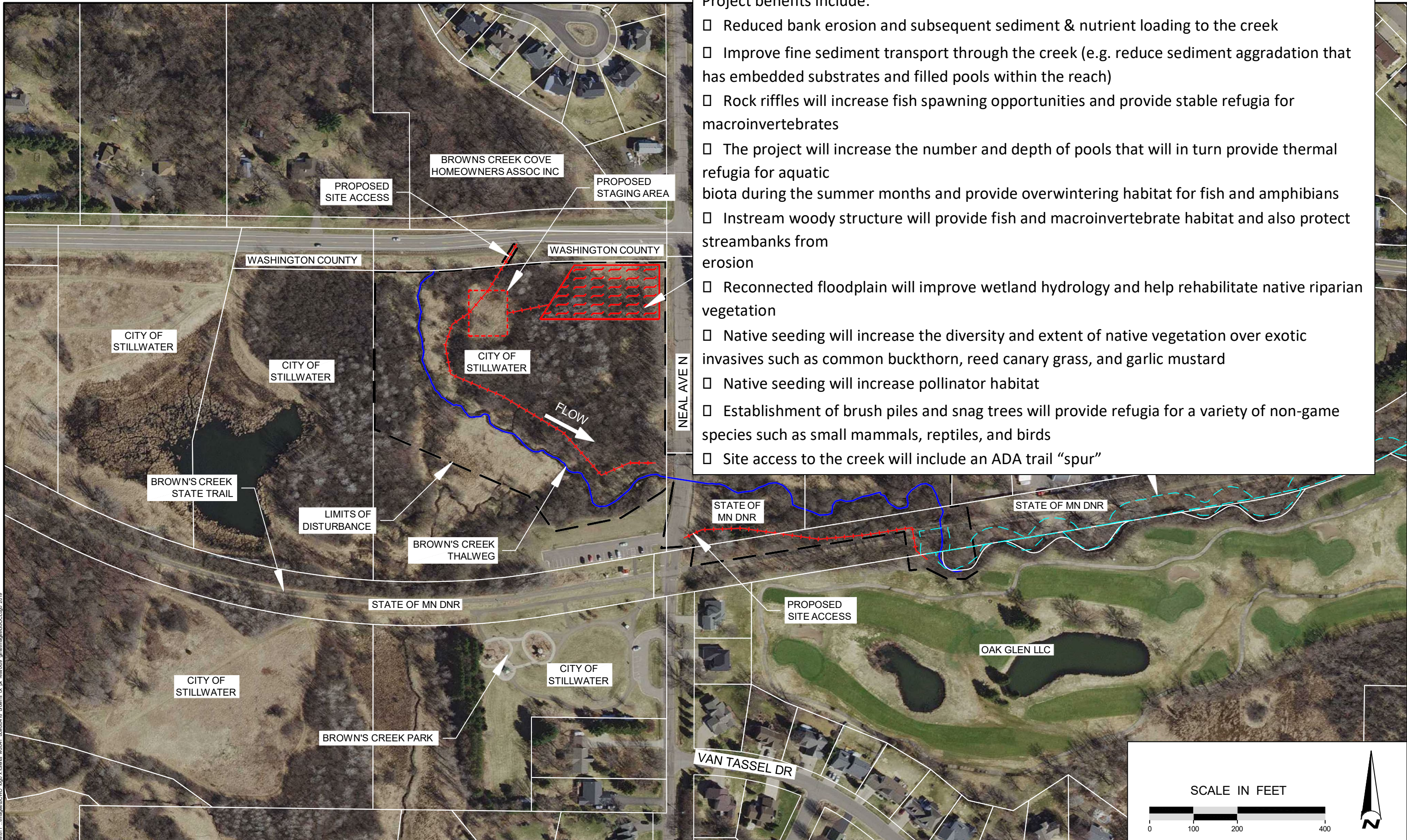
H: White Oak Savannah: 7:25-7:45pm

- Discuss elements of the district inspection and permitting program



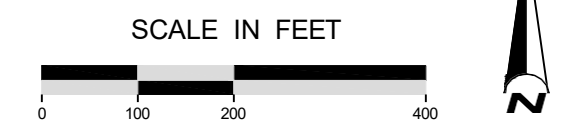
Managers:

Klayton Eckles, President • Celia Wirth, Vice-President • Gerald Johnson, Treasurer • Chuck LeRoux, Secretary



Project benefits include:

- Reduced bank erosion and subsequent sediment & nutrient loading to the creek
- Improve fine sediment transport through the creek (e.g. reduce sediment aggradation that has embedded substrates and filled pools within the reach)
- Rock riffles will increase fish spawning opportunities and provide stable refugia for macroinvertebrates
- The project will increase the number and depth of pools that will in turn provide thermal refugia for aquatic biota during the summer months and provide overwintering habitat for fish and amphibians
- Instream woody structure will provide fish and macroinvertebrate habitat and also protect streambanks from erosion
- Reconnected floodplain will improve wetland hydrology and help rehabilitate native riparian vegetation
- Native seeding will increase the diversity and extent of native vegetation over exotic invasives such as common buckthorn, reed canary grass, and garlic mustard
- Native seeding will increase pollinator habitat
- Establishment of brush piles and snag trees will provide refugia for a variety of non-game species such as small mammals, reptiles, and birds
- Site access to the creek will include an ADA trail "spur"




File Date: 09/29/2023
 Project: Browns_Creek_WD041_BCD0418_Browns_Ck_Pk_Restor09_GNISMap041_0418-CD.dwg
 Xrefs: 40041_0418-SURFACE
 40041_0418-XBASE
 40041_0418-PRASE
 40041_0418-LBASE
 Images: \Images\BCVD_top_xrefs.wd041_bcd0418_browns_ck_pk_restor09_gnis\Images\SSC041.dwg 2/19

EOR water ecology community
 EMMONS & OLIVIER RESOURCES, INC.
 1919 UNIV. AVE. W. #300 ST. PAUL, MN
 TEL: 651.770.8448 WWW.EORINC.COM

NOT FOR CONSTRUCTION

DATE	NO.	DESCRIPTION
06/30/2023	1	30% DESIGN PLAN SET
	2	
	3	
	4	
	5	
	6	

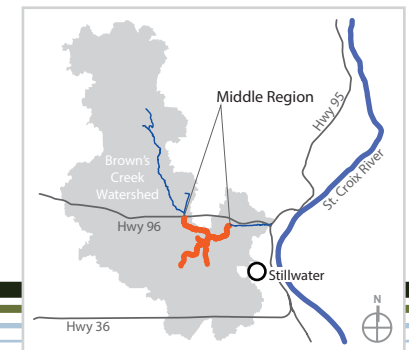
DESIGNED BY: EOR
 DRAWN BY: DEM
 CHECKED BY: MJM
 EOR JOB #0041-0418
 CLIENT PROJECT #XXX-XXXX



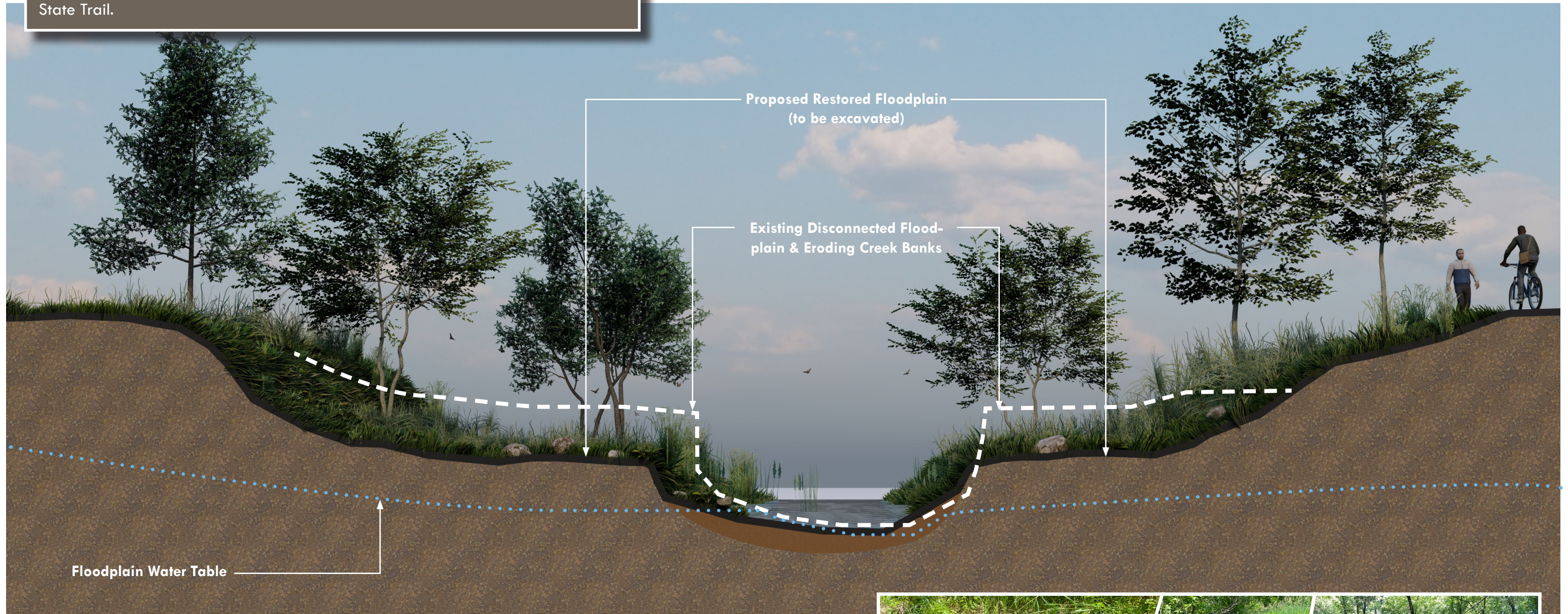
**BROWN'S CREEK PARK
 STREAM RESTORATION**
 WASHINGTON COUNTY, STILLWATER, MN

BROWN'S CREEK

Restoration Between McKusick Road & Brown's Creek State Trail



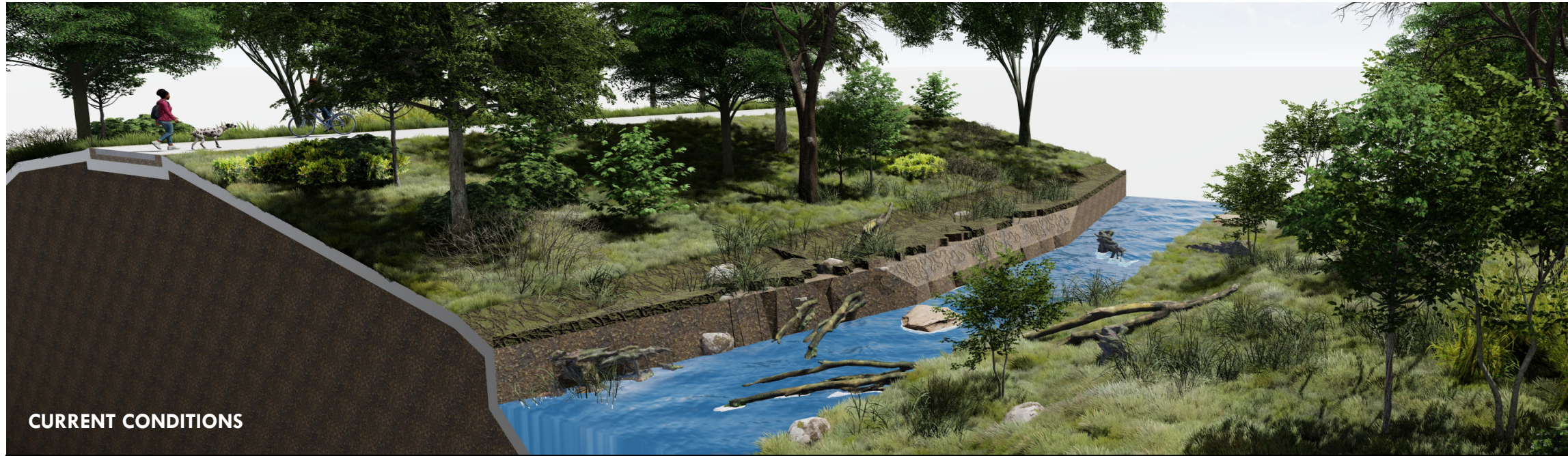
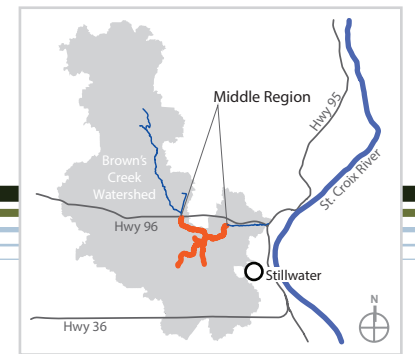
Potential restoration activities include bank shaping along existing eroded banks throughout the project reach and selective tree thinning that would benefit the herbaceous understory in this reach and improve creek access from Brown's Creek State Trail.



EXISTING ERODING CREEK BANKS IN PROJECT REACH

BROWN'S CREEK

Restoration Between McKusick Road & Brown's Creek State Trail



CURRENT CONDITIONS



AFTER POTENTIAL RESTORATION

Habitat restoration for macroinvertebrates and fish will include restoration of riffle and pool habitat which is lacking in much of the project reach due to bank erosion and instream sedimentation. Based on the length of the reach, it is anticipated about 25 riffles and pools will be restored. Furthermore, the project will include removal of invasive species and will improve access to the creek from the existing Brown's Creek State Trail. Trees proposed for harvest are comprised of boxelder and will be incorporated into the creek for fish and invertebrate habitat. The project will also include restoration of native herbaceous vegetation in the riparian corridor via native seeding along the reconnected floodplain. Native seed mixes proposed include State Mix 34-271 Wet Meadow South & West and 34-261 Riparian South & West.

MENDEL WETLAND BACKGROUND

Mendel wetland is a large wetland complex located between Manning Ave and Mendel Ave north of Highway 96. The wetland is partially drained to the south by a ditch that runs north-south through the east side of the wetland. The BCWD has assessed this wetland and explored options for improving wetland function & value, while gaining water quality and volume control returns

The BCWD and the Washington Conservation District have had interest in restoring/conserving the Mendel Road Wetland for some time. Portions of the wetland are of high floristic quality, containing a viable stand of Tamarack (*Larix laricina*). The wetland is directly drained to Brown's Creek and the conjecture is that restoring a more stable wetland hydrology will reduce nutrient loading and/or reduce thermal loading and/or improve the quality (functions and values) of the wetland.

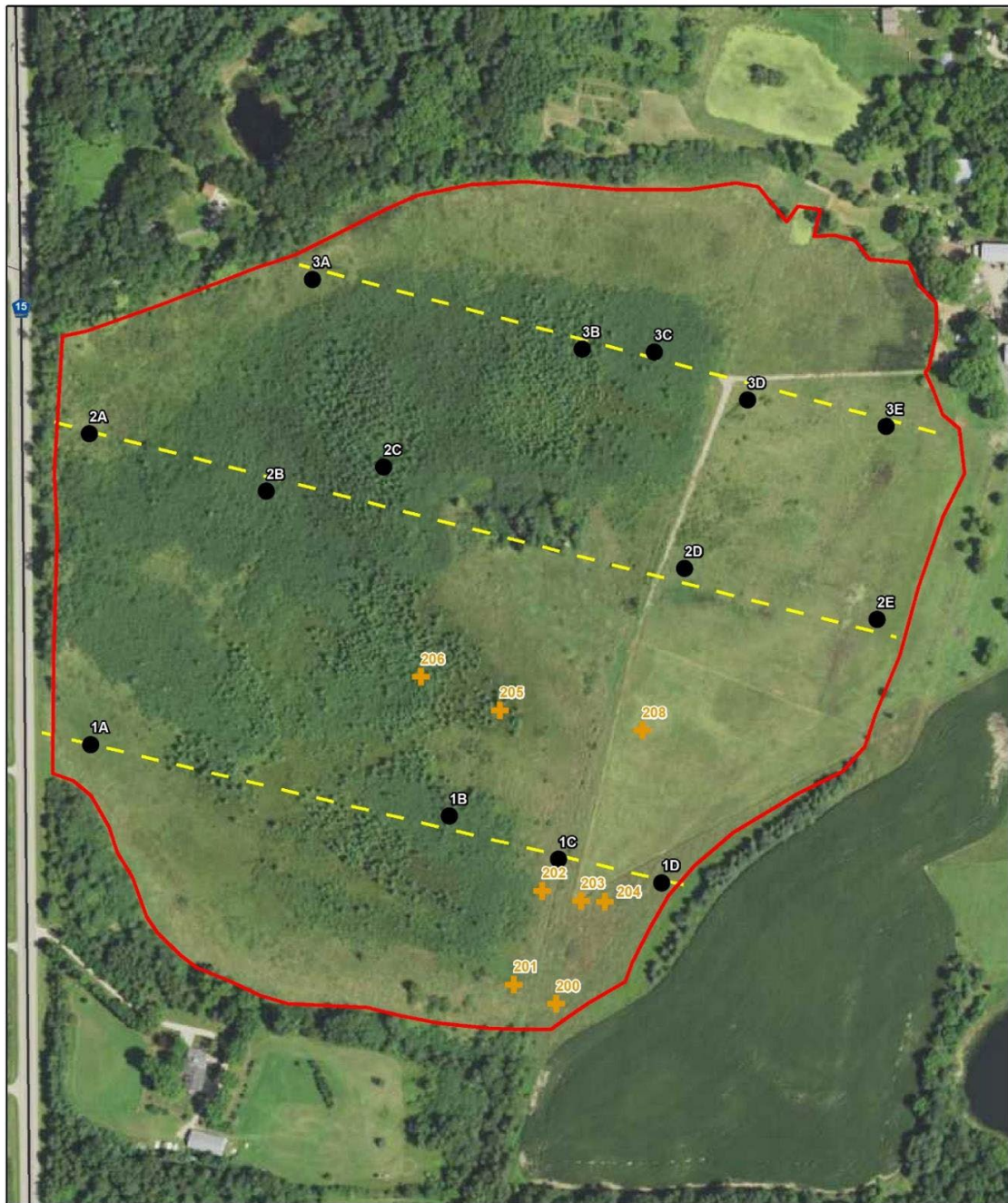
One approach to garnering water quality and habitat returns is to restore wetland hydrology by reducing or eliminating artificial drainage via a full or partial blockage of the existing ditch. Adjacent land use includes pasture and row cropping. To date a single landowner has raised concerns that the pasture would be less usable under a restored condition due to the perception of an increase in soil moisture.

The monitoring data indicate that the ditch only lowers groundwater levels within an area less than 50 feet away from the ditch. These findings indicate that the Mendel Wetland Restoration project (partial or full ditch blockage) would not cause groundwater flooding nor adverse impact on the adjoining or adjacent active pasture or row crop field(s).

A restoration project for the Mendel wetland provides some ecological benefits and may have the potential for a wetland banking project. Aside from the landowner approval there are relatively minor challenges to a simple wetland restoration project that provides ecological and hydrologic benefits to the District.



Figure 1 – General location of ‘Mendel Road Wetland’, which is NE of the Manning Avenue and Hwy 96 Intersection



- Study Area
- + Soil Test Pit
- FQA Plot
- FQA Transect



**Mendel Road Wetland
Floristic Quality Assessment
and Soil Survey**

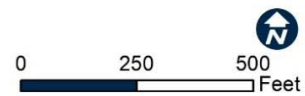


Figure 2 – FQA plot and soil survey pit locations

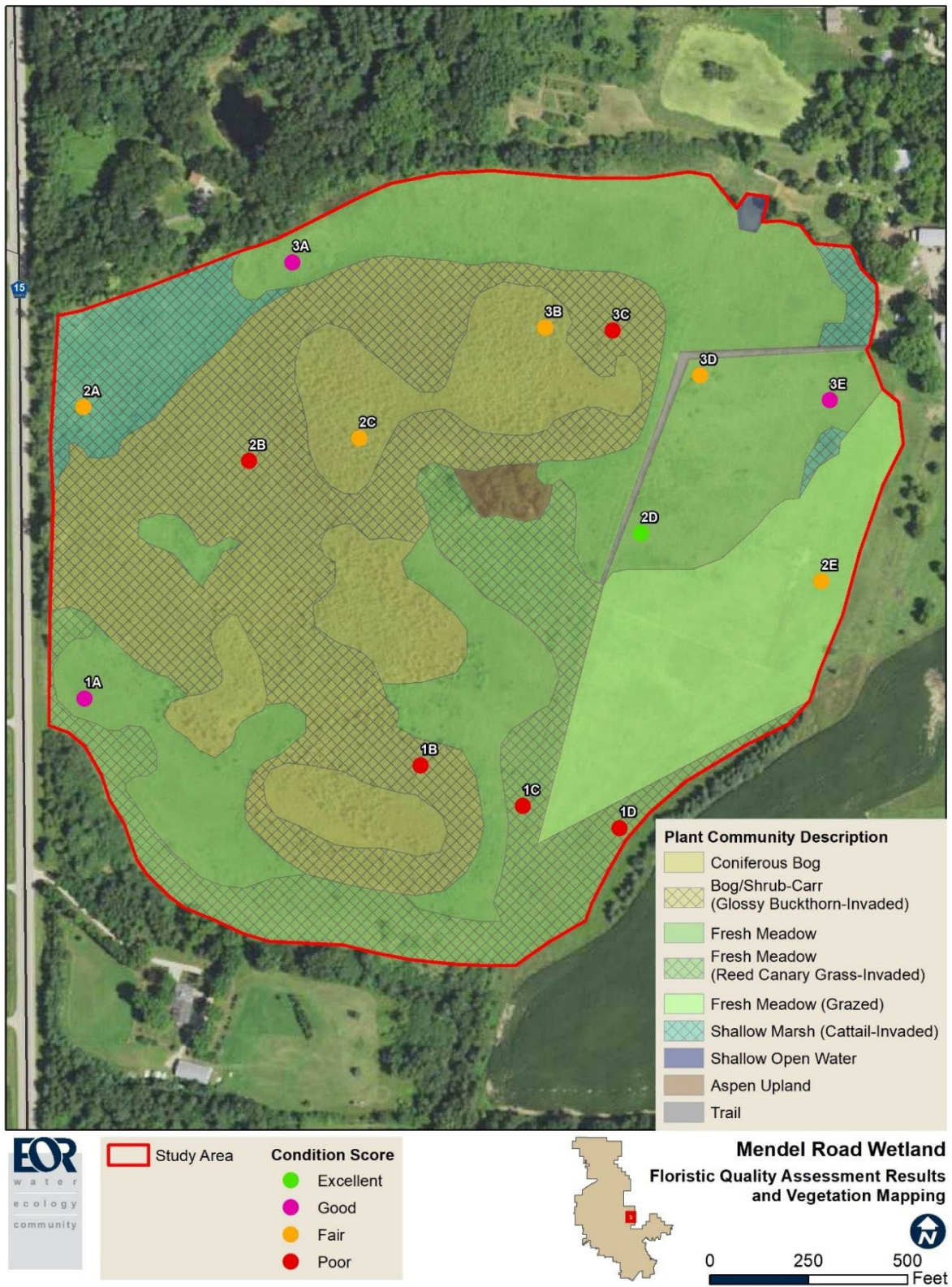


Figure 3 – FQA and plant community mapping results

Brown's Creek Conservation Area Background

Site description: The Brown's Creek Conservation Area (BCCA) is located in Northern Washington County off of 110th St N. near the Gateway Trail's crossing of Manning Ave N. The 13 acre parcel contains 1300 feet of Brown's Creek, 2.4 acres of wetlands, a 5.22 acres upland area, with the remaining acreage being wooded. The property was purchased in January 2017. Following the general direction of a public input process the Board decided the site will be actively managed for protection and restoration of the natural resources and allow infrequent passive recreation. No trails or facilities will be maintained.

The 2017 management plan for the property used the Minnesota Land Cover Classification System (MLCCS) to classify and characterize the existing conditions and land cover. Seven units were identified as seen in the table and map below.



Figure 1 Brown's Creek Conservation Area Unit Map

Long Term Management Goals

Unit 1, which is degraded grassland, will be converted to a native prairie; Units 3 & 4 will be managed as an Oak Woodland-Brushland. Unit 4 also contains a small knob of upland prairie area with desirable native species. All units will require management to control invasive species and promote floristic diversity and quality. Of the natural resource management actions proposed, Units 2, 5 & 6 are prioritized above others for the predictable aquatic habitat and water quality (modest) gains. Management of woody invasive species, particularly in Unit 6, will allow greater sunlight to penetrate, which will spur herbaceous growth thus setting forth a predictable narrowing and deepening of the stream. A narrower stream width-to-depth ratio will inevitably afford superior habitat and greater bank stability.

Restoration Activities

The BCWD successfully partnered with Great River Greening for a 5 year grant for restoration work beginning July 1st 2018 and ending June 23, 2023. This grant will allow for \$52,000 worth of prairie, wetland, and woodland restoration.

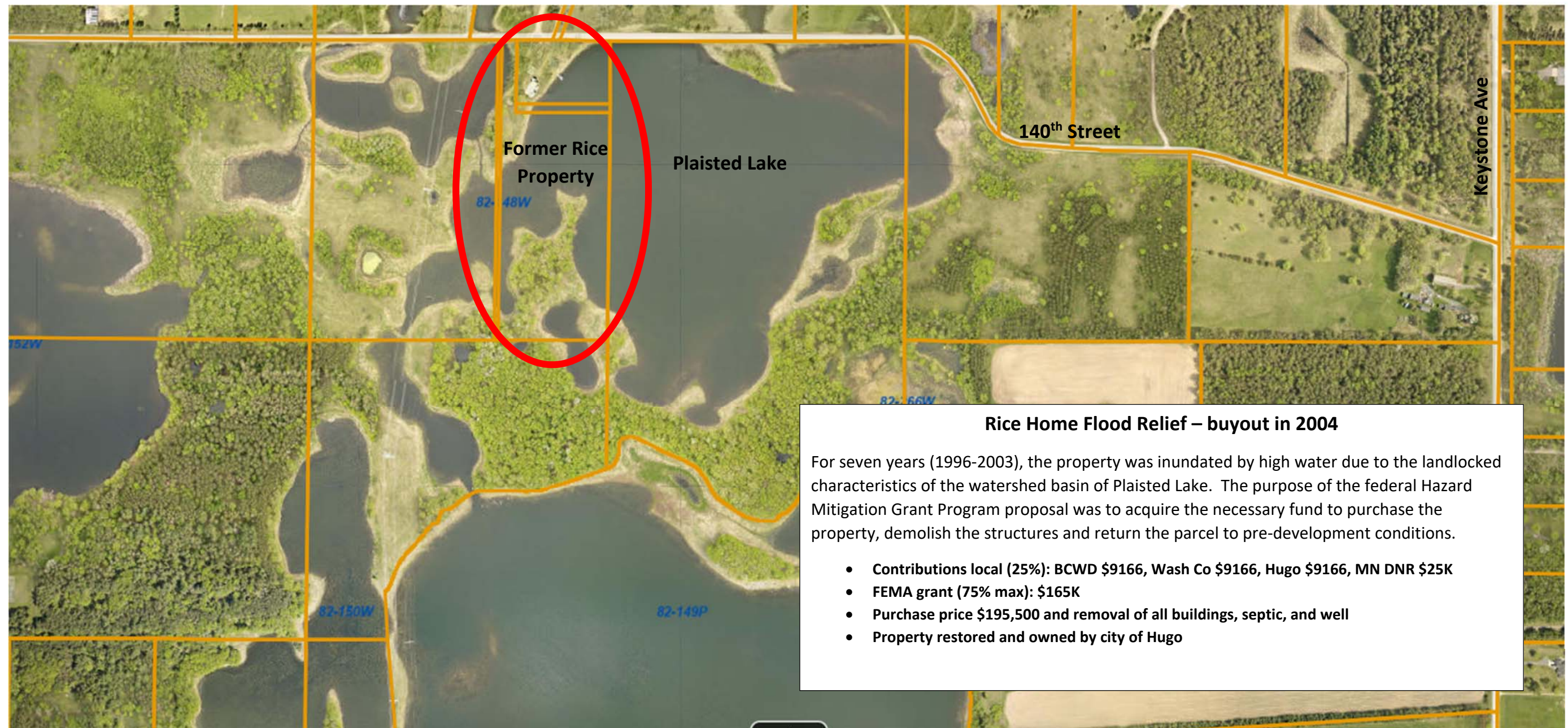
Work that has occurred since then includes:

- Collection of up to 50% of the available seed from up to 50 individual *Liparis lilliifolia* occurred as part of a project with the Minnesota Landscape Arboretum.
- A tree survey was completed to identify high value native species, as well as ecologically significant snags.
- A brush mower was used to remove buckthorn from units 2, 5, and 6. Removal of red cedar and limbing of large conifer species, many of them non-native, occurred in Unit 1. The goal of this was to allow for fire to be used as a management tool for a potential future prairie restoration. The removed biomass was piled and burned in Unit 1. Removal of red cedar also occurred in Unit 3 in an effort to remove some of the canopy to allow for native herbaceous species to resurface in the understory. Burn piles were limited to the slopes of Unit 3.
- Some raking of ash in the burn piles occurred to encourage regrowth.
- Follow up stump cutting and re-treatment plus foliar treatment for buckthorn.
- Savannah grass seed supplemental seeding and cover crop (oats) were seeded into burn scar areas to begin to re-build the organic matter in the soil.
- Invasive removal efforts: Dames Rocket, lamium, garlic mustard, mullein, thistle, Lily of the Valley, bull thistle.

Next steps:

- This fall: buckthorn removal and native seeding event through the CAC Open Yard Series
- Planning for future restoration activities with the CAC and WCD using the BCWD budgeted funds

Plaisted Lake and Flood Mitigation Project



Rice Home Flood Relief – buyout in 2004

For seven years (1996-2003), the property was inundated by high water due to the landlocked characteristics of the watershed basin of Plaisted Lake. The purpose of the federal Hazard Mitigation Grant Program proposal was to acquire the necessary fund to purchase the property, demolish the structures and return the parcel to pre-development conditions.

- Contributions local (25%): BCWD \$9166, Wash Co \$9166, Hugo \$9166, MN DNR \$25K
- FEMA grant (75% max): \$165K
- Purchase price \$195,500 and removal of all buildings, septic, and well
- Property restored and owned by city of Hugo

Why did BCWD Participate?

BCWD participated based on the following criteria determined in February 2003:

- Must fulfill ALL of the following criteria:
 1. Must have standing water in home for more than three (3) years
 2. Flooding must have operational impact on BOTH the septic system and well
 3. The cost of moving the dwelling structure must exceed the cost of new construction
 4. Must not have available area to build new dwelling or move current dwelling on contiguous property

How has Plaisted Lake responded?

Plaisted Lake was removed (delisted) from the state impaired waters list in 2022. It was only one of ~50 lakes in the state of MN!

BCWD does not have pre-project lake data, but began lake monitoring in 2008. It was impaired for excess nutrients. The lake continues to show an improving trend. Grades in 2008 were D+ and now consistently grading A-/B+ and meeting all state shallow lake standards. Likely, the removal of a nonconforming septic system has contributed to the improvements.

The 70-acre lake has a maximum depth of ~12ft and 100% littoral zone (light can penetrate to the bottom allowing plant growth over the whole lake).

South School Section and Goggins Lakes Background Information

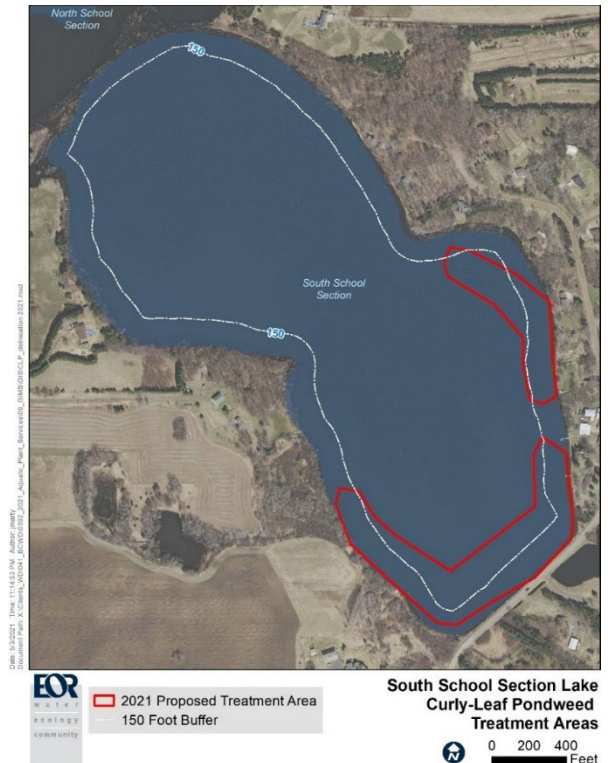
Through annual monitoring and occasional treatments over the last 6 years, the BCWD has been successful at managing curly-leaf pondweed (*Potamogeton crispus*, CLP) at low densities in South School Section Lake. In 2015, curly-leaf pondweed growth was so dense that it formed mats on the surface that restricted and/or prevented boater access in portions of South School Section Lake. During the development of the Northern Chain of Lakes Watershed Restoration and Protection Strategy in 2016, South School Section lakeshore homeowners expressed interest in treating curly-leaf pondweed as soon as possible as their priority concern. A successful endothall treatment (2017) and high-water levels in 2018, 2019, and 2020 have significantly reduced the abundance of curly-leaf pondweed in South School Section Lake. As lake levels have risen over the last few years, the littoral zone has shrunk and pushed much of the aquatic vegetation (CLP included) closer to shore. After a pretreatment survey in 2021, CLP was treated again to prevent colonization of the newly inundated littoral zone.

The BCWD has also prevented the colonization of Goggins Lake since first discovering CLP in the lake. In May of 2020, EOR Conservation Biologist Mike Majeski found that curly-leaf pondweed had spread to Goggins Lake. This was the first recorded observation of curly-leaf pondweed in Goggins Lake. A rapid response effort was designed to eradicate CLP from Goggins Lake, or at a minimum reduce further spread. Small, isolated patches of CLP were treated in Goggins Lake in 2021. The post-treatment survey indicates that these efforts were successful at killing the nascent stands of CLP in Goggins Lake.

No CLP treatment is recommended for 2022 based on the 2022 delineation survey results. The number of points at which CLP was detected in South School Section Lake has decreased greatly since the 2021 treatment and is absent from Goggins Lake altogether. Additionally, CLP was only growing at sparse densities at the sites where it was detected. At this point, the density of CLP is considerably lower than it was in 2019, when CLP was detected at 35 sites, and herbicide treatment was considered unnecessary and not cost-effective.

Point-intercept aquatic plant surveys of South School Section Lake (SSSL) and Goggins Lake were completed on August 26, 2022

The FQI scores from both lakes indicate that the floristic quality of the plant communities increased since last surveys in 2014. The reason for the improvements is not immediately clear and could be due to several factors and their interactions such as water level fluctuations, water quality, aquatic plant management, or simply natural variability. Additionally, though FQI scores improved, the invasive EWM was observed at both SSSL and Goggins for the first time, with relatively high frequency of occurrence (44% of sites) at SSSL.



While every lake and lake user is different, most experts agree that CLP treatments, which almost exclusively involve the use of contact herbicides, are not warranted unless CLP occupies 15% or more of the littoral zone due to the potential for damage to non-target species. Intermittent treatments of CLP conducted over the past 5 years have helped to keep CLP below this threshold. The efficacy of these treatments has likely been aided by above average lake levels which likely reduced the area in which CLP could germinate or sprout from turions in deeper areas while expanding the littoral zone into shallower areas where little or no CLP seed/turion bank existed. EOR recommends spring CLP surveys every three years, which likely will be sufficient to identify problematic CLP growth greater than 15% or more of the littoral zone that warrants treatment.

Further, given that the quality of the aquatic plant community appears to be at least stable and possibly increasing, EOR is not recommending treatments to target EWM. However, the increase in the abundance of EWM should be monitored via early summer point-intercept aquatic plant surveys conducted every three years (e.g., 2025). If the frequency of EWM continues to increase to the detriment of the native plant community, EOR would likely recommend that BCWD explore herbicide treatments using ProcellaCOR. EOR has had outstanding success with ProcellaCOR treatments on lakes in Wisconsin and Minnesota both in terms of control of the target species (EWM) and avoidance of impacts to the native plant community. Progress towards achieving control of these target species is subject to change based on feedback from lake users and methods of control.

Animation of Northern Chain of Lakes Filling

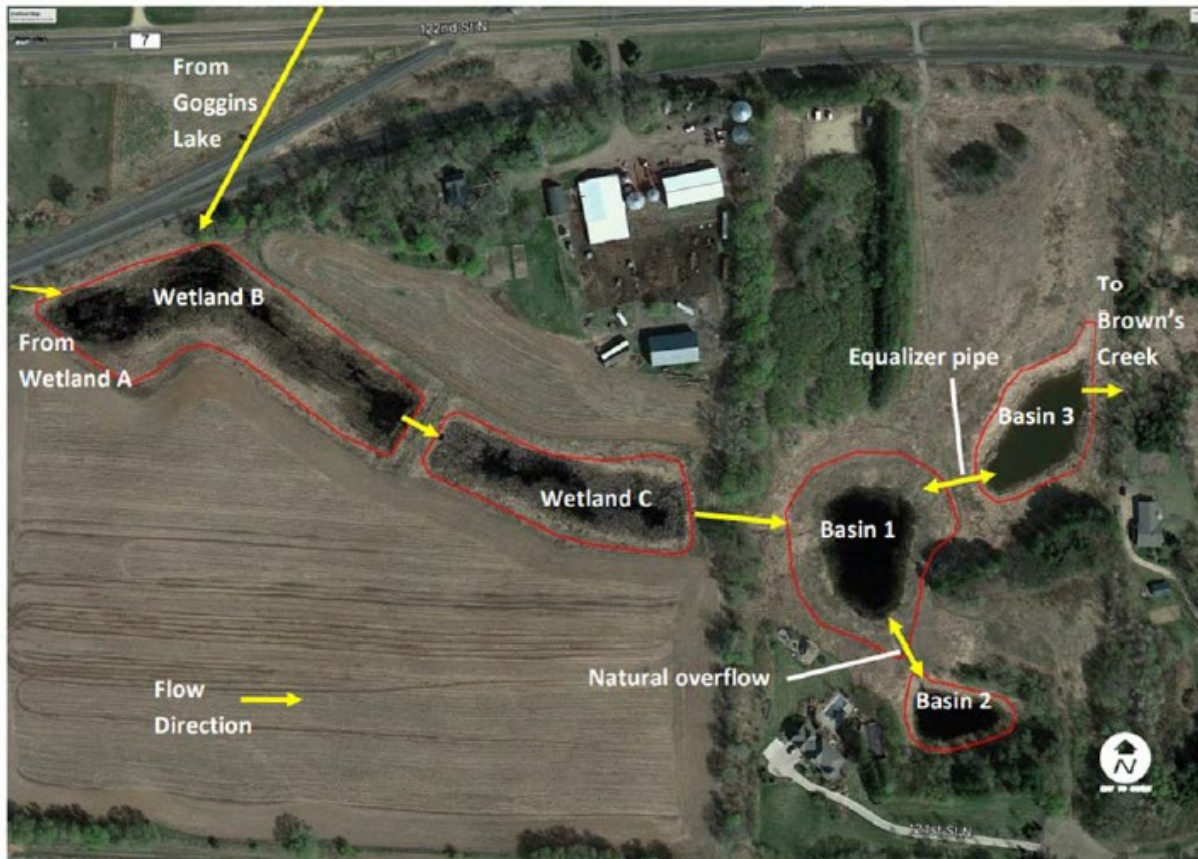


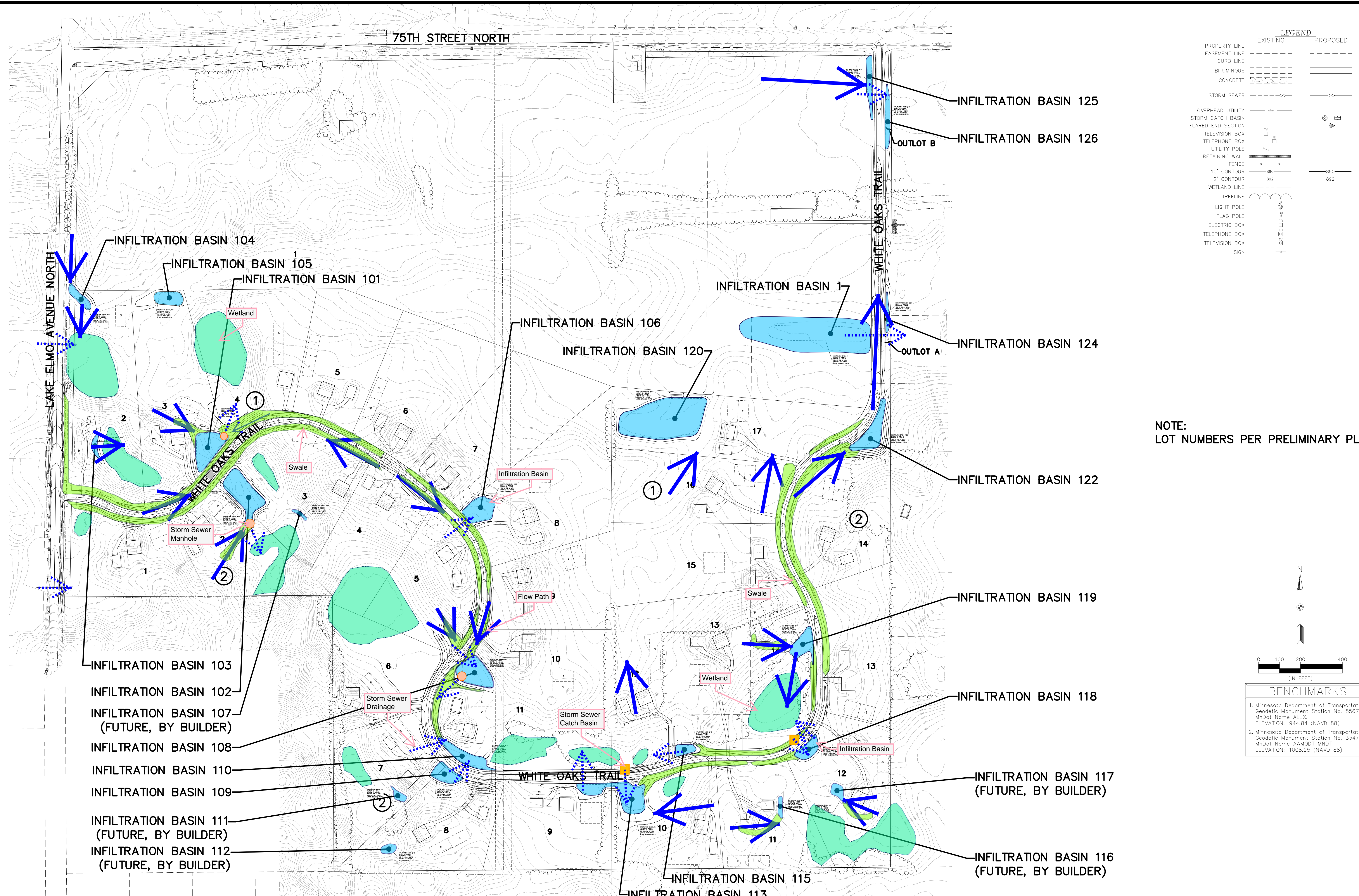
Trout Habitat Preservation Project/ Goggins Outlet Background

History: Constructed in 2000, this project provides a stable surface water outlet to the Goggins, South and North School Section, and Plaisted lakes. The outlet elevation is set at 970.5, which was determined to be the approximate natural runout elevation for these basins and protects all upstream homes, septics and wells. The highest recorded elevation for these lakes was over 972. Without the project, the overflow elevation would have been approximately elevation 980, risking approximately a dozen homes.

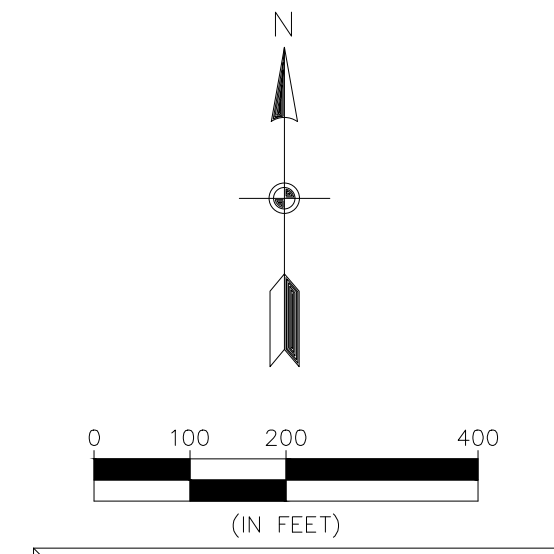
Project Benefits: This project was designed to capture, store and infiltrate the overflow from the Goggins-School Section lake system prior to discharge to the downstream wetland, which is considered the headwaters of Brown's Creek. This innovative outlet project has numerous benefits beyond flood control (e.g., runoff retention, increased wildlife/pollinator habitat, water quality treatment, groundwater recharge) and won the Minnesota Association of Watershed Districts (MAWD) Project of the Year Award in 2004.

DeWolf Wetland: This wetland serves as a pre-treatment system for runoff prior to it entering the THPP project.



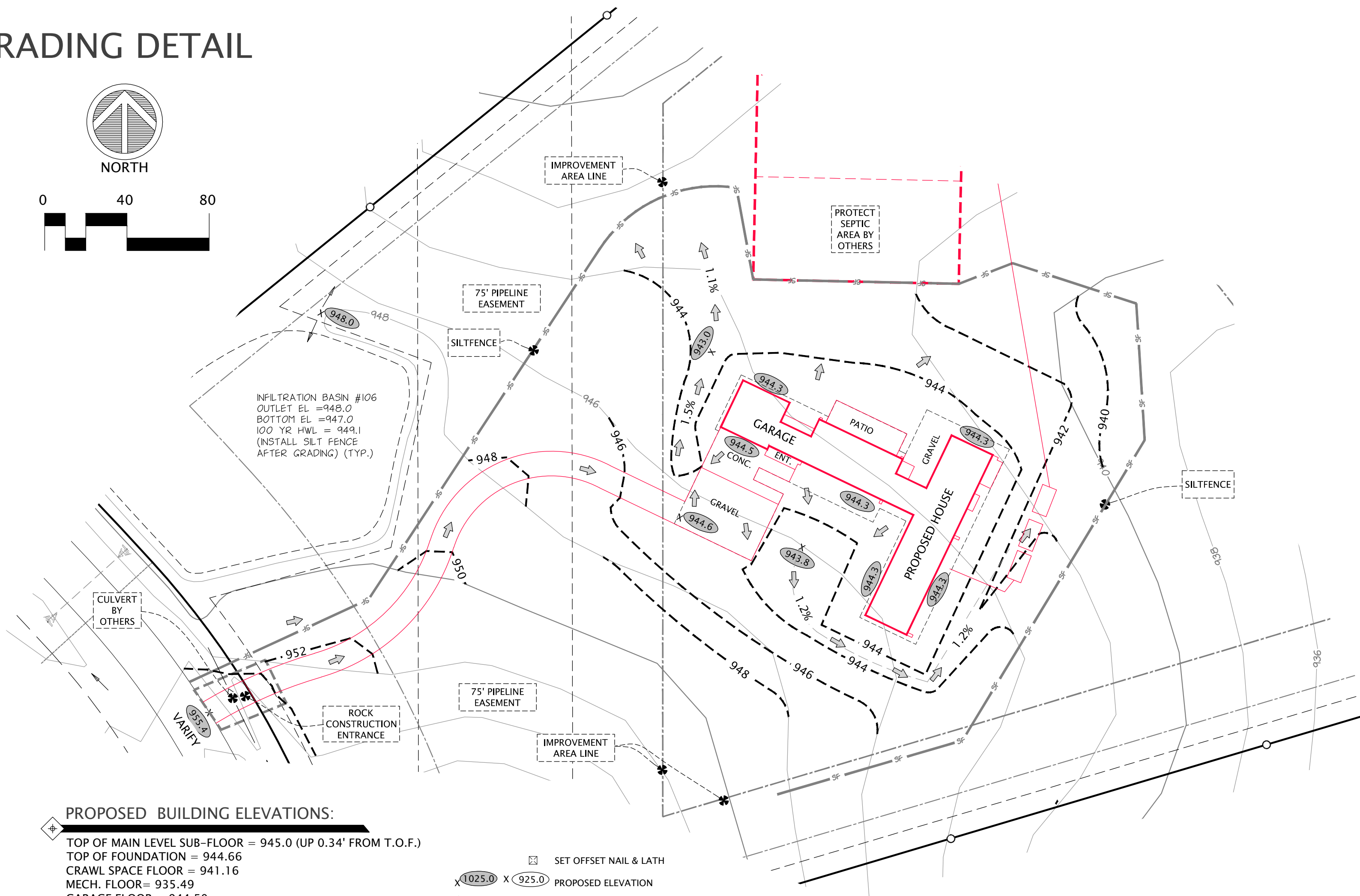
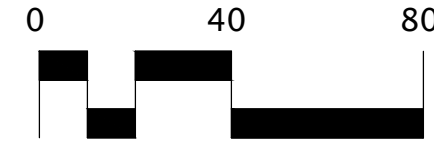


NOTE:
LOT NUMBERS PER PRELIMINARY PLAT



BENCHMARKS	
1.	Minnesota Department of Transportation Geodetic Monument Station No. 85671, MnDot Name ALEX, ELEVATION: 944.84 (NAVD 88)
2.	Minnesota Department of Transportation Geodetic Monument Station No. 33477, MnDot Name AAMODT MNDT, ELEVATION: 1008.95 (NAVD 88)

GRADING DETAIL



PROPOSED BUILDING ELEVATIONS:

TOP OF MAIN LEVEL SUB-FLOOR = 945.0 (UP 0.34' FROM T.O.F.)
 TOP OF FOUNDATION = 944.66
 CRAWL SPACE FLOOR = 941.16
 MECH. FLOOR = 935.49
 GARAGE FLOOR = 944.50

#1 LOWEST ALLOWABLE FLOOR ELEVATION = 944.5 AS SHOWN ON GRADING PLAN DATED 1-26-18. VERIFY WITH PROJECT ENGINEER AND RULING AUTHORITIES IF ACCEPTABLE.

#2 SEE FOUNDATION LOWER LEVEL PLAN SHEET A-100 PLANS DATED 10-21-22 FROM PKA ARCHITECTURE.

#3 VERIFY ABOVE ELEVATIONS WITH FINAL FOUNDATION DETAILS.

#4 PROPOSED GRADING FROM PLANS BY PEBL DESIGN DATED 10-28-21

- SET OFFSET NAIL & LATH
- PROPOSED ELEVATION
- PROPOSED CONTOUR
- PROPOSED DRAINAGE
- NOTES DENOTES EXISTING ELEV.
- DENOTES SILT FENCE
- EXISTING CONTOURS

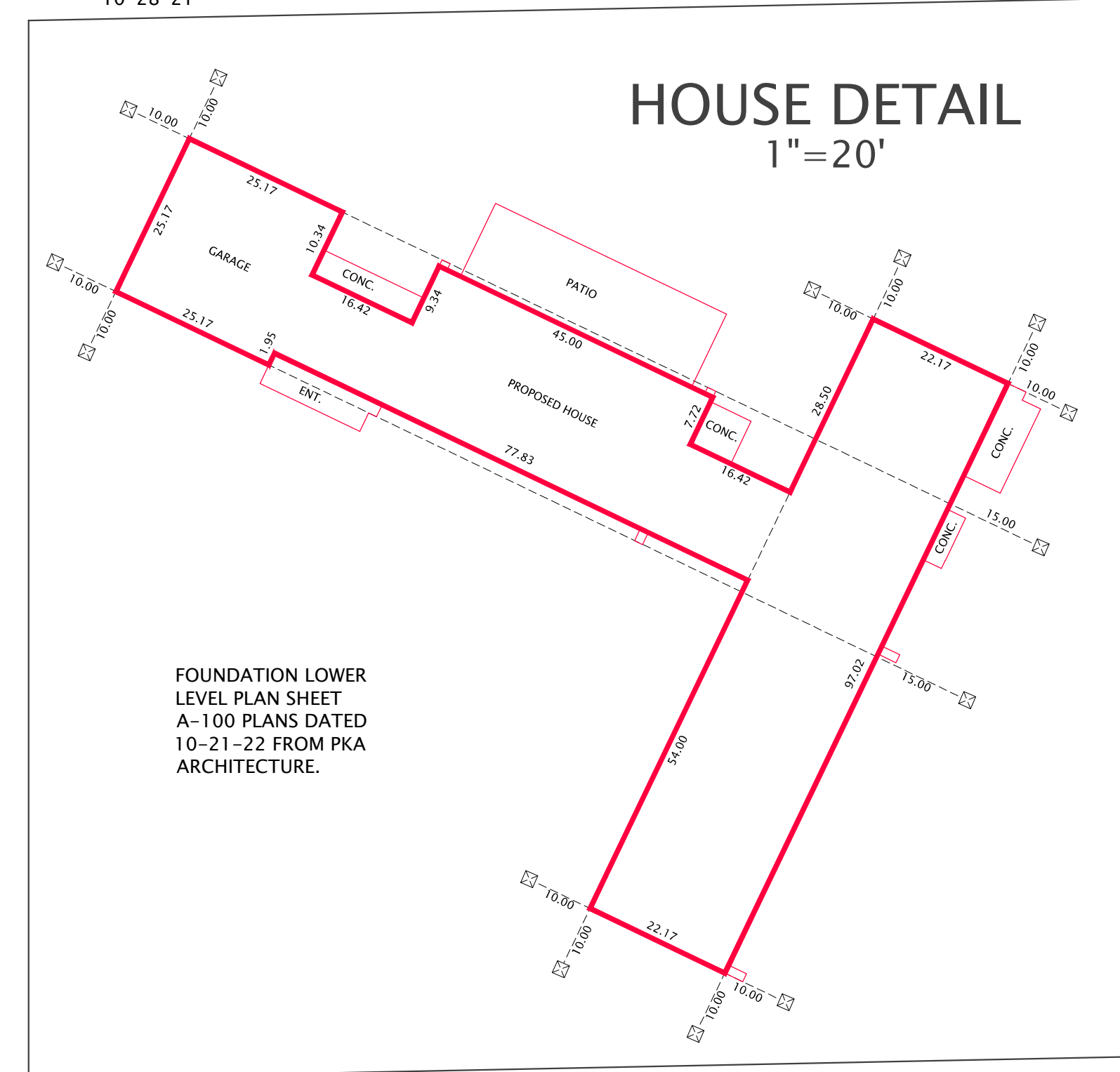
PROPOSED IMPROVEMENT AREAS:

HOUSE = 4,233 (IN SQUARE FEET)
 FRONT ENTRANCE = 85
 PATIO = 456
 CONCRETE = 225
 DRIVEWAY = 753
 GRAVEL DRIVEWAY = 4,402

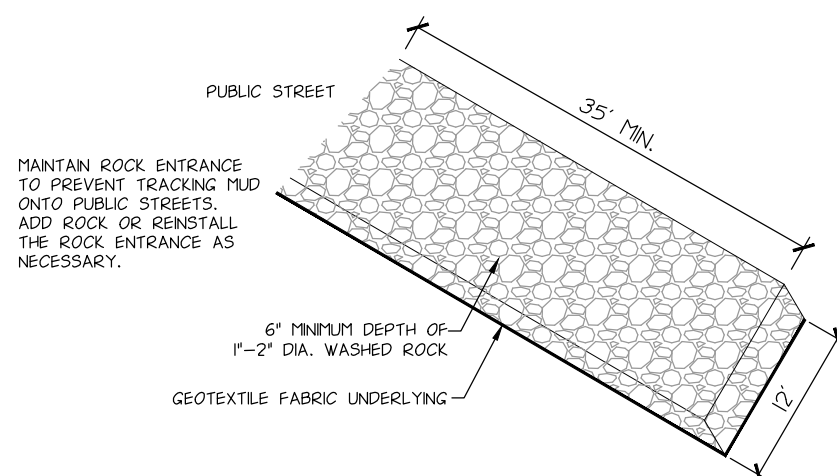
TOTAL IMPROVEMENTS = 10,154 SQ.FT.
 3.0% (% OF TOTAL LOT AREA)

SEPTIC

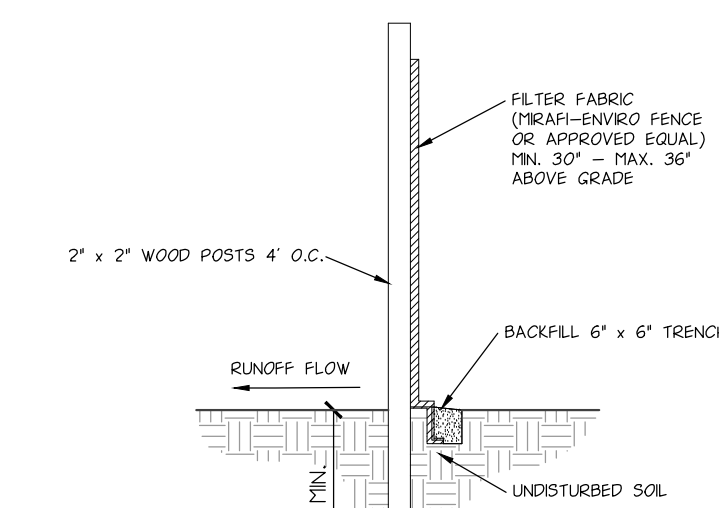
SEPTIC AREAS AS SHOWN ON REPORT BY ALL STATE SEPTIC SERVICES, LLC DATED 7-9-22



FOUNDATION LOWER LEVEL PLAN SHEET A-100 PLANS DATED 10-21-22 FROM PKA ARCHITECTURE.



1 ROCK CONSTRUCTION ENTRANCE NO SCALE



2 SILT FENCE NO SCALE

LEGEND

- FOUND CAST IRON MONUMENT
- FOUND MONUMENT (AS NOTED)
- SET IRON PIPE MARKED WITH MN LICENSE NO. 25718
- CABLE TV PEDESTAL
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- GUY WIRE
- POWER POLE
- GAS METER
- TELEPHONE PEDESTAL
- SANITARY CLEANOUT
- WATER WELL
- MAIL BOX
- BUILDING LINE
- BITUMINOUS SURFACE
- CONCRETE SURFACE
- UNDERGROUND TELEPHONE
- OVERHEAD UTILITY
- UNDERGROUND GAS
- FENCE
- TREES

CALL BEFORE YOU DIG!
Gopher State One Call
 TWIN CITY AREA: 651-454-0002
 TOLL FREE: 1-800-252-1166

- ### CONSTRUCTION SEQUENCING
- BEGIN CONSTRUCTION IN FALL OF 2022.
- INSTALL SILT FENCE ALONG PERIMETER OF SITE TO BE DISTURBED AS SHOWN ON THIS PLAN.
 - INSTALL ROCK CONSTRUCTION ENTRANCE. LOCATION MAY BE ADJUSTED IN THE FIELD BASED ON DIRECTION FROM OWNER'S REPRESENTATIVE.
 - EXCAVATE FOUNDATION FOR NEW HOME.
 - BACKFILL FOUNDATION AND ROUGH GRADE.
 - CONSTRUCT NEW HOME.
 - CONSTRUCT DRIVEWAY.
 - INSTALL WALLS AND LANDSCAPING FEATURES.
 - FINISH GRADE.
 - SEED OR SOD ALL REMAINING DISTURBED AREAS AS SHOWN ON THIS PLAN.
 - REMOVE SILT FENCE ONCE VEGETATION IS ESTABLISHED.
- END CONSTRUCTION SUMMER OF 2023.

LEGAL DESCRIPTION:

Lot 7, Block 1, WHITE OAKS SAVANNA, Washington County, Minnesota.

TITLE NOTES:

- Subject to Easements as shown on the record plat. (AS SHOWN ON THIS SURVEY)
- Subject to Brown's Creek Watershed Declaration per Doc. No. 4156448 list Wetland Buffers and Storm Water Maintenance Facilities located on throughout the development. (AS SHOWN ON THIS SURVEY)
- Subject to Homeowners association per Doc. No. 4156448.
- Subject to Reciprocal Easements per Doc. no. 4156447.

AREA:

TOTAL AREA AS SHOWN = 336,838 SQ.FT. / 7.73 ACRES

SURVEY NOTES:

- BEARINGS ARE BASED ON THE WASHINGTON COUNTY COORDINATE SYSTEM NAD 1983.
- UNDERGROUND UTILITIES NOT SHOWN.
- CONTOURS SHOWN PER LIDAR DATA OBTAINED FROM THE DNR MNTPO WEBSITE MERGED WITH THE PROPOSED GRADING PLAN DATED 1-26-18. NOT FIELD VERIFIED.

MILLER / DUIS RESIDENCE

CONTACT:

Ashley Vanden Bosch, Assoc. AIA
 Designer
 920.205.5349

PKA. ARCHITECTURE
 Minneapolis, Minnesota
 612.353.4920
 www.pkarch.com

COUNTY/CITY:

WASHINGTON COUNTY
 CITY OF GRANT

REVISIONS:

DATE	REVISION
4-28-22	PRELIMINARY
9-14-22	REVISED
11-1-22	REVISED

CERTIFICATION:

I hereby certify that this plan 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.

Daniel L. Thurnmes
 Daniel L. Thurnmes Registration Number: 25718
 Date: 4-28-22

PROJECT LOCATION:

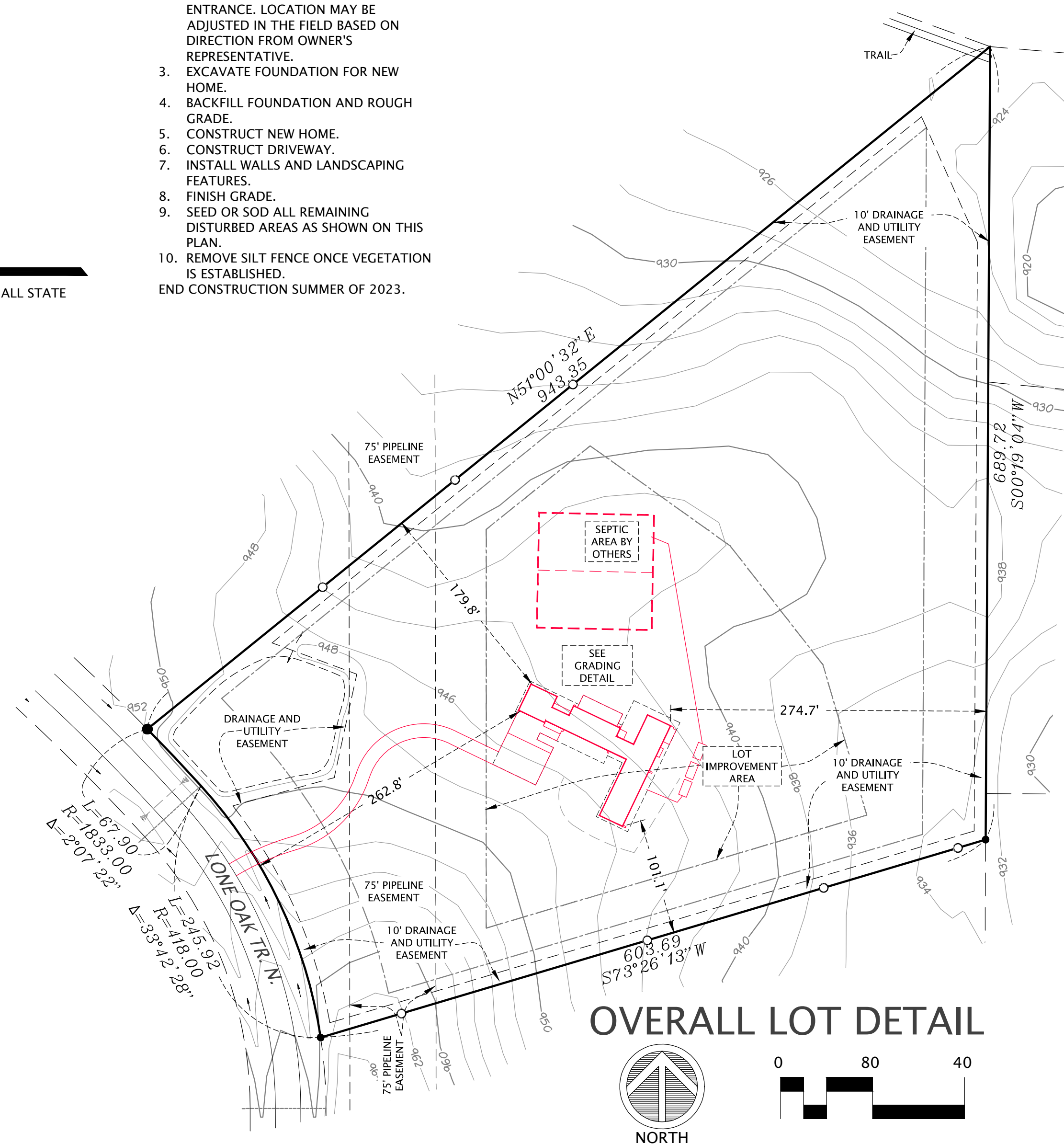
7164
 LONE OAK TRAIL N.
 PID# 2503021340005

Suite #200
 1970 Northwestern Ave.
 Stillwater, MN 55082
 Phone 651.275.8969
 dan@cssurvey.net

CORNERSTONE LAND SURVEYING, INC.

FILE NAME SURVJCS6L
 PROJECT NO. JC21056L

CERTIFICATE OF SURVEY



OVERALL LOT DETAIL

