MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

Meeting: Board of Managers
Meeting date: 6/26/2025
Agenda Item #: 9.1
Item type: Permit

Title: Permit #24-544: Idyllvale Shores Development, Orono

Prepared by: Abigail Couture, Permitting Technician
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Recommendation:
Approval of MCWD permit application 24-544 with the submitted plans and on the following conditions:

- Payment of permit application, mailing, and engineering review fees; totaling $6,532.96
- Submit a draft Maintenance Declaration in accordance with the Waterbody Crossings and Structures, Wetland Protection, and Stormwater Management Rules, and on MCWD approval, file with Hennepin County and provide the recorded copy to MCWD
- Provide financial assurance in the amount of $10,621.67 in accordance with the Erosion and Sediment Control, Wetland Protection, and Stormwater Management Rules
- Submit contractor contact information for inspections
- Before culvert replacement begins, MCWD staff will be notified 5 business days in advance via email

Project Location and Scope:
Project Purpose and Scope:
Blue Pencil Collective (Developer) and Civil Methods (Applicant's Engineer), on behalf of the Pass Family Trust (Applicant), have applied for a Minnehaha Creek Watershed District (MCWD) permit to subdivide three parcels into a five-parcel subdivision. As part of the subdivision, building pads will be constructed for future single-family homes. This permit is for erosion control, wetland protection, floodplain alteration, waterbody crossings, and stormwater management related to the subdivision. The applicant does not intend to develop each lot with a single-family home but instead plans to sell the lots to individual developers or builders for construction. This subdivision permit extends to all lots, and one of its conditions includes a maintenance declaration containing notations allowing the District to verify that the individual lot developments comply with this permit and MCWD rules.

Location and Hydrology:
The Project is located at 215 North Arm Lane, Orono, within the Lake Minnetonka subwatershed. Three wetlands are located on-site, with the northern two connected by a second-order, intermittent stream, draining to the eastern wetland and ultimately outletting into the North Arm channel of Lake Minnetonka, a Public Water Basin. Except for approximately a quarter of an acre in the southwest corner of the site, the entire site drains to the east through the wetlands. The site location and waterbodies can be seen in the project location map in Attachment A.

The Project area consists of 25.35 acres of primarily undeveloped land containing one single-family house and two outbuildings. Attachment A provides a Project area map and Attachment B contains the site plans.

Regulatory Framework and Triggers:
The MCWD's Erosion Control, Stormwater Management, Waterbody Crossings and Structures, Wetland Protection, and Floodplain Alteration, rules are applicable for this Project. MCWD staff and the District Engineer have reviewed the Project and concluded it meets the applicable MCWD rules. The Project is before the Board of Managers due to public requests by neighboring property owners with concerns about drainage, wetland protection, monitoring of the site, and future permitting requirements.

MCWD Rule Analysis:

Erosion Control Rule:

MCWD's Erosion Control Rule applies to projects that propose to disturb more than 5,000 square feet or move greater than 50 cubic yards of material. The Project proposes to disturb 9.52 acres (414,691.2 square feet) and excavate approximately 10,000 cubic yards; therefore, the rule applies. The Applicant proposes silt fence perimeter control at all locations downgradient of disturbance and between the disturbance and the wetlands. In addition, a rock construction entrance and inlet protection will be in place during construction (page 9 of Attachment B). Turf grass seed (MN DOT Mix 25-151) will be placed in the mowed areas and MN DOT Mix 33-261 and plant plugs will be placed in stormwater basins as the final stabilization method. Erosion control blankets will be utilized on seeded areas until fully stabilized. Subsequent owners who build the single-family homes will be required to conform to the District's General Permit requirements in Section 5 underneath this permit. Staff have reviewed the permit and have found it to be complete and compliant with all Erosion Control Rule requirements.

Stormwater Management Rule:

MCWD's Stormwater Management Rule applies to development that meets criteria for site size, extent of site disturbance, and impervious surface as outlined in Table 1 of the rule. The Project is subject to Section 2(a)(1) of the Stormwater Management Rule and the rule is applicable due to the subdivision of a tract larger than an acre into more than two buildable lots. The Project is therefore subject to Table 1 of the rule for stormwater treatment. Because the Project proposes to increase site impervious surface by over 50%, the Applicant is required to treat the entire site's post-development impervious surface for volume and rate control. Subsequent owners who build on the lots will be required to confirm that the proposed single-family home hardcover amounts fall under the proposed impervious with this permit. Staff and the MCWD Engineer have reviewed the permit and have found it to be compliant with all Stormwater Management Rule requirements.

The Applicant proposes three aboveground stormwater basins to capture and treat the entire site impervious surface to meet the Stormwater Management Rule requirements. Basins 1 and 3 are filtration basins located in the center and north areas of the site, respectively, and capture the majority of runoff from the site's impervious surface. Basin 2 is a smaller infiltration basin located on the south end of the site. Any runoff water after treatment will ultimately discharge to Wetland 2.

Volume Control

Section 3(a)1 of the Stormwater Management Rule requires volume control in the amount of 1 inch over the impervious surface area required in Table 1 of the rule. The Project is required to treat 1 inch over the entire site's proposed impervious surface, which is 1.80 acres. The rule requires infiltration where feasible. Basin 2 is an infiltration basin capturing 0.140 acres of impervious and is therefore required to provide 508 cubic feet of volume to meet the rule. However, the basin is oversized to provide 635 cubic feet of storage.

According to Section 3(b), infiltration is prohibited in areas where soils are predominantly HSG D (clay) or otherwise unreliable for infiltration. Soil borings found clay soils in sections of the property, in which infiltration is prohibited, which prompted the Applicant to pursue filtration methods for two of the basins. Other volume reduction practices listed in Appendix A of the rule would not be able to feasibly provide the level of volume control required. Therefore, as indicated in Section 3(c), filtration practices are required to achieve phosphorus control in an amount equivalent to that which would be achieved through the required volume reduction.

Phosphorus Control (if applicable)

Appendix A of the Stormwater Management Rule further explains that filtration practices are to achieve the phosphorus control credit by treating twice the required volume reduction. Therefore, both filtration basins are sized for 2 inches over the treatment area, double the required volume for infiltration. The required volume for Basin 1 is 8,538 cubic feet but the basin is oversized to provide 10,112 cubic feet, providing an infiltration volume of 4,170 cubic feet. The required volume for Basin 3 is 2,333 cubic feet but the basin is oversized to provide 3,042 cubic feet, providing an infiltration volume of 1,167 cubic feet.

Rate Control

Section 4 of the rule requires that the proposed work not increase the peak runoff rate from the site, in aggregate, for design storm events, and that any increase in peak runoff at any specific point of discharge not have a local adverse impact. The Applicant has demonstrated on page 6 of Attachment C that aggregate rates during 2-year, 10-year, and 100-year design storms will decrease from the existing condition. Additionally, there is no increase at any specific point of site discharge to Wetland 2 on the eastern side of the Project or offsite to the southwest (see Table 1).

Discharge Point	Storm Size	Existing (cfs)	Proposed (cfs)	Rate Change (cfs)
East Wetland	2-year	12.0	9.5	-2.5
	10-year	29.2	24.3	-4.9
	100-year	74.6	71.9	-2.7
Southwest	2-year	0.4	0.3	-0.1
	10-year	0.9	0.7	-0.2
	100-year	2.5	1.8	-0.7

Table 1. Site Discharge Rate Control Summary

Freeboard Requirements
Section 6 of the rule requires two feet of vertical separation between the 100-year high water elevation of a waterbody or stormwater practice and the low opening of any structure, unless the structure opening is hydraulically disconnected from the waterbody or practice. The future single-family homes are encompassed under this permit and will require elevations of low openings be submitted, but all of the building pads have hydraulic disconnection from the stormwater basins, provided through the proposed grading. The 100-year high water elevation for Basin 1, located in the middle of the site, is 953.6 ft. The 100-year high water elevation for Basin 2, located in Lot 5 along the southern edge of the site, is 945.6 ft. The 100-year high water elevation for Basin 3, located in Lot 4 on the northern portion of the site, is 954.7 ft.

The District Engineer reviewed for hydraulic disconnection between the building pads and the 100-year high water elevation of all three basins and confirmed that hydraulic disconnection is met, based on the grading around the basins providing separation.

Additionally, the District Engineer reviewed hydraulic disconnection between Basin 2 and the existing off-site house located at 340 North Arm Lane and confirmed it will be met due to the proposed berm west of Basin 2, which is at least two feet higher than the 100-year high water elevation of the basin.

Section 7(b) also provides that an action conforming to the Stormwater Management Rule must align with Table 2 for allowable impacts to downgradient waterbodies. The Project conforms to these standards in alignment with Table 2.

Wetland Management Class / Waterbody	Permitted Bounce for Design Storm Events	Inundation Period for 1- or 2-Year Design Storm Event	Inundation Period for 10- and 100-Year Design Storm Events	Runout Control Elevation
Manage 1	Existing plus 0.5 feet	Existing plus 1 day	Existing plus 2 days	No change
Manage 2	Existing plus 1.0 feet	Existing plus 2 days	Existing plus 14 days	0 to 1.0 ft above existing runout

Table 2. Impact on Downgradient Waterbodies, unapplicable rows removed (Stormwater Management Rule Section 7)

Section 10(c) of the rule requires, as a condition of permit issuance, that the property owner file a maintenance declaration on the deed establishing perpetual maintenance for the stormwater facilities. We include this as a recommended permit condition.

Waterbody Crossings and Structures Rule:
MCWD's Waterbody Crossings and Structures Rule is applicable when a roadway, bridge, boardwalk, utility, conveyance, or associated structure is proposed below the top of bank of a waterbody.

There are currently two 18” corrugated metal pipes (CMP) that connect Wetland 1 and Wetland 2. The Project proposes to replace these with two 36” reinforced concrete pipes (RCP).

Section 3(a) states that the use of the bed or bank of a waterbody must meet a demonstrated specific need. The need for the culvert replacement is to provide safe vehicular access to the proposed house on Lot 4. The existing site conditions have a culvert for a field crossing, so the Applicant proposes replacing the culvert to make it suitable for vehicular access to the house.

Section 3(b) requires that the project retain hydraulic capacity and a project in a watercourse may not increase upstream or downstream flood stage. The Project is in a watercourse and the Applicant has modeled the proposed culverts and found there is no increase in upstream or downstream flood stage. The changes in the 100-year high water elevations are outlined in the table below. The MCWD Engineer has reviewed the analysis and finds it meets Waterbody Crossings and Structures rule requirements.

Location	Existing 100-Year Elevation (ft)	Proposed 100-Year Elevation (ft)	Change in 100-Year Elevation (ft)
Upstream of Culvert	946.94	946.92	-0.02
Downstream of Culvert	943.65	943.65	-0.00

Table 3. 100-Year High Water Level Summary

Section 3(c) requires that the project preserve navigational capacity. There is no navigational capacity in the existing or proposed condition. This stream is intermittent with low flows that are not capable of navigation.

Section 3(d) requires that aquatic and upland wildlife passage be preserved. Due to the intermittent flow, there is limited aquatic wildlife passage in the existing condition and passage capacity will be maintained. The increase in culvert size from 18” to 36” diameter allows for upland wildlife passage within the culvert. The proposed driveway over the stream will not inhibit the passage of larger wildlife.

Section 3(e) requires that the crossing be designed to not promote erosion or scour, or otherwise affect bed or bank stability or water quality within the waterbody. The proposed design includes riprap downstream of the culvert to disperse flow and not increase erosion. The design has been reviewed by the District engineer to ensure that the proposed design will not promote erosion, scour, or adversely affect water quality.

Section 3(f) requires that the crossing be the “minimal impact” solution to the specific need. The project must meet the demonstrated need of creating access to the proposed home and not increase upstream or downstream flood stage while being the minimal impact solution. The Applicant reviewed a No-Build alternative, which does not meet the Project need as it would not allow access to Lot 4. The second alternative would be to shift the driveway to the west, which would result in impacts to Wetland 1. This proposed waterbody crossing is located strategically between Wetland 1 and 2, avoiding a wetland crossing which would generate additional wetland impacts. Through the applicant's analysis the project meets rule

Wetland Protection Rule:

MCWD’s Wetland Protection Rule states in Section 4(a)(2) that if an activity requires a permit under the Stormwater Management Rule, a permanent vegetated buffer is required on the part of a wetland that is downgradient of the new or reconstructed impervious surface. The onsite wetlands are shown on page 3 of Attachment B and the wetland boundary was determined by a delineation performed in April 2024 that the MCWD approved in June 2024 (W24-010, see Attachment D). Wetland 1 is classified as a Manage 2 wetland and requires a 30-foot buffer. Wetland 2 is classified as a Manage 1 wetland and requires a 40-foot buffer. Wetland 3 is not directly downgradient of proposed impervious and therefore does not require a buffer.

The Applicant proposes buffer averaging for Wetland 1 and 2. The Applicant also proposes to apply paragraphs 5(a)(1) and 5(a)(2) of the rule. Paragraph 5(a)(1) allows the Base Width of the buffer to be reduced by two feet for each five

percent by which the average slope of the buffer area falls below 20 percent. Section 5(a)(2) allows the Base Width to be reduced by two feet for each Hydrologic Soil Group (HSG) grade above Type D.

Wetland 1 has a required width of 24 feet using buffer averaging and width reduction, as allowed under Section 5(a). The required buffer area for Wetland 1 is 30,874 square feet. Using buffer averaging, in accordance with Section 5(c), the Applicant is exceeding the requirement by providing an average base width of 24.5 feet and a wetland buffer area of 31,345 square feet.

Wetland 2 has an average buffer area slope of 7.0% making the required buffer Base Width, after reduction, 36 feet. The soil class is both HSG C and D, so it does not qualify for an additional reduction based on the HSG. The Applicant proposes a buffer about 740 feet in length, ranging in width from 20.0 to 53.5 feet with an average width of 36.8 feet. The required buffer area for Wetland 2 is 26,716 square feet. The Applicant is exceeding this by providing an average buffer base width of 36.8 feet and a wetland buffer area of 27,063 square feet.

The Applicant has included adequate site plans showing property lines, the wetland delineation, location of the wetland buffer area, location of buffer monuments, proposed grading areas within the buffer, and the proposed buffer Planting Plan, all in compliance with Section 7 of the Wetland Protection Rule. The wetland buffer will be fenced off from the construction site with a silt fence, except for the areas that will be disturbed during construction. The proposed Planting Plan (page 9 of Attachment B) will be utilized for restoring wetland buffer disturbed during construction, approximately 8,481 square feet of the total 57,937 square feet of wetland buffer. The Applicant intends to seed the disturbed wetland buffer area using the BWSR Seed Mix 32-251: Mid Diversity Moist Buffer South & West to achieve rule compliance. The Planting Plan describes the bed preparation, seed application rate, and maintenance schedule for the following five years. To meet Section 6(e), the Planting Plan specifies protection of tree root zones and plans to decompact soils after construction.

Section 4(c) of the rule requires permanent wetland buffer monuments to be installed no more than 200 feet apart and on all lot lines. The Applicant proposes 14 and 9 buffer monuments for Wetlands 1 and 2, respectively, which meets the requirements of the rule.

Section 4(d) of the rule requires, as a condition of permit issuance, that the property owner file a maintenance declaration on the deed establishing the perpetual buffer and maintenance of the buffer after establishment. We include this as a recommended permit condition.

Additionally, the rule states in Section 2(a) that where it is the Local Government Unit (LGU), it will administer the Wetland Conservation Act (WCA). In the City of Orono, MCWD is the LGU. In accordance with Section 8420.0420 Subpart 8, a de-minimis exemption allowing 90 square feet of impacts to Wetland 1 was granted (W24-061, see Attachment D). The impacts are located on the eastern side of Wetland 1 in order to replace and extend the culvert.

Floodplain Alteration Rule

MCWD's Floodplain Alteration Rule is applicable when a project proposes to fill, excavate, or grade within the floodplain of a waterbody. Because the Project proposes fill and excavation within the floodplain of the unnamed intermittent stream for the culvert replacement, the rule is triggered.

Section 2(b) of the Floodplain Alteration Rule states that a structure intended for residential occupancy must be constructed so that door and window openings are at least two feet above the 100-year high water elevation of the waterbody or hydraulic disconnection be met. While constructing single-family homes are not included with this permit, future single-family homes will be required to conform with Section2(b) of the rule and confirm that freeboard is met.

Section 4(a) states that any floodplain fill must be offset so there is no loss in flood storage between the ordinary high water (OHW) and 100-year floodplain elevations. The Project proposes 26.44 cubic yards (714 cubic feet) of fill within the 100-year floodplain of the intermittent stream. This fill is due to the culvert extension. To offset the fill, the Applicant proposes 40.26 cubic yards (1,087 cubic feet) of compensatory storage within the stream's floodplain, located

upstream of the culvert on the north side of the wetland, as shown in Figure 1 in Attachment B. This cut will result in the creation of 13.82 cubic yards (373 cubic feet) of net floodplain storage.

Section 4(c) states that fill within a watercourse must meet the following criteria:

1. No impervious surface may be placed within the 10-year floodplain or within 25 feet of the watercourse centerline, whichever greater, unless the surface is: (1) no more than 10% of the site 10-year floodplain area; or (2) a linear component of a public roadway or trail: The Project proposes impervious surface for the driveway within 25 feet of the centerline of the intermittent stream. However, the proposed impervious surface is not within the 10-year floodplain of the intermittent stream as the driveway elevation is above the 100-year floodplain elevation. Therefore, the Project conforms to Section 4(c)1, as the proposed impervious surface is no more than 10% of the site's 10-year floodplain area.

2. Applicant must meet the No-Rise Standard: The Applicant has submitted HydroCAD models showing that the proposed culvert and associated fill meets the No Rise Standard by not increasing the 100-year high water level by more than 0.00 ft from the existing to proposed condition. As shown in Table 1 (above), the 100-year high water level is shown to decrease upstream of the culvert and not change downstream of the culvert.

Public Request for Board Review:

MCWD staff have been coordinating with members of the public since November 2024 regarding the Project, many of which are directly adjacent to the proposed development. A couple of landowners who live directly south and east of the development have expressed concerns about drainage impacts on their properties. In total, approximately five landowners have had direct contact with MCWD.

As the development moved through the City's Planning Commission and City Council, many of the abovementioned residents also expressed similar concerns at those meetings, which MCWD staff have tracked. The first City of Orono Planning Commission meeting was held on November 18, 2024, where the decision was tabled so the Applicant could revise to better align with City regulations. During the February 18, 2025, Planning Commission meeting, the development was denied 5 to 2 primarily for the turn radius on the road but still moved onto the City Council for review. The Applicant revised the road's turn radius prior to the March 10, 2025, City Council meeting where the Council approved the Preliminary Plat. The Applicant still needs to go in front of the City Council for Final Plat Approval.

As a part of the MCWD review process, a public notice (Attachment E), which started on May 27th and concluded June 9th, was sent to property owners within 600 feet of the Project parcel, in which comments, questions, and request for consideration by the Board of Managers could be received. Written comments from the public can be found in Attachment F. Due to the public interest leading up to the public notice, MCWD met with four concerned property owners and an Orono City Councilmember to discuss the Project and review the general concerns of owners in the area, including concerns of neighbors unable to attend the meeting. During the meeting, Board consideration was requested (see Attachment G). The following concerns have been raised over the last few months:

- Stormwater drainage from the increase in impervious surface resulting in increased runoff and decreased water quality
- Negative impacts to the on-site wetlands
- Monitoring requirements during and post construction
- Future required MCWD permitting

MCWD staff and the MCWD Engineer reviewed the public comments and assessed these concerns. The following outlines MCWD's response to address each of these concerns received, within the framework of the MCWD rules.

<u>Drainage and Stormwater Management</u>

MCWD's Stormwater Management Rule regulates impervious and requires treatment of runoff and no increase in rates. Members of the public have expressed concerns with the amount of proposed impervious and the drainage patterns for Lots 4 and 5. Specifically, there are concerns regarding the steep incline of the driveway on Lot 4 and how the runoff will be routed to the adjacent Wetland 1. A vegetated swale along the eastern edge of Wetland 1 will be constructed to

direct runoff into filtration Basin 3, and not directly into Wetland 1. As noted in the Stormwater Management Rule review section above, runoff rates across the site will not increase and the basins are sized to provide more volume than is required. With regard to Lot 4, no grading will occur within Wetland 1, so the existing flow path off-site to the south will be maintained.

During the meeting, concerns were raised about water quality and treatment of runoff. The District requires one inch over the impervious surface to be treated to provide for water quality, which is in alignment with the Minnesota Stormwater Manual and the Minnesota Pollution Control Agency's (MPCA) standards.

As outlined below, regular site inspections and review of as-builts when the Project is completed will confirm that the Project was built in accordance with the approved plans, specifically for the drainage path and the stormwater basins. MCWD rules are designed to protect and improve water quality to adjacent waterbodies. The rules are met; therefore, this will be achieved.

Wetland Protection

The public raises concerns about the on-site wetlands and the proximity of the impervious surfaces to the wetlands. MCWD's Wetland Protection Rule, as outlined above, is applicable, and the proposed Project has been reviewed and found to be in compliance with the rule. As a part of this rule, wetland buffers will be established downgradient of the proposed impervious surface on Wetlands 1 and 2. The Applicant is meeting the required buffer area and providing an additional 818 square feet of buffer. The requirement to maintain the wetland buffer will be permanently memorialized on the property title as a condition of permit issuance. According to Section 6 of the Wetland Protection Rule, the following is not allowed within the wetland buffer:

- Placement of structures or fill
- Mowing, cultivating, cropping, or mulching
- Excavation or other disturbance

During construction, 2,722 square feet of wetland buffer will be disturbed and will be restored according to the approved planting plan. However, disturbance will not extend into the wetland (except for the de-minimis impact to Wetland 1), and erosion control will be in place between the land disturbance and the wetlands.

In the remaining 55,215 square feet of wetland buffer that will not be disturbed during construction, silt fences will be in place between the construction limits and the wetland buffer boundary to protect the wetlands during construction, in alignment with Section 6(e) of the Wetland Protection Rule. Inspections will be conducted throughout construction to ensure erosion control is functioning properly and protecting water resources from direct impacts.

Site Monitoring

Concerns have been raised regarding monitoring of the Project during and after construction to ensure the MCWD permit is adhered to. Financial assurance in the amount of $10,621.67 will be held while the Project is ongoing for the Stormwater Management, Wetland Protection, and Erosion Control Rules.

MCWD and city staff will conduct routine inspections during construction to inspect erosion and perimeter control and check for overall compliance with the permitted plans, within the framework of the MPCA's Stormwater Pollution Prevention Program (SWPPP). If needed, financial assurance can be drawn upon in accordance with Section 3(a) of the Financial Assurance Rule. Once the Project is complete, as-built surveys will be required from the Applicant to close out the permit and release the financial assurance to the Applicant. MCWD staff and the District Engineer will review the as-builts for compliance with the approved plans.

As a condition of permit issuance, the Applicant will be required to file a declaration on the property title obligating the property owner to maintain the stormwater features, wetland buffers, and culvert crossing.

Future Permitting

Concerns were raised about future MCWD permitting requirements and the allowed scope within this permit. Because each lot will be graded to contain a house pad and the individual lots will be sold prior to single-family home construction, each lot will fall under this permit and additional review from MCWD will be required to confirm the proposed plans align with this permit.

Residents have noted discussion about future access to the North Arm channel in Lake Minnetonka. Although Lots 4 and 5 are the only lots with lake access, reaching the lake would require crossing Wetlands 2 and 3. Section 6(d) of MCWD's Wetland Protection Rule allows for a four-foot-wide path through the wetland buffer to access the wetlands in the most direct way. No additional MCWD permit would be needed for a path through the wetland buffer. However, if landowners would like to cross the wetlands, additional MCWD and/or Wetland Conservation Act (WCA) permitting may be applicable. To install docks in the North Arm channel, landowners would need to coordinate with and obtain applicable permits from the Lake Minnetonka Conservation District (LMCD).

No wetland crossings, via boardwalk, raised path, or other means, are authorized by this permit. Landowners would need to obtain additional permit approval and/or MCWD concurrence in amending the buffer maintenance declaration to install a wetland crossing of this nature.

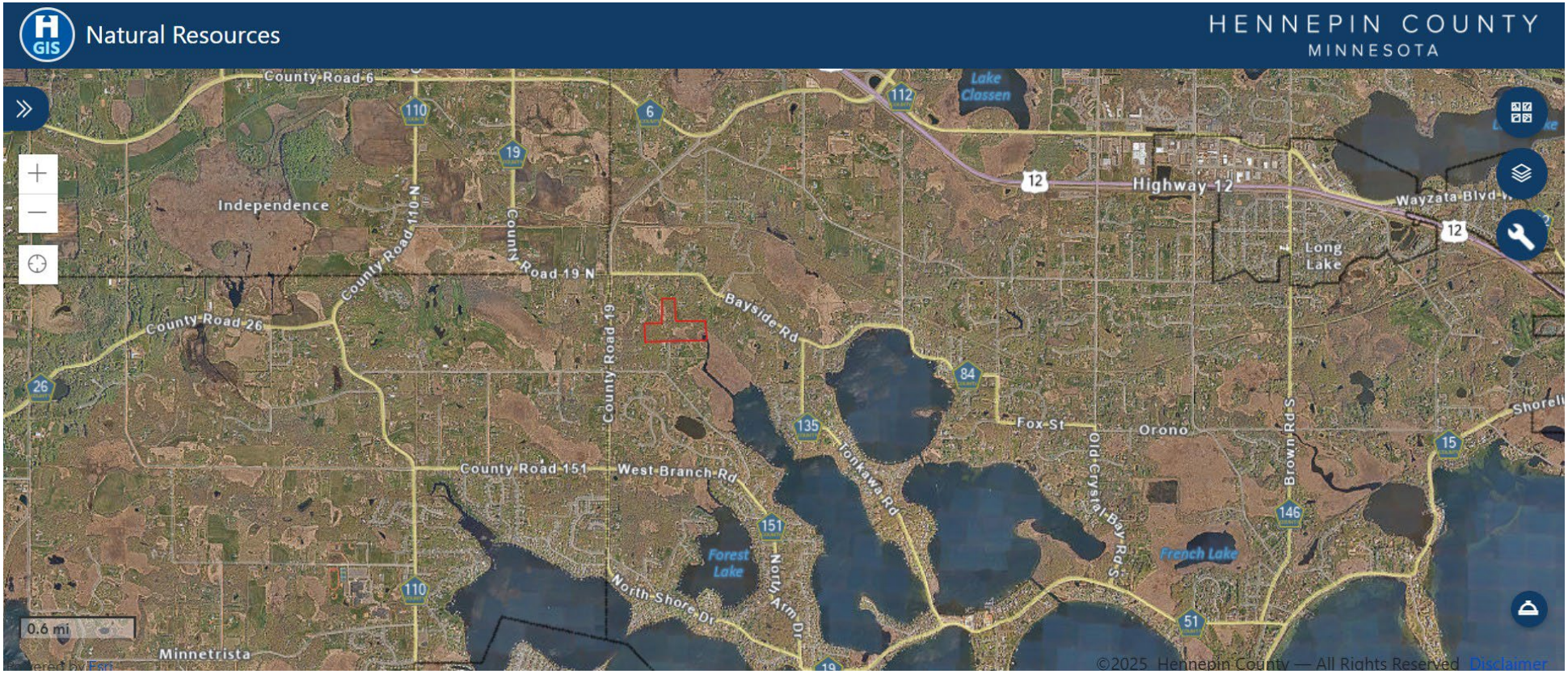
Summary:
The Applicant has applied for a Minnehaha Creek Watershed District permit under the Erosion Control, Stormwater Management, Waterbody Crossings and Structures, Wetland Protection, and Floodplain Alteration Rules.

Based on staff and MCWD Engineer analysis of the Applicant's submittals, the application meets all of the criteria for all applicable rules.

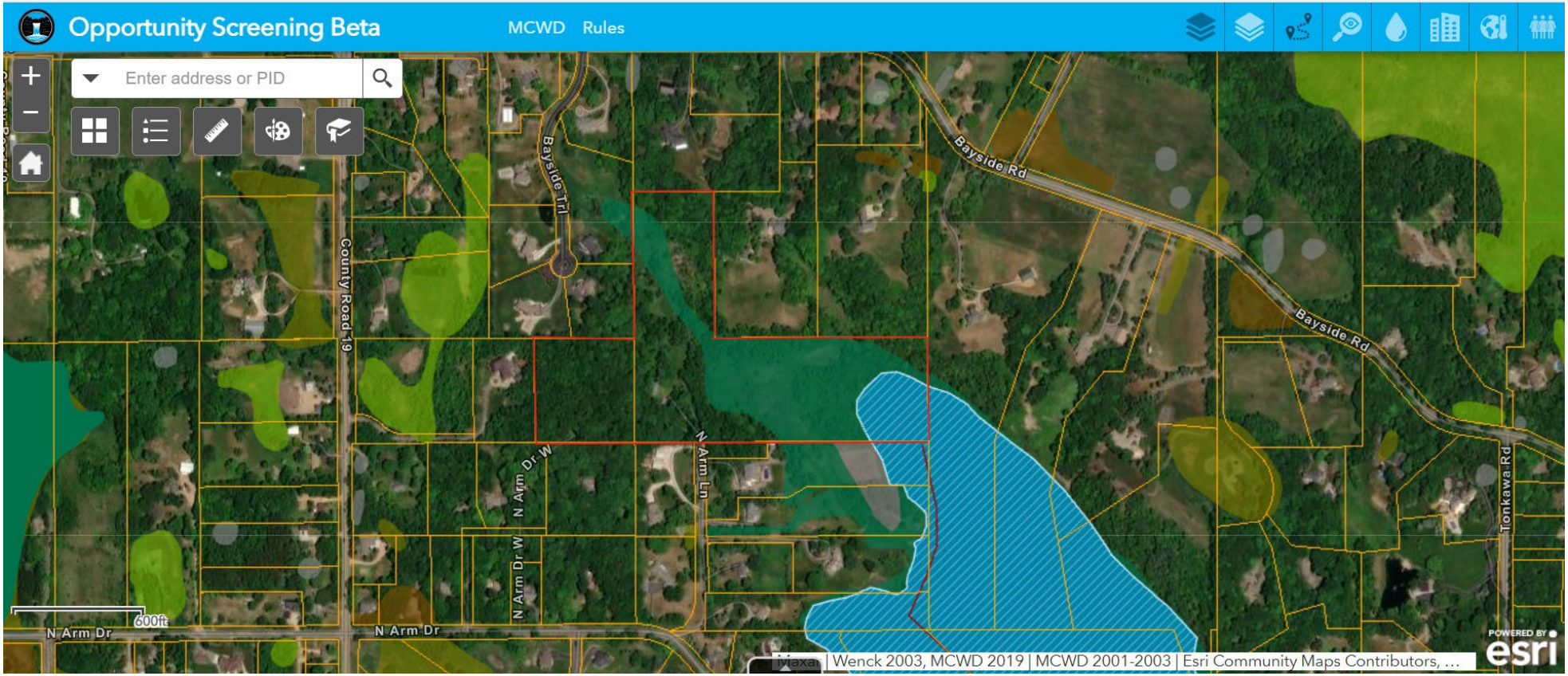
Therefore, staff recommends approval of the permit application, with the conditions listed at the beginning of this report.

Attachments:
Attachment A – Project Location Map
Attachment B – Site Plans
Attachment C – Stormwater Management Plan
Attachment D – WCA Decisions
Attachment E – Public Notice
Attachment F – Public Comments
Attachment G - Request for Board Consideration

Attachment A:
Project Location Map



Project location outlined in red, off of the North Arm Channel of Lake Minnetonka.



Project area outlined in red. MCWD's FAW layer shows the wetlands in dark green on the site. DNR Public Water Basins is the blue striped layer.

Attachment B:
Site Plans

PRELIMINARY PLANS FOR

IDYLLVALE SHORES

ORONO, MN

JUNE 2025

VICINITY MAP

PROJECT TITLE

CONTACTS

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INDEX

LEGEND:

- PROPERTY LINE
- SETBACK
- EASEMENT
- WETLAND
- CONTOUR
- SPOT ELEVATION
- DRAINAGE DIRECTION
- BITUMINOUS SURFACE
- BITUMINOUS SURFACE, HEAVY
- CONCRETE SURFACE
- LIGHT POST
- CURB & GUTTER
- STORM SEWER / CULVERT
- DRAINTILE
- SANITARY SEWER
- WATERMAIN
- CLEANOUT
- SANITARY MANHOLE
- WETLAND BUFFER
- INFILTRATION/FILTRATION BASIN
- SEPTIC FIELD
- TREE LINE
- STORMWATER POND
- ROCK RIPRAP, RANDOM CRUSHED
- EROSION CONTROL BLANKET
- TURF REINFORCEMENT MAT
- GEOGRID OR ARTICULATED CONCRETE
- STABILIZED CONST. ENTRANCE
- SILT FENCE
- SEDIMENT CONTROL LOG
- INLET PROTECTION
- FENCE
- RETAINING WALL

NOTES

THE EXISTING UTILITY INFORMATION SHOWN IN THIS PLAN HAS BEEN SURVEYED BY OTHERS; THE CONTRACTOR SHALL FIELD VERIFY EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION AS REQUIRED BY STATE LAW. NOTIFY 811 OR GOPHER STATE ONE CALL (1.800.252.1166).

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38–02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

PLAN REFERENCES:
1. CITY OF ORONO ENGINEERING DESIGN MANUAL
2. MINNESOTA DEPT. OF TRANSPORTATION – STANDARD SPECIFICATIONS FOR CONSTRUCTION, LATEST EDITION.
3. CITY ENGINEERS ASSOCIATION OF MINNESOTA STANDARD SPECIFICATIONS, LATEST EDITION.
4. UNREINFORCED CONCRETE PER ACI 330R–08 AND ACI 330.1–03.

811 Know what's below. Call before you dig.

CIVIL METHODS, INC.
P.O. Box 28038
St. Paul, MN 55128
o:763.210.5713 | www.civilmethods.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

KENT E. BRANDER
DATE: 06-20-2025
LIC. NO.: 44578

DESIGNED: KEB
DRAWN: KEB
CHECKED: DMP

DATE / REVISION:
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06-20-2025 Modified Per MCWD Comments. NOT FOR CONSTRUCTION

PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

COVER SHEET

SHEET NO: **C001**

Print Date: 6/20/2025 11:11 AM
File Loc: C:\CM\Civil Methods, Inc\CM1 - Documents\7. Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\Sheets\00_COVER.dwg

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
- UNIDENTIFIED MANHOLE
- BUILDING LINE
- BITUMINOUS SURFACE
- CONCRETE SURFACE
- UNDERGROUND TELEPHONE
- OVERHEAD UTILITY
- UNDERGROUND GAS
- FENCE
- TREES

FLOOD INFORMATION:

PORTIONS OF THIS PROPERTY LIES WITHIN ZONE AE, AREAS DETERMINED TO BE WITHIN THE 0.2% ANNUAL CHANCE FLOODPLAIN OTHER AREAS INCLUDING ALL BUILDINGS ARE LOCATED IN ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN ON FEMA FLOOD INSURANCE RATE MAP NUMBER 27053C0285E HAVING AN EFFECTIVE DATE OF NOVEMBER 4TH, 2016. THE BASE FLOOD ELEVATION OF 931.1 IS SHOWN ON THE SURVEY FOR REFERENCE PURPOSES ONLY. VERIFIED BY OTHERS.

AREA:

TOTAL AREA AS SHOWN = 1,104,200 SQ.FT. / 25.35 ACRES

LEGAL DESCRIPTION:

(THE FOLLOWING LEGAL DESCRIPTION IS PROVIDED BY THE OWNER. NO TITLE OPINION OR TITLE COMMITMENT WAS PROVIDED) SUBJECT TO CHANGE.

All that part of the East 1/2 of the Northwest 1/4 of Section 6, Township 117 North, Range 23, West of the 5th Principal Meridian, bounded by a line described as follows: Commencing at the Southwest corner of the Northwest 1/4 of the Northeast 1/4 of the Northwest 1/4 of said Section 6; thence South along the West line of said East 1/2 of the Northwest 1/4 to a point distant 854.5 feet North of the Southwest corner of said East 1/2 of the Northwest 1/4; thence East parallel with the South line of said East 1/2 of the Northwest 1/4, a distance of 280 feet; thence South parallel with the West line of said East 1/2 of the Northwest 1/4 to the South line of said East 1/2 of the Northwest 1/4; thence East along the South line of said East 1/2 of the Northwest 1/4, a distance of 33 feet; thence North parallel with the West line of said East 1/2 of the Northwest 1/4, a distance of 854.5 feet; thence East parallel with the South line of said East 1/2 of the Northwest 1/4 to a point distant 22 rods East of the West line of said East 1/2 of the Northwest 1/4; thence North parallel with the West line of said East 1/2 of the Northwest 1/4 to the South line of said Northwest 1/4 of the Northeast 1/4 of the Northwest 1/4; thence West along said South line to the point of beginning.
ALSO, All that part of the Southeast 1/4 of the Northwest 1/4 of Section 6, Township 117, Range 23, described as follows: Commencing at the Northeast corner of the Southeast 1/4 of the Northwest 1/4 of said Section thence West along the North line of the Southeast 1/4 of the Northwest 1/4 of said Section 6 to a point distant 22 rods East of the Northwest corner of the Southeast 1/4 of the Northwest 1/4 of said Section 6; thence South and parallel with the West line of the Southeast 1/4 of the Northwest 1/4 of said Section 6 to a point distant 854.5 feet North of the South line of the Northwest 1/4 of said Section 6; thence East to a point on the East line of the Northwest 1/4 of said Section 6 distant 854.5 feet North of the Southeast corner of the Northwest 1/4 of said Section 6; thence North along said East line to the point of beginning.
ALSO, That part of the Southeast 1/4 of the Northwest 1/4 of Section 6, Township 117, Range 23, described as follows: Commencing at the Southeast corner of Southeast 1/4 of the Northwest 1/4; thence West along the South line of said Southeast 1/4 of the Northwest 1/4 a distance of 1020.6 feet to the point of beginning of "Line A"; thence North parallel with the West line of said Southeast 1/4 of the Northwest 1/4 a distance of 854.5 feet to the point of beginning of the property begin described, and said "Line A" there ending; thence East parallel with said South line a distance of 290 feet; thence South parallel with the West line of said Southeast 1/4 of the Northwest 1/4 a distance of 75 feet; thence West parallel with said South line a distance of 290 feet to said "Line A11; thence North along said "Line A11 to the point of beginning.
EXCEPT the right of way of North Arm Lane, as dedicated as public highway, per Document No. 7835812.
AND
Outlot B, IDYLL VALE FARM, according to the recorded plat thereof, Hennepin County1 Minnesota.

TITLE NOTES:

NO TITLE OPINION OR TITLE COMMITMENT WAS PROVIDED THAT WOULD SHOW EASEMENTS OR ENCUMBRANCES OF RECORD. EASEMENTS MAY EXIST THAT ARE NOT SHOWN. SUBJECT TO CHANGE.

1. 10' DRAINAGE AND UTILITY EASEMENTS AS SHOWN ON OUTLOT B.

UNDERGROUND UTILITIES NOTES:

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THIS SURVEY HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. GOPHER STATE ONE CALL LOCATE TICKET NUMBER(S) XXXXXXXX. SOME MAPS WERE RECEIVED, WHILE OTHER UTILITIES DID NOT RESPOND TO THE LOCATE REQUEST. ADDITIONAL UTILITIES OF WHICH WE ARE UNAWARE MAY EXIST.

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

5/22/2025 THIS NOTE ADDED BY CIVIL METHODS INC. SURVEY CAD FILE INDICATED 2-24'-LONG 18"-DIA CMP CULVERTS. NO END SECTIONS INDICATED. SURVEY INDICATED U/S INV 944.1 AND D/S INV 943.5

SURVEY NOTES:

1. BEARINGS ARE BASED ON THE HENNEPIN COUNTY COORDINATE SYSTEM NAD 1983-1996.
2. UNDERGROUND UTILITIES SHOWN PER VISUAL INSPECTION. THERE MAY SOME UNDERGROUND UTILITIES, GAS, ELECTRIC, ETC. NOT SHOWN OR LOCATED.
3. CONTOURS SHOWN PER LIDAR DATA OBTAINED FROM THE DNR MNTOPO WEBSITE. NOT FIELD VERIFIED.
4. DATE OF FIELD LOCATION OF BUILDINGS, ROAD, ETC. = 5-3-24. ADDITIONAL TOPOGRAPHY ON 9-9-24 IN AREAS OF PROPSOED ROADS AND WITHIN 75' OF OHWL.
5. ELEVATIONS BASED ON GPS DERIVED VALUES FOR NAVD 88.

WETLAND NOTES:

1. WETLANDS SHOWN ON THIS SURVEY WERE PROVIDED BY THE OWNER AS SHOWN ON SURVEY BY JAMES R. HILL, INC. DATED 8-12-23. NOT VERIFIED BY CORNERSTONE LAND SURVEYING, INC.

SEPTIC/WELL

THE EXISTING SEPTIC AND WELL WERE NOT LOCATED AT THE TIME OF THE SURVEY.

0 80 160

NORTH

IDYLLVALE SHORES

CONTACT:

KASEY JOHNSON
BLUE PENCIL COLLECTIVE
651.419.6367
kasey@bluepencilcollective.com

COUNTY/CITY:

HENNEPIN COUNTY
CITY OF ORNO

REVISIONS:

DATE	REVISION
5-8-24	PRELIMINARY ISSUE
6-30-24	ADD SEPTIC BORINGS
9-10-24	ADDITIONAL TOPO

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. Thurmes Registration Number: 25718

Date: 5-8-24

PROJECT LOCATION:

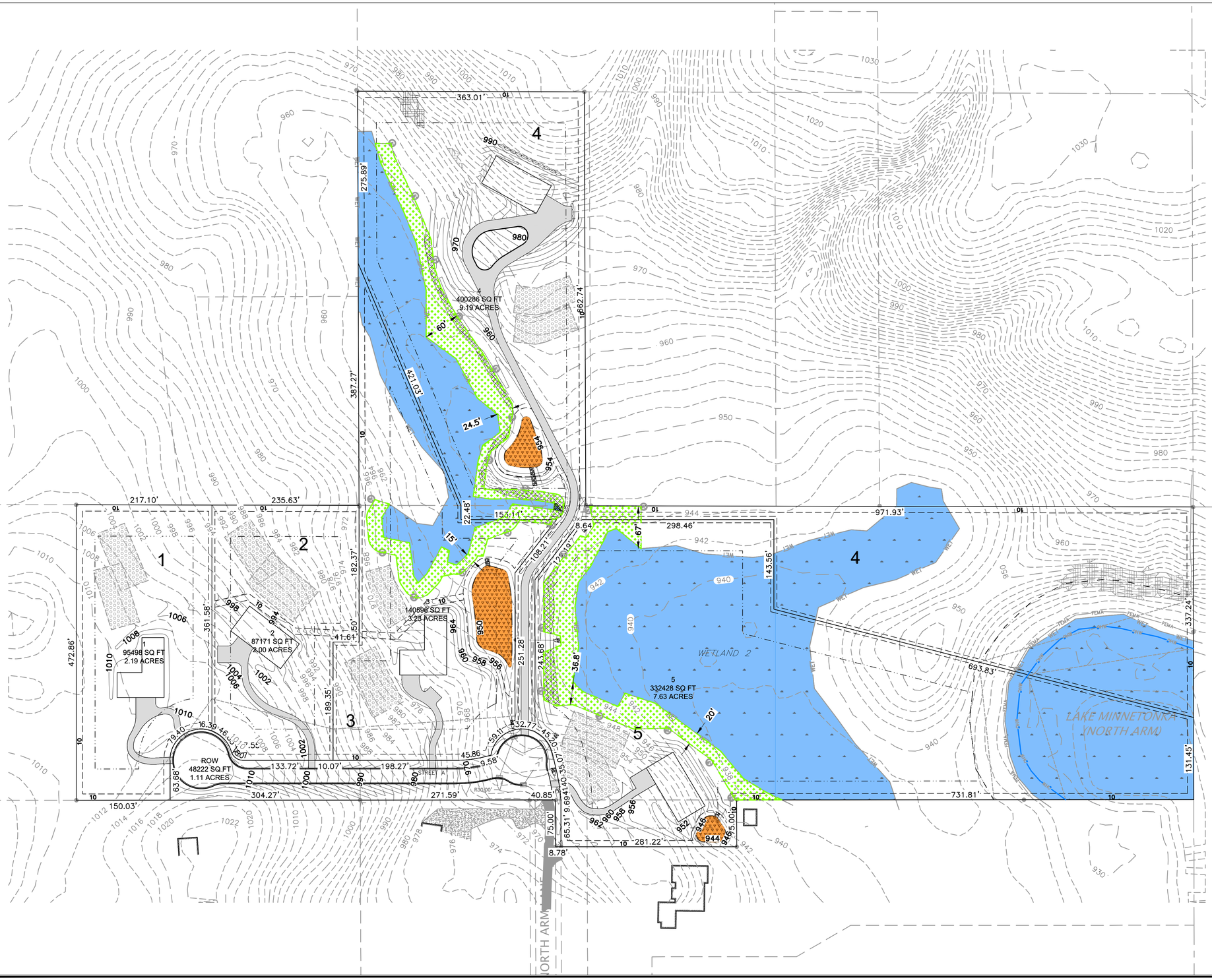
215 NORTH ARM LANE
PID#0611723240001
PID#0611723230001
PID#0611723240002

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

CORNERSTONE
LAND SURVEYING, INC.

FILE NAME SURVBPC01
PROJECT NO. BPC24001

CERTIFICATE OF SURVEY



BENCHMARK
SEE SURVEY DOCUMENTATION

N

0 80 160 Feet

LEGEND:

- PROPERTY LINE
- SETBACK
- EASEMENT
- LOT WIDTH MEASUREMENT
- WETLAND BOUNDARY
- WETLAND BUFFER BOUNDARY
- CONTOUR
- WETLAND
- WETLAND BUFFER
- SEPTIC AREA
- STORMWATER MANAGEMENT BASIN
- SLOPES >30%
- WETLAND SIGN/MARKER
- GRADING WITHIN BUFFER AREA

SITE DATA:

TOTAL PROPERTY AREA: ±25.35 AC
EXISTING HARD SURFACE: ±0.15 AC
PROPOSED HARD SURFACE: ±1.87 AC
PROPOSED HARD SURFACE %: 7.4%

ZONING: LR-1A & RR-1B
DIMENSIONAL REQUIREMENTS (SAME FOR BOTH ZONES)
LOT AREA (MIN): 2.0 AC
LOT WIDTH (MIN): 200 FT
HEIGHT (MAX): 30 FT

SETBACKS (SAME FOR BOTH ZONES):

SETBACK VALUES IN FEET	STREET/ FRONT	INTERIOR SIDE	SIDE STREET	REAR/ STREET
PRINCIPAL BLDG	50	30	30	50
ACCESSORY BLDG	50	15	30	15
OVERSIZE ACC. BLDG.	50	30	30	50
ACCESSORY STRUCTURES	25	15	15	15

SITE CONDITIONS: WOODED; SINGLE FAMILY RESIDENCE
ADJACENT DEVELOPMENT: RURAL AND LAKESHORE RESIDENTIAL
PROPOSED USE: RURAL RESIDENTIAL

WETLAND BUFFER DATA:

WETLAND 1 (MANAGE 2):

PRESUMED BASE BUFFER WIDTH: 30 FT
ADJUSTED BASE BUFFER WIDTH: 24 FT
REQUIRED BUFFER AREA: 30874 SF
MINIMUM ALLOWABLE BUFFER WIDTH: 15 FT
MAXIMUM ALLOWABLE BUFFER WIDTH: 60 FT
AVERAGE BUFFER WIDTH: 24.5 FT
PROVIDED BUFFER AREA: 31345 SF

WETLAND 2 (MANAGE 1):

PRESUMED BASE BUFFER WIDTH: 40 FT
ADJUSTED BASE BUFFER WIDTH: 36 FT
REQUIRED BUFFER AREA: 26716 SF
MINIMUM ALLOWABLE BUFFER WIDTH: 20 FT
MAXIMUM ALLOWABLE BUFFER WIDTH: 80 FT
AVERAGE BUFFER WIDTH: 36.8 FT
PROVIDED BUFFER AREA: 27063 SF

811 Know what's below. Call before you dig.

CIVIL METHODS, INC.
P.O. Box 28038
St. Paul, MN 55128
o:763.210.5713 | www.civilmethods.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

KENT E. BRANDER DATE: 06-20-2025 LIC. NO.: 44578

DESIGNED: KEB
DRAWN: KEB
CHECKED: DMP

DATE / REVISION:
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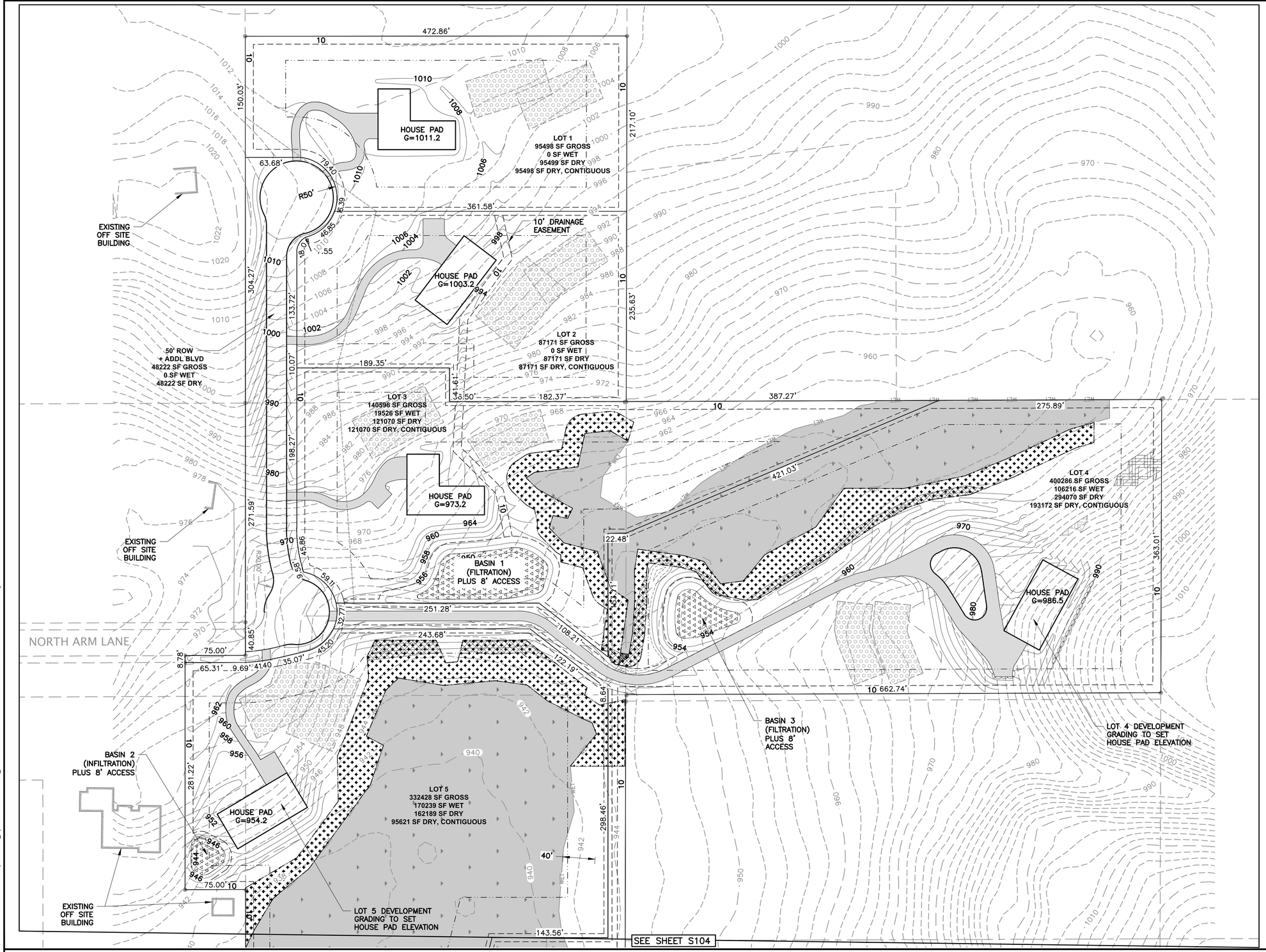
PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

PRELIMINARY PLAT - OVERALL

SHEET NO: **S102**

Print Date: 6/20/2025 11:11 AM
File Loc: C:\CM\Civil Methods, Inc\CMI - Documents\7. Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\Sheets\PRELIMINARY PLAT.dwg



BENCHMARK
SEE SURVEY DOCUMENTATION

0 60 120 Feet

LEGEND:

- PROPERTY LINE
- SETBACK
- EASEMENT
- LOT WIDTH MEASUREMENT
- WETLAND BOUNDARY
- WETLAND BUFFER BOUNDARY
- CONTOUR
- WETLAND
- WETLAND BUFFER
- SEPTIC AREA
- SLOPES >30%

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PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

PRELIMINARY PLAT

SHEET NO: **S103**

Print Date: 6/20/2025 11:11 AM
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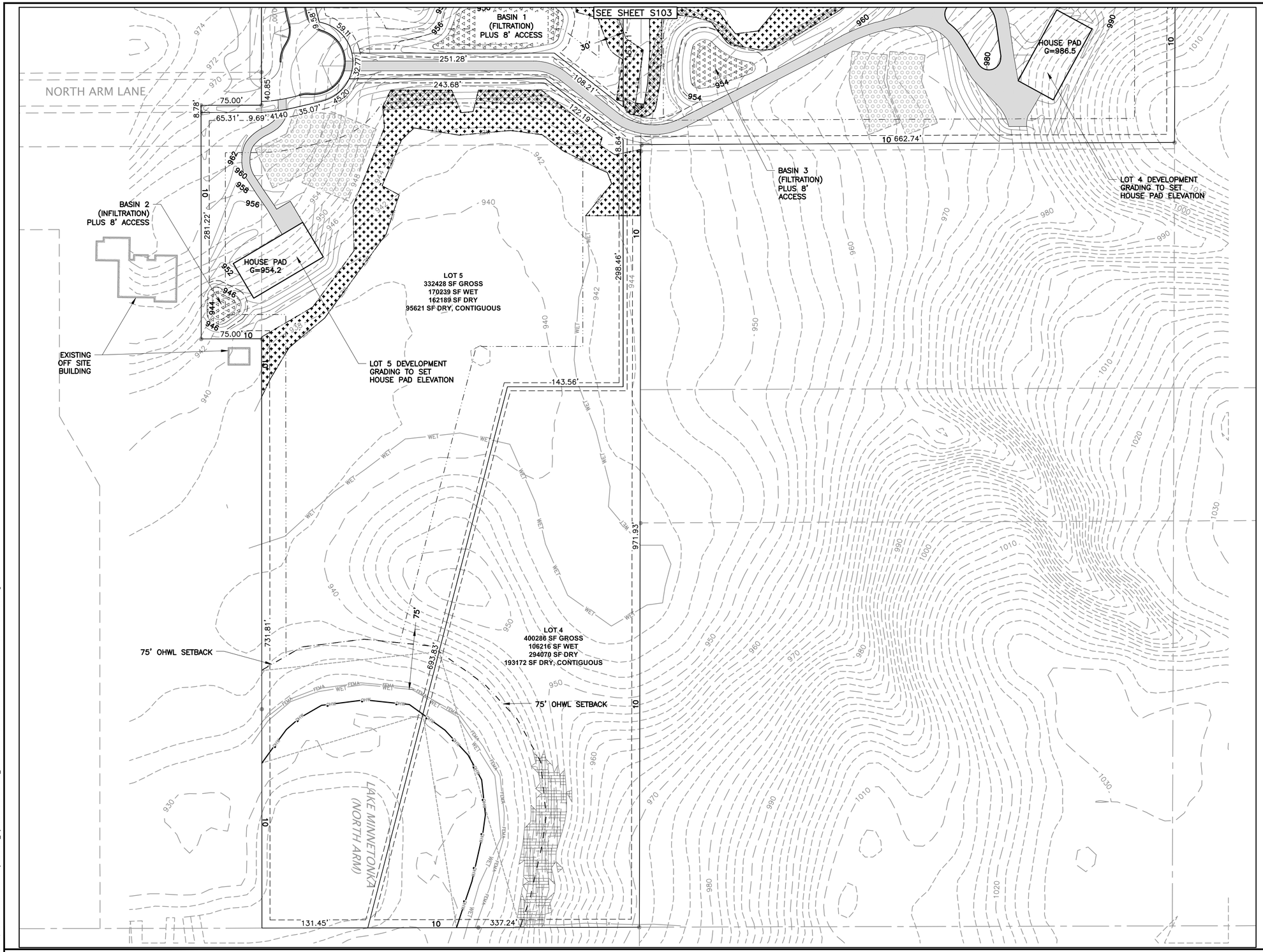

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PROJ. OWNER: BRADLEY J PASS

PRELIMINARY PLAT

SHEET NO: **S104**

Print Date: 6/20/2025 11:11 AM
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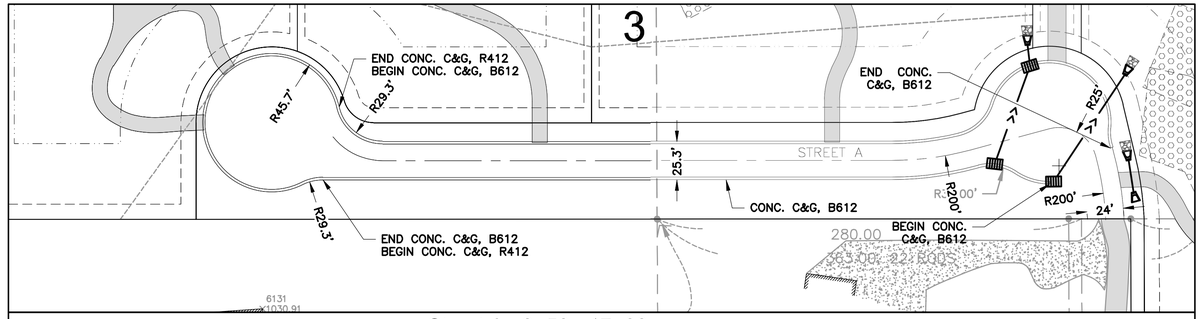

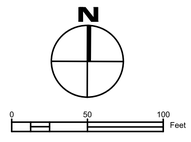

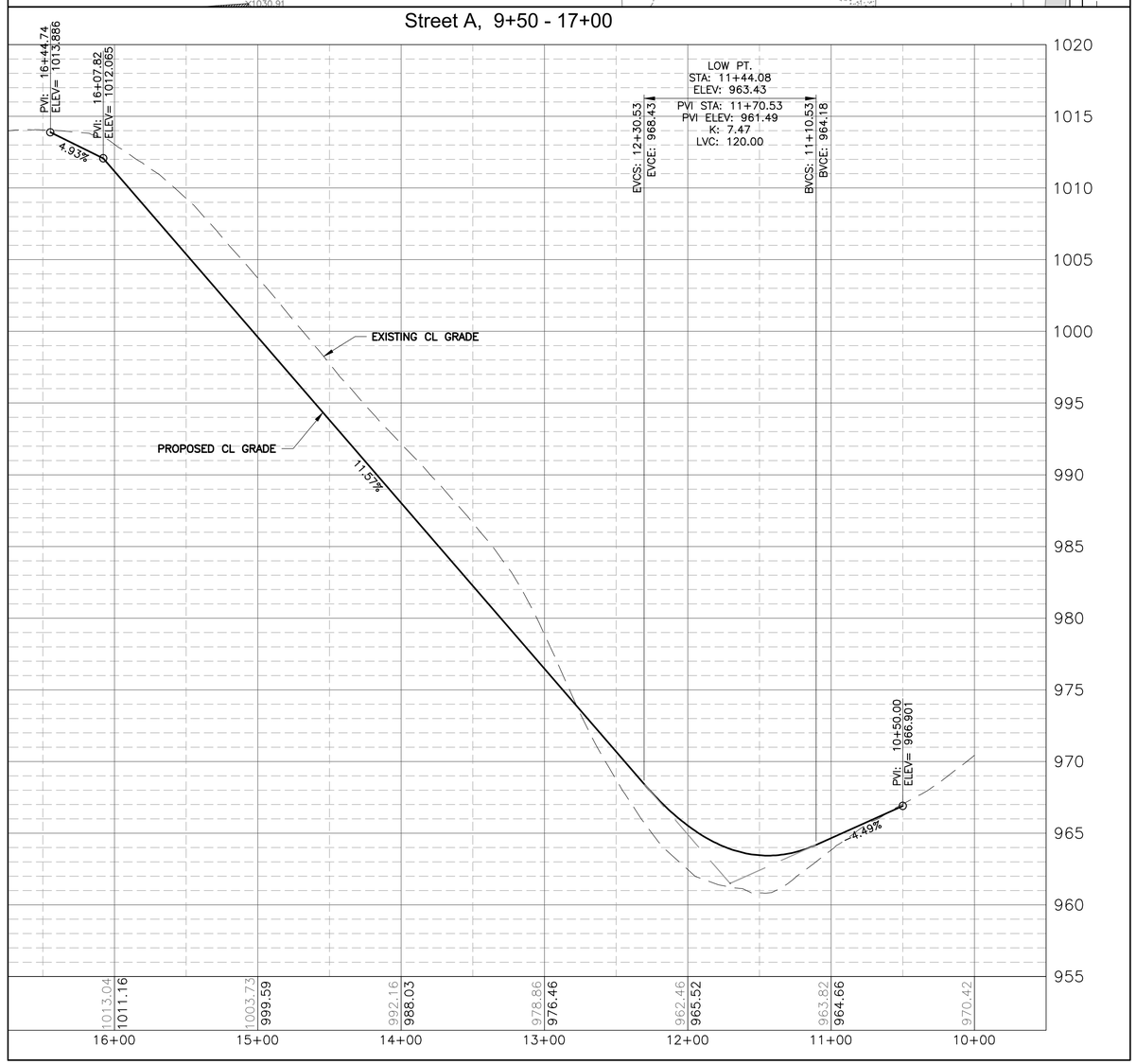

GENERAL NOTES:

1. The subsurface utility location information in this plan is utility quality level D. This utility quality level was determined according to the guidelines of CI/ASCE 38–02, titled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data." Engineer does not guarantee the accuracy of utility locations or that all existing utilities are shown; Contractor is responsible for locating utilities prior to digging.
2. See Certificate of Survey and Preliminary Plat for additional existing and proposed information.
3. Dimensions are to top back of curb or edge of bituminous, unless noted otherwise.
4. See detail and note sheets for additional specifications.

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PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

STREET PLAN & PROFILE

SHEET NO: **C401**

Print Date: 6/20/2025 11:11 AM
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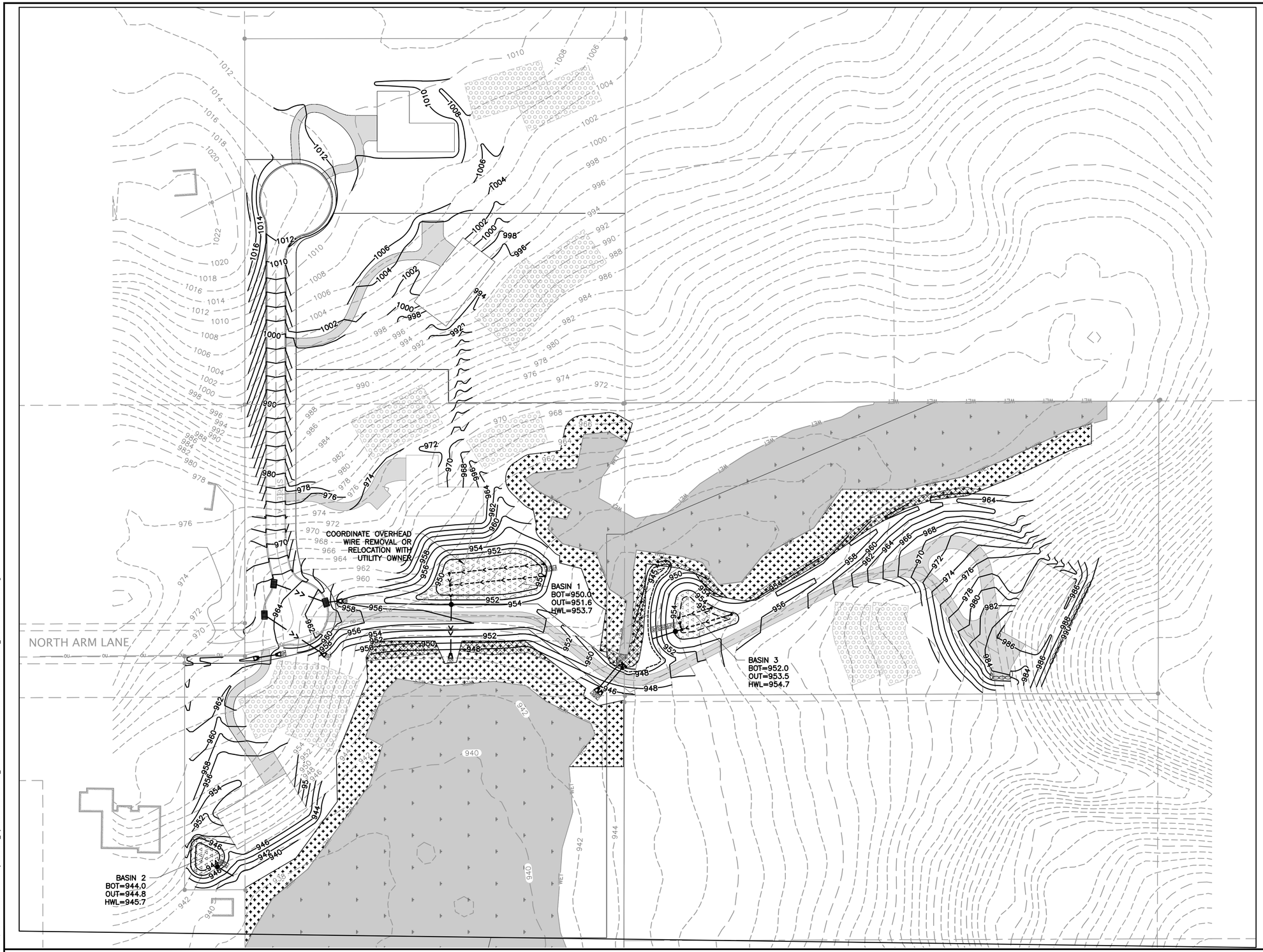

N

0 60 120 Feet

BENCHMARK
SEE SURVEY DOCUMENTATION

LEGEND:

- PROPERTY LINE
- WETLAND BOUNDARY
- CONTOUR
- SPOT ELEVATION
- WETLAND BUFFER
- BIORETENTION/INFILTRATION BASIN
- SEPTIC AREA
- GRADING WITHIN BUFFER
- DRAINAGE DIRECTION
- BITUMINOUS SURFACE
- BITUMINOUS SURFACE, HEAVY
- CONCRETE SURFACE
- CURB & GUTTER
- STORM SEWER/CULVERT
- DRAINTILE
- SANITARY SEWER
- WATERMAIN
- CLEANOUT
- SANITARY MANHOLE
- TREE LINE
- STORMWATER POND
- ROCK RIPRAP, RANDOM CRUSHED
- EROSION CONTROL BLANKET
- TURF REINFORCEMENT MAT
- STABILIZED CONST. ENTRANCE
- SILT FENCE
- SEDIMENT CONTROL LOG
- INLET PROTECTION
- FENCE
- RETAINING WALL
- SUBCATCHMENT NODE ID
- BASIN NODE ID
- REACH NODE ID
- SUBCATCHMENT DELINEATION
- DRAINAGE DIRECTION
- TREE PROTECTION FENCE
- WETLAND MARKER

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GRADING & DRAINAGE - OVERALL

SHEET NO: C500

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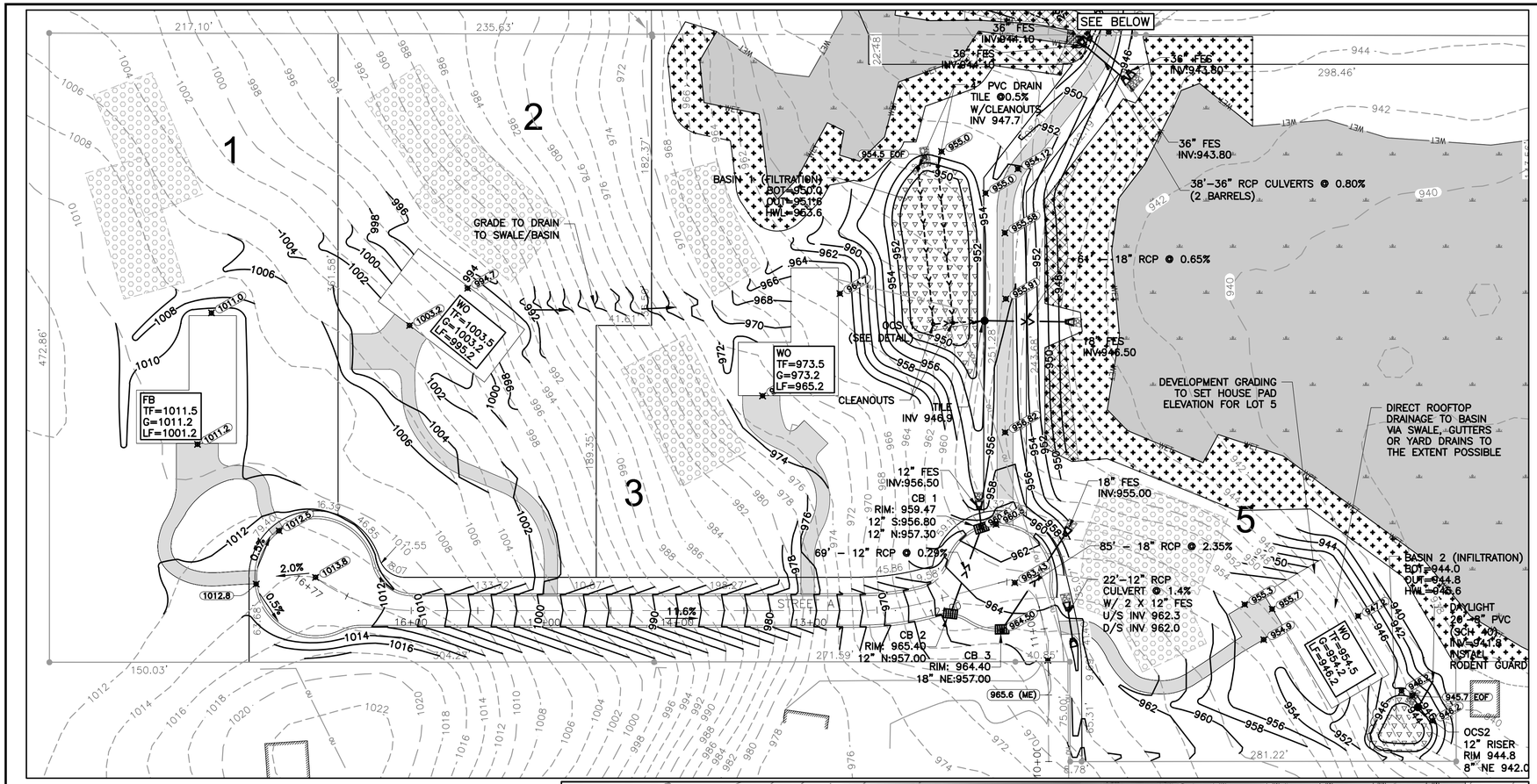
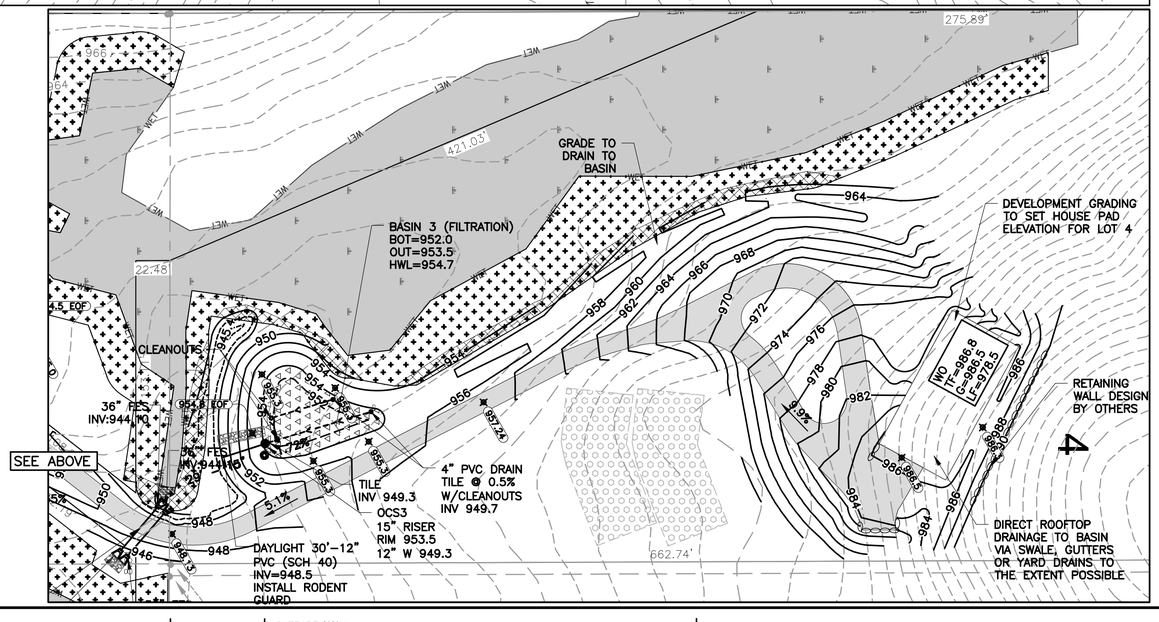
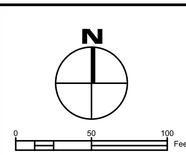


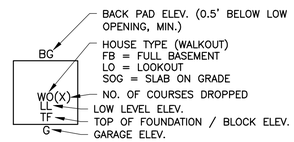




BENCHMARK
SEE SURVEY DOCUMENTATION

LEGEND:

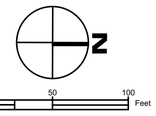
- PROPERTY LINE
- WETLAND
- WETLAND BUFFER
- CONTOUR
- SPOT ELEVATION
- DRAINAGE DIRECTION
- STORM SEWER / CULVERT
- BITUMINOUS SURFACE
- RIPRAP
- RETAINING WALL
- SEPTIC AREA
- DRAINTILE W/ CLEANOUT



TYPICAL LOT & HOUSE PAD

GENERAL NOTES:

1. The subsurface utility location information in this plan is utility quality level D. This utility quality level was determined according to the guidelines of CI/ASCE 38-02, titled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data." Engineer does not guarantee the accuracy of utility locations or that all existing utilities are shown; Contractor is responsible for locating utilities prior to digging.
2. Construction shall comply with all applicable governing codes.
3. Damaged items or property shall be repaired or replaced at Contractor's expense.
4. See erosion control plan and SWPPP for required controls to be installed prior to site disturbance.
5. Contractor shall install demarcation fencing at around septic fields (no grading permitted in septic areas) and at property line as necessary.
6. Contours shown are to final grade.
7. Curb point elevations are at flow line, unless noted otherwise.
8. Maximum grading slope in mowed areas to be 3:1 (2:1 in natural areas).
9. Swales between lots shall be 2.0% (min.)
10. Retaining walls over 4' high require structural engineer certification.
11. See details and note sheets for additional specifications.



Know what's below. Call before you dig.

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KENT E. BRANDER
DATE: 06-20-2025
LIC. NO.: 44578

DESIGNED: KEB
DRAWN: KEB
CHECKED: DMP

DATE / REVISION:
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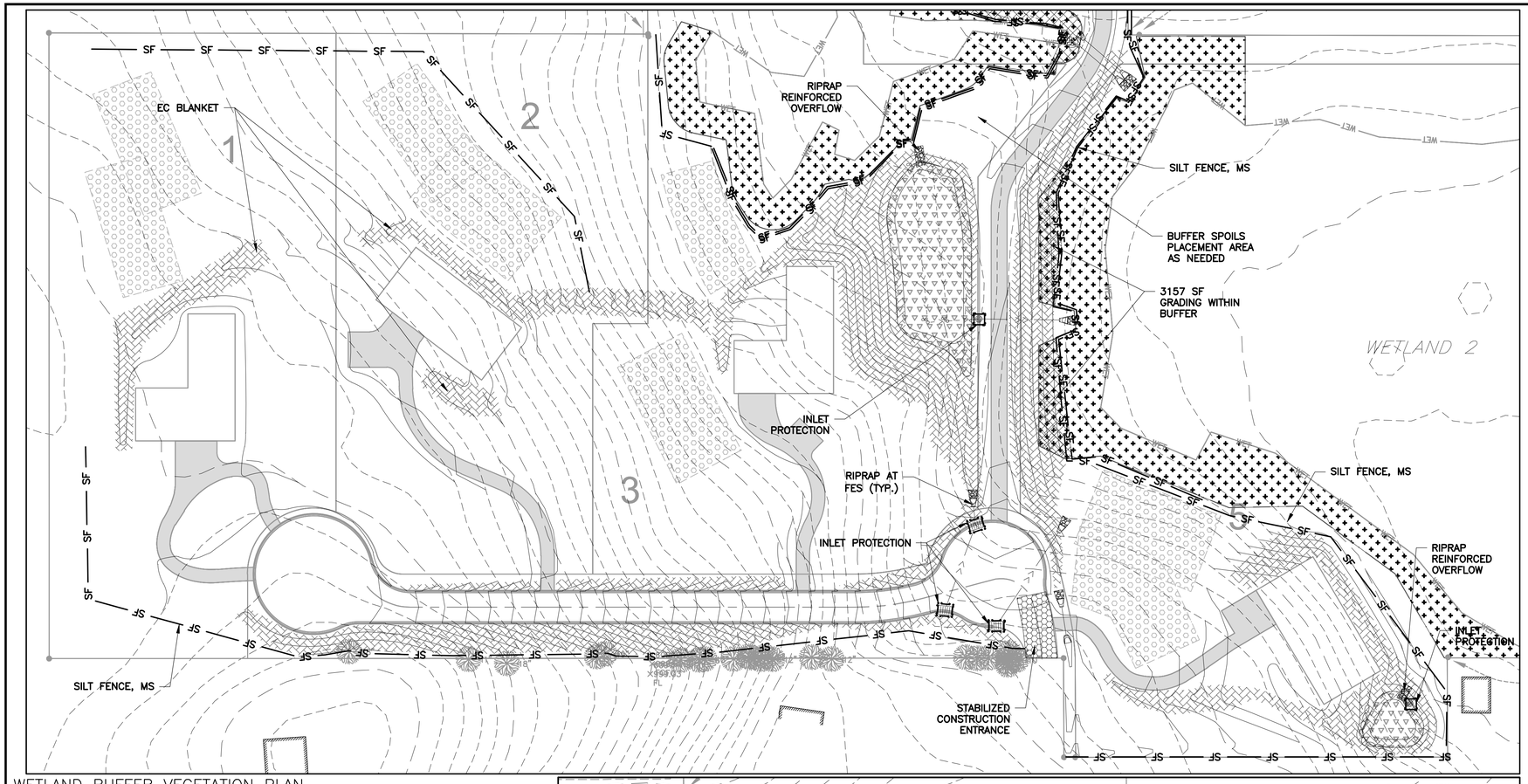
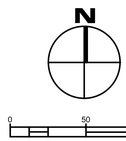
PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

GRADING & DRAINAGE

SHEET NO: **C501**

Print Date: 6/20/2025 11:12 AM
File Loc: C:\CM\Civil Methods, Inc\CMI - Documents\7. Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\Sheets\51_GRADING.dwg





BENCHMARK
SEE SURVEY DOCUMENTATION

LEGEND:

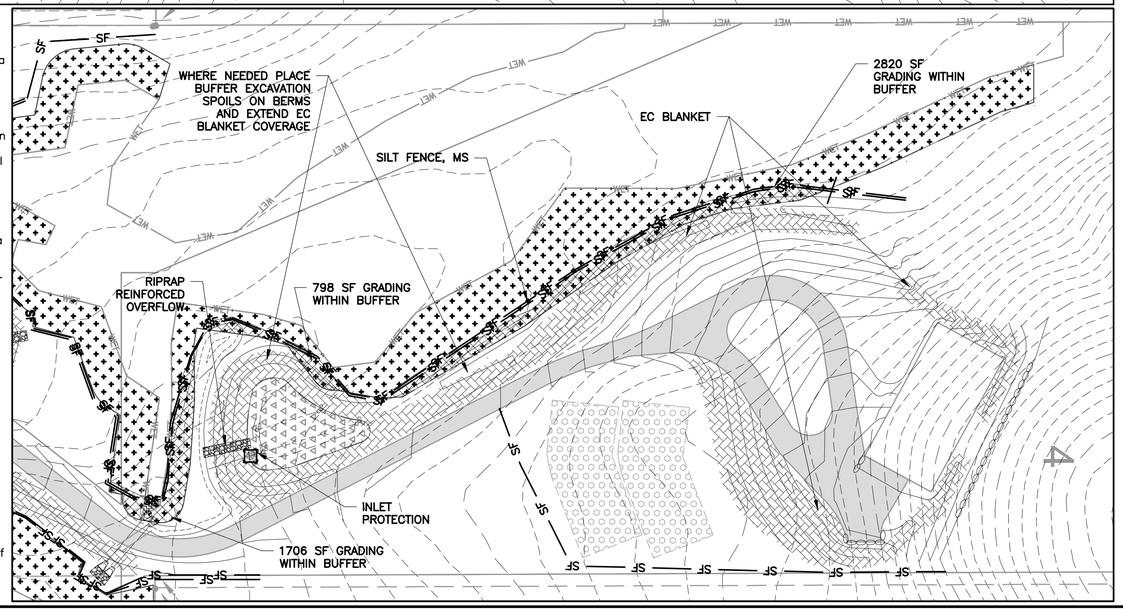
- WETLAND BUFFER
- RAIN GARDEN PLANTINGS
- ROCK RIPRAP, RANDOM CRUSHED
- EROSION CONTROL BLANKET, CAT. 20
- STABILIZED CONST. ENTRANCE
- SILT FENCE — SF —
- SEDIMENT CONTROL LOG
- INLET PROTECTION
- EXCAVATION AREA WITHIN BUFFER

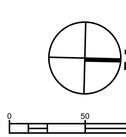
EROSION & SEDIMENT CONTROL NOTES:

1. See SWPPP sheet for additional information; Contractor is responsible for ensure MPCA NPDES construction Stormwater Permit is obtained as required prior to construction.
2. Topsoil, vegetation, and erosion control items installed and maintained per Mn/DOT 2571–2575.
3. Perimeter sediment controls shall be installed as indicated prior to site disturbance, and shall be installed to allow for high–flow bypass or overflow to prevent failure during significant rainfall.
4. Silt fence shall be of type indicated on the plan (Mn/DOT 3886).
5. Contractor is responsible for keeping sediment from leaving the property, including vehicle tracking. Should sediment be tracked offsite onto adjacent street, Contractor shall sweep Within 24 hours.
6. Install silt fence or sediment control log around any soil stockpiles that will be present for more than 7 days (if no perimeter controls in place to prevent sediment transport).
7. Inlet protection shall be in place on inlets throughout construction; type shall be suitable for each phase of construction.
8. Install sediment control logs around rim of bioretention basins immediately after construction and leave in place until construction has ended and site is stabilized with vegetation.
9. Sediment control logs shall be minimum 8" diameter wood or straw (Mn/DOT 3897).
10. Devices shall be inspected weekly and after all rainfall events exceeding 1", and maintained as necessary to keep the intended functional condition.
11. Accumulated sediment shall be removed from sediment control devices when ½ of device height has been reached.
12. After rough grading is completed, and topsoil spread, areas shall be seeded and blanketed (or sodded) within 7 days. Areas not being actively worked must be covered with temporary seed within 14 days.
13. Random crushed riprap per Mn/DOT 3601 shall be of class and quantity as indicated, and shall include geotextile fabric (3733).
14. Seed in mowed areas shall be Mn/DOT Mix 25–151 (3876) residential turf,
15. Seed infiltration basin, bioretention basin / rain garden bottoms with Mn/DOT Mix 33–261, or shall be planted with wet–tolerant "rain garden" plant plugs per planting plan.
16. Prior to planting, bioretention basins shall be covered with hydraulic mulch matrix (3884) or Cat.10 blanket (3885).
17. Ditch bottoms <1.5% and 3:1 slopes shall include erosion control blanket, Cat.20 (3885).
18. Ditch bottoms 1.5%–5% and 2:1 slopes shall include erosion control blanket, Cat.25 (3885).
19. Ditch bottoms 5%–7% and slopes of 1.5:1–1:1 shall include Cat.30 or 35 blanket (3885).
20. All other seeded areas, including infiltration basin shall be seeded (or planted) and covered with hydraulic mulch matrix (3884.B2), blanket (Cat.10 or 15), or straw mulch, Type 1 (no straw in basins).
21. Turf shall be installed by a qualified professional and/or per the Mn/DOT Seeding Manual (latest edition), at rates indicated in the manual.
22. Perimeter sediment controls shall remain in place until vegetation is growing / established in all disturbed areas.
23. Erosion during construction shall be repaired by the Contractor within 24 hours of discovery.

WETLAND BUFFER VEGETATION PLAN

1. The plan area shown to the right includes the four areas where excavation is planned to take place within the buffer. This wetland buffer vegetation plan applies to those areas. The total area of buffer disturbance is expected to be 8481 SF.
2. Tree root zones shall be protected during construction and use of heavy equipment shall be minimized within wetland buffers and stormwater management areas. Following construction, soil in wetland buffers or shall be decompacted and organic matter incorporated to a depth of 18 inches. Within tree drip lines or critical root zones, or within 10 FT of a subsurface utility, decompaction shall be done solely by incorporating organic material. Fencing and other protection measures shall be removed following construction.
3. This plan is subject to review and approval by the Minnehaha Creek Watershed District. Additional guidance applicable to this plan is available from the BWSR informational sheet on Seed Mix 32–251 as well as the BWSR Buffer Establishment and Management Toolbox (https://bwsr.state.mn.us/buffer–establishment–and–management–toolbox).
4. Description and specification of seed and plant materials, including supplier and origin:
   The indicated areas will be seeded using BWSR Seed Mix 32–251, "Mid Diversity Moist Buffer South & West Mix." The seed will be supplied by MNL or another MNDOT–approved vendor with a focus on local and Minnesota–sourced seed.
5. Bed preparation:
   Following grading within the buffer area and general stabilization of the site, the disturbed buffer area shall be cleared of debris and non–native vegetation. The soil surface should be lightly roughened/raked to improve seed contact.
6. Seeding or planting method and application rate:
   Seed shall be hand broadcast evenly in the affected areas and lightly raked or rolled to ensure contact. Based on the expected construction schedule, fall seeding is anticipated and should be done after November 1. (If the construction schedule changes and spring seeding is required it should be done between May 1–July 1.) The application rate is 32.4 PLS lb/acre.
7. Measures for site protection and erosion prevention during establishment:
   Temporary erosion control measures (erosion control blanket) shall be used if needed until vegetation establishes. Disturbance to the planted area shall be minimized.
8. Inspection and maintenance schedule:
   Years 1–2: Monitor on at least a monthly basis and water as needed if dry/during prolonged dry periods. Hand–pull weeds as needed to remove non–native and invasive species promptly. If invasive species are persistent, spot herbicide application by licensed personnel may be considered.
   Years 2–5: Continue to monitor and control invasive species.
   Ongoing: Monitor vegetation establishment on at least an annual basis. Generally assess species diversity and cover. Consider supplemental seeding or planting after Year 3 if establishment is slow.
9. Criteria for buffer vegetation establishment.
   Years 1–2: Achieve at least 50% ground cover of planted native species and temporary cover (if used). Control of significant invasive species.
   Years 3–5: Increase in native species diversity and cover to resemble the native community. Less than 10% cover of non–native invasive species. Evidence of natural recruitment.





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PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

EROSION & SEDIMENT CONTROL

SHEET NO: **C601**

Print Date: 6/20/2025 11:12 AM
File Loc: C:\CM\Civil Methods, Inc\CM1 - Documents\7- Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\Sheets\60_EROSION.dwg

ALL CONSTRUCTION ACTIVITIES MUST MEET THE REQUIREMENTS OF THE MPCA'S **GENERAL PERMIT AUTHORIZATION TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NPDES/SDS PROGRAM (MNR100001)**. All sheets of this planset, as well as the related Project SWMP, are hereby referenced as part of this SWPPP; any related pages shall be revised as appropriate for differing site conditions. Specific reference permit sections included in parentheses throughout.

SITE AND CONSTRUCTION DESCRIPTION:

This project includes site grading for a new rural residential subdivision in the City of Orono, Hennepin County, MN (Lat: 44.975262, Long: −92.639664).

The site work will include disturbance of 9.52 of the 25.35 acres for the construction of one public street (50' ROW) and cul−de−sac to serve 5 rural residential lots, as well as associated driveways, stormwater management, site grading, septic, well, and landscaping features. Approximately 10,000 CY of material will be excavated and relocated on−site, and all areas will be stabilized and restored as indicated in the plans. Riprap will be installed at all storm sewer and culvert pipe outlets.

The existing site contains one house and small outbuildings, and is otherwise an undeveloped natural area. No groundwater or soil contamination is anticipated (16.15).

The Contractor shall sign the MPCA NPDES Construction Stormwater Permit application as "Operator" and be solely responsible for meeting the erosion and sediment control requirements of the permit.

Disturbed Area: 9.52 acres
Pre−Construction Impervious Area: 0.55 acres
Post−Construction Impervious Area: 1.88 acres
Newly Created Impervious Area: 1.33 acres
Permanent Stormwater Treatment Required (If >1.0 acre): YES

PERMANENT STORMWATER MANAGEMENT:

Permanent stormwater management is required by the MPCA and Minnehaha Creek Watershed District (MCWD), and is described in detail in the project Stormwater Management Plan (SWMP) document. In summary, the site has been designed to treat a WQV equivalent to 1 inch of infiltration from the site impervious area. Filtration is planned for part of the treatment, with the WQV increased by a factor of 2 for the area treated by filtration rather than infiltration. Discharge rates from the site have been maintained.

Soil mapping for the area indicates a prevalence of Hydrologic Soil Group (HSG) Type C or C/D soils of limited infiltration capacity (Soil Map, Appendix A). A low infiltration rate of 0.25 IN/HR is assumed for the site soils. Soil borings have confirmed the character of the soils as mapped.

Stormwater runoff from the overall site drains to the southeast to Lake Minnetonka. Runoff flow in the interior of the site is governed by local topography, which is generally fairly steep in the upland areas. Three wetlands have been identified and delineated on the property and are described in detail in the project wetland delineation report. Runoff from the site flows to these wetlands before discharging into Lake Minnetonka. There is an existing overland overflow channel connecting Wetland 1 (upstream) to Wetland 2 (downstream); Wetland 2 discharges at the southern property boundary, with flow proceeding southeast to Lake Minnetonka. Wetland 3 is the open water and surrounding area at the southeast corner of the property. It receives runoff from the additional connected upland on the property, and it is directly connected as part of the Lake Minnetonka open water area.

The project site does not discharge to an Impaired Water within 1 mile, as defined by the State's Impaired Waters List (see map).

EROSION & SEDIMENT CONTROL

1. The contractor shall use phased construction whenever practical to minimize disturbed area at any one time. Disturbed area shall not exceed that which can be effectively inspected and maintained.
2. A 50' natural buffer shall be preserved within surface waters adjacent to construction. If not feasible, redundant (double) perimeter sediment controls separated by 5.0' are required. Special Waters require 100' buffer.
3. All exposed soil areas, including stockpiles, must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
4. The following shall be installed within 24 hours of connection to surface water or property edge:
   4.1. Energy dissipation (riprap) at all outlet aprons
   4.2. Stabilization of temporary or permanent drainage swales within 200' of property boundary or connection to surface water (e.g., storm sewer inlet, drainage swale, etc.)
5. A vehicle tracking BMP must be installed at the site entrance where haul vehicles are entering and exiting the site, including: rock pad, slash mulch, wash rack, etc. Streets must be swept within 24 hours of discovery of offsite tracking.
6. Temporary stockpiles must have silt fence or other applicable sediment control device around the base of the pile.
7. The Contractor shall be responsible to control sediment−laden surface water from leaving site. All mobilized sediment that has left the construction zone shall be collected by the contractor and properly disposed of at no additional cost to the owner.
8. Any fines levied due to inadequate erosion or sediment control practices, sediment discharging from the site, etc., shall be the responsibility of the Contractor.
9. Inlets shall be protected from sediment at all times, with appropriate protection installed for each phase of development.
10. Infiltration / filtration basins shall not be excavated to final grade until contributing drainage area has been fully stabilized, unless rigorous measures are incorporated to keep sediment from draining to the basins (16.4).
11. When excavating to within 3' of final grade of infiltration / filtration system, areas shall be staked to ensure vehicles and equipment do not compact the soil.
12. Adjacent roads must be inspected and kept clear of sediment; roads to be swept within 24 hours of tracked sediment discovery.
13. Additional temporary BMPs may be required to reduce the potential for sediment transport during construction. If deemed necessary by onsite personnel, Engineer or Owner shall be contacted immediately for approval or guidance, if available. Otherwise best judgment shall be used to provide rapid stabilization or sediment controls as necessary to minimize potential pollutant discharge.

CONSTRUCTION IMPLEMENTATION SCHEDULE & PHASING

1. Install perimeter silt fence / sediment logs, and construction entrance as shown prior to site disturbance.
2. Complete soil stripping and rough grading of site.
3. Install bioretention areas and outlet means.
4. Install pavement and curbing as indicated.
5. Replace topsoil and establish vegetative cover.
6. Complete site restoration and final stabilization measures (remove temporary controls after construction acitivity has ceased and vegetation is established).
7. Submit Notice of Termination (NOT) to MPCA within 30 days.

DEWATERING & BASIN DRAINING

1. Dewatering water, if necessary, must be discharged to a sediment control device (e.g., sediment basin or trap, filter bag, etc.) to prevent sediment−laden water with visual turbidity from discharging downstream. To the extent feasible, use well−vegetated upland areas of the site to infiltrate dewatering water before discharge. Contractor must visually check and photograph the discharge at the beginning and at least once every 24 hours of operation.
2. If nuisance conditions result from the discharge (e.g., cloudy or opaque water, oil film, erosion, etc.), Contractor must cease dewatering and correct the situation immediately.
3. If discharge water contains oil or grease, an oil−water separation or filtration device shall be used prior to discharge.
4. Use appropriate energy dissipation measures on all discharges to prevent erosion at discharge outlet. Discharge must not cause nuisance or erosive conditions to downstream properties or receiving channels. Excessive inundation of downstream wetlands is not permitted (if applicable).
5. If filters with backwash water are used, all backwash water must be hauled offsite for disposal, returned to the beginning of the treatment process, or incorporated into the site in a manner not causing erosion.

INSPECTIONS & MAINTENANCE

1. The contractor must routinely inspect the construction site and areas adjacent to the project once every 7 days during construction, and within 24 hrs of receiving more than ½" of rain in 24 hrs. Rainfall amounts must be measured by a properly installed rain gage onsite, or from a weather station within 1 mile of the project, or from a weather reporting system with site specific radar rainfall summaries (11.11).
2. All inspections and rainfalls > ½" must be recorded and retained onsite with the SWPPP. Inspections shall include: date/time, name of individual, date & amount of rainfall, findings, corrective actions, observed discharge/location/description, any proposed SWPPP amendments.
3. Inspections may be suspended when work is stopped due to frozen conditions. The Contractor's inspector must resume inspections within 24 hours after runoff occurs at the site or prior to resuming construction, whichever comes first.
4. Silt fence (or related perimeter control device) must be maintained when accumulated sediment reaches ½ the height of the device, or if device becomes ineffective (by the end of the next business day following discovery).
5. Permanent and temporary sediment basins, if applicable, shall be drained and cleaned when sediment depth reaches ½ of original storage volume; complete within 72 hrs of discovery. Must be cleaned prior to project completion.
6. Non−functional BMPs must be repaired or replaced by the end of the next business day following discovery.
7. Inspect downstream ditch / drainage system for signs of erosion or sediment buildup during each inspection; stabilize within 7 days.
8. Contractor shall inspect and photograph dewatering discharges at the beginning and every 24 hours during operation.
9. Inspect vehicle exit locations and adjacent streets; remove sediment from surfaces within 1 day.

POLLUTION PREVENTION

1. All solid waste generated at the site must be disposed of in accordance with all applicable federal and state regulations.
2. All hazardous materials must be properly stored/contained to prevent spills or leaks; materials must be properly disposed of perapplicable regulations, including Minn. Rule Ch. 7045. Restricted access storage areas must be provided to prevent vandalism.
3. Vehicle or equipment washing must be confined to a defined area (minimum of 100' from pond or drainage ditch); runoff containing any hazardous materials must be collected and properly disposed of. Defined area must be delineated with heavy−duty silt fence (incidental); no engine degreasing is allowed on−site.
4. Pesticides, herbicides, insecticides, fertilizers, treatment chemicals, and landscape materials must be under cover to prevent pollutant discharge, or protected by similar means to minimize potential contact with stormwater.
5. Concrete and other washout waste must be effectively contained – solid and liquid washout waste must not contact ground and must be disposed of properly in compliance with MPCA rules. A sign must be installed at washout area requiring personnel to utilize the proper facilities for disposal of concrete and other wastes.
6. The contractor is solely responsible for monitoring air pollution and ensuring that it does not exceed levels set by any agency or LGU. This includes dust created by work performed at the site; air pollution and dust control measures are incidental to the contract. The engineer may require additional dust control measures to be implemented, as necessary.
7. Adequate temporary restroom facilities shall be present onsite in a stable and secure location during construction operations, and shall be maintained in an adequate functioning condition.

FINAL STABILIZATION & NOTICE OF TERMINATION (NOT)

1. The Contractor must ensure final site stabilization meets the Permit requirements, and submit the NOT within 30 days.
2. Final stabilization includes uniform perennial vegetative cover of at least 70% of the expected final growth density over the entire pervious surface area, or other equivalent cover to prevent soil erosion.
3. All temporary synthetic and structural BMPs must be removed as part of final stabilization.
4. Ground or aerial photographs shall be taken and submitted with the NOT, confirming final stabilization measures.

SWPPP UPDATES & RECORD RETENTION

1. The SWPPP, all revisions to it, and inspection & maintenance records are the responsibility of the Contractor and must remain at the site during construction hours. The materials may be kept in a field office, onsite vehicle, or "SWPPP Mailbox", or be otherwise electronically available on−site.
2. This SWPPP shall be updated within 7 days to include additional or modified designs when there is a change in design having significant effect on the discharge of pollutants to surface waters or groundwater.
3. Training documentation shall be provided by Contractor as outlined below and required.
4. The SWPPP, project permits, inspection/maintenance logs, stormwater maintenance agreements, and stormwater management design calculations must be retained for 3 years after submittal of permit NOT. Contractor shall provide Owner or Engineer copies of inspection and maintenance logs prior to final payment.

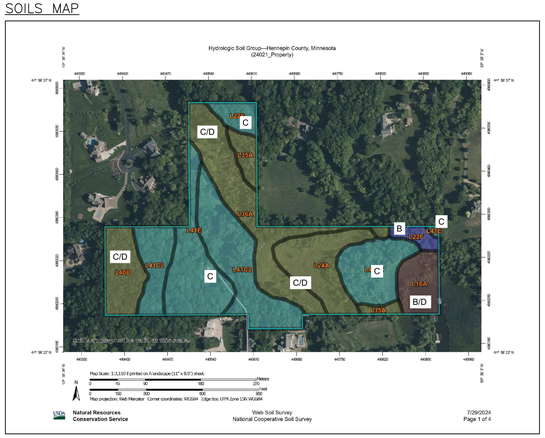
TRAINING REQUIREMENTS

1. The permittees must comply with the training requirements as outlined in Section 21 of the Permit. The Contractor shall have a trained individual performing BMP installations and inspections, as required.
2. Training table (below) to be completed prior to construction, as appropriate.

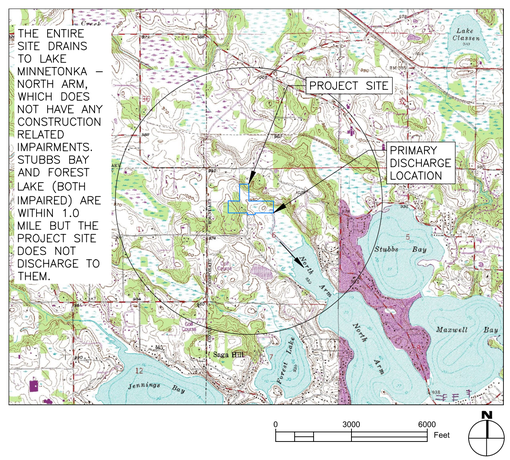
RESPONSIBLE PARTIES & TRAINING SUMMARY

	COMPANY	CONTACT	PHONE	TRAINING DATE	COURSE / ENTITY	CONTENT
OWNER:				NA	NA	NA
SWPPP PREPARER:	CIVIL METHODS, INC.	KENT BRANDER, PE	763.210.5713	1/24/2022	UNIVERSITY OF MN	DESIGN OF CONSTR. SWPPPS
GENERAL CONTRACTOR / INSPECTOR:						
EROSION & SEDIMENT CONTROL INSTALLER:						
PERMANENT BMP OPERATOR / MAINTAINER:				NA	NA	NA

SOILS MAP



DOWNSTREAM SURFACE WATERS AND WETLANDS



EROSION & SEDIMENT CONTROL QUANTITIES

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SWPPP NARRATIVE

SHEET NO: **C602**

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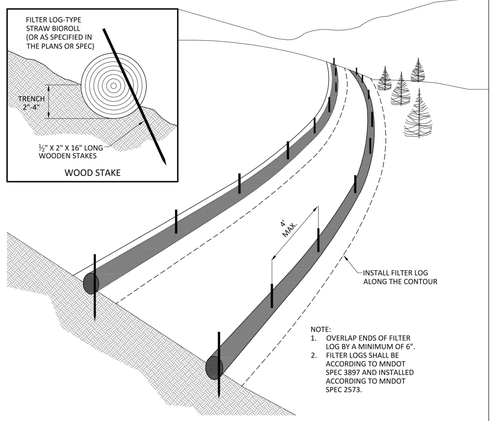
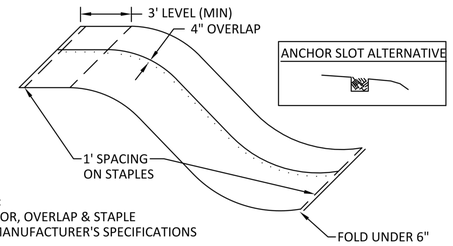


PERIMETER PROTECTION-FILTER LOG
NOT TO SCALE

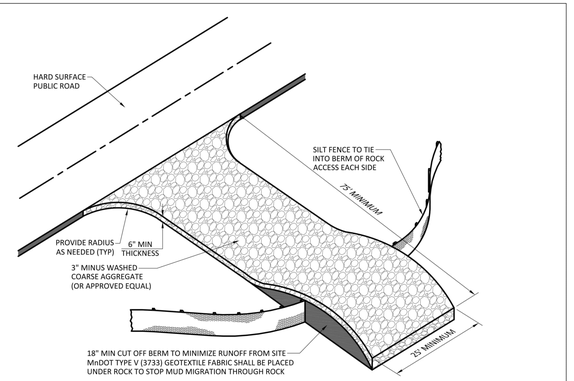
ORONO PLATE NO: ERO-005	PERIMETER PROTECTION - FILTER LOG	DETAIL LOG REVISIONS: DATE: Created August 2018	BOLTON & MENK Real People. Real Solutions.



NOTE:
ANCHOR, OVERLAP & STAPLE
PER MANUFACTURER'S SPECIFICATIONS

EROSION CONTROL BLANKET INSTALLATION
NOT TO SCALE

ORONO PLATE NO: ERO-200	EROSION CONTROL BLANKET INSTALL	DETAIL LOG REVISIONS: DATE: Created August 2018	BOLTON & MENK Real People. Real Solutions.



ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE

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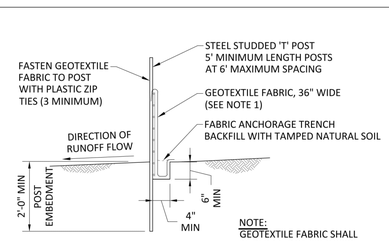
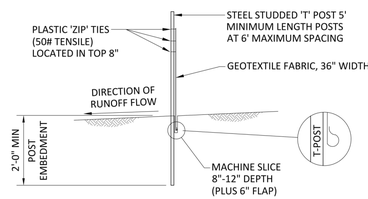
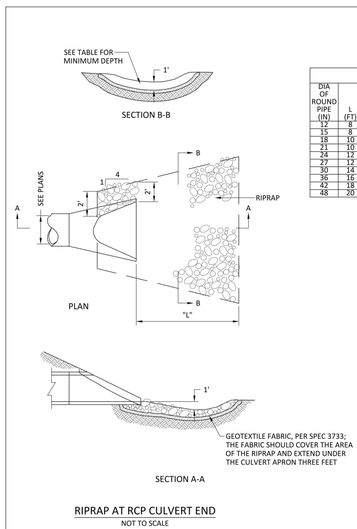


SILT FENCE - HEAVY DUTY
NOT TO SCALE



SILT FENCE - MACHINE SLICED
NOT TO SCALE

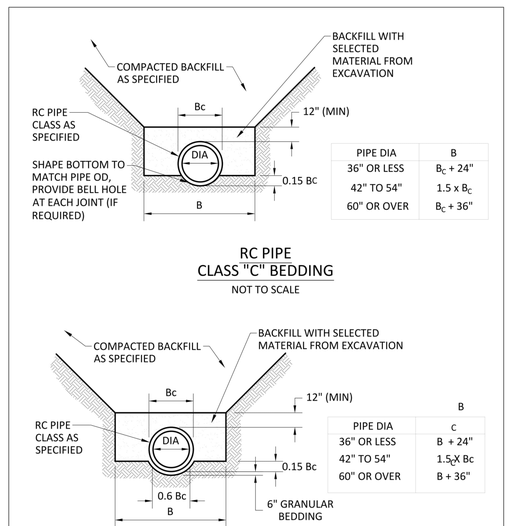
ORONO PLATE NO: ERO-400	SILT FENCE	DETAIL LOG REVISIONS: DATE: Created August 2018	BOLTON & MENK Real People. Real Solutions.



DIA OF ROUND PIPE (IN)	L (FT)	CLASS II d50=6" 12" DEPTH RIPRAP (CU YD)	CLASS III d50=9" 18" DEPTH RIPRAP (CU YD)	CLASS IV d50=12" 24" DEPTH RIPRAP (CU YD)
12	8	3.0	4.4	5.9
15	8	3.2	4.8	6.4
18	10	4.3	6.4	8.5
21	10	4.7	7.1	9.4
24	12	6.2	9.2	12.3
27	12	6.6	9.9	13.2
30	14	8.2	12.3	16.4
36	16	10.6	15.8	21.1
42	18	12.5	18.7	24.9
48	20	14.8	22.2	29.6

RIPRAP AT RCP CULVERT END
NOT TO SCALE

ORONO PLATE NO: ERO-600	RIPRAP AT RC CULVERT END	DETAIL LOG REVISIONS: DATE: Created August 2018	BOLTON & MENK Real People. Real Solutions.



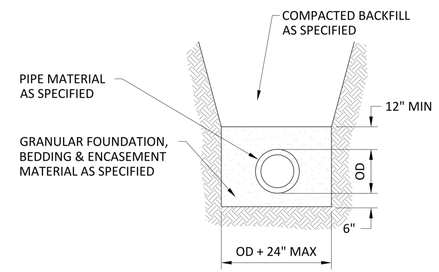
PIPE DIA	B
36" OR LESS	B_c + 24"
42" TO 54"	1.5 x B_c
60" OR OVER	B_c + 36"

RC PIPE
CLASS "C" BEDDING
NOT TO SCALE

PIPE DIA	C	B
36" OR LESS	B + 24"	
42" TO 54"	1.5x Bc	
60" OR OVER	B + 36"	

RC PIPE
CLASS "B" BEDDING
NOT TO SCALE

ORONO PLATE NO: STO-000	RC PIPE BEDDING	DETAIL LOG REVISIONS: DATE: Created August 2018	BOLTON & MENK Real People. Real Solutions.



NON-RIGID STORM SEWER TRENCH
NOT TO SCALE

ORONO PLATE NO: STO-001	NON-RIGID PIPE BEDDING	DETAIL LOG REVISIONS: DATE: Created August 2018	BOLTON & MENK Real People. Real Solutions.

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KENT E. BRANDER
DATE: 06-20-2025
LIC. NO.: 44578

DESIGNED: KEB
DRAWN: KEB
CHECKED: DMP

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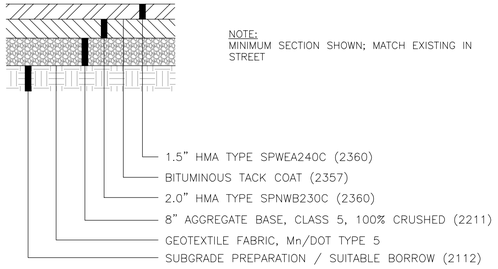
06-20-2025 Modified Per MCWD Comments. NOT FOR CONSTRUCTION

PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

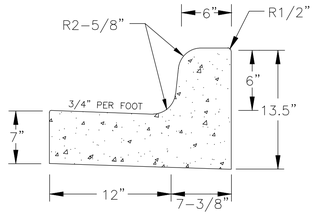
DETAILS

SHEET NO: **C701**

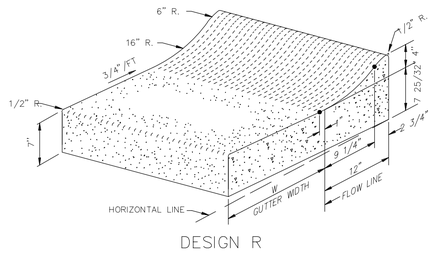
Print Date: 6/20/2025 11:12 AM
File Loc: C:\CM\Civil Methods, Inc\CMI - Documents\7. Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\Sheets\70_DETAILS.dwg



1 ASPHALT PAVEMENT SECTION



2 CONCRETE CURB & GUTTER, B612

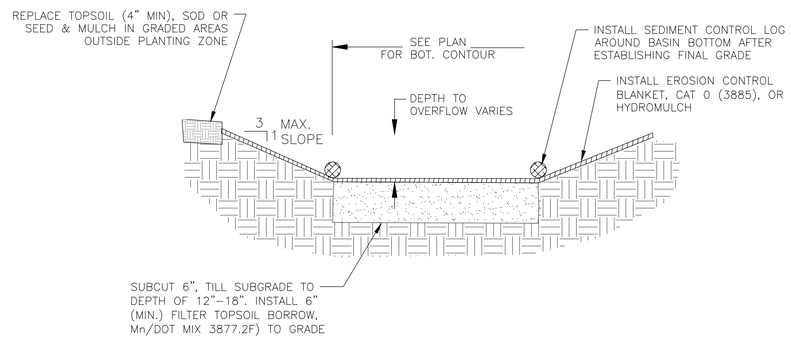


DESIGN R

R DESIGN NO.	GUTTER WIDTH W	CONCRETE CU. YDS. PER LIN. FT.	CONCRETE LIN. FT. PER CU. YD.
R412	12"	0.0492	20.3
R418	18"	0.0600	16.7
R424	24"	0.0708	14.1
R436	36"	0.0924	10.8

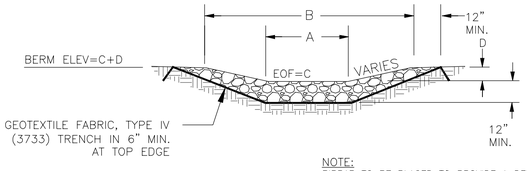
3 CONCRETE CURB & GUTTER, R412

BASIN VEGETATION: INSTALL WET-TOLERANT "RAIN GARDEN" NATIVE SEED MIX (Mn/DOT MIX 33-261 OR EQ)



4 INFILTRATION BASIN

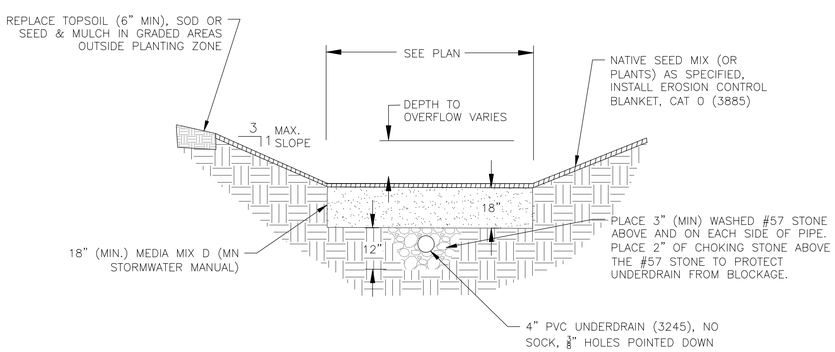
	A	B	C	D
BASIN 1	4.0'	8.0'	954.2	0.5'
BASIN 2	3.0'	6.0'	945.7	0.5'
BASIN 3	3.0'	6.0'	954.8	0.5'



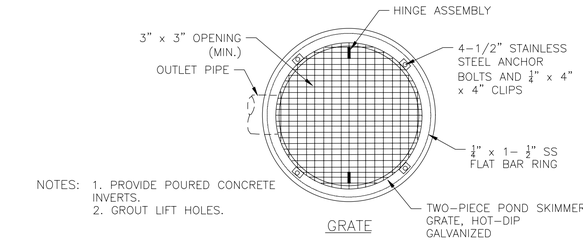
NOTE:
RIPRAP TO BE PLACED TO PROVIDE A DEFINED WEIR AREA, TRENCHED IN A MIN. OF 12", WITH DOWNSTREAM SIDE BOWLED SLIGHTLY FOR ENERGY DISSIPATION

5 REINFORCED BASIN OVERFLOW

PLANTING ALTERNATE: INSTALL NATIVE PLANT PLUGS (SIZE 2") FROM LIST (OR SIMILAR) SPACED PER SUPPLIER INSTRUCTIONS

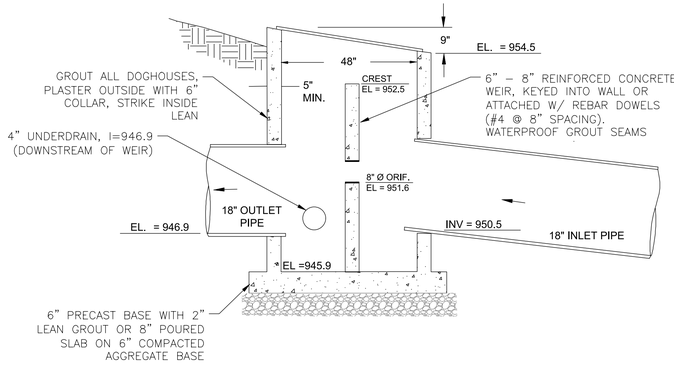


6 BIOFILTRATION BASIN



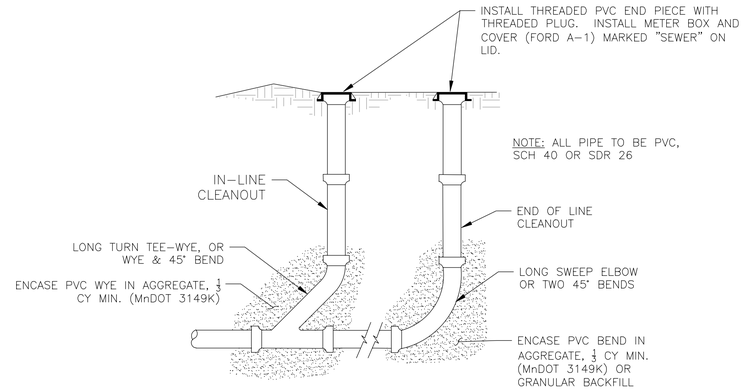
NOTES: 1. PROVIDE POURED CONCRETE INVERTS.
2. GROUT LIFT HOLES.

GRATE



OCS1 (BASIN 1)

7 POND OCS W/ INTERNAL WEIR AND INLET PIPE



8 DRAIN TILE CLEANOUT

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KENT E. BRANDER
DATE: 06-20-2025
LIC. NO.: 44578

DESIGNED: KEB
DRAWN: KEB
CHECKED: DMP

DATE / REVISION:
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PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

DETAILS

SHEET NO: **C702**

Print Date: 6/20/2025 11:12 AM
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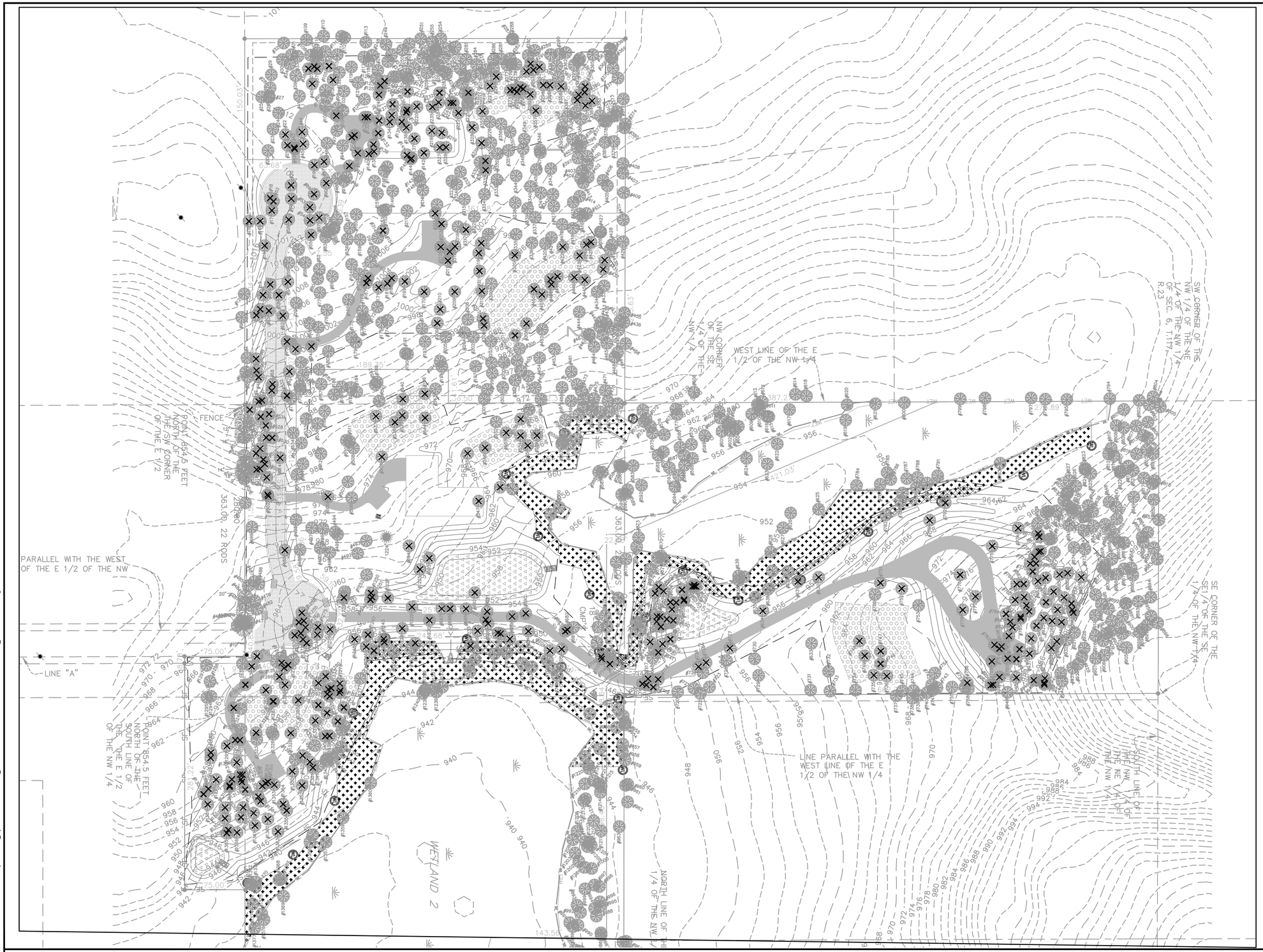

BENCHMARK
SEE SURVEY DOCUMENTATION

0 60 120 Feet

LEGEND:

- PROPERTY LINE
- SETBACK
- EASEMENT
- WETLAND (WET)
- CONTOUR
- BITUMINOUS SURFACE
- RIPRAP
- SEPTIC AREA
- TREE (PRESERVE)
- TREE (REMOVE)

TREE SUMMARY:

TOTAL TREES = 1306

TREES REMOVED = 420

Know what's below. Call before you dig.

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PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

TREE PRESERVATION & REMOVAL

SHEET NO: **C801**

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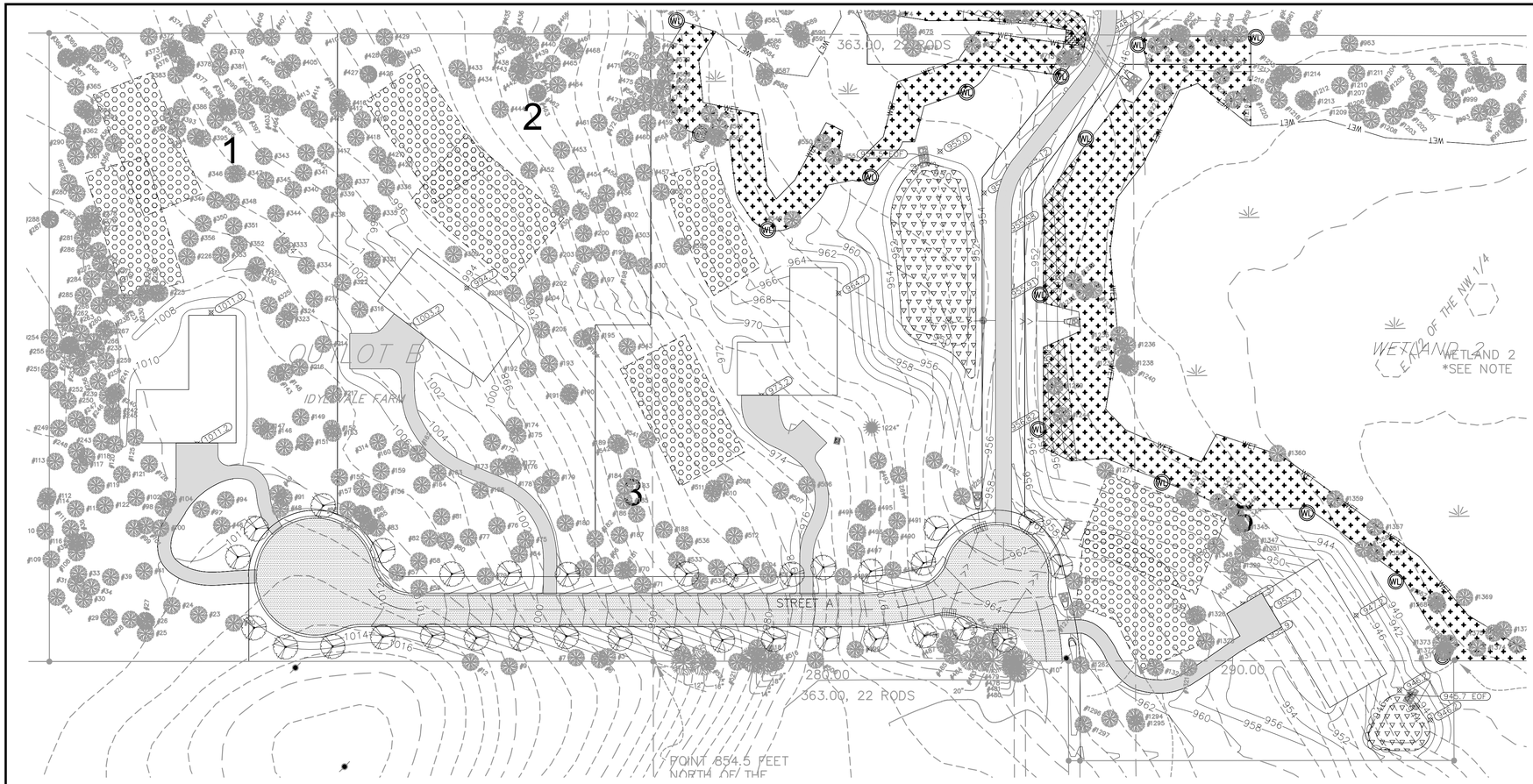


N

0 50 100 Feet

BENCHMARK
SEE SURVEY DOCUMENTATION

LEGEND:

- PROPERTY LINE
- EASEMENT
- DECIDUOUS OVERSTORY TREE
- STORMWATER SEED MIX

LANDSCAPING SUMMARY:

ZONE: LR–1A RURAL RESIDENTIAL

1 TREE / 40 FT ROAD FRONTAGE

REQUIRED: 1,390 FT / 40 = 35 TREES
PROVIDED: 38 TREES

PLANT SCHEDULE

TREES

KEY	QTY	COMMON NAME	BOTANICAL NAME	ROOT	CAL/SIZE
-	38	Honeylocust, Oak, Maple	Varies	B&B	2.0"

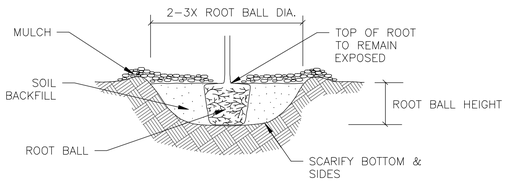
NOTES:
1. TREES MAY BE ANY SUITABLE SPECIES OF OAK, HONEYLOCUST OR HARDWOOD MAPLE (NO SPECIES SHALL EXCEED 50% OF TOTAL QUANTITY).
2. DECIDUOUS TREES 2.0" DIAMETER MEASURED 12" ABOVE GROUND UPON INSTALLATION.
3. TREES AND SHRUBS SHALL BE WARRANTED FOR A PERIOD OF 1 YEAR AFTER INSTALLATION. DEAD OR DISEASED PLANTS WITHIN THIS PERIOD SHALL BE REPLACED AT CONTRACTOR EXPENSE.
4. THE PLANTING DETAILS REPRESENT ADEQUATELY DRAINED SOIL CONDITIONS. THE CONTRACTOR SHOULD EXERCISE DISCRETION IN SETTING PLANTS 1"–3" HIGHER IN POORLY DRAINED SOILS.
5. ON 2:1 SLOPES OR GREATER, DO NOT CONSTRUCT THE UPHILL HALF OF THE WATERING BASIN.
6. ON WET, POORLY DRAINED SOILS, DO NOT CONSTRUCT WATERING BASIN.
7. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE DRAINAGE IN HEAVY POORLY DRAINED OR IMPERVIOUS SOILS.
8. PLANTS SHOULD BE SET AT THE PROPER DEPTH WHEREBY THE BEGINNING TAPER OF THE ROOT FLARE IS AT THE SAME ELEVATION AS THE FINISHED SOIL GRADE. THIS SHOULD BE THE SAME DEPTH AS THE PLANTS WERE GROWN AT IN THE NURSERY. NOTE THAT THE ROOTS OF BALLED AND BURLAPPED PLANTS ARE UNACCEPTABLE WHEN THEY ARE COVERED BY MORE THAN 4" OF SOIL IN THE TOP OF THE BALL.
9. DELAY MULCH PLACEMENT IF NECESSARY TO ALLOW MORE TIME FOR EXCESS SOIL MOISTURE TO EVAPORATE FROM PLANTING AREAS BEFORE PLACING MULCH.

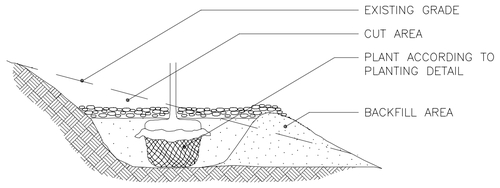
BALLED & BURLAPPED STOCK

1. SCARIFY SIDES AND BOTTOM OF HOLE.
2. PROCEED WITH CORRECTIVE PRUNING AS REQUIRED, REMOVING ANY WINDING OR GIRDING ROOTS.
3. SET PLANT ON UNDISTURBED NATIVE SOIL, OR THOROUGHLY COMPACTED BACKFILL SOIL AT THE SAME DEPTH (IF PROPER) AS IT WAS GROWN IN THE NURSERY.
4. EXPOSE ROOT FLARE AND SET AT GRADE. REMOVE ALL BURLAP AND ROPES FROM TOP ⅓ OF ROOT BALL, CUT WIRE BASKET DOWN TO SECOND HORIZONTAL WIRE FROM THE BOTTOM, AND DISPOSE OF OFF–SITE. CONTRACTOR IS RESPONSIBLE TO MAINTAIN PLUMB POSITION THROUGHOUT THE MAINTENANCE PERIOD, STAKE AS NECESSARY.
5. APPLY WATER TO SETTLE PLANTS AND FILL VOIDS THEN CONSTRUCT 3" DEPTH WATERING BASIN.
6. WATER THOROUGHLY WITHIN 2 HOURS.
7. PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.
8. BIODEGRADABLE TWINE MAY BE LEFT ON AS SUPPORT BETWEEN THE ROOT BALL AND ROOT COLLAR UNTIL THE END OF THE PLANT ESTABLISHMENT PERIOD AT WHICH TIME IT MUST BE CUT AND TOTALLY REMOVED FROM THE ROOT COLLAR. THE TWINE MUST BE TIED OR RETIED TO MID–LEVEL LOOPS OR POINTS ON THE BASKET. USE OF NONBIODEGRADABLE TWINE IS PROHIBITED.

CONTAINER STOCK

1. SCARIFY SIDES AND BOTTOM OF HOLE.
2. PROCEED WITH CORRECTIVE PRUNING.
3. REMOVE CONTAINER AND SCORE OR PRUNE OUTSIDE OF SOIL MASS TO REDIRECT CIRCLING FIBROUS ROOTS AS NECESSARY.
4. SET PLANT ON UNDISTURBED NATIVE SOIL, OR THOROUGHLY COMPACTED BACKFILL SOIL AT THE SAME DEPTH (IF PROPER) AS IT WAS GROWN IN THE NURSERY.
5. APPLY WATER TO SETTLE PLANTS AND FILL VOIDS THEN CONSTRUCT 3" DEPTH WATERING BASIN.
6. WATER THOROUGHLY WITHIN 2 HOURS.
7. PLACE MULCH WITHIN 48 HOURS OF THE SECOND WATERING UNLESS SOIL MOISTURE IS EXCESSIVE.





NOTE:
1. EXTENDED EXCAVATION AND BACKFILL SOIL TO A POINT DOWNSLOPE EQUAL TO OR LOWER IN ELEVATION THAN THE BOTTOM OF THE HOLE DIRECTLY BENEATH THE PLANT TO INSURE ADEQUATE DRAINAGE IN HEAVY SOILS. GRANULAR SOIL MUST BE ADDED AS BACKFILL IN AREAS OF POOR DRAINAGE.

FOR STEEP SLOPES

1 ISOLATED TREE PLANTINGS
BALLED & BURLAPPED OR CONTAINER STOCK

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CHECKED: DMP

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PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

LANDSCAPING

SHEET NO: **C802**

Print Date: 6/20/2025 11:13 AM
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NOTE: BACKGROUND TOPOGRAPHIC CONTOURS FROM MNDNR LIDAR; DETAILED CONTOURS IN DRIVEWAY CROSSING WORK AREA DRAWN BASED ON SURVEY DATA OR GRADING DESIGN INFORMAITON.

EXISTING FLOODPLAIN/PONDING AREA
100-YR HWL=946.9
OWHL=945.4

2-18" CMP CULVERTS

18" CMP'S

5064
5063.38
943.3 INV
CMP 1.6FT
CMP 2 1.6FT

SB 6 L3
958.46

EXISTING CONDITION

PROPOSED COMPENSATORY STORAGE
BOT=945.4
OUT=946.9
VOL=1087 CF
EXCLUDES EXISTING STORAGE

PROPOSED FLOODPLAIN/PONDING AREA
100-YR HWL=946.9

FLOODPLAIN FILL
AT OR BELOW 946.9
VOL=714 CF

INFILT BASIN 3
BOT=952.0
OUT=953.5
HWL=954.7

954.8 EOF

36" FES
INV:944.10

36" FES
INV:943.80

954.5 EOF

FILT. BASIN 1
BOT=950.0
OUT=

SB 6 L3
958.46

PROPOSED CONDITION

N

0 20 40 Feet

LEGEND:

- CONTOUR
- OHWL OR 100-YR HWL CONTOUR
- FLOODPLAIN FILL EXTENTS
- COMPENSATORY STORAGE EXTENTS

STORMWATER COMPLIANCE NARRATIVE

The existing and proposed contours in the work area are shown along with the indicated elevations. As indicated on the figure, lidar-based contours are supplemented with detailed survey information in the culvert work area. It should be noted that for the 100-year storm, the existing culverts in this vicinity are expected to overtop, with flows controlled by overland overflow. The tributary floodplain affected by the driveway construction is therefore just the ponding area upstream of the culverts. The 100-year HWL in both existing and proposed conditions is 946.9. The amount of fill placed for the driveway crossing between the OHWL and the 100-year HWL is 714 CF. To compensate for the floodplain storage lost due to driveway crossing construction, additional storage will be created between the culvert area and Basin 3, with excavation between elevations 945.4 and 946.9. This will create an additional 1087 CF of floodplain storage, more than making up for the fill placed for the driveway.

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KENT E. BRANDER
DATE: 05-22-2025
LIC. NO.: 44578

DESIGNED: KEB
DRAWN: KEB
CHECKED: DMP

DATE / REVISION:
04-18-2025 Figure for Response to Comments, NOT FOR CONSTRUCTION
05-13-2025 Modified per MCWD Comments. NOT FOR CONSTRUCTION
05-22-2025 Modified per MCWD Comments. NOT FOR CONSTRUCTION

PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J PASS

DRIVEWAY CROSSING ANALYSIS

SHEET NO: **FIG 1**

Print Date: 5/22/2025 3:45 PM
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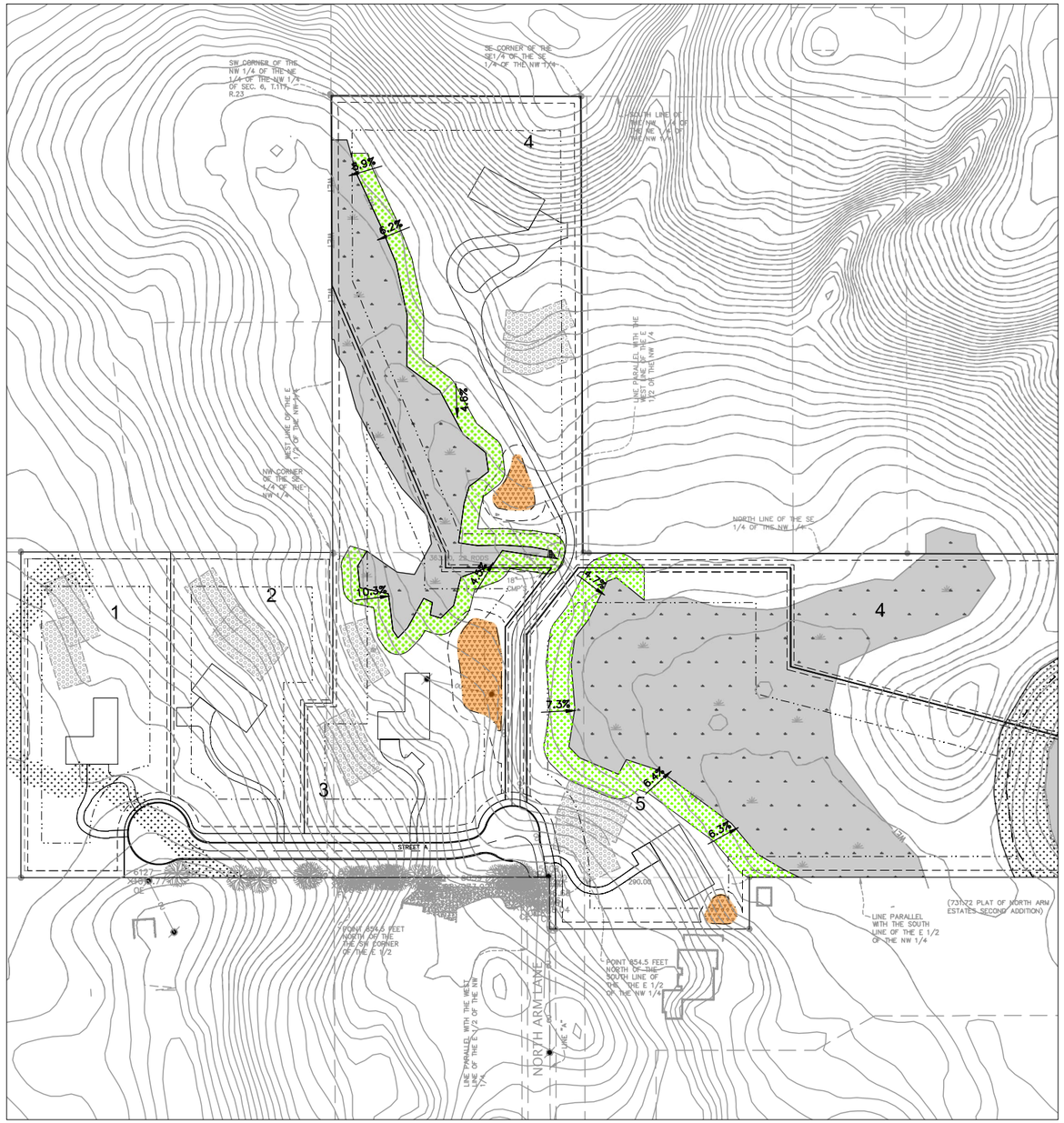
BASE BUFFER
WETLAND 1 24 FT BASE WIDTH
WETLAND 1 BASE BUFFER AREA 30874 SF
WETLAND 1 AVG BUFFER SLOPE 7.2%
WETLAND 2 36 FT BASE WIDTH
WETLAND 2 BASE BUFFER AREA 26716 SF

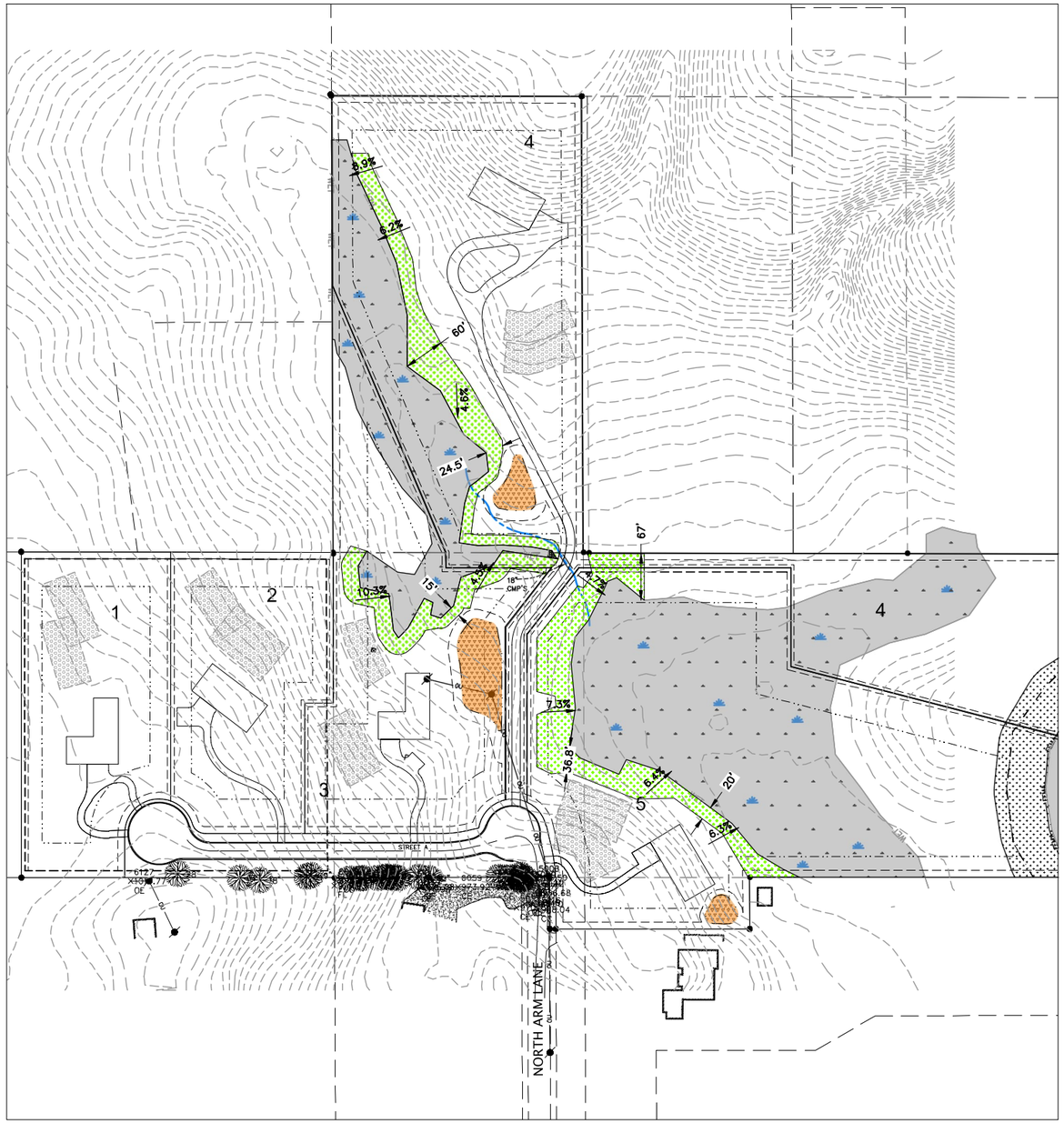
AVERAGED BUFFER
WETLAND 1 31345 SF
WETLAND 1 LENGTH 1279 FT
WETLAND 1 AVG WIDTH 24.5 FT
WETLAND 1 MAX WIDTH 59.6 FT
WETLAND 1 MIN WIDTH 15.0 FT

WETLAND 2 27063 SF
WETLAND 2 LENGTH 736 FT
WETLAND 2 AVG WIDTH 36.8 FT
WETLAND 2 MAX WIDTH 53.5 FT
WETLAND 2 MIN WIDTH 20.0 FT

N
0 100 200 Feet



REQUIRED BUFFER WITHOUT AVERAGING



PROPOSED BUFFER WITH AVERAGING

CIVIL METHODS, INC.
PO Box 28038
St. Paul, MN 55128
o:763.210.5713 | www.civilmethods.com

IDYLLVALE SHORES
BRADLEY J PASS
215 NORTH ARM LANE, ORONO, MN

BUFFER AVERAGING DIAGRAMS

SHEET NO:

Print Date: 5/22/2025 3:53 PM
File Loc: C:\CM\Civil Methods, Inc\CMI - Documents\7. Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\XrefBase\24021_Buffer Calcs.dwg

Attachment C:
Stormwater Management Plan

STORMWATER MANAGEMENT PLAN

IDYLLVALE SHORES
ORONO, MN

DATE: 05-13-2025
CMI PROJECT NO.: 24021

PREPARED FOR:
Blue Pencil Collective

PREPARED BY:
Civil Methods, Inc.
PO Box 28038
St. Paul, MN 55128

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

Name: Kent Brander, PE

Signed: 

Date: 05-13-2025

Registration: MN No. 44578

CIVIL METHODS, INC.
PROFESSIONAL ENGINEERS
LAND | WATER | INFRASTRUCTURE

Table of Contents

1. INTRODUCTION

The Idyllvale Shores project includes the construction of a rural residential subdivision and related infrastructure at an existing property at 215 North Arm Ln, Orono, MN 55364 (Hennepin County PID 0611723240001). Five lots with new homes are planned, and they are to be accessed with a new cul-de-sac road. This Stormwater Management Plan (SWMP) addresses the grading and stormwater controls necessary to mitigate the impacts of the project.

Governmental agencies with jurisdiction over drainage and stormwater for this project include:

- City of Orono (City)
- Minnehaha Creek Watershed District (MCWD)
- Minnesota Pollution Control Agency (MPCA)

Where needed, site conditions have been modeled with the HydroCAD modeling software using the TR-20 methodology and Atlas 14 design rainfall amounts.

Applicability

- Project requires an NPDES/SDS Permit because more than 1 acre of soil is disturbed.
- Project is subject to the rules and permitting requirements of the MCWD, including but not limited to: erosion control permit, wetland permit, and stormwater permit.
- Project is generally subject to the City of Orono rules, standards, and permitting requirements.

Regulatory Stormwater Requirements:

1) An erosion and sediment control plan meeting all agency requirements and a stormwater pollution prevention plan (SWPPP) meeting the requirements of the MPCA construction stormwater permit must be provided.
2) Volume reduction practices consistent with Appendix A of the MCWD stormwater rule must be installed to provide volume reduction in an amount equal to one inch times the area of impervious surface stated in Table 1 of the stormwater rule.
3) Rate control practices must be provided to prevent an increase in the peak runoff rate from the site, in aggregate, for design storm events.
4) There must be two feet of vertical separation (freeboard) between the 100-year HWL of a waterbody or stormwater practice and the low opening of any hydraulically connected structure.

2. EXISTING SITE CONDITIONS

Under existing conditions, the property contains a house and several accessory structures, landscaped areas, woods, wetlands, other green space, and open water pertaining to Lake Minnetonka (North Arm). The total impervious area on site is approximately 6,535 SF. Soil mapping for the area indicates a prevalence of Hydrologic Soil Group (HSG) Type C or C/D soils of limited infiltration capacity (Soil Map, Appendix A). A low infiltration rate of 0.25 IN/HR is assumed for the site soils. This estimate is supported by results of a soil investigation conducted on the site, showing mainly HSG C and some HSG B soils at the elevations that would impact stormwater BMP infiltration rates (Soil Report, Appendix A)

Stormwater runoff from the overall site drains to the southeast to Lake Minnetonka. Runoff flow in the interior of the site is governed by local topography, which is generally steep in the upland areas. Drainage area boundaries and flow directions at the site are illustrated in Appendix B. Three wetlands have been identified and delineated on the property and are described in detail in the project wetland delineation report. Runoff from the site flows to these wetlands before discharging into Lake Minnetonka. There is an existing overland overflow channel connecting Wetland 1 (upstream) to Wetland 2 (downstream); Wetland 2 discharges at the southern property boundary, with flow proceeding southeast to Lake Minnetonka. Wetland 3 is the open water and surrounding area at the southeast corner of the property. It receives runoff from the additional connected upland on the property, and it is directly connected as part of the Lake Minnetonka open water area.

3. PROPOSED SITE CONDITIONS

The proposed conditions include the construction of the cul-de-sac road, five single-family homes with associated driveways, septic fields, wells, and all associated grading, landscaping, and stormwater management features. A small amount of wetland (less than the de minimis amount of 400 SF) is expected to be filled or impacted for placement of the driveway culvert serving Lot 4. Aside from that, no other wetland impacts are expected to occur, and the wetlands will be protected during construction.

The overall site drainage patterns will remain the same as under existing conditions, with all runoff from the site eventually discharging southeast to Lake Minnetonka. The overall project is expected to result in a total of 1.803 AC of impervious area on the site. Three stormwater basins are proposed to capture and infiltrate or filter runoff from the project area, providing rate control, volume control, and associated water quality treatment prior to discharge downstream. These basins are illustrated in Appendix B and in the project plans.

4. STORMWATER MANAGEMENT REQUIREMENTS

4.1 RUNOFF VOLUME CONTROL

Under normal conditions, runoff volume control must be provided in an amount equal to one inch times the area of regulated site impervious area. In situations where infiltration is not feasible, filtration may be used in lieu of infiltration, but the treatment volume must be doubled. The amount of on-site impervious area under proposed conditions overall is 1.803 AC. Of this amount, 1.176 AC will drain to the main stormwater basin in the central portion of the property. The soil boring taken closest to this location indicated the presence of groundwater at elevation 950. Given the site topography, it is not feasible to install an infiltration basin at this location that would provide the requisite 3 FT of vertical separation between groundwater and the bottom of the basin. Therefore, a filtration basin (Basin 1) is proposed for this location.

The amount of filtration required is twice the amount that would be required for infiltration, which in this case would be a volume equal to 1 IN over the contributing impervious area of 1.176 AC, or 4,269 CF; doubling this for filtration, the required volume is 8,538 CF. As designed, Basin 1 provides 10,112 CF of storage for filtration below the primary outlet, well exceeding the requirement.

Following agency review, it was determined that the soil and groundwater condition in the vicinity of Basin 3 would not support an infiltration basin. Therefore, Basin 3 is also proposed as a filtration basin. The total impervious area draining to Basin 3 is 0.320 AC. This leads to a volume control requirement of 2,323 CF for filtration. As designed, Basin 3 provides 3,042 CF of storage for filtration below the primary outlet, well exceeding the requirement.

The remaining basin (Basin 2) can be feasibly constructed as an infiltration basin, so the base water quality volume of one inch over the contributing impervious area would apply. Basin 2 would be installed in the south portion of the property and would receive runoff from Lot 5 impervious area. The total impervious area draining to Basin 2 would be 0.140 AC, leading to an infiltration volume requirement of 508 CF. As designed, Basin 2 provides 712 CF of storage for infiltration below the primary outlet, exceeding the requirement.

Drawdown of water levels in infiltration basins must occur within 48 hours. Using an infiltration rate of 0.25 IN/HR for the infiltration basin, determined from the best available information about site soils, this would allow for an overall ponding depth of 1.0 FT. Basin 2 will retain the required volume at a depth of 0.8 FT, meeting the depth requirement. Engineered media will be installed in the filtration basins, so the rate of flow through the media will be higher, with 1 IN/HR as a conservative assumption. In theory this would allow a ponding depth up to 4 FT; however, following best practices for maintenance and long term performance, the ponding depths in Basins 1 and 3 are limited to 1.6 FT and 1.5 FT, respectively.

There is a small amount of impervious area that cannot be feasibly routed to one of the stormwater treatment basins. Notes have been added to the plans so that builders are instructed to use gutters, yard drains, or other means to direct water to treatment basins to the extent possible, but this possible additional treatment is not included in the calculation because it is uncertain. As proposed, 1.636 AC of impervious area (91% of the total) is treated by the basins. In addition, the basins are sufficiently oversized to provide more than the required treatment volume for the full amount of proposed impervious area. As indicated above, the total proposed impervious area is 1.803 AC, indicating an overall water quality treatment volume of 6,545 CF. Basin 1 provides 10,112 CF of filtration volume, which is equivalent to 5,056 CF of volume treatment for water quality purposes. Similarly, Basin 3 provides 3,042 CF of filtration volume, equivalent to 1,521 CF of volume treatment for water quality. These can be added to the 712 CF provided by Basin 2, for a total equivalent water quality treatment volume of 7,289 CF, exceeding the overall requirement.

4.2 Runoff Rate Control

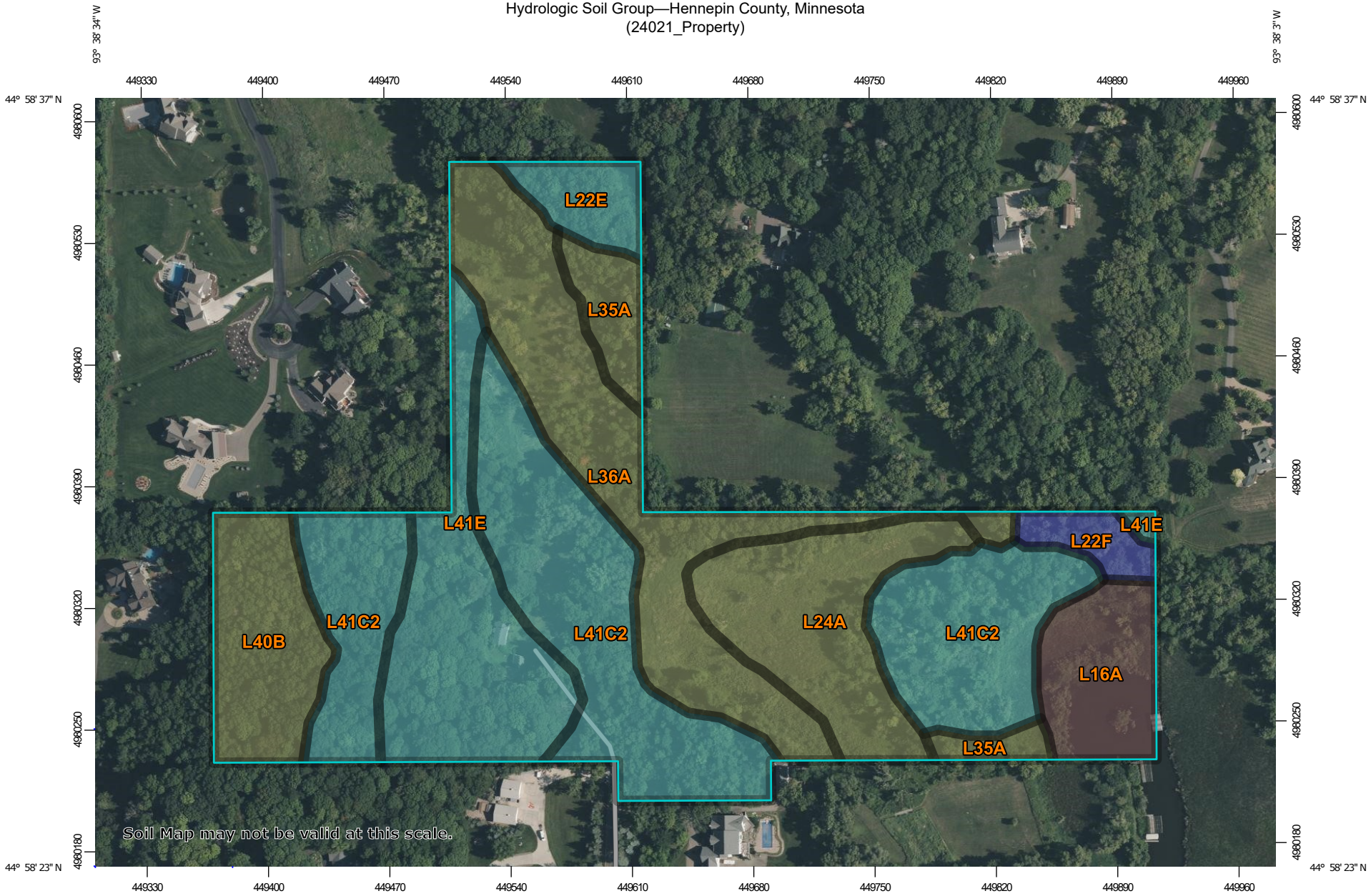
Stormwater management measures must limit peak runoff flow rates to existing conditions for the 2-, 10-, and 100-year storms. The rate control requirement is determined in aggregate from the site. This requirement is also met with the three proposed stormwater basins. The following table summarizes the aggregate peak flow rates for both existing and proposed conditions. As indicated in the table, for all regulated storms, the peak flow rates under proposed conditions are lower than the peak flow rates under existing conditions. Detailed HydroCAD model input and results are provided in Appendix C.

Table 1: Summary of Peak Discharge Rates

Location	Final Discharge (Aggregate)	
Conditions	Existing	Proposed
Node	1R	1R
2-YR STORM	12.1	9.7
10-YR STORM	29.6	24.7
100-YR STORM	75.7	72.7

Appendix A – Soils Information

Hydrologic Soil Group—Hennepin County, Minnesota
(24021_Property)



Map Scale: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 45 90 180 270

Feet
0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hennepin County, Minnesota
Survey Area Data: Version 19, Sep 10, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 29, 2023—Sep 13, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
L16A	Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes	B/D	1.6	6.3%
L22E	Lester loam, 10 to 22 percent slopes	C	0.8	3.0%
L22F	Lester loam, morainic, 25 to 35 percent slopes	B	0.5	2.0%
L24A	Glencoe clay loam, 0 to 1 percent slopes	C/D	2.9	11.5%
L35A	Lerdal loam, 1 to 3 percent slopes	C/D	1.0	3.9%
L36A	Hamel, overwash-Hamel complex, 0 to 3 percent slopes	C/D	4.8	19.1%
L40B	Angus-Kilkenny complex, 2 to 6 percent slopes	C/D	2.0	8.0%
L41C2	Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded	C	8.3	32.6%
L41E	Lester-Kilkenny complex, 16 to 22 percent slopes	C	3.4	13.4%
Totals for Area of Interest			**25.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interstate Geotechnical Engineering, Inc
Patrick J Hines, PE
5636 Perkins Ave N
Oak Park Heights MN 55082
(612) 414-5770

29 October 2024

Mr Kent Brander
Civil Methods, Inc
PO Box 28038
St. Paul MN 55128

Re: Subsurface Soil Investigation
Proposed Stormwater Detention/Infiltration Facilities
215 North Arm Lane, Orono, Minn

In accordance with your authorization, I have completed the above referenced investigation to determine site suitability for the proposed construction. Please accept this letter and attachments as my report of work accomplished to date.

The site is an existing tract of just under 45 acres at the end of the existing roadway. It is sort of inverted "T" shaped. The surrounding area is rural residential. It is proposed to subdivide the site into 7 larger lots for residential construction. Also to be constructed will be an extension of North Arm Lane, one private road and driveways, two of them quite long, plus infiltration basins. Site terrain is lightly rolling and moderately wooded, except for the area of former buildings, which were recently removed. There are numerous delineated wetlands on the site, and the end of the North Arm of Lake Minnetonka is present on the east end of the site. It seems that many borings had been put down on the site previously, but these were for establishment of onsite wastewater disposal systems. The area is known for glacial till soils, but with variations.

You had furnished several drawings showing proposed locations of borings, changed as preliminary plans were fleshed out. Ultimately, four areas were ultimately proposed as infiltration basin areas, concentrated in the south and south east areas of the site. One proposed boring location (#222) was staked by others, surface elevation provided, put down as indicated. Two more boring locations (221A & 216A) were determined by myself. Boring 221A is 50' southeast of the previously staked 221. Boring 216A is about 30' north and 40' west of the adjacent property lines. Said lines had to be estimated based upon information in the drawings. You may wish to have the locations of these borings determined more accurately in the course of further site surveys. Ground surface elevations of the borings were determined either by direct measurement down from a marking hub or by using an engineer's level and referencing marked hubs nearby. Datum appears to be mean sea level. While generated elevations match elevation information in the site drawings quite well, accuracy of this should not be taken as any greater than the methods used would imply.

Refer to the attached drawing for a schematic of boring locations. It is a size altered portion of one of the furnished drawings. In addition, borings were marked in the field with lath.

Method of investigation was primarily the hand auger (HA) procedure, described as per the attached explanation sheet, which also describes the method of groundwater measurement. Boring 222 advancement was made difficult by the presence of groundwater in a sandy intermediate layer, so this boring was completed using the power flight auger (FA) method, described as per that same explanation sheet. As this is an investigation for hydrologic purposes, soils were classified according to the USDA Soil Class System (chart attached). I personally performed the hand auger portion of the borings, and assisted the drill crew in performing the lower portion of the one boring, immediately classifying soils onsite. Soil consistency or firmness was determined on an empirical basis by such means of drilling ease or difficulty, nature of recovered soil samples, etc. Some soils at estimated basin contact level and just below were bagged and retained for possible further examination and testing later.

Attached is a log of each of the borings together with a key explaining terms and entries on the log sheets. Note that the numbering of the southerly two contains an "A" so as not to be confused with other previously staked proposed boring locations. Please be advised that the depth of individual layers of soils may vary somewhat from what is indicated on the logs due to the inexact nature of auger sampling and, most importantly, the occurrence of transition between soil layers. Also be advised that soil conditions not at the boring locations may vary.

The borings generally found normal to somewhat thick topsoil and the expected cohesive subsoil, but with varying thickness sandy inclusions and laminations. The topsoil is 1', $2^{3}/_{4}$' & 2' thick at the locations of Borings 216A, 221A & 222, respectively. The upper foot is a an organic silt loam or loam, black, loose. Below in the latter two borings is an organic silty clay loam, black, transitioning out in the lower portion.

Below the bulk of soils encountered is versions of clay loam. The upper portion of Boring 216A is loam, loose to firm with depth, to $4^{3}/_{4}$'. To $7^{1}/_{2}$' in Boring 222 is silty clay loam, soft to medium. This material is increasingly silty with depth, ultimately a borderline silt loam. From $7^{1}/_{2}$' to $8^{3}/_{4}$' here is a genuine clay, rather silty, gray, medium to stiff, with a little more silty clay loam below. These soils are the result of a lacustrine (lake deposits) or slopewash origin. No silty soils were found below topsoil in Boring 221A.

All subsoil in Boring 221A and the lower portions of Borings 216A & 222, are a clay loam, rather sandy, the sand fraction being finer grained at first. Gravel contents are low, typically negligible to a trace. Darker olive browns, yellowish browns and olive grays predominate. The lowest portions are dark gray, the sand fraction being slightly coarser. They are predominantly of medium consistency, stiffer with depth. However, there is a thin softer zone from $7^{1}/_{4}$' to 8' in Boring 221A, due to a high water content. Note that, in Boring 222, there is a layer of sand, fairly clean, coarser grained and with gravel with depth, from $8^{1}/_{4}$' to $10^{3}/_{4}$', firm, but saturated and waterbearing. In Boring 221A only a thin sandy waterbearing layer was found at 7', $^{1}/_{4}$' thick. No such granular inclusions were found in Boring 216A, but sand laminations are suspected since water seeped into the bore hole void very slowly. These soils are glacial till (brought in by, later consolidated by, glaciers). The sand layer, inclusion and laminations are probably the result of an alluvial (stream) event in the over-all glacial deposition process.

In any event, the encountered soils are mostly USDA Hydrologic Group "C" soils. They are possibly borderline "B" in the lower lacustrine portion of Boring 222 due to their classification plus inplace firmness. The clay inclusion in Boring 222 is a Group "D", and the sand layer here is Group "A", but this is probably redundant as they are below groundwater level. The lower stiffer soils are sufficiently deep that they would not affect infiltration rates according to USDA recommendations.

None of the borings were met with refusal, indicating lack of bedrock to depth drilled. It is unlikely that there are any soils at deeper levels would affect detention and infiltration design.

After ASTM recommended periods of observation, groundwater was found at depths of 6.9', $5^{1}/_{4}$' & $7^{1}/_{4}$' (elevations 938±, $947^{1}/_{2}$± & $950^{1}/_{4}$±) in Borings 216A, 221A & 222, respectively, all considerably above North Arm OHW and flood levels of 929.4 & 931.1, respectively. The great elevation difference indicates that the groundwater is very localized, originating from the sand layers, inclusions and laminations in otherwise cohesive soil masses. In Boring 216A, it seems to be somewhat related to elevation of the nearby wetland delineation. At other borings it is higher, thus a perched condition, the water being trapped in the sand layers and inclusions. As water travels slowly through an otherwise cohesive soil mass, the levels are likely stable. Therefore I recommend using the encountered levels for design purposes The frequent mottling of upper cohesive soil is not indicative of *aquifer* groundwater fluctuation, but is due to the nature of clay to mottle for various reasons.

But, also bear in mind that, as explained in one of the referenced attachments, that groundwater can still occur and vary due to many variables undeterminable within the time frame, scope and budget allowed in this investigation. Indications are for the time and conditions of testing only.

Regarding infiltration potential, I have not determined or estimated any coefficients of permeability. Rather, I am of the opinion that the cohesive soils encountered are, or will function as noted above, mostly USDA Hydrologic Soil Group "C", borderline "B" in the one noted case. The "A" and "D" soils, as noted earlier, are below groundwater level and thus will not affect a basin above water level. In turn I presume that infiltration rates will be estimated on that basis. I have attached a second set of bore logs with my assessment of hydrologic groups noted in red. It should be noted that the USDA recommends separation from slower soil below of 40" for the recommended infiltration rate be valid.

While performing fieldwork, and while this is not a level II environmental review, I did not notice any unusual appearances or odors of recovered soil samples that would have indicated environmental contamination.

Borings 221A & 222 may also be considered applicable to roadway design. Most likely, Boring 221A is in an embankment situation while the surface of Boring 222 will be within 3' of top of subgrade. At both boring locations the upper foot of topsoil, being organic, very silty and loose, should be removed. The lower organic soil at Boring 221A, being more

cohesive and soft to medium or better, may remain inplace. At the location of Boring 222 any organic soil within 3' of top of subgrade should be removed. Otherwise, site soils are cohesive, not prone to frost boiling despite being somewhat silty (the clay content mitigates this potential). The encountered soils likely to be within 3' of top of subgrade are likely AASHTO A-4 soils. Thus the main roadway should be designed presuming R-20 soils with a low traffic volume.

Refer to the "Limitations of Investigation" attached to this report. Due to the nature of random small volume sampling and testing, no warranty of the site is made or implied.

Thank you for the opportunity to have been of service. If you have any questions on this, or if I can be of assistance in any additional capacity, do not hesitate to contact me at your convenience.

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

Respectfully submitted,

INTERSTATE GEOTECHNICAL ENGINEERING, Inc

Patrick J Hines, PE
President
Reg No 12086

enclosures

pH/SC

METHOD OF INVESTIGATION

AUGER BORINGS

The Auger Boring procedure is one of the simplest methods of soil investigation and sampling. Its limitations are that recovered samples are disturbed samples, and that depth of possible investigation is limited by various factors. Depending upon skill of the operator or crew chief, various engineering properties of soil, such as soil profile, estimated inplace strength, etc, may be determined by this method. It may also be used to retrieve samples for laboratory testing and determination of suitability of soil for other purposes.This describes the most often procedures used.

In this procedure, augers are advanced into the ground by hydraulic/ mechanical means. At intervals, usually 5', the auger withdrawn and soil samples are retrieved and classified, retaining samples as necessary for further analysis. Record data includes depth to changes in strata, description of soil in each major stratum, groundwater depth or elevation where found, and other information. This is in accordance with the American Society for Testing and Materials (ASTM) Designation: D 1452-80, "Standard Practice for Soil Investigation and Sampling by Auger Borings".

Sometimes, hand auger borings of various types are used to accomplish the same purpose. However, penetration depth is usually limited. Its advantage is greater accuracy and the fact that a hand auger boring may be the only type possible where access is limited for power auger machinery.

(over)

GROUNDWATER

To check for groundwater, the boring is usually probed for the presence of water (1) inside the hollow-stem auger, prior to auger withdrawal, (2) in the bore hole, immediately after auger withdrawal, and (3) again in the bore hole after a sufficient amount for groundwater to accumulate and stabilize therein.

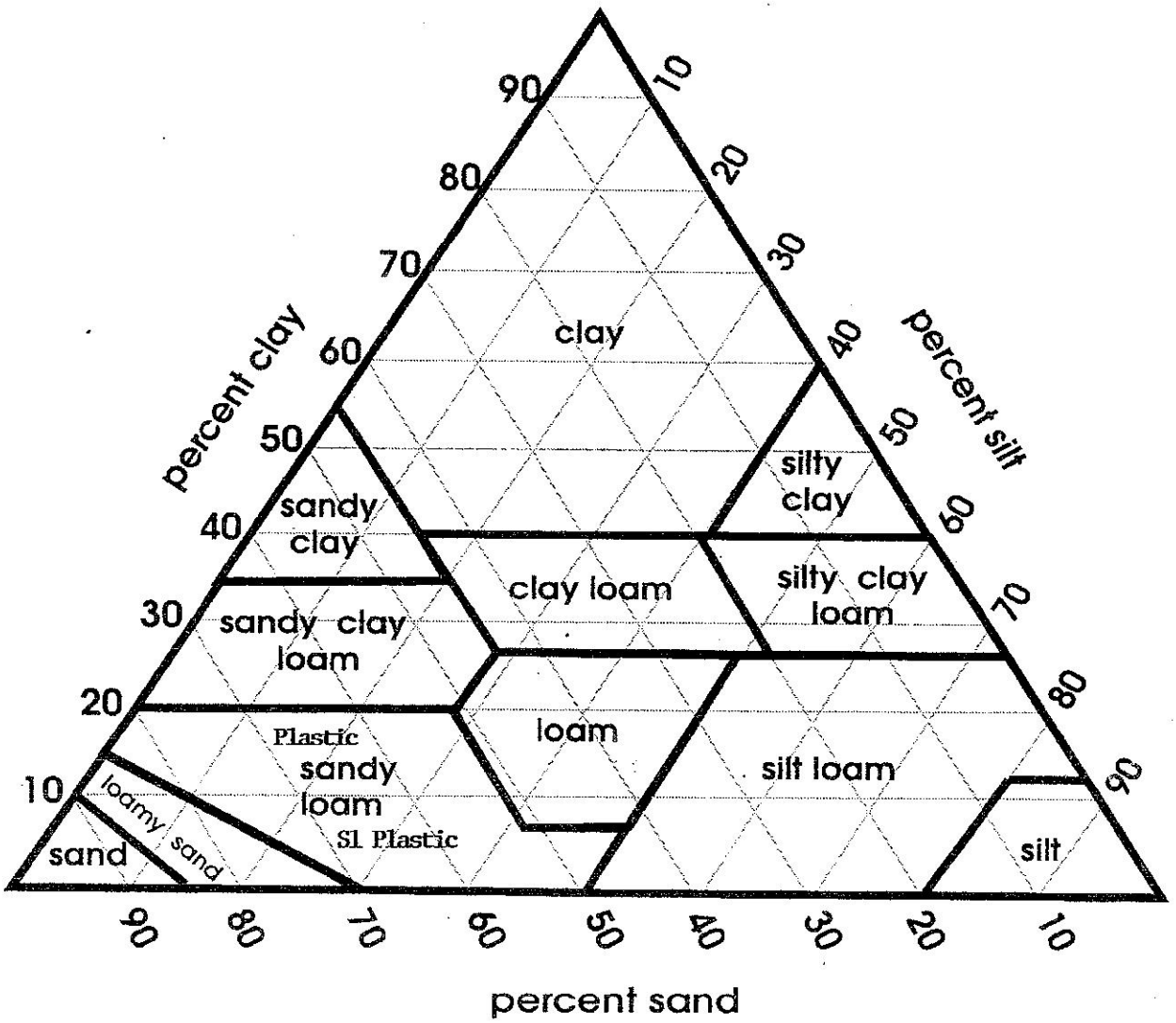
It is emphasized that indicated results are for the time and conditions of testing only. Groundwater can fluctuate as a function of many variables.

SOIL CLASSIFICATION

Recovered soil samples are usually first classified by the drilling crew chief in the field and then verified by the Soils Engineer shortly thereafter. Selected soil samples may be subject to a program of laboratory tests. Unless otherwise indicated, the soil classification system used is ASTM Designation: D 2488-84, "Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). This is also known as the Unified Soil Classification System.

Other soil classification systems may be used, such as AASHTO, USDA, Mn/DOT, etc. If an alternate system is used, it will be noted and described noted in the main body of the report.

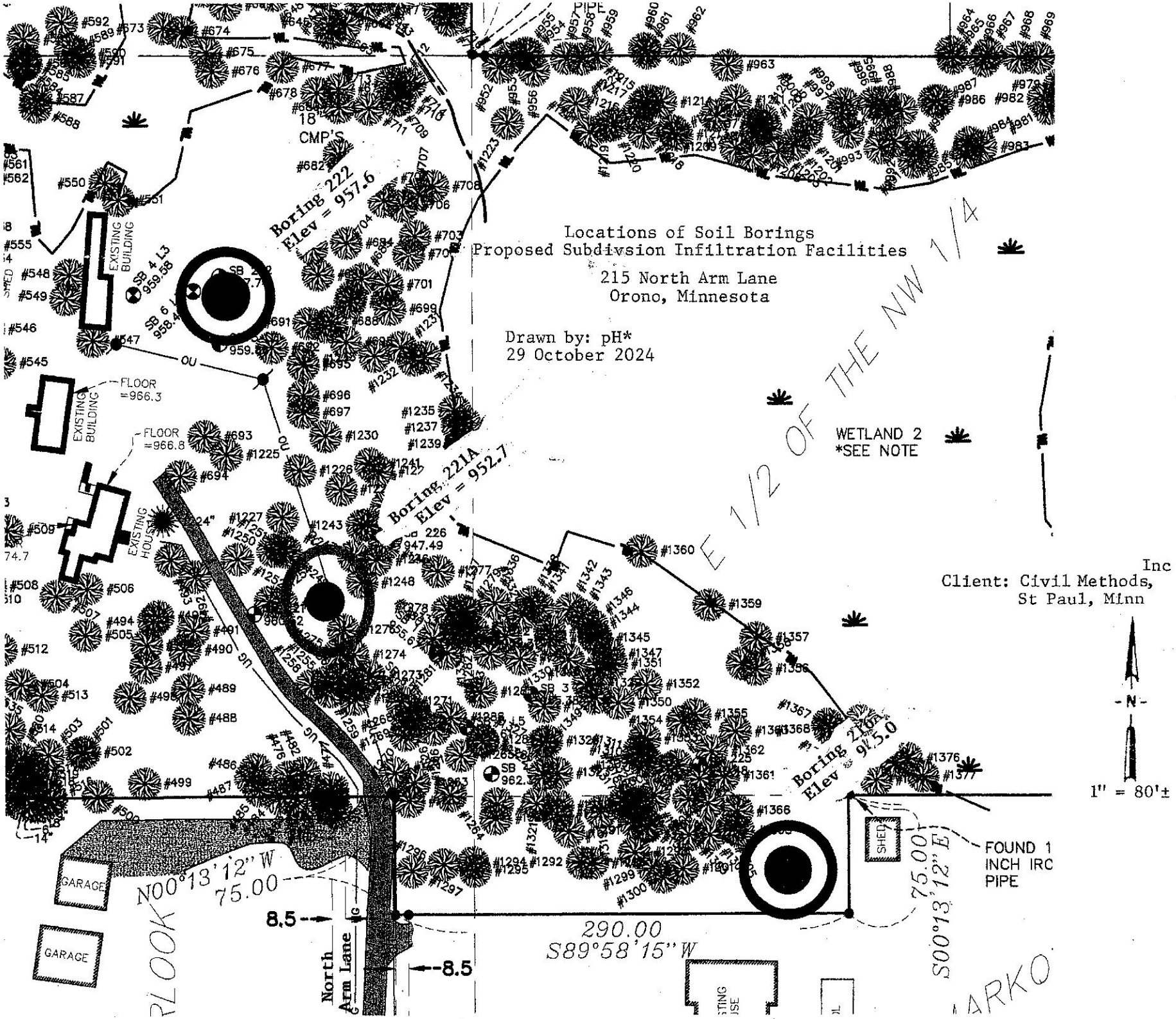
Interstate Geotechnical Engineering, Inc
5636 Perkins Ave N
Oak Park Heights MN 55082



USDA Soil Textural Classification

Soil Separate Sizes

particle name	particle size range (mm)	sieve numbers
v. coarse sand	2.0 - 1.0	10 - 18
coarse sand	1.0 - 0.5	18 - 35
medium sand	0.5 - 0.25	35 - 60
fine sand	0.25 - 0.10	60 - 140
v. fine sand	0.10 - 0.05	140 - 270



*Base drawing is a size altered portion of a sketch furnished by the Client

SOIL BORING LOG

Patrick J Hines, PE

8167 100th St S
Cottage Grove MN 55016

PROJECT: Proposed Subdivision Infiltration Facilities
215 North Arm Lane, Orono, Minnesota

LOG OF BORING NO: 216A

DEPTH IN FEET	SURFACE ELEVATION: 945.0 / DESCRIPTION AND CLASSIFICATION	GEOLOGY	N	WB	SAMPLE #	SAMPLE TYPE	SAMPLE R	LAB & OTHER TESTS W	DEN	L.L. / P.L.
1	SILT LOAM, Organic, Black, w/ tr small roots, occasional small wood root low moisture content, loose	Topsoil		N	1	HA				
2	LOAM, Very Dark to Dark* Yellowish Brown, w/ tr gravel somewhat low moisture content, loose sparsely mottled to firm	Lacustrine		N	2	HA				*w/ depth
3										
4	Dark Yellowish Brown to Yellowish Brown* near normal moisture content firm normal moisture content									
4.75 5	CLAY LOAM, Dark Yellowish Brown, mottled (sand fraction is biased finer grained), w/ tr fine gravel	Glacial Till		N	3	HA				
6	normal moisture content, medium									
7	Dark Olive Brown, mottled		(elev 938±) Y	▼ 6.9'						
8	medium to stiff									
9										
10	slight water encountered while drilling									
11	CLAY LOAM, rather sandy (sand fraction is biased finer gr), Dark Olive Gray w/ tr gravel, normal moisture content			N	4	HA				
12	medium to stiff									
13										
14	Dark Gray, sandier (sand fraction is sl coarser gr than before)									
14.99 15	stiff									
	End of Boring - No Refusal									
16	Bore hole void backfilled w/ produced cuttings on 27 October 2024									

Weather: 58°F, Calm, Mostly Cloudy, Lt Rain Developing

WATER LEVEL MEASUREMENTS

DATE	TIME brs	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
24 Oct	16:14	14.99'		None		14.9'
" "	16:38			"		14.1'
27 "	15:38			14½'		6.9'

DRILLING DATA

Crew Chief: pH

Method: 3" SCS Bucket (Hand) Auger

Boring Completed: 24 October 2024

SOIL BORING LOG

Patrick J Hines, PE

8167 100th St S
Cottage Grove MN 55016

PROJECT: Proposed Subdivision Infiltration Facilities
215 North Arm Lane, Orono, Minnesota

LOG OF BORING NO: 221A

SURFACE ELEVATION: 952.7

DEPTH IN FEET	DESCRIPTION AND CLASSIFICATION	GEOLOGY	N	WB	SAMPLE #	SAMPLE TYPE	SAMPLE R	LAB & OTHER TESTS W	DEN	LL / PL	
	SILT LOAM, Organic, Black, w/ a few small roots, moist, loose	Topsoil		N	1	HA					
1	SILTY CLAY LOAM, Organic, Black, w/ occ small root, normal moisture content soft to medium	Sub-Topsoil		N	2	HA					
2	less organic, w/ tr gravel medium										
2.75 3	CLAY LOAM, rather sandy, Very Dark Olive Brown* w/ tr gravel, occ small root to 4'± normal moisture content medium	Glacial Till		N	3	HA					* lighter w/ depth
4											
5	Dark Olive Brown, mottled higher moisture content, soft			▼ 5¼' (elev 947½±)							
6				Y	4	HA					
7	← thin gravel & coarse sand layer										
7¼	soft to medium high fine sand fraction										
8	medium to stiff			N							
9											
10	w/ tr to a little gravel										
11				N	5	HA					
12											
13											
	w/ Dark Gray inclusions										
14	CLAY LOAM, quite sandy, Dk Gray, w/ tr to a little gravel, normal moicture con-			N	6	HA					
14.99 15	medium to stiff tent										
	End of Boring - No Refusal										
16	Bore hole void backfilled w/ produced cuttings on 28 October 2024										

Weather: (28th) 74°F, Mostly Clear, NW 0-5 mph± Breeze
(24th) 58°F, Calm, Mostly Cloudy

WATER LEVEL MEASUREMENTS

DATE	TIME hrs	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
24 Oct	13:33	11'		None		9½'
" "	14:30			6.7'		5.7'
27 "	15:02			"		5¼'
28 "	14:08	to 14.99'		None		10.8'

DRILLING DATA

Crew Chief: pH
Method: 3" SCS Bucket (Hand) Auger
Commenced: 23 October 2024
Boring Completed: 28 October 2024

SOIL BORING LOG

Patrick J Hines, PE

8167 100th St S
Cottage Grove MN 55016

PROJECT: Proposed Subdivision Infiltration Facilities
215 North Arm Lane, Orono, Minnesota

LOG OF BORING NO: 222

SURFACE ELEVATION: 957.6

DEPTH IN FEET	DESCRIPTION AND CLASSIFICATION	GEOLOGY	N	WB	SAMPLE #	SAMPLE TYPE	SAMPLE R	LAB & OTHER TESTS W	DEN	LL / P.L.	
	LOAM, Organic, Black, w/ a few small roots low moisture content, loose *	Topsoil		N	1	HA					*more moist w/ depth
1	SILTY CLAY LOAM, Mildly Organic, Black to Lt Black** w/ occasional small root normal moisture content, soft to med	Sub-topsoil		N	2	HA					**w/ depth
2	SILTY CLAY LOAM, Very Dark Yellowish Brown*** normal moisture content, soft to medium, w/ Black Organic inclusions to 2½'	Slopewash		N	3	HA					***lighter w/ depth
3											****sand laminations @ interface
4	SILTY CLAY LOAM, slightly sandy, Dark Olive Brown, sparsely mottled normal moisture content, soft to medium	Lacustrine		N	4	HA					
5	Light Olive Brown, abundantly mottled @ 3.75'+ medium very silty, low plasticity, borderline Silt Loam										
6											
7				▼ 7¼' (elev 950¼±)							
8	CLAY, rather silty, Gray to Dark Gray mottled, normal moisture content medium to stiff			N	5	HA					
8¼	SAND, rather well graded to poorly graded (biased coarser gr w/ depth), w/ a little loam (borderline Loamy Sand at first, less loamy w/ depth)	Coarse Alluvium		Y	6	HA					
9											
10	w/ a little fine gravel (more w/ depth) saturated, firm										
10.75	SILTY CLAY LOAM, low plasticiy, Dark Olive Brown, saturated, medium	Lacustrine		N	7	HA					
11	CLAY LOAM, quite sandy, Dark Gray w/ tr to a little gravel normal moisture content, medium to stiff	Glacial Till		N	8	FA					
12											
13	less sandy										
14											
14.99											
15	End of Boring - No Refusal										
16	Bore hole void backfilled w/ produced cuttigns on 23 October 2024										

Weather: (23rd) 45°F, Clear, NW 0-5 mph± Breeze
(21st) 80°F±, Calm, Mostly Clr

WATER LEVEL MEASUREMENTS

DATE	TIME hrs	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
19 Oct	12:46	6'		None		None
21 "	15:34	to 11'		"		9½'
" "	15:47			"		7.4'
23 "	16:53			"		7¼'
25 "	10:33	to 14.99'		NR		NR

DRILLING DATA

Crew Chief: pH
(None 21st)
Method: 3" SCS Bucket (Hand) Auger
6" Power Flight Auger (CME 45B Drill Rig on F350)
Commenced: 19 October 2024
Boring Completed: 25 October 2024

Patrick J Hines, PE

8167 100th St E
Cottage Grove MN 55016

PROJECT: BORING LOG KEY

LOG OF BORING NO: _____

DEPTH IN FEET	SURFACE ELEVATION: / DESCRIPTION AND CLASSIFICATION	GEOLOGY	N	WS	SAMPLE #	SAMPLE TYPE	SAMPLE R	LAB & OTHER TESTS W	DEN	LL P.L.
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										

Soil Classification, using visual-manual and/or laboratory methods, according to the Unified Soil Classification System, or to other system as appropriate

Origin of Soil

Other Data as Necessary

Atterberg Limits*

Penetration "N" Value - Number of blows to drive Split-Barrel Sampler one foot

In-place Density*

Water Bearing
Y = Yes
N = No
▽ = Water Level Symbol

Moisture Content*

Length of Sample Recovered

Sample Number

Indicates Type of Sample:
SPS = Split-barrel
FA = Flight Auger
HA = Hand Auger
ST = Shelby Tube (thinwall)

* = lab test on test sized sample

WATER LEVEL MEASUREMENTS

DATE	TIME	SAMPLING DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING WATER LEVEL	WATER LEVEL

DRILLING DATA

Crew Chief: _____

Drilled: _____

SOIL BORING LOG

Patrick J Hines, PE

8167 100th St S
Cottage Grove MN 55016

PROJECT: Proposed Subdivision Infiltration Facilities
215 North Arm Lane, Orono, Minnesota

LOG OF BORING NO: 216A

SURFACE ELEVATION: 945.0

DEPTH IN FEET	DESCRIPTION AND CLASSIFICATION	GEOLOGY	N	WB	SAMPLE #	SAMPLE TYPE	SAMPLE R	LAB & OTHER TESTS W	DEN	L.L. P.L.	
1	SILT LOAM, Organic, Black, w/ tr small roots, occasional small wood root, low moisture content, loose B	Topsoil		N	1	HA					
2	LOAM, Very Dark to Dark* Yellowish Brown, w/ tr gravel, somewhat low moisture content, loose to firm, sparsely mottled B-C	Lacustrine		N	2	HA					*w/ depth
3											
4	Dark Yellowish Brown to Yellowish Brown*, near normal moisture content, firm, normal moisture content C										
4.75 5	CLAY LOAM, Dark Yellowish Brown, mottled (sand fraction is biased finer grained), w/ tr fine gravel, normal moisture content, medium C	Glacial Till		N	3	HA					
6											
7	Dark Olive Brown, mottled			▼ 6.9' (elev 938±) Y							
8	medium to stiff										
9											
10	slight water encountered while drilling										
11	CLAY LOAM, rather sandy (sand fraction is biased finer gr), Dark Olive Gray w/ tr gravel, normal moisture content, medium to stiff C			N	4	HA					
12											
13	Dark Gray, sandier (sand fraction is sl coarser gr than before)										
14	stiff										
14.99 15	End of Boring – No Refusal										
16	Bore hole void backfilled w/ produced cuttings on 27 October 2024										

Weather: 58°F, Calm, Mostly Cloudy, Lt Rain Developing

WATER LEVEL MEASUREMENTS

DATE	TIME hrs	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
24 Oct	16:14	14.99'		None		14.9'
" "	16:38			"		14.1'
27 "	15:38			14½'		6.9'

DRILLING DATA

Crew Chief: pH
Method: 3" SCS Bucket (Hand) Auger
Boring Completed: 24 October 2024

SOIL BORING LOG

Patrick J Hines, PE

8167 100th St S
Cottage Grove MN 55016

PROJECT: Proposed Subdivision Infiltration Facilities
215 North Arm Lane, Orono, Minnesota

LOG OF BORING NO: 221A

SURFACE ELEVATION: 952.7

DEPTH IN FEET	DESCRIPTION AND CLASSIFICATION	GEOLOGY	N	WB	SAMPLE #	SAMPLE TYPE	SAMPLE R	LAB & OTHER TESTS W	DEN	L.L. P.L.	
	SILT LOAM, Organic, Black, w/ a few small roots, moist, loose B	Topsoil		N	1	HA					
1	SILTY CLAY LOAM, Organic, Black, w/ occ small root, normal moisture content soft to medium	Sub-Topsoil		N	2	HA					
2	less organic, w/ tr gravel C medium										
2.75 3	CLAY LOAM, rather sandy, Very Dark Olive Brown* w/ tr gravel, occ small root to 4'± normal moisture content	Glacial Till		N	3	HA					* lighter w/ depth
4	medium E										
5	Dark Olive Brown, mottled higher moisture content, soft			▼ 5¼' (elev 947½±)							
6				Y	4	HA					
7	← thin gravel & coarse sand layer										
7¼	soft to medium high fine sand fraction										
8	medium to stiff			N							
9											
10	w/ tr to a little gravel C										
11				N	5	HA					
12											
13											
	w/ Dark Gray inclusions										
14	CLAY LOAM, quite sandy, Dk Gray, w/ tr to a little gravel, normal moicture content			N	6	HA					
14.99 15	medium to stiff										
	End of Boring - No Refusal										
16	Bore hole void backfilled w/ produced cuttings on 28 October 2024										

Weather: (24th) 58°F, Calm, Mostly Cloudy (28th) 74°F, Mostly Clear, NW 0-5 mph± Breeze

WATER LEVEL MEASUREMENTS

DATE	TIME hrs	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
24 Oct	13:33	11'		None		9½'
" "	14:30			6.7'		5.7'
27 "	15:02			"		5¼'
28 "	14:08	to 14.99'		None		10.8'

DRILLING DATA

Crew Chief: pH

Method: 3" SCS Bucket (Hand) Auger

Commenced: 23 October 2024

Boring Completed: 28 October 2024

SOIL BORING LOG

Patrick J Hines, PE

8167 100th St S
Cottage Grove MN 55016

PROJECT: Proposed Subdivision Infiltration Facilities
215 North Arm Lane, Orono, Minnesota

LOG OF BORING NO: 222

DEPTH IN FEET	SURFACE ELEVATION: 957.6 / DESCRIPTION AND CLASSIFICATION	GEOLOGY	N	WB	SAMPLE #	SAMPLE TYPE	SAMPLE R	LAB & OTHER TESTS W	DEN	L.L. / P.L.	
	LOAM, Organic, Black, w/ a few small roots low moisture content, loose *	Topsoil		N	1	HA					*more moist w/ depth
1	B										
	SILTY CLAY LOAM, Mildly Organic, Black to Lt Black** w/ occasional small root normal moisture content, soft to med ****	Sub-topsoil		N	2	HA					**w/ depth
2	B-C										
	SILTY CLAY LOAM, Very Dark Yellowish Brown*** normal moisture content, soft to medium, w/ Black Organic inclusions to 2½'	Slopewash		N	3	HA					***lighter w/ depth
3	C										****sand laminations @ interface
	SILTY CLAY LOAM, slightly sandy, Dark Olive Brown, sparsely mottled normal moisture content, soft to medium	Lacustrine		N	4	HA					
4											
	Light Olive Brown, abundantly mottled @ 3.75'+ medium very silty, low plasticity, borderline Silt Loam	C									
5											
6	B-C										
7				▼ 7¼' (elev 950¼±)							
	CLAY, rather silty, Gray to Dark Gray mottled, normal moisture content medium to stiff			N	5	HA					
8	D										
8¼	SAND, rather well graded to poorly graded (biased coarser gr w/ depth), w/ a little loam (borderline Loamy Sand at first, less loamy w/ depth) w/ a little fine gravel (more w/ depth) saturated, firm	Coarse Alluvium		Y	6	HA					
9											
10	A										
10.75	SILTY CLAY LOAM, low plasticiy, Dark Olive Brown, saturated, medium	Lacustrine		N	7	HA					
11	C										
	CLAY LOAM, quite sandy, Dark Gray w/ tr to a little gravel normal moisture content, medium to stiff	Glacial Till		N	8	FA					
12	C										
13											
	less sandy										
14											
14.99											
15	End of Boring - No Refusal										
	Bore hole void backfilled w/ produced cuttigns on 23 October 2024										
16											

Weather: (21st) 80°F±, Calm, Mostly Clr
(23rd) 45°F, Clear, NW 0-5 mph± Breeze

WATER LEVEL MEASUREMENTS

DATE	TIME hrs	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
19 Oct	12:46	6'		None		None
21 "	15:34	to 11'		"		9½'
" "	15:47			"		7.4'
23 "	16:53			"		7¼'
25 "	10:33	to 14.99'		NR		NR

DRILLING DATA

Crew Chief: pH
(None 21st)
Method: 3" SCS Bucket (Hand) Auger
6" Power Flight Auger (CME 45B Drill Rig on F350)
Commenced: 19 October 2024
Boring Completed: 25 October 2024

Mr Kent Brander, Civil Methods, Inc
Re: Proposed Stormwater Detention/Infiltration Facilities
215 North Arm Lane, Orono, Minn
29 October 2024

LIMITATIONS OF INVESTIGATION

The Soils Engineer has prepared this report in accordance with generally accepted soils engineering practice utilizing an ordinary level of care. Because the borings represent only a small portion of the total site and for other reasons, it is not warranted that the borings are necessarily representative of the entire site but only of the boring locations at the time of the investigation. No warranty of the site is made or implied, nor can the soils engineer be held responsible for facts not disclosed.

The scope of this report is limited strictly to geotechnical issues which include identifying and analyzing soils and only those conclusions expressly made. Note that, outside of noting that no unusual appearances or odors were encountered, this work is generally not intended to document the presence or absence of any environmental contaminants at the site, nor for identifying applicable local, state or federal laws or regulations of a non-geotechnical nature which may or may not be applicable to this site.

Because of the influence of various construction procedures on site suitability, results presented in this report may lead to successful accomplishment of the work only if appropriate and continuing review of construction and conditions is carried out by capable personnel.

Soils retrieved in the field investigation process were classified in the field by the Soils Engineer. Most were immediately discarded, excepting those bagged and saved for possible later examination and testing. The bore holes have been backfilled with produced cuttings. However, they may settle, so the site owner should check them periodically and, if settled, backfilled with more soil so that tripping hazards do not occur.

This report is provided only for the use of the Client named in the report and consultants and agents for the stated purpose. No other representations are made to other parties or for other purposes.

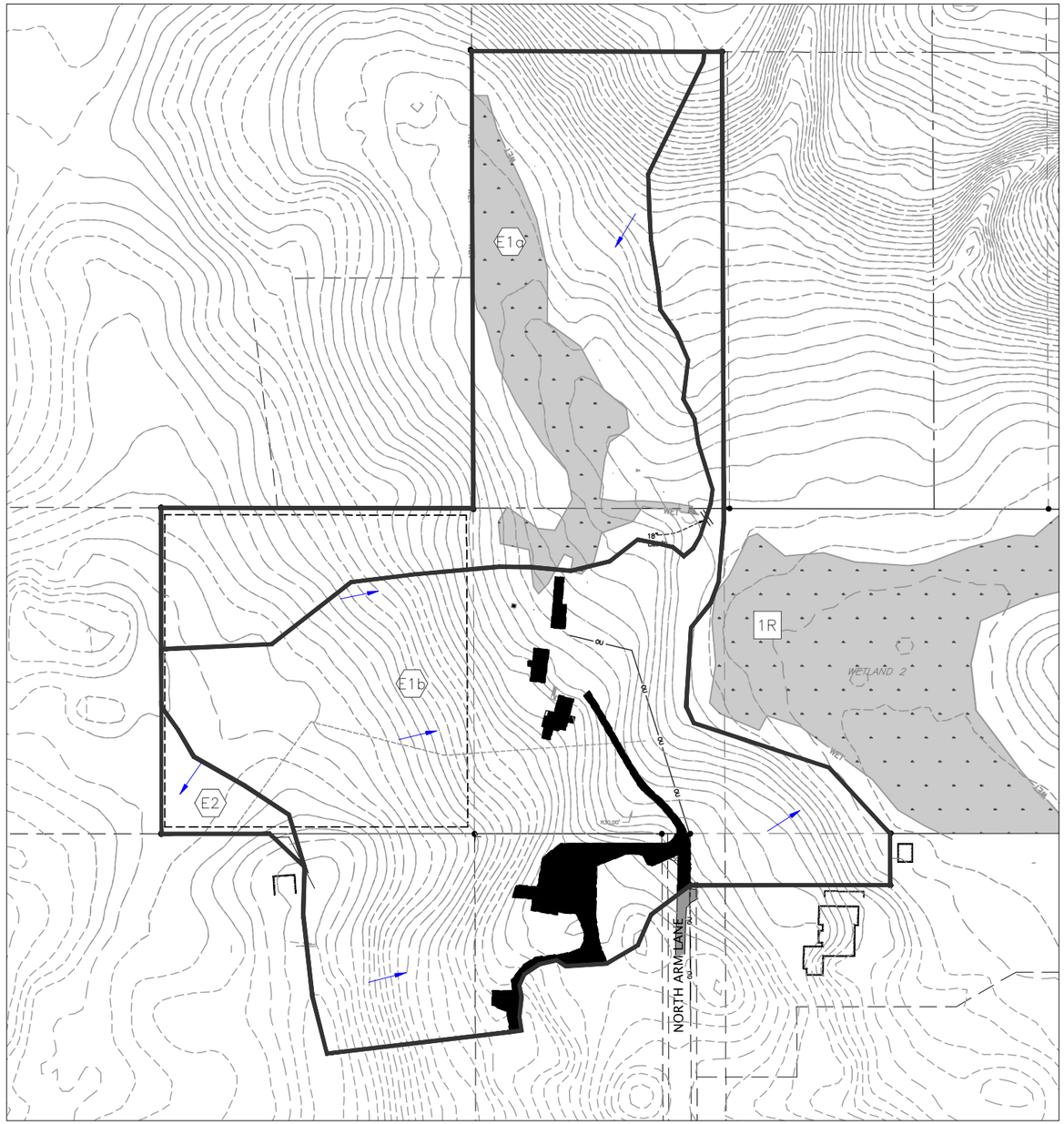
Appendix B – Drainage Diagrams

LEGEND:

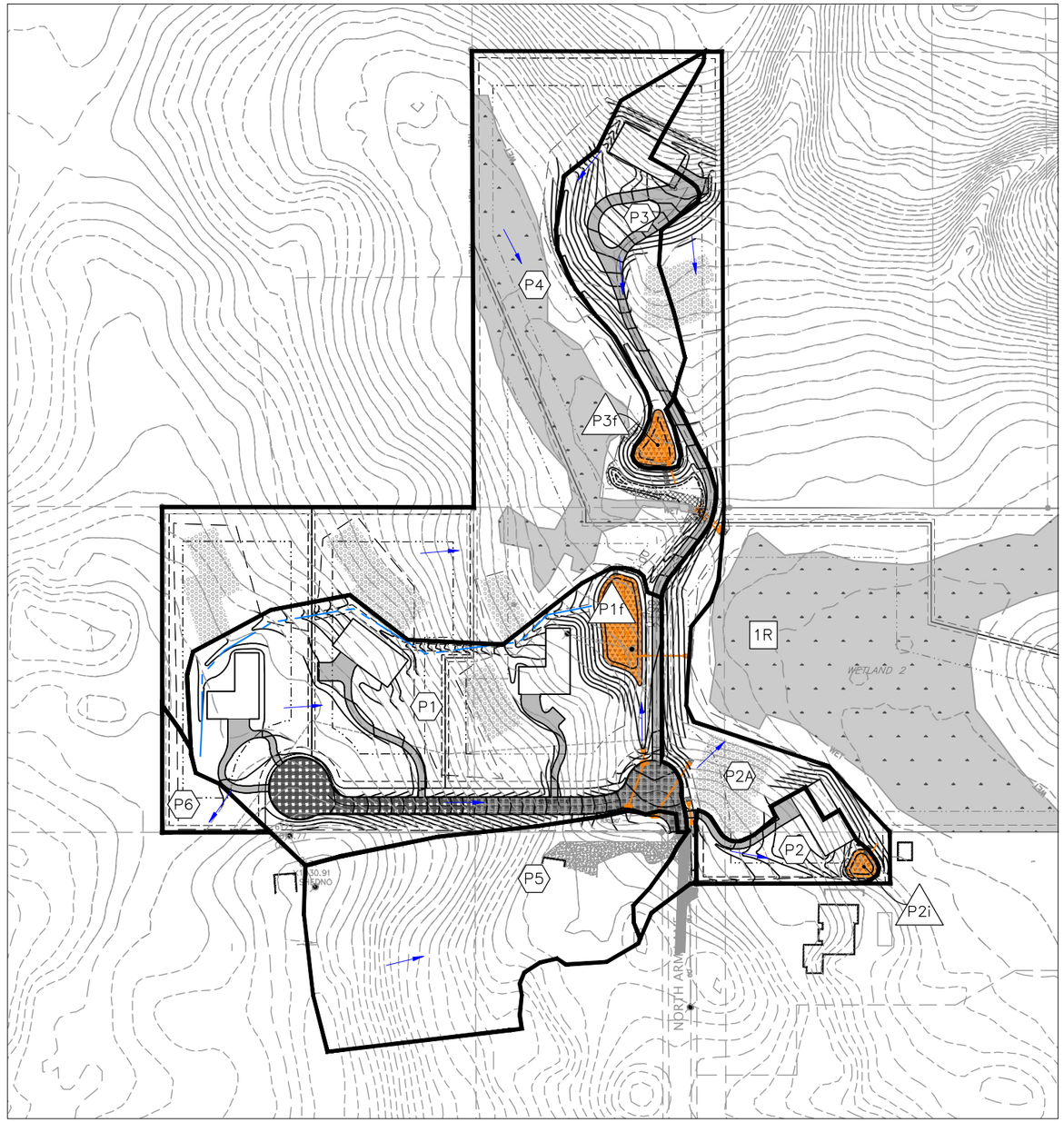
- SUBCATCHMENT NODE ID (X)
- BASIN NODE ID (X)
- REACH NODE ID (X)
- SUBCATCHMENT DELINEATION
- DRAINAGE DIRECTION

N

0 100 200 Feet



EXISTING CONDITION



PROPOSED CONDITION

CIVIL METHODS, INC.
PO Box 28038
St. Paul, MN 55128
o:763.210.5713 | www.civilmethods.com

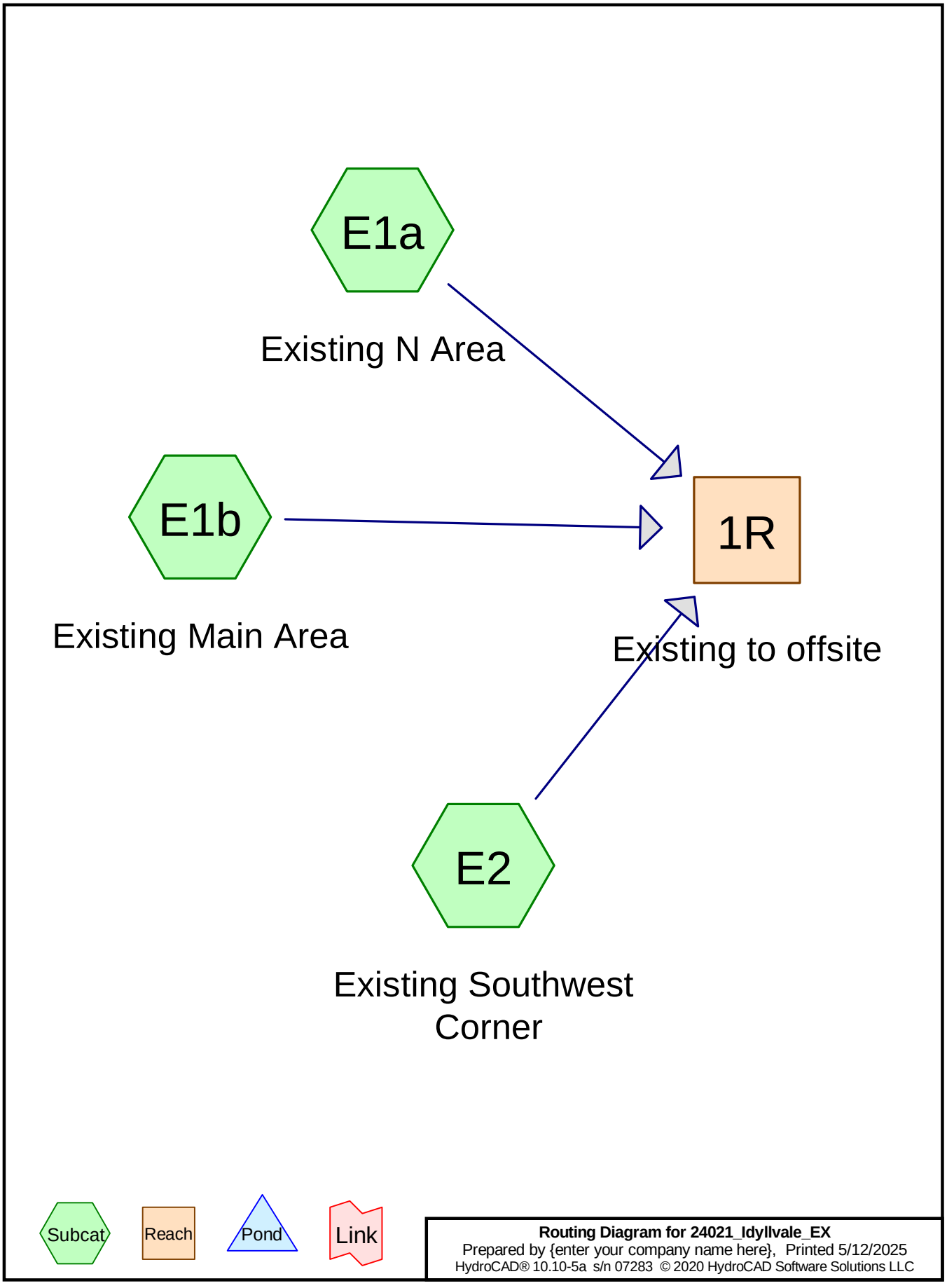
IDYLLVALE SHORES
BRADLEY J PASS
215 NORTH ARM LANE, ORONO, MN

DRAINAGE DIAGRAM

SHEET NO: FIG1

Print Date: 5/12/2025 4:02 PM
File Loc: C:\CM\Civil Methods, Inc\CMI - Documents\7. Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\XrefBase\24021_WR.dwg

Appendix C – HydroCAD Report



Routing Diagram for 24021_Idyllvale_EX
Prepared by {enter your company name here}, Printed 5/12/2025
HydroCAD® 10.10-5a s/n 07283 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	MSE 24-hr	3	Default	24.00	1	2.86	2
2	10-Year	MSE 24-hr	3	Default	24.00	1	4.26	2
3	100-Year	MSE 24-hr	3	Default	24.00	1	7.32	2

Summary for Subcatchment E1a: Existing N Area

Runoff = 4.50 cfs @ 12.37 hrs, Volume= 0.408 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
	5.835	70	Woods, Good, HSG C
*	0.567	85	Wetland
*	0.204	98	Impervious
	6.606	72	Weighted Average
	6.402	71	96.91% Pervious Area
	0.204	98	3.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
5.7	550	0.1040	1.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.9	650	Total			

Summary for Subcatchment E1b: Existing Main Area

Runoff = 7.46 cfs @ 12.39 hrs, Volume= 0.694 af, Depth= 0.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
	9.920	70	Woods, Good, HSG C
*	0.964	85	Wetland
*	0.348	98	Impervious
	11.232	72	Weighted Average
	10.884	71	96.90% Pervious Area
	0.348	98	3.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0450	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
7.6	706	0.0960	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.0	806	Total			

Summary for Subcatchment E2: Existing Southwest Corner

Runoff = 0.37 cfs @ 12.19 hrs, Volume= 0.022 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
	0.410	70	Woods, Good, HSG C
*	0.000	98	
	0.410	70	Weighted Average
	0.410	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Reach 1R: Existing to offsite

Inflow Area = 18.248 ac, 3.02% Impervious, Inflow Depth = 0.74" for 2-Year event
Inflow = 12.13 cfs @ 12.37 hrs, Volume= 1.124 af
Outflow = 12.13 cfs @ 12.37 hrs, Volume= 1.124 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Summary for Subcatchment E1a: Existing N Area

Runoff = 10.99 cfs @ 12.34 hrs, Volume= 0.909 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
	5.835	70	Woods, Good, HSG C
*	0.567	85	Wetland
*	0.204	98	Impervious
	6.606	72	Weighted Average
	6.402	71	96.91% Pervious Area
	0.204	98	3.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
5.7	550	0.1040	1.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.9	650	Total			

Summary for Subcatchment E1b: Existing Main Area

Runoff = 18.22 cfs @ 12.35 hrs, Volume= 1.545 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
	9.920	70	Woods, Good, HSG C
*	0.964	85	Wetland
*	0.348	98	Impervious
	11.232	72	Weighted Average
	10.884	71	96.90% Pervious Area
	0.348	98	3.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0450	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
7.6	706	0.0960	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.0	806	Total			

Summary for Subcatchment E2: Existing Southwest Corner

Runoff = 0.94 cfs @ 12.18 hrs, Volume= 0.051 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
	0.410	70	Woods, Good, HSG C
*	0.000	98	
	0.410	70	Weighted Average
	0.410	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Reach 1R: Existing to offsite

Inflow Area = 18.248 ac, 3.02% Impervious, Inflow Depth = 1.65" for 10-Year event
Inflow = 29.63 cfs @ 12.35 hrs, Volume= 2.505 af
Outflow = 29.63 cfs @ 12.35 hrs, Volume= 2.505 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Summary for Subcatchment E1a: Existing N Area

Runoff = 28.05 cfs @ 12.34 hrs, Volume= 2.251 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
	5.835	70	Woods, Good, HSG C
*	0.567	85	Wetland
*	0.204	98	Impervious
	6.606	72	Weighted Average
	6.402	71	96.91% Pervious Area
	0.204	98	3.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.2	100	0.0400	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
5.7	550	0.1040	1.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.9	650	Total			

Summary for Subcatchment E1b: Existing Main Area

Runoff = 46.60 cfs @ 12.35 hrs, Volume= 3.828 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
	9.920	70	Woods, Good, HSG C
*	0.964	85	Wetland
*	0.348	98	Impervious
	11.232	72	Weighted Average
	10.884	71	96.90% Pervious Area
	0.348	98	3.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.4	100	0.0450	0.10		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
7.6	706	0.0960	1.55		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
24.0	806	Total			

Summary for Subcatchment E2: Existing Southwest Corner

Runoff = 2.48 cfs @ 12.18 hrs, Volume= 0.133 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

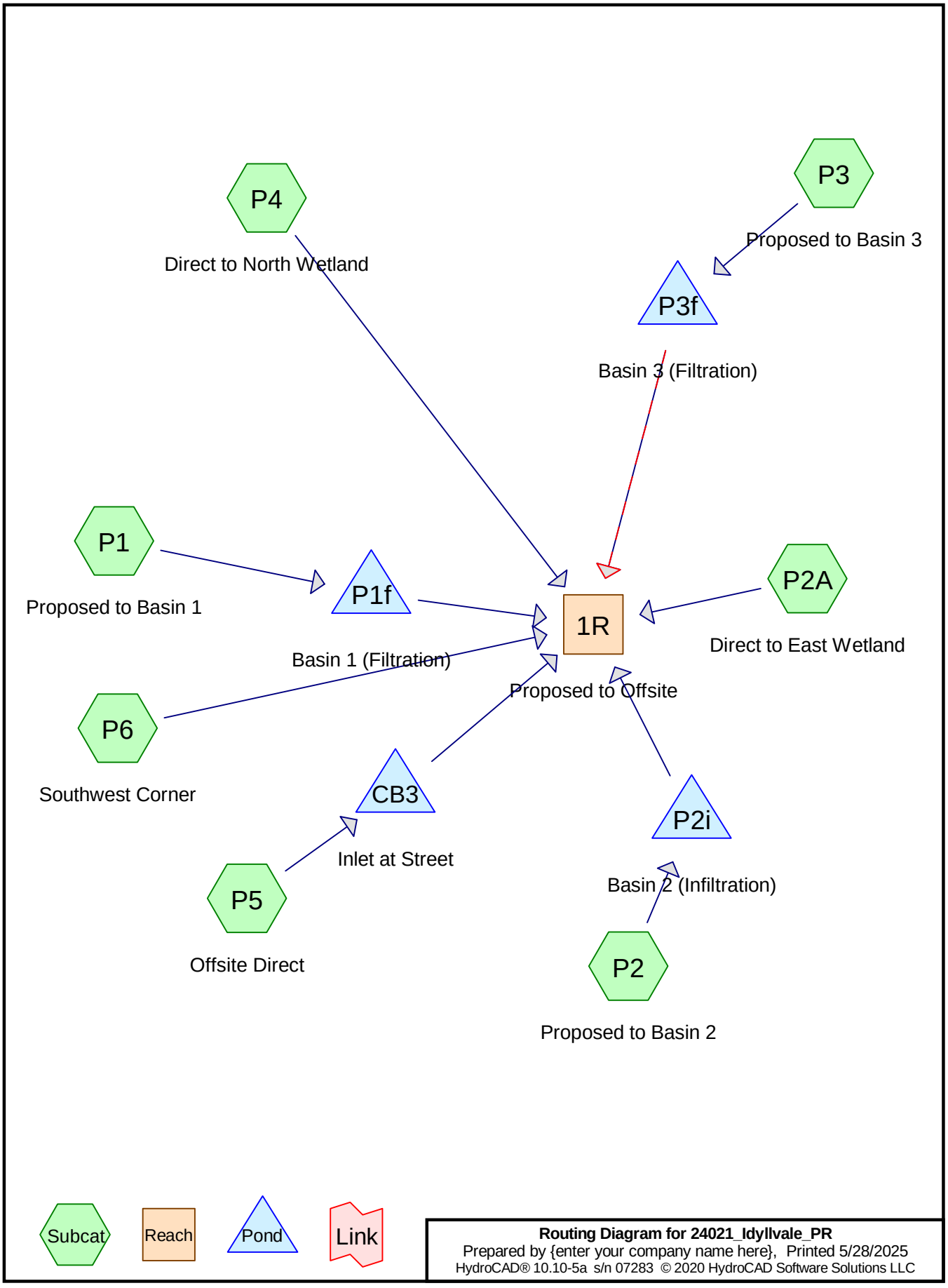
	Area (ac)	CN	Description
	0.410	70	Woods, Good, HSG C
*	0.000	98	
	0.410	70	Weighted Average
	0.410	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Summary for Reach 1R: Existing to offsite

Inflow Area = 18.248 ac, 3.02% Impervious, Inflow Depth = 4.09" for 100-Year event
Inflow = 75.69 cfs @ 12.34 hrs, Volume= 6.212 af
Outflow = 75.69 cfs @ 12.34 hrs, Volume= 6.212 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs



Routing Diagram for 24021_Idyllvale_PR
Prepared by {enter your company name here}, Printed 5/28/2025
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	MSE 24-hr	3	Default	24.00	1	2.86	2
2	10-Year	MSE 24-hr	3	Default	24.00	1	4.26	2
3	100-Year	MSE 24-hr	3	Default	24.00	1	7.32	2

Summary for Subcatchment P1: Proposed to Basin 1

Runoff = 5.74 cfs @ 12.28 hrs, Volume= 0.457 af, Depth= 1.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
*	1.176	98	
	0.344	74	>75% Grass cover, Good, HSG C
	3.411	70	Woods, Good, HSG C
	4.931	77	Weighted Average
	3.755	70	76.15% Pervious Area
	1.176	98	23.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.86"
7.3	650	0.0880	1.48		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.7	750	Total			

Summary for Subcatchment P2: Proposed to Basin 2

Runoff = 1.08 cfs @ 12.16 hrs, Volume= 0.058 af, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
*	0.140	98	
	0.402	74	>75% Grass cover, Good, HSG C
	0.542	80	Weighted Average
	0.402	74	74.17% Pervious Area
	0.140	98	25.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment P2A: Direct to East Wetland

Runoff = 1.88 cfs @ 12.21 hrs, Volume= 0.123 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
*	0.080	98	
	1.987	70	Woods, Good, HSG C
	2.067	71	Weighted Average
	1.987	70	96.13% Pervious Area
	0.080	98	3.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Summary for Subcatchment P3: Proposed to Basin 3

Runoff = 2.64 cfs @ 12.16 hrs, Volume= 0.142 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
*	0.320	98	
	1.047	74	>75% Grass cover, Good, HSG C
	1.367	80	Weighted Average
	1.047	74	76.59% Pervious Area
	0.320	98	23.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment P4: Direct to North Wetland

Runoff = 4.88 cfs @ 12.37 hrs, Volume= 0.432 af, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
	4.498	70	Woods, Good, HSG C
*	1.533	85	Wetland
*	0.087	98	
	6.118	74	Weighted Average
	6.031	74	98.58% Pervious Area
	0.087	98	1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9					**Direct Entry, Same as "Existing condition" calc**

Summary for Subcatchment P5: Offsite Direct

Runoff = 2.83 cfs @ 12.28 hrs, Volume= 0.223 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

	Area (ac)	CN	Description
*	0.401	98	
	2.536	70	Woods, Good, HSG C
	2.937	74	Weighted Average
	2.536	70	86.35% Pervious Area
	0.401	98	13.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
5.2	500	0.1040	1.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.1	600	Total			

Summary for Subcatchment P6: Southwest Corner

Runoff = 0.27 cfs @ 12.18 hrs, Volume= 0.015 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-Year Rainfall=2.86"

Area (ac)	CN	Description
0.286	70	Woods, Good, HSG C
0.286	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0					**Direct Entry,**

Summary for Reach 1R: Proposed to Offsite

Inflow Area = 18.248 ac, 12.08% Impervious, Inflow Depth = 0.94" for 2-Year event
Inflow = 9.70 cfs @ 12.30 hrs, Volume= 1.424 af
Outflow = 9.70 cfs @ 12.30 hrs, Volume= 1.424 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Summary for Pond CB3: Inlet at Street

Inflow Area = 2.937 ac, 13.65% Impervious, Inflow Depth = 0.91" for 2-Year event
Inflow = 2.83 cfs @ 12.28 hrs, Volume= 0.223 af
Outflow = 2.83 cfs @ 12.27 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.0 min
Primary = 2.83 cfs @ 12.27 hrs, Volume= 0.222 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 961.27' @ 12.27 hrs Surf.Area= 23 sf Storage= 44 cf

Plug-Flow detention time= 4.6 min calculated for 0.222 af (100% of inflow)
Center-of-Mass det. time= 2.2 min (821.8 - 819.6)

Volume	Invert	Avail.Storage	Storage Description
#1	958.00'	861 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
958.00	13	0	0
961.00	13	39	39
962.00	50	32	71
963.00	440	245	316
964.00	650	545	861

Device	Routing	Invert	Outlet Devices
#1	Primary	958.00'	**18.0" Round Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 958.00' / 957.00' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	961.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.83 cfs @ 12.27 hrs HW=961.27' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 2.83 cfs of 13.50 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 2.83 cfs @ 1.69 fps)

Summary for Pond P1f: Basin 1 (Filtration)

Inflow Area = 4.931 ac, 23.85% Impervious, Inflow Depth = 1.11" for 2-Year event
Inflow = 5.74 cfs @ 12.28 hrs, Volume= 0.457 af
Outflow = 0.36 cfs @ 13.88 hrs, Volume= 0.457 af, Atten= 94%, Lag= 96.2 min
Primary = 0.36 cfs @ 13.88 hrs, Volume= 0.457 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 951.84' @ 13.88 hrs Surf.Area= 7,486 sf Storage= 11,849 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 592.3 min (1,397.0 - 804.7)

Volume	Invert	Avail.Storage	Storage Description
#1	950.00'	42,615 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
950.00	5,420	0	0
952.00	7,670	13,090	13,090
954.00	10,570	18,240	31,330
955.00	12,000	11,285	42,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	950.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	947.50'	**18.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 947.50' / 947.00' S= 0.0091 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	951.60'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	952.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.36 cfs @ 13.88 hrs HW=951.84' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 0.36 cfs of 16.11 cfs potential flow)
  ├─**1=Exfiltration** (Exfiltration Controls 0.17 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 0.18 cfs @ 1.65 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond P2i: Basin 2 (Infiltration)

Inflow Area = 0.542 ac, 25.83% Impervious, Inflow Depth = 1.29" for 2-Year event
Inflow = 1.08 cfs @ 12.16 hrs, Volume= 0.058 af
Outflow = 0.69 cfs @ 12.24 hrs, Volume= 0.058 af, Atten= 37%, Lag= 5.1 min
Discarded = 0.01 cfs @ 12.24 hrs, Volume= 0.025 af
Primary = 0.68 cfs @ 12.24 hrs, Volume= 0.033 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 944.96' @ 12.24 hrs Surf.Area= 1,096 sf Storage= 887 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 514.9 min (1,308.4 - 793.5)

Volume	Invert	Avail.Storage	Storage Description
#1	944.00'	3,707 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
944.00	744	0	0
946.00	1,475	2,219	2,219
947.00	1,500	1,488	3,707

Device	Routing	Invert	Outlet Devices
#1	Discarded	944.00'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	942.00'	**8.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 942.00' / 941.80' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#3	Device 2	944.80'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.24 hrs HW=944.96' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.68 cfs @ 12.24 hrs HW=944.96' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.68 cfs of 2.73 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 0.68 cfs @ 1.32 fps)

Summary for Pond P3f: Basin 3 (Filtration)

Inflow Area = 1.367 ac, 23.41% Impervious, Inflow Depth = 1.24" for 2-Year event
Inflow = 2.64 cfs @ 12.16 hrs, Volume= 0.142 af
Outflow = 0.28 cfs @ 12.83 hrs, Volume= 0.142 af, Atten= 89%, Lag= 40.7 min
Primary = 0.28 cfs @ 12.83 hrs, Volume= 0.142 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 953.57' @ 12.83 hrs Surf.Area= 2,698 sf Storage= 3,218 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 464.6 min (1,260.7 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	952.00'	11,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
952.00	1,448	0	0
953.00	2,210	1,829	1,829
954.00	3,072	2,641	4,470
955.00	3,785	3,429	7,899
956.00	4,000	3,893	11,791

Device	Routing	Invert	Outlet Devices
#1	Device 2	952.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	949.30'	**12.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 949.30' / 948.50' S= 0.0267 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	953.50'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	954.80'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 4.00 8.00

Primary OutFlow Max=0.28 cfs @ 12.83 hrs HW=953.57' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.28 cfs of 7.34 cfs potential flow)
├**1=Exfiltration** (Exfiltration Controls 0.06 cfs)
└**3=Orifice/Grate** (Weir Controls 0.22 cfs @ 0.84 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=952.00' TW=0.00' (Dynamic Tailwater)
└**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Subcatchment P1: Proposed to Basin 1

Runoff = 11.48 cfs @ 12.27 hrs, Volume= 0.866 af, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
*	1.176	98	
	0.344	74	>75% Grass cover, Good, HSG C
	3.411	70	Woods, Good, HSG C
	4.931	77	Weighted Average
	3.755	70	76.15% Pervious Area
	1.176	98	23.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.86"
7.3	650	0.0880	1.48		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.7	750	Total			

Summary for Subcatchment P2: Proposed to Basin 2

Runoff = 2.04 cfs @ 12.15 hrs, Volume= 0.107 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
*	0.140	98	
	0.402	74	>75% Grass cover, Good, HSG C
	0.542	80	Weighted Average
	0.402	74	74.17% Pervious Area
	0.140	98	25.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment P2A: Direct to East Wetland

Runoff = 4.62 cfs @ 12.20 hrs, Volume= 0.276 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
*	0.080	98	
	1.987	70	Woods, Good, HSG C
	2.067	71	Weighted Average
	1.987	70	96.13% Pervious Area
	0.080	98	3.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Summary for Subcatchment P3: Proposed to Basin 3

Runoff = 5.05 cfs @ 12.15 hrs, Volume= 0.263 af, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
*	0.320	98	
	1.047	74	>75% Grass cover, Good, HSG C
	1.367	80	Weighted Average
	1.047	74	76.59% Pervious Area
	0.320	98	23.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment P4: Direct to North Wetland

Runoff = 11.20 cfs @ 12.35 hrs, Volume= 0.929 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
	4.498	70	Woods, Good, HSG C
*	1.533	85	Wetland
*	0.087	98	
	6.118	74	Weighted Average
	6.031	74	98.58% Pervious Area
	0.087	98	1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9					**Direct Entry, Same as "Existing condition" calc**

Summary for Subcatchment P5: Offsite Direct

Runoff = 6.20 cfs @ 12.26 hrs, Volume= 0.453 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

	Area (ac)	CN	Description
*	0.401	98	
	2.536	70	Woods, Good, HSG C
	2.937	74	Weighted Average
	2.536	70	86.35% Pervious Area
	0.401	98	13.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
5.2	500	0.1040	1.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.1	600	Total			

Summary for Subcatchment P6: Southwest Corner

Runoff = 0.70 cfs @ 12.17 hrs, Volume= 0.036 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-Year Rainfall=4.26"

Area (ac)	CN	Description
0.286	70	Woods, Good, HSG C
0.286	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0					**Direct Entry,**

Summary for Reach 1R: Proposed to Offsite

Inflow Area = 18.248 ac, 12.08% Impervious, Inflow Depth = 1.91" for 10-Year event
Inflow = 24.73 cfs @ 12.27 hrs, Volume= 2.903 af
Outflow = 24.73 cfs @ 12.27 hrs, Volume= 2.903 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Summary for Pond CB3: Inlet at Street

Inflow Area = 2.937 ac, 13.65% Impervious, Inflow Depth = 1.85" for 10-Year event
Inflow = 6.20 cfs @ 12.26 hrs, Volume= 0.453 af
Outflow = 6.20 cfs @ 12.26 hrs, Volume= 0.452 af, Atten= 0%, Lag= 0.0 min
Primary = 6.20 cfs @ 12.26 hrs, Volume= 0.452 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 961.45' @ 12.26 hrs Surf.Area= 30 sf Storage= 49 cf

Plug-Flow detention time= 2.4 min calculated for 0.452 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (813.0 - 811.8)

Volume	Invert	Avail.Storage	Storage Description
#1	958.00'	861 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
958.00	13	0	0
961.00	13	39	39
962.00	50	32	71
963.00	440	245	316
964.00	650	545	861

Device	Routing	Invert	Outlet Devices
#1	Primary	958.00'	**18.0" Round Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 958.00' / 957.00' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	961.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.20 cfs @ 12.26 hrs HW=961.45' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 6.20 cfs of 13.98 cfs potential flow)
↑—**2=Orifice/Grate** (Weir Controls 6.20 cfs @ 2.19 fps)

Summary for Pond P1f: Basin 1 (Filtration)

Inflow Area = 4.931 ac, 23.85% Impervious, Inflow Depth = 2.11" for 10-Year event
Inflow = 11.48 cfs @ 12.27 hrs, Volume= 0.866 af
Outflow = 2.49 cfs @ 12.79 hrs, Volume= 0.866 af, Atten= 78%, Lag= 31.0 min
Primary = 2.49 cfs @ 12.79 hrs, Volume= 0.866 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 952.66' @ 12.79 hrs Surf.Area= 8,631 sf Storage= 18,490 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 384.7 min (1,184.9 - 800.2)

Volume	Invert	Avail.Storage	Storage Description
#1	950.00'	42,615 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
950.00	5,420	0	0
952.00	7,670	13,090	13,090
954.00	10,570	18,240	31,330
955.00	12,000	11,285	42,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	950.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	947.50'	**18.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 947.50' / 947.00' S= 0.0091 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	951.60'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	952.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=2.49 cfs @ 12.79 hrs HW=952.66' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 2.49 cfs of 17.87 cfs potential flow)
  ├─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 1.44 cfs @ 4.11 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Weir Controls 0.85 cfs @ 1.32 fps)

Summary for Pond P2i: Basin 2 (Infiltration)

Inflow Area = 0.542 ac, 25.83% Impervious, Inflow Depth = 2.37" for 10-Year event
Inflow = 2.04 cfs @ 12.15 hrs, Volume= 0.107 af
Outflow = 1.86 cfs @ 12.19 hrs, Volume= 0.107 af, Atten= 9%, Lag= 1.9 min
Discarded = 0.01 cfs @ 12.19 hrs, Volume= 0.026 af
Primary = 1.85 cfs @ 12.19 hrs, Volume= 0.081 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 945.12' @ 12.19 hrs Surf.Area= 1,153 sf Storage= 1,062 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 290.9 min (1,078.8 - 787.9)

Volume	Invert	Avail.Storage	Storage Description
#1	944.00'	3,707 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
944.00	744	0	0
946.00	1,475	2,219	2,219
947.00	1,500	1,488	3,707

Device	Routing	Invert	Outlet Devices
#1	Discarded	944.00'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	942.00'	**8.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 942.00' / 941.80' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#3	Device 2	944.80'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.19 hrs HW=945.12' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.85 cfs @ 12.19 hrs HW=945.12' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 1.85 cfs of 2.81 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 1.85 cfs @ 1.85 fps)

Summary for Pond P3f: Basin 3 (Filtration)

Inflow Area = 1.367 ac, 23.41% Impervious, Inflow Depth = 2.31" for 10-Year event
Inflow = 5.05 cfs @ 12.15 hrs, Volume= 0.263 af
Outflow = 2.88 cfs @ 12.25 hrs, Volume= 0.263 af, Atten= 43%, Lag= 5.9 min
Primary = 2.88 cfs @ 12.25 hrs, Volume= 0.263 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 953.86' @ 12.25 hrs Surf.Area= 2,954 sf Storage= 4,059 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 295.5 min (1,085.6 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	952.00'	11,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
952.00	1,448	0	0
953.00	2,210	1,829	1,829
954.00	3,072	2,641	4,470
955.00	3,785	3,429	7,899
956.00	4,000	3,893	11,791

Device	Routing	Invert	Outlet Devices
#1	Device 2	952.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	949.30'	**12.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 949.30' / 948.50' S= 0.0267 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	953.50'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	954.80'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 4.00 8.00

Primary OutFlow Max=2.88 cfs @ 12.25 hrs HW=953.86' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 2.88 cfs of 7.62 cfs potential flow)
└**1=Exfiltration** (Exfiltration Controls 0.07 cfs)
└**3=Orifice/Grate** (Weir Controls 2.81 cfs @ 1.97 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=952.00' TW=0.00' (Dynamic Tailwater)
└**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Summary for Subcatchment P1: Proposed to Basin 1

Runoff = 25.99 cfs @ 12.26 hrs, Volume= 1.910 af, Depth= 4.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
*	1.176	98	
	0.344	74	>75% Grass cover, Good, HSG C
	3.411	70	Woods, Good, HSG C
	4.931	77	Weighted Average
	3.755	70	76.15% Pervious Area
	1.176	98	23.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.86"
7.3	650	0.0880	1.48		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.7	750	Total			

Summary for Subcatchment P2: Proposed to Basin 2

Runoff = 4.35 cfs @ 12.15 hrs, Volume= 0.227 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
*	0.140	98	
	0.402	74	>75% Grass cover, Good, HSG C
	0.542	80	Weighted Average
	0.402	74	74.17% Pervious Area
	0.140	98	25.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment P2A: Direct to East Wetland

Runoff = 11.84 cfs @ 12.20 hrs, Volume= 0.691 af, Depth= 4.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
*	0.080	98	
	1.987	70	Woods, Good, HSG C
	2.067	71	Weighted Average
	1.987	70	96.13% Pervious Area
	0.080	98	3.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.0					**Direct Entry,**

Summary for Subcatchment P3: Proposed to Basin 3

Runoff = 10.87 cfs @ 12.15 hrs, Volume= 0.566 af, Depth= 4.97"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
*	0.320	98	
	1.047	74	>75% Grass cover, Good, HSG C
	1.367	80	Weighted Average
	1.047	74	76.59% Pervious Area
	0.320	98	23.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Summary for Subcatchment P4: Direct to North Wetland

Runoff = 27.21 cfs @ 12.35 hrs, Volume= 2.224 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
	4.498	70	Woods, Good, HSG C
*	1.533	85	Wetland
*	0.087	98	
	6.118	74	Weighted Average
	6.031	74	98.58% Pervious Area
	0.087	98	1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.9					**Direct Entry, Same as "Existing condition" calc**

Summary for Subcatchment P5: Offsite Direct

Runoff = 14.94 cfs @ 12.26 hrs, Volume= 1.058 af, Depth= 4.32"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

	Area (ac)	CN	Description
*	0.401	98	
	2.536	70	Woods, Good, HSG C
	2.937	74	Weighted Average
	2.536	70	86.35% Pervious Area
	0.401	98	13.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.9	100	0.1000	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.86"
5.2	500	0.1040	1.61		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
17.1	600	Total			

Summary for Subcatchment P6: Southwest Corner

Runoff = 1.82 cfs @ 12.17 hrs, Volume= 0.093 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-Year Rainfall=7.32"

Area (ac)	CN	Description
0.286	70	Woods, Good, HSG C
0.286	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.0					**Direct Entry,**

Summary for Reach 1R: Proposed to Offsite

Inflow Area = 18.248 ac, 12.08% Impervious, Inflow Depth = 4.43" for 100-Year event
Inflow = 72.66 cfs @ 12.32 hrs, Volume= 6.741 af
Outflow = 72.66 cfs @ 12.32 hrs, Volume= 6.741 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Summary for Pond CB3: Inlet at Street

Inflow Area = 2.937 ac, 13.65% Impervious, Inflow Depth = 4.32" for 100-Year event
Inflow = 14.94 cfs @ 12.26 hrs, Volume= 1.058 af
Outflow = 14.93 cfs @ 12.26 hrs, Volume= 1.057 af, Atten= 0%, Lag= 0.1 min
Primary = 14.93 cfs @ 12.26 hrs, Volume= 1.057 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 961.97' @ 12.26 hrs Surf.Area= 49 sf Storage= 69 cf

Plug-Flow detention time= 1.1 min calculated for 1.057 af (100% of inflow)
Center-of-Mass det. time= 0.6 min (801.0 - 800.4)

Volume	Invert	Avail.Storage	Storage Description
#1	958.00'	861 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
958.00	13	0	0
961.00	13	39	39
962.00	50	32	71
963.00	440	245	316
964.00	650	545	861

Device	Routing	Invert	Outlet Devices
#1	Primary	958.00'	**18.0" Round Culvert** L= 60.0' Ke= 0.500 Inlet / Outlet Invert= 958.00' / 957.00' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	961.00'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=14.93 cfs @ 12.26 hrs HW=961.97' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 14.93 cfs of 15.28 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 14.93 cfs @ 4.75 fps)

Summary for Pond P1f: Basin 1 (Filtration)

Inflow Area = 4.931 ac, 23.85% Impervious, Inflow Depth = 4.65" for 100-Year event
Inflow = 25.99 cfs @ 12.26 hrs, Volume= 1.910 af
Outflow = 17.66 cfs @ 12.42 hrs, Volume= 1.910 af, Atten= 32%, Lag= 9.3 min
Primary = 17.66 cfs @ 12.42 hrs, Volume= 1.910 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 953.65' @ 12.42 hrs Surf.Area= 10,064 sf Storage= 27,732 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 205.5 min (997.6 - 792.1)

Volume	Invert	Avail.Storage	Storage Description
#1	950.00'	42,615 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
950.00	5,420	0	0
952.00	7,670	13,090	13,090
954.00	10,570	18,240	31,330
955.00	12,000	11,285	42,615

Device	Routing	Invert	Outlet Devices
#1	Device 2	950.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	947.50'	**18.0" Round Culvert** L= 55.0' Ke= 0.500 Inlet / Outlet Invert= 947.50' / 947.00' S= 0.0091 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	951.60'	**8.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 2	952.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=17.66 cfs @ 12.42 hrs HW=953.65' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert** (Passes 17.66 cfs of 19.77 cfs potential flow)
  ├─**1=Exfiltration** (Exfiltration Controls 0.23 cfs)
  ├─**3=Orifice/Grate** (Orifice Controls 2.20 cfs @ 6.31 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Weir Controls 15.22 cfs @ 3.51 fps)

Summary for Pond P2i: Basin 2 (Infiltration)

Inflow Area = 0.542 ac, 25.83% Impervious, Inflow Depth = 5.03" for 100-Year event
Inflow = 4.35 cfs @ 12.15 hrs, Volume= 0.227 af
Outflow = 3.04 cfs @ 12.22 hrs, Volume= 0.227 af, Atten= 30%, Lag= 4.2 min
Discarded = 0.01 cfs @ 12.22 hrs, Volume= 0.026 af
Primary = 3.03 cfs @ 12.22 hrs, Volume= 0.201 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 945.58' @ 12.22 hrs Surf.Area= 1,323 sf Storage= 1,638 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 146.4 min (925.6 - 779.2)

Volume	Invert	Avail.Storage	Storage Description
#1	944.00'	3,707 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
944.00	744	0	0
946.00	1,475	2,219	2,219
947.00	1,500	1,488	3,707

Device	Routing	Invert	Outlet Devices
#1	Discarded	944.00'	**0.250 in/hr Exfiltration over Surface area**
#2	Primary	942.00'	**8.0" Round Culvert** L= 20.0' Ke= 0.500 Inlet / Outlet Invert= 942.00' / 941.80' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 0.35 sf
#3	Device 2	944.80'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 12.22 hrs HW=945.58' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.03 cfs @ 12.22 hrs HW=945.58' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 3.03 cfs @ 8.68 fps)
└**3=Orifice/Grate** (Passes 3.03 cfs of 3.35 cfs potential flow)

Summary for Pond P3f: Basin 3 (Filtration)

Inflow Area = 1.367 ac, 23.41% Impervious, Inflow Depth = 4.97" for 100-Year event
Inflow = 10.87 cfs @ 12.15 hrs, Volume= 0.566 af
Outflow = 6.46 cfs @ 12.24 hrs, Volume= 0.566 af, Atten= 41%, Lag= 5.4 min
Primary = 6.46 cfs @ 12.24 hrs, Volume= 0.566 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Peak Elev= 954.66' @ 12.24 hrs Surf.Area= 3,545 sf Storage= 6,665 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 158.2 min (939.1 - 780.9)

Volume	Invert	Avail.Storage	Storage Description
#1	952.00'	11,791 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
952.00	1,448	0	0
953.00	2,210	1,829	1,829
954.00	3,072	2,641	4,470
955.00	3,785	3,429	7,899
956.00	4,000	3,893	11,791

Device	Routing	Invert	Outlet Devices
#1	Device 2	952.00'	**1.000 in/hr Exfiltration over Surface area**
#2	Primary	949.30'	**12.0" Round Culvert** L= 30.0' Ke= 0.500 Inlet / Outlet Invert= 949.30' / 948.50' S= 0.0267 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	953.50'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	954.80'	**Custom Weir/Orifice, Cv= 2.62 (C= 3.28)** Head (feet) 0.00 0.50 Width (feet) 4.00 8.00

Primary OutFlow Max=6.45 cfs @ 12.24 hrs HW=954.66' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 6.45 cfs of 8.34 cfs potential flow)
├**1=Exfiltration** (Exfiltration Controls 0.08 cfs)
└**3=Orifice/Grate** (Orifice Controls 6.37 cfs @ 5.19 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=952.00' TW=0.00' (Dynamic Tailwater)
└**4=Custom Weir/Orifice** (Controls 0.00 cfs)

Attachment D:
WCA Decisions

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: Minnehaha Creek Watershed District	**County:** Hennepin
Applicant Name: Brad and Carol Pass	**Applicant Representative:** Ken Arndt (MRN)
Project Name: 215 North Arm Lane	**LGU Project No. (if any):** W24-010
Date Complete Application Received by LGU: 04/16/2024	
Date of LGU Decision: 06/17/2024	
Date this Notice was Sent: 06/17/2024	

WCA Decision Type - check all that apply

☒ Wetland Boundary/Type ☐ Sequencing ☐ Replacement Plan ☐ Bank Plan (not credit purchase)
☐ No-Loss (8420.0415) ☐ Exemption (8420.0420)
Part: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H Subpart: ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits: ☐ Bank Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☐ Approve ☐ Approve w/Conditions ☐ Deny ☒ No TEP Recommendation

LGU Decision

☒ Approved with Conditions (specify below)[1] ☐ Approved[1] ☐ Denied
List Conditions:

1. Any impacts to the wetlands will require additional permitting (WCA sequencing/replacement/bank and MCWD permits).
2. Must comply with all applicable local, state, and federal laws, regulations, and ordinances.

Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other:

Decision is valid for: ☒ 5 years (default) ☐ Other (specify):

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☐ Attachment(s) (specify):
☒ Summary:
The TEP (Maggie Menden/Trey Jonas (MCWD) and Jed Chesnut (BWSR) met on-site with the applicant representative (Ken Arndt) on 5/21. The TEP provided comments on the delineation and asked that the report be updated. These comments consisted of connecting the channel between wetland 1 and wetland 2, as well as a slight change in the NW corner of wetland 2. The updated and approved delineation report is attached (Updated 6/10/2024).

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☒ Site Location Map ☐ Project Plan(s)/Descriptions/Reports (specify):

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☒ Yes[1] ☐ No

[1]*If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Send petition and $100 fee to: Minnehaha Creek Watershed District ATTN: Permitting 15320 Minnetonka BLVD Minnetonka, MN 55345

Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: Stacey Lijewski – Stacey.lijewski@co.hennepin.mn.us ☒ BWSR TEP Member: Jed Chesnut – jed.chesnut@state.mn.us
☐ LGU TEP Member (if different than LGU contact):
☒ DNR Representative: Wes Saunders-Pearce – wes.saunders-pearce@state.mn.us
☐ Watershed District or Watershed Mgmt. Org.:
☒ Applicant: 1abjpass@gmail.com ☒ Agent/Consultant: ken.arndt@mnrinc.us

Optional or As Applicable:

☒ Corps of Engineers: usace_requests_mn@usace.army.mil
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):
☐ Members of the Public (notice only): ☐ Other:

Signature: Maggie Menden	**Date:** 06/17/2024

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.

WETLAND DELINEATION REPORT
215 NORTH ARM LANE AND
PINS 0611723240002 & 0611723230021, ORONO, MN

Prepared for:
Brad & Carol Pass
2536 18th Ave. S.
Minneapolis, MN 55404

APRIL 11 (UPDATED 6-10-24), 2024

Prepared by:
Midwest Natural Resources, Inc.
1032 West 7th Street, Suite 150
St. Paul, Minnesota 55102
www.mnrinc.us

TABLE OF CONTENTS

Tables

Appendices

INTRODUCTION

Midwest Natural Resources, Inc. (MNR) was contracted by Brad & Carol Pass to provide wetland delineation services for their properties located at 215 North Arm Lane and PINs 0611723240002 & 0611723230021 in Orono, Hennepin County, Minnesota (**Appendix A, Figure 1**). On April 9, 2024 MNR conducted a routine wetland delineation within the site to determine any wetland boundaries. In all, the boundaries of three wetlands and one linear waterbody were delineated within the site. No other areas within the survey area were reviewed for the presence of wetland.

DESKTOP REVIEW

Prior to conducting the field surveys, MNR staff conducted a desktop review to evaluate existing data within the project area including the following. All data are illustrated in the figures in **Appendix A**.

- MN DNR Public Waters Inventory (PWI) (**Figure 2)**
- US FWS National Wetlands Inventory (NWI) (**Figure 3**)
- Hennepin County Soil Survey (**Figure 4**)
- LiDAR elevation
- Aerial imagery
- Climate data (**Appendix B**)

METHODS

The entire survey area was surveyed via pedestrian surveys to investigate the presence of wetlands, and the potential wetland features identified in the desktop review were targeted for investigation. All potential wetlands were evaluated utilizing the Routine "Onsite" Determination Method contained in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region for the 1987 Wetlands Delineation Manual Technical Report Y-87-1. For each potential wetland within the survey area, the three wetland parameters (vegetation, hydrology, and soils) were examined to determine wetland status. If positive wetland status was determined, a sample transect was established where the wetland/upland transition occurs. In each transect, the three parameters (vegetation, hydrology, and soils) were documented at a sample point within the wetland and in the adjacent upland.

Vegetation was assessed at each sample point by identifying the dominant species present and noting wetland indicator status. Hydrologic indicators were evaluated for characteristics including, but not limited to, the presence or absence of inundated or saturated soils, high water table, drift lines, drainage patterns, and landscape position. The final parameter, soils, was assessed by digging a soil pit to at least 18 inches, where feasible, and examining the soil profile for indicators of hydric soils. In locations where a soil pit could not be dug due to the presence of buried utilities, soils were assumed hydric or non-hydric based on the dominant vegetation and presence or absence of hydrologic indicators, respectively.

All data and information pertaining to each wetland and upland sample point were collected using the applicable Corps wetland determination forms, and representative photos of each feature reviewed were collected. Wetland boundaries were recorded spatially with GPS units (Trimble GeoXT 6000) and were flagged in the field. Areas not meeting wetland criteria were documented with a non-wetland sample point and a representative photograph.

All spatial data was collected in WGS84 and post-processed in ArcMap using Trimble Positions Desktop Add-in.

RESULTS

MNR conducted the field survey of the Pass properties on April 9, 2024 and it is noted that the survey area consists of a single-family residence with out-buildings, deciduous woodland/forest, upland grassland, upland grassland with scattered red cedar, common buckthorn dominated shrubland, three wetlands, and one linear water body. In total, four aquatic resources were mapped within the site including three wetlands and one linear water body.

Wetlands

A total of three wetlands were mapped within the site (**Appendix A, Figure 5**). Below is a table that summarizes the delineated wetlands by Circular 39 type, Cowardin classification, Eggers and Reed Plant Community, and by size in acres followed by a general description for the single feature. Additional information and photos pertaining to the documented wetland features are available in the wetland determination forms provided in **Appendix C**. Included in **Appendix D** are the MnRAM Classification and Site Response Reports for Wetlands 1-3.

Table 1. Delineated Wetland Features[1]

Wetland ID	Feature ID	Cowardin Classification	Circ. 39 Type/s	Eggers & Reed Plant Community Type	Acres
Wetland 1	23-249-w1	PEMD	Type 2	Fresh Wet Meadow	1.52
Wetland 2	23-249-w2	PEMD/C	Type 2/3	Fresh Wet Meadow/Shallow Marsh	3.49
Wetland 3	23-249-w3	PEMC & L2ABH	Type 3	Shallow Marsh	1.80

[1]The Feature ID corresponds to the sampling point name on the Wetland Determination Forms and in the spatial data

Wetland 1

MnRAM: Manage 2

Wetland 1 is a Type 2 (PEMD; Fresh Wet Meadow) wetland located within the northern extent of the survey area and is approximately 1.52-acres in area within the site. This wetland extends off-site to the northwest as a similar type wetland and is dominated primarily by reed canary grass. Within the far southwestern part of Wetland 1 there appears to be areas of seepage discharge with very moist to saturated soils observed. Located at the southern end of this wetland is a channel that drains the wetland in a southernly direction. The DNR updated National Wetlands Inventory (June, 2013) maps this wetland as a PEM1A wetland. The MN DNR Public Waters Inventory does not map any public waters where Wetland 1 is located.

Wetland 2

MnRAM: Manage 1

Wetland 2 is a Type 2/3 (PEMD/C; Fresh Wet Meadow/Shallow Marsh) wetland located within the eastern part of the survey area and is approximately 3.49-acres in area within the site. This wetland extends off-site to the south as a similar type wetland. The fresh wet meadow community is dominated primarily by reed canary grass with some lake sedge and the shallow marsh community is dominated by cattail and lake sedge. Located in the northwest corner of this wetland is a channel that drains water from Wetland 1. The DNR updated National Wetlands Inventory (June, 2013) maps

this wetland as a PEM1C wetland. The MN DNR Public Waters Inventory does not map any public waters where Wetland 2 is located.

Wetland 3

MnRAM: Preserve

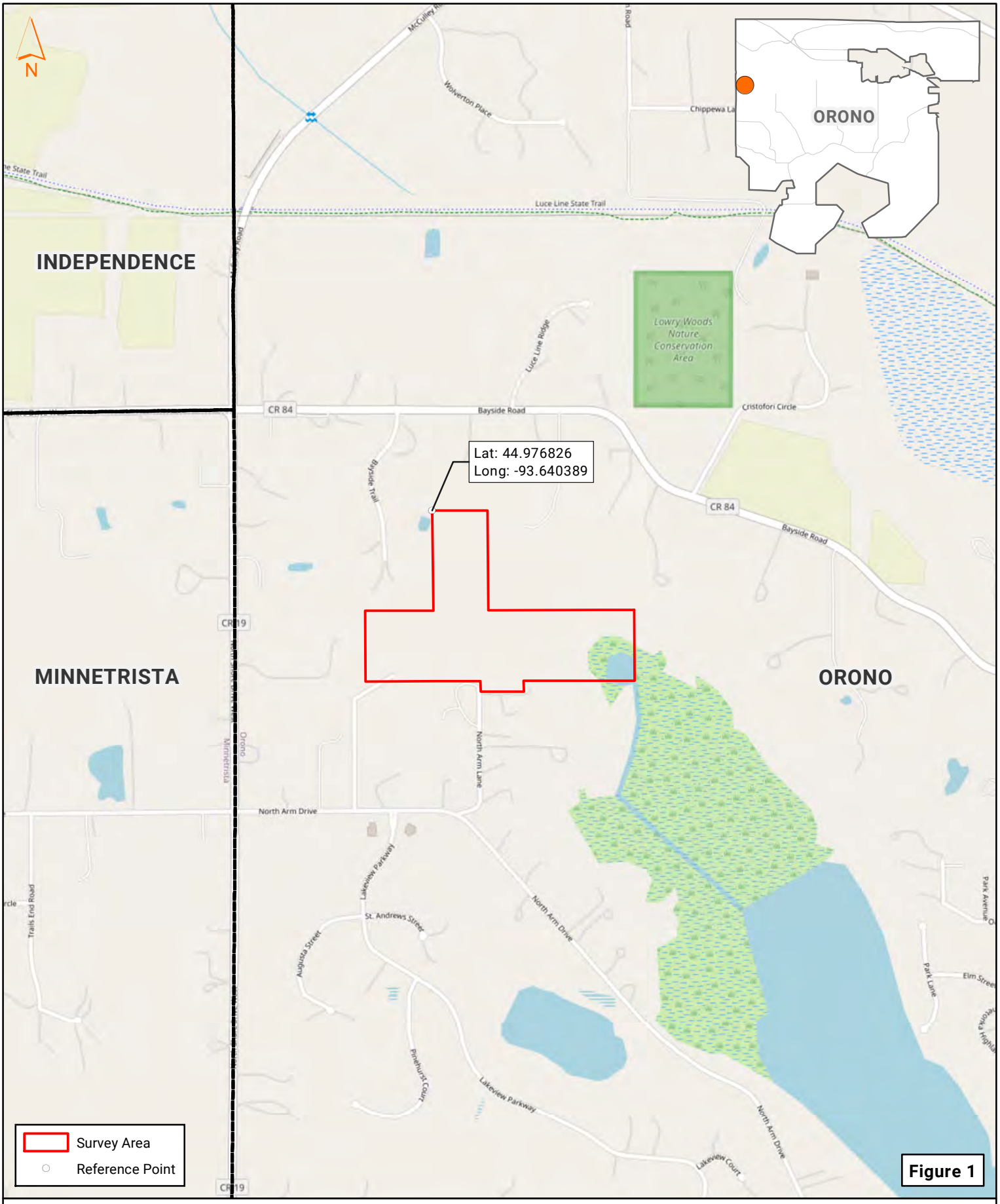
Wetland 3 is a Type 3 (PEMC; Shallow Marsh) wetland located within the far eastern part of the survey area and is approximately 1.80-acres in area within the site. This wetland extends off-site to the south and east as a similar type wetland with an excavated open water channel. The emergent part of this wetland is dominated by cattail with reed canary grass, bluejoint, and lake sedge. Located in the southeastern corner of this wetland is an excavated open water area of the north arm to Lake Minnetonka that allows boats to navigate to the lake and dock. The DNR updated National Wetlands Inventory (June, 2013) maps this wetland as a PFO1A, PEM1C, L2ABH wetland complex. The MN DNR Public Waters Inventory maps Wetland 3 as public waters Minnetonka-North Arm (27013313-P).

Other Aquatic Resources

Channel 1

Located between Wetlands 1 and 2 is an intermittent, linear water body. Photo taken from the southern end of Wetland 1 facing south. At the time of the surveys in November 2023 and April 2024, water was observed flowing through the channel. Channel 1 has a double culvert located within the southern 1/3 of its length which has allowed for accessing the land east of the channel.

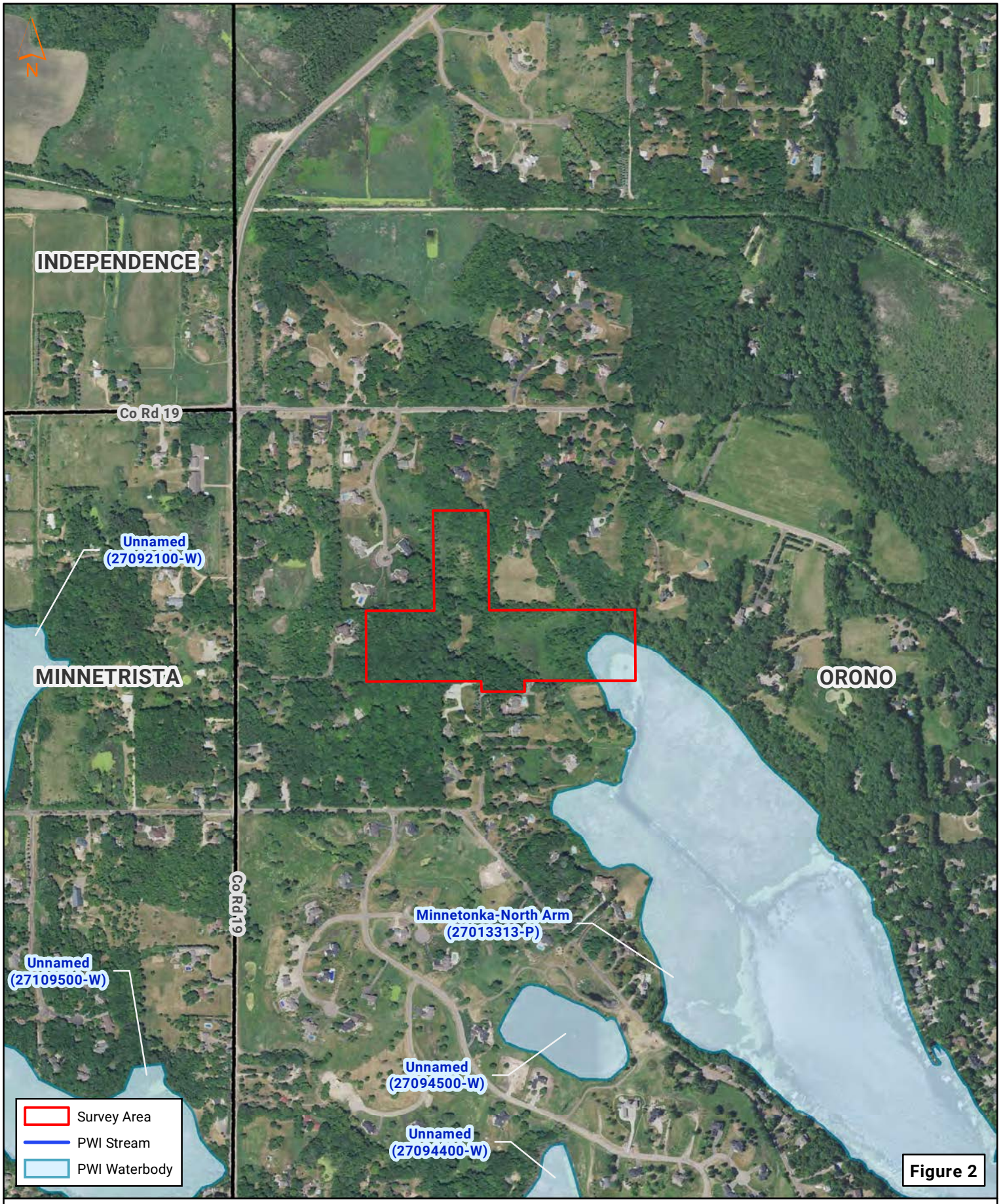
Appendix A – Supporting Site Figures



Sources: OpenStreetMap, US Census Bureau, Date: 4/10/2024

0 400 800 Feet

Survey Site Location
Brad & Carol Pass
215 North Arm Lane and PINs 0611723240002 & 0611723230021
Orono, MN



Sources: USDA Farm Service Agency NAIP Imagery, 2021, MnGeo, MN Department of Natural Resources, US Census Bureau, Date: 4/10/2024

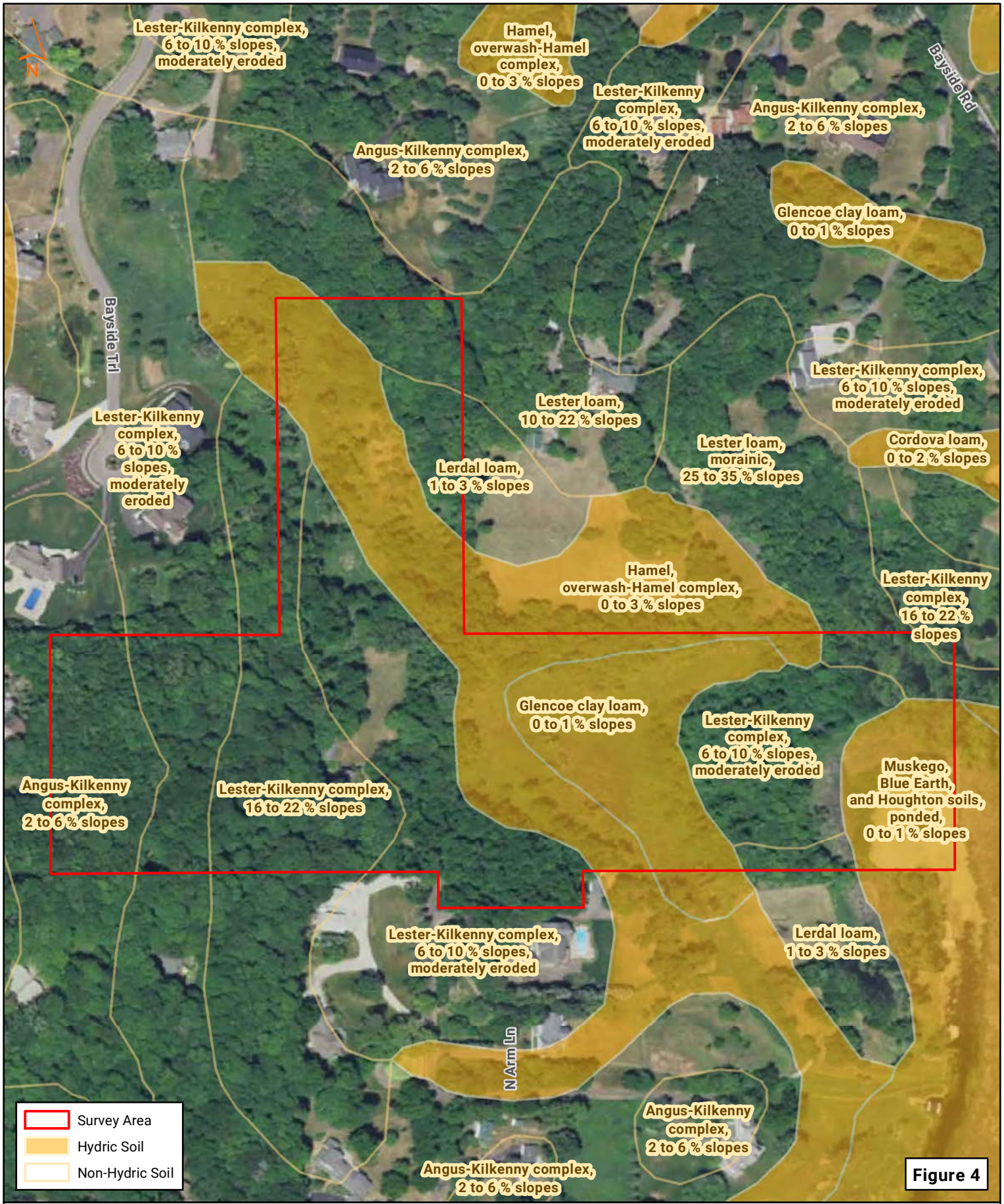
0 400 800 Feet

MN DNR Public Waters Inventory
Brad & Carol Pass
215 North Arm Lane and PINs 0611723240002 & 0611723230021
Orono, MN

Sources: USDA Farm Service Agency NAIP Imagery, 2021, MnGeo, MN Department of Natural Resources, US Fish and Wildlife Service, US Census Bureau, Date: 4/10/2024

0 100 200 Feet

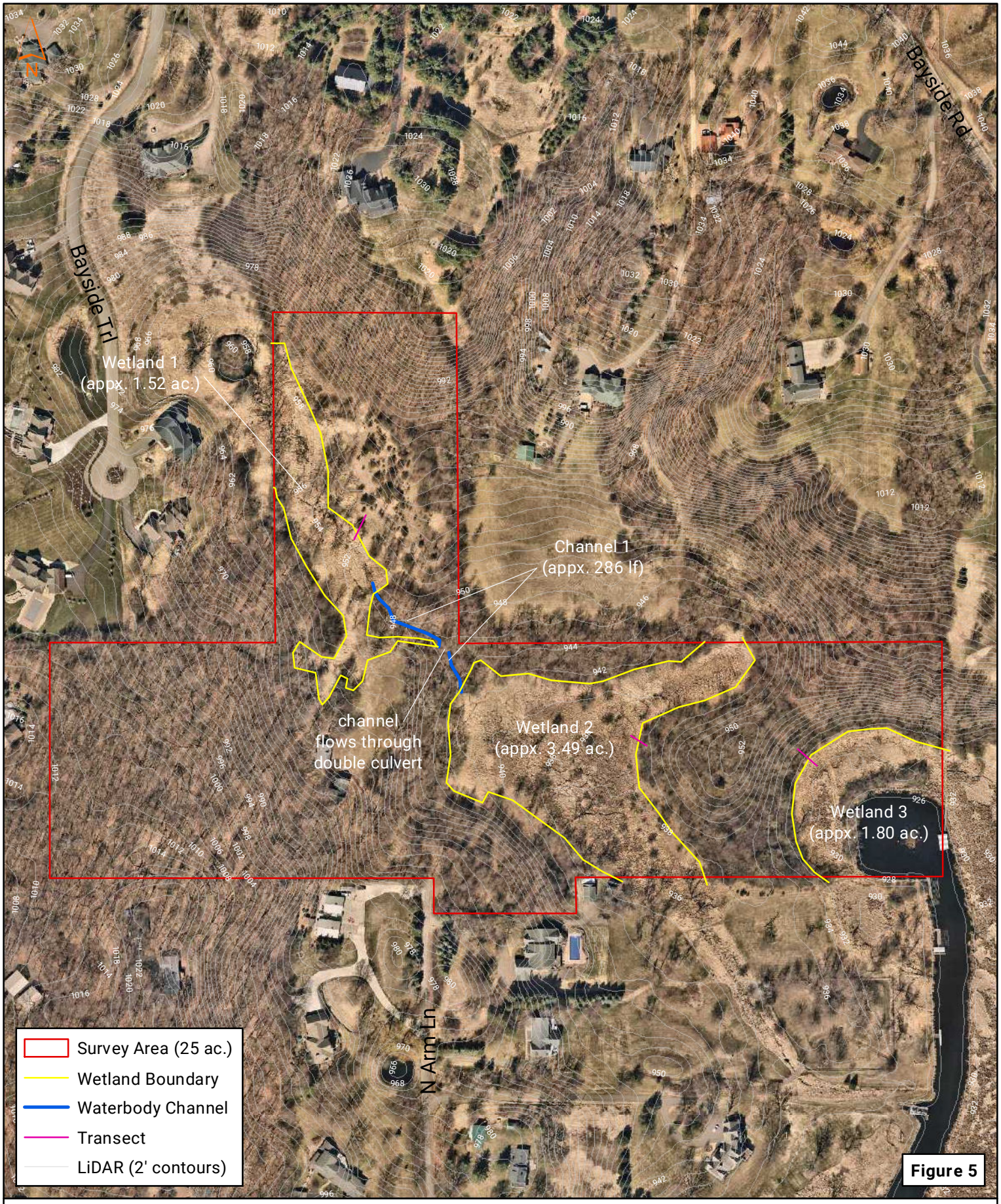
US FWS National Wetlands Inventory
Brad & Carol Pass
215 North Arm Lane and PINs 0611723240002 & 0611723230021
Orono, MN



Sources: USDA Farm Service Agency NAIP Imagery, 2021, MnGeo, MN Department of Natural Resources, USDA Natural Resources Conservation Service, US Census Bureau, Date: 4/10/2024

0 100 200 Feet

Hennepin County Soil Survey / SSURGO Soil Map Units
Brad & Carol Pass
215 North Arm Lane and PINs 0611723240002 & 0611723230021
Orono, MN



Sources: color Hennepin 6 in, 2021, MnGeo, MN Department of Natural Resources, US Census Bureau, Date: 6/10/2024

0 200 400 Feet

Delineated Aquatic Resources
Brad & Carol Pass
215 North Arm Lane and PINs 0611723240002 & 0611723230021
Orono, MN

Appendix B – Climate Data

Past Year's Precipitation Data from Gridded Database

Source: Minnesota State Climatology Office website:
https://climateapps.dnr.state.mn.us/gridded_data/precip/wetland/wetland.asp

Since the delineation of the Pass properties was conducted on April 9, 2024 daily precipitation data from the months of January February and March were reviewed. Precipitation data for the three months prior to April were obtained from the Minnesota Climatology Working Group for the area of Hennepin County where the nearest precipitation data was collected. Precipitation data was obtained using the following as the target location:

County: Hennepin
Township Name: Excelsior
Nearest Community: Stubbs Bay
Township Number: 117N
Range Number: 23W
Section Number: 6

Aerial photograph or site visit date: Tuesday, April 9, 2024

Table 1. Precipitation Worksheet Using Gridded Database (Score Using 1991-2020 Normal Period)

values are in inches	first prior month: **March 2024**	second prior month: **February 2024**	third prior month: **January 2024**
estimated precipitation total for this location:	**missing**	**missing**	**missing**
there is a 30% chance this location will have less than:	1.02	0.52	0.47
there is a 30% chance this location will have more than:	1.75	1.11	1.18
type of month: dry normal wet	**missing**	**missing**	**missing**
monthly score	**missing**	**missing**	**missing**
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	**missing**		

Table 2. Recent Precipitation from Excelsior 1.8 W Weather Station

	January	February	March	1st 7 days of April
Precipitation (in.)	0.28" (rain) 2.5" (snow)	0.83" (rain) 6.5" (snow)	2.03" (rain) 14" (snow)	0.06"

Average Temperature Climate Data

Source: MN Department of Natural Resources Local Climatological Data:
https://www.dnr.state.mn.us/climate/historical/lcd.html?loc=msp

Average monthly high temperature for the three months preceding the month of the site visit as well as the day of the survey are recorded in Table 3 below. Temperature data were obtained from the MN Department of Natural Resources Local Climatological Data website and is based on weather measurements collected by the National Weather Service and the Federal Aviation Administration.

Table 3. Monthly Average High Temperature

	January	February	March	April 9, 2024
Temperature (°F)	27.3°	42.9°	46.5°	61°

Appendix C
Wetland Determination Data Forms
&
Representative Photos

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 215 & North Arm Lane & PINs 0611723240002 & 0611723230021 City/County: Orono/Hennepin Sampling Date: 2024-04-09

Applicant/Owner: Brad & Carol Pass State: Minnesota Sampling Point: 23-249-w1-w

Investigator(s): Grace Lehinger, Aria Searles, Cody Lachinski, Ken Arndt Section, Township, Range: sec 06 T117N R023W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 44.975667 Long: -93.639762 Datum: WGS84

Soil Map Unit Name: Hamel, overwash-Hamel complex, 0 to 3 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No ____	**Is the Sampled Area within a Wetland?** Yes ✔ No ____
Hydric Soil Present?	Yes ✔ No ____	
Wetland Hydrology Present?	Yes ✔ No ____	

Remarks:
Fresh meadow dominated strongly by reed canary grass. Soils are saturated peat with standing water present. A channel drains this wetland to the south toward Wetland 2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	10	Y	FACW
2.			
3.			
4.			
5.			
	10.0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Phalaris arundinacea*	98	Y	FACW
2. *Cirsium arvense*	2	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100.0	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	108.00	x 2 =	216.00
FAC species	0.00	x 3 =	0.00
FACU species	2.00	x 4 =	8.00
UPL species	0.00	x 5 =	0.00
Column Totals:	110.00 (A)		224.00 (B)

Prevalence Index = B/A = 2.04

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Emergent wetland dominated strongly by reed canary grass.

SOIL

Sampling Point: 23-249-w1-w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/1	100					p	peat

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ✔ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Soils meet the A3 indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✔ No ___ Depth (inches): 1

Water Table Present? Yes ✔ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Standing water is present and soils are saturated at the surface.


23-249-w1-w
2024-04-09
Lat/Long: 44.975667, -93.639762 (Data Form)
Direction: S


23-249-w1-w
2024-04-09
Lat/Long: 44.975667, -93.639762 (Data Form)
Direction: NW

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 215 & North Arm Lane & PINs 0611723240002 & 0611723230021 City/County: Orono/Hennepin Sampling Date: 2024-04-09

Applicant/Owner: Brad & Carol Pass State: Minnesota Sampling Point: 23-249-w1-u

Investigator(s): Grace Lehinger, Ken Arndt, Aria Searles, Cody Lachinski Section, Township, Range: sec 06 T117N R023W

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): Convex

Slope (%): 0-2 Lat: 44.975712 Long: -93.639677 Datum: WGS84

Soil Map Unit Name: None NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✔	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?	Yes ____	No ✔	
Wetland Hydrology Present?	Yes ____	No ✔	

Remarks:
Upland sideslope dominated by smooth brome, reed canary grass, goldenrod and redcedar. Soils are non-hydric.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Juniperus virginiana*	20	Y	FACU
2. *Fraxinus pennsylvanica*	5	Y	FACW
3.			
4.			
5.			
	25.0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	5	Y	FAC
2.			
3.			
4.			
5.			
	5.0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Bromus inermis*	50	Y	UPL
2. *Solidago canadensis*	25	Y	FACU
3. *Phalaris arundinacea*	15	N	FACW
4. *Trifolium pratense*	10	N	FACU
5. *Medicago sativa*	5	N	UPL
6. *Cirsium arvense*	5	N	FACU
7.			
8.			
9.			
10.			
	110.0 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	20.00	x 2 =	40.00
FAC species	5.00	x 3 =	15.00
FACU species	60.00	x 4 =	240.00
UPL species	55.00	x 5 =	275.00
Column Totals:	140.00 (A)		570.00 (B)

Prevalence Index = B/A = 4.07

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)
Upland sideslope dominated by smooth brome, goldenrod and reed canary grass.

SOIL

Sampling Point: 23-249-w1-u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	100					CL	clay loam
8-17	10YR 5/4	100					CL	clay loam
17-24	10YR 2/1	100					SICL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

Soils are clay mineral and do not meet hydric indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present.


23-249-w1-u
2024-04-09
Lat/Long: 44.975712, -93.639677 (Data Form)
Direction: SE

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 215 & North Arm Lane & PINs 0611723240002 & 0611723230021 City/County: Orono/Hennepin Sampling Date: 2024-04-09

Applicant/Owner: Brad & Carol Pass State: Minnesota Sampling Point: 23-249-w2-w

Investigator(s): Grace Lehinger, Aria Searles, Cody Lachinski, Ken Arndt Section, Township, Range: sec 06 T117N R023W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 44.974401 Long: -93.637561 Datum: WGS84

Soil Map Unit Name: Glencoe clay loam, 0 to 1 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:
Type 2/3, fresh meadow/shallow marsh wetland dominated by cattail, bluejoint, lake sedge, and Joe-pye weed with a fringe of reed canary grass. Soils are saturated peat with standing water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. *Cornus alba*	2	N	FACW
2.			
3.			
4.			
5.			
	2.0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Carex lacustris*	35	Y	OBL
2. *Calamagrostis canadensis*	25	Y	OBL
3. *Typha latifolia*	15	N	OBL
4. *Eutrochium purpureum*	15	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	90.0 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75.00	x 1 =	75.00
FACW species	2.00	x 2 =	4.00
FAC species	15.00	x 3 =	45.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	92.00 (A)		124.00 (B)

Prevalence Index = B/A = 1.35

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Emergent wetland dominated by lake sedge, Joe-pye weed, bluejoint and cattail.

SOIL

Sampling Point: 23-249-w2-w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	95	2.5YR 4/6	5	C	M	PEAT	
18-24	10YR 3/1	95	2.5YR 4/6	5	C	M	PEAT	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ✔ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Soils meet the A3 hydric indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✔ No ___ Depth (inches): 1

Water Table Present? Yes ✔ No ___ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soils are saturated and standing water is present.

23-249-w2-w
2024-04-09

Lat/Long: 44.974401, -93.637561 (Data Form)

View from channel outlet facing south ac
ross Wetland 2.

23-249-w2-w
2024-04-09

Lat/Long: 44.974401, -93.637561 (Data Form)

View from far eastern extent of Wetland 2
facing west across basin.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 215 & North Arm Lane & PINs 0611723240002 & 0611723230021 City/County: Orono/Hennepin Sampling Date: 2024-04-09

Applicant/Owner: Brad & Carol Pass State: Minnesota Sampling Point: 23-249-w2-u

Investigator(s): Grace Lehinger, Ken Arndt, Cody Lachinski, Aria Searles Section, Township, Range: sec 06 T117N R023W

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): Convex

Slope (%): 0-2 Lat: 44.974452 Long: -93.637520 Datum: WGS84

Soil Map Unit Name: Glencoe clay loam, 0 to 1 percent slopes NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:
Upland forested slope dominated by common buckthorn and goldenrod. The soils were hydric but there were no wetland hydrology indicators present.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhamnus cathartica*	20	Y	FAC
2. *Prunus serotina*	15	Y	FACU
3. *Fraxinus pennsylvanica*	5	N	FACW
4.			
5.			
	40.0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Zanthoxylum americanum*	20	Y	FACU
2. *Rhamnus cathartica*	15	Y	FAC
3.			
4.			
5.			
	35.0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Solidago canadensis*	25	Y	FACU
2. *Rhamnus cathartica*	20	Y	FAC
3. *Equisetum sylvaticum*	10	N	FACW
4. *Calamagrostis canadensis*	5	N	OBL
5. *Rubus idaeus*	5	N	FACU
6.			
7.			
8.			
9.			
10.			
	65.0	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5.00	x 1 =	5.00
FACW species	15.00	x 2 =	30.00
FAC species	55.00	x 3 =	165.00
FACU species	65.00	x 4 =	260.00
UPL species	0.00	x 5 =	0.00
Column Totals:	140.00 (A)		460.00 (B)

Prevalence Index = B/A = 3.29

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

Remarks: (Include photo numbers here or on a separate sheet.)
Upland forest dominated by common buckthorn in the canopy and shrub layers, with saplings, bluejoint, goldenrod and horsetail at the ground layer.

SOIL

Sampling Point: 23-249-w2-u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	95	2.5YR 4/6	5	C	M	SIL	silty loam
18-24	10YR 2/1	98	2.5YR 4/6	2	C	M	SICL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Soils are dark mineral with small amounts of redox throughout and meets the F6 hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): ___

Water Table Present? Yes ___ No ✔ Depth (inches): ___

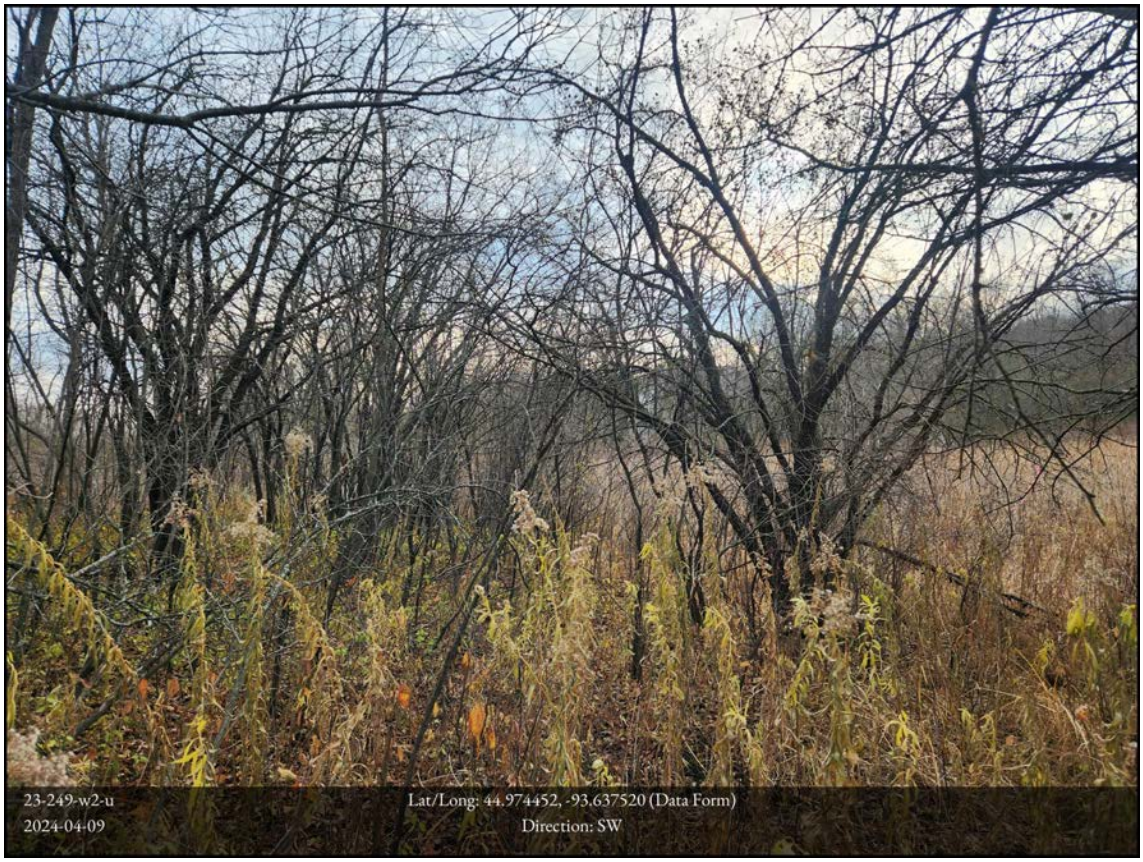
Saturation Present? (includes capillary fringe) Yes ___ No ✔ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present.


23-249-w2-u
2024-04-09
Lat/Long: 44.974452, -93.637520 (Data Form)
Direction: SW

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 215 & North Arm Lane & PINs 0611723240002 & 0611723230021 City/County: Hennepin County Sampling Date: 2024-04-09

Applicant/Owner: Brad & Carol Pass State: Minnesota Sampling Point: 23-249-w3-w

Investigator(s): Grace Lehinger, Ken Arndt, Cody Lachinski, Aria Searles Section, Township, Range: sec 06 T117N R023W

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0-2 Lat: 44.974427 Long: -93.636120 Datum: WGS84

Soil Map Unit Name: Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:
Wetland 3 is a shallow marsh dominated by cattail and reed canary grass with bluejoint and lake sedge.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. *Typha angustifolia*	40	Y	OBL
2. *Phalaris arundinacea*	25	Y	FACW
3. *Carex lacustris*	10	N	OBL
4. *Calamagrostis canadensis*	10	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	85.0 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60.00	x 1 =	60.00
FACW species	25.00	x 2 =	50.00
FAC species	0.00	x 3 =	0.00
FACU species	0.00	x 4 =	0.00
UPL species	0.00	x 5 =	0.00
Column Totals:	85.00 (A)		110.00 (B)

Prevalence Index = B/A = 1.29

Hydrophytic Vegetation Indicators:

✔ 1 - Rapid Test for Hydrophytic Vegetation

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Emergent wetland dominated by reed canary grass with cattail, bluejoint and lake sedge also common.

SOIL

Sampling Point: 23-249-w3-w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/1	95	2.5YR 4/6	5	C	M	SICL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✔ No ___

Remarks:

Soils meet the F6 hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✔ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ✔ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ✔ Geomorphic Position (D2)
- ✔ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✔ Depth (inches): _____

Water Table Present? Yes ✔ No ___ Depth (inches): 2

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 1

Wetland Hydrology Present? Yes ✔ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soils were saturated at a depth of 1" from the soil surface.


23-249-w3-w
2024-04-09
Lat/Long: 44.974427, -93.636120 (Data Form)
View from north side facing southwest ac
ross basin.


23-249-w3-w
2024-04-09
Lat/Long: 44.974427, -93.636120 (Data Form)
THe open water part of Wetland 3

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 215 & North Arm Lane & PINs 0611723240002 & 0611723230021 City/County: Orono/Hennepin Sampling Date: 2024-04-09

Applicant/Owner: Brad & Carol Pass State: Minnesota Sampling Point: 23-249-w3-u

Investigator(s): Grace Lehinger, Ken Arndt, Aria Searles, Cody Lachinski Section, Township, Range: sec 06 T117N R023W

Landform (hillslope, terrace, etc.): Sideslope Local relief (concave, convex, none): Convex

Slope (%): 3-7 Lat: 44.974382 Long: -93.636263 Datum: WGS84

Soil Map Unit Name: Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✔
Hydric Soil Present?	Yes ____ No ✔	
Wetland Hydrology Present?	Yes ____ No ✔	

Remarks:
Upland forested side slope with green ash and black cherry in the canopy and common buckthorn at the shrub and ground layers. Soils are non-hydric.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Rhamnus cathartica*	20	Y	FAC
2. *Fraxinus pennsylvanica*	15	Y	FACW
3. *Prunus serotina*	10	Y	FACU
4.			
5.			
	45.0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. *Rhamnus cathartica*	25	Y	FAC
2.			
3.			
4.			
5.			
	25.0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. *Rhamnus cathartica*	40	Y	FAC
2. *Prunus serotina*	10	N	FACU
3. *Phalaris arundinacea*	10	N	FACW
4. *Rubus idaeus*	5	N	FACU
5. *Galium boreale*	5	N	FAC
6.			
7.			
8.			
9.			
10.			
	70.0	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0.00	x 1 =	0.00
FACW species	25.00	x 2 =	50.00
FAC species	90.00	x 3 =	270.00
FACU species	25.00	x 4 =	100.00
UPL species	0.00	x 5 =	0.00
Column Totals:	140.00 (A)		420.00 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✔ 2 - Dominance Test is >50%
- ✔ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Upland forested side slope dominated by common buckthorn at the shrub and ground layers with sparse green ash and black cherry trees above.

SOIL

Sampling Point: 23-249-w3-u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					SIL	silt loam
12-24	10YR 2/2	100					SICL	silty clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Dark Surface (S7)
- ___ Iron-Manganese Masses (F12)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:

Soils are dry mineral and do not meet hydric indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present.


23-249-w3-u
2024-04-09
Lat/Long: 44.974382, -93.636263 (Data Form)
Direction: NW

Appendix D

MnRAM

Management Classification &

Site Response Reports

Management Classification Report for 2023-249 Wetland 1 **215 North Arm Lane Site**

ID: 50

HENNEPIN County
Mississippi (Metro) Watershed, #20
Corps Bank Service Area 7

Based on the MnRAM data input from field and office review and using the classification settings as shown below, this wetland is classified as Manage 2

Functional rank of this wetland based on MnRAM data	Functional Category	Self-defined classification value settings for this management level
Low	Vegetative Diversity/Integrity	Moderate
Moderate	Habitat Structure (wildlife)	Moderate
Not Applicable	Amphibian Habitat	Low
Not Applicable	Fish Habitat	Moderate
Not Applicable	Shoreline Protection	Low
Moderate	Aesthetic/Cultural/Rec/Ed and Habitat	Moderate / Low
Moderate	Stormwater/Urban Sensitivity and Vegetative Diversity	-/ -
Moderate	Wetland Water Quality and Vegetative Diversity	-/ -
Moderate	Characteristic Hydrology and Vegetative Diversity	-/ -
Moderate	Flood/Stormwater Attenuation*	-
Not Applicable	Commericial use*	-
Moderate	Downstream Water Quality*	-

The critical function that caused this wetland to rank as **Manage 2** was
Maintenance of Characteristic Wildlife Habitat Structure

Details of the formula for this action are shown below:

Maintenance of Characteristic Wildlife Habitat Str (Q3e*2+Q39+Q40+Q41+(Q23+Q24+Q25)/3+Q13+Q20)/8

Question	*Value*	*Description*
13	0.1	Outlet: hydrologic regime
20	0.1	Stormwater runoff
23	1	Buffer width
24	1	Adjacent area Management
25	0.5	Adjacent area diversity
39	0.5	Detritus
3e	0.1	<No Description Found>
40	0.5	Wetland interspersion/landscape

* The classification value settings for these functions are not adjustable

Management Classification Report for 2023-249 Wetland 1

215 North Arm Lane Site

ID: 50

HENNEPIN County
Mississippi (Metro) Watershed, #20
Corps Bank Service Area 7

41	0.5	Wildlife barriers

This report was printed on: Wednesday, April 10, 2024

* The classification value settings for these functions are not adjustable

MnRAM: Site Response Record

For Wetland: 2023-249 Wetland 1

Location: 27-117-23-06-001

215 North Arm Lane Site

Plant Community: Fresh (Wet) Meadow

Cowardin Classification: PEMB

Circular 39: Type 2

4	*Listed, rare, special species?*	No
5	*Rare community or habitat?*	No
6	*Pre-European-settlement condition?*	No

Hydrogeomorphology / topography:

7 Depressional/FlowThru

8-1	*Maximum water depth*	0 inches
8-2	*% inundated*	0%
9	*Immediate drainage--local WS*	10 acres
10	*Esimated size/existing site:*	*(see #66)*
11-Upland Soil		Kilkenny
11-Wetland Soil		Hamel loam

12	*Outlet for flood control*	C
13	*Outlet for hydro regime*	C
14	*Dominant upland land use*	B
15	*Wetland soil condition*	A
16	*Vegetation (% cover)*	100%
17	*Emerg. veg flood resistance*	C
18	*Sediment delivery*	A
19	*Upland soils (soil group)*	B
20	*Stormwater runoff*	C
21	*Subwatershed wetland density*	B
22	*Channels/sheet flow*	B
23	*Adjacent buffer width*	250 feet

Adjacent area management

24-A	*Full*	100%
24-B	*Manicured*	0%
24-C	*Bare*	0%

Adjacent area diversity/structure

25-A	*Native*	0%
25-B	*Mixed*	100%
25-C	*Sparse*	0%

Adjacent area slope

26-A	*Gentle*	30%
26-B	*Moderate*	70%
26-C	*Steep*	0%

27	*Downstream sens./WQ protect.*	A
28	*Nutrient loading*	B
29	*Shoreline wetland?*	No

Shoreline Wetland

30	*Rooted veg., % cover*	0%
31	*Wetland in-water width*	0 feet
32	*Emerg. veg. erosion resistance*	
33	*Erosion potential of site*	
34	*Upslope veg./bank protection*	
35	*Rare wildlife?*	No
36	*Scare/Rare/S1/S2 community*	No
37	*Vegetative cover*	NA
38	*Veg. community interspersion*	NA
39	*Wetland detritus*	B
40	*Interspersion on landscape*	B
41	*Wildlife barriers*	B

Amphibian-breeding potential

42	*Hydroperiod adequacy*	Inadequate
43	*Fish presence*	A
44	*Overwintering habitat*	
45	*Wildlife species (list)*	
46	*Fish habitat quality*	NA
47	*Fish species (list)*	
48	*Unique/rare opportunity*	No
49	*Wetland visibility*	C
50	*Proximity to population*	Yes
51	*Public ownership*	C
52	*Public access*	C
53	*Human influence on wetland*	A
54	*Human influence on viewshed*	B
55	*Spatial buffer*	B
56	*Recreational activity potential*	C
57	*Commercial crop--hydro impact*	NA

Groundwater-specific questions

58	*Wetland soils*	Discharge
59	*Subwatershed land use*	Discharge
60	*Wetland size/soil group*	Recharge
61	*Wetland hydroperiod*	Discharge
62	*Inlet/Outlet configuration*	Discharge
63	*Upland topo relief*	Recharge

Additional information

64	*Restoration potential*	No
65	*LO affected by restoration*	
66	*Existing size*	3.49
	Restorable size	0
	Potential new wetland	0
67	*Average width of pot. buffer*	0 feet
68	*Ease of potential restoration*	
69	*Hydrologic alterations*	0
70	*Potential wetland type*	0
71	*Stormwater sensitivity*	B
72	*Additional treatment needs*	C

Watershed: Mississippi (Metro)

WS# 20 Service Area: 7

For functional ratings, please run the Summary tab report.

This report printed on: 4/10/2024

Management Classification Report for 2023-249 Wetland 2 **215 North Arm Lane Site**

ID: 49

HENNEPIN County
Mississippi (Metro) Watershed, #20
Corps Bank Service Area 7

Based on the MnRAM data input from field and office review and using the classification settings as shown below, this wetland is classified as Manage 1

Functional rank of this wetland based on MnRAM data	Functional Category	Self-defined classification value settings for this management level
Moderate	Vegetative Diversity/Integrity	High
Moderate	Habitat Structure (wildlife)	High
Moderate	Amphibian Habitat	Moderate
Not Applicable	Fish Habitat	High
Not Applicable	Shoreline Protection	Moderate
Moderate	Aesthetic/Cultural/Rec/Ed and Habitat	High / Moderate
Moderate	Stormwater/Urban Sensitivity and Vegetative Diversity	High / Moderate
High	Wetland Water Quality and Vegetative Diversity	High / Moderate
High	Characteristic Hydrology and Vegetative Diversity	High / Moderate
Moderate	Flood/Stormwater Attenuation*	-
Not Applicable	Commericial use*	High
Moderate	Downstream Water Quality*	-

The critical function that caused this wetland to rank as **Manage 1** was
Maintenance of Characteristic Amphibian Habitat

Details of the formula for this action are shown below:

Maintenance of Characteristic Amphibian Habitat (Q43) * [(Q44 + 2*Q23wildlife + Q14 +Q 41 + Q20 reversed)/6]

Question	*Value*	*Description*
14	0.5	Upland land use
20	1	Stormwater runoff
23	1	Buffer width
41	0.5	Wildlife barriers
43	1	Amphib breeding potential--fish presence
44	0.1	Amphib & reptile overwintering habitat

This report was printed on: Wednesday, April 10, 2024

* The classification value settings for these functions are not adjustable

MnRAM: Site Response Record

For Wetland: 2023-249 Wetland 2

Location: 27-117-23-06-001

215 North Arm Lane Site

Plant Community: Fresh (Wet) Meadow

Cowardin Classification: PEMB

Circular 39: Type 2

Plant Community: Shallow Marsh

Cowardin Classification: PEM1C

Circular 39: Type 3

4	*Listed, rare, special species?*	No
5	*Rare community or habitat?*	No
6	*Pre-European-settlement condition?*	No

Hydrogeomorphology / topography:

7		Depressional/FlowThru
8-1	*Maximum water depth*	6 inches
8-2	*% inundated*	30%
9	*Immediate drainage--local WS*	10 acres
10	*Esimated size/existing site:*	*(see #66)*
11-Upland Soil		Kilkenny
11-Wetland Soil		Hamel loam

12	*Outlet for flood control*	B
13	*Outlet for hydro regime*	A
14	*Dominant upland land use*	B
15	*Wetland soil condition*	A
16	*Vegetation (% cover)*	100%
17	*Emerg. veg flood resistance*	C
18	*Sediment delivery*	A
19	*Upland soils (soil group)*	B
20	*Stormwater runoff*	C
21	*Subwatershed wetland density*	B
22	*Channels/sheet flow*	B
23	*Adjacent buffer width*	250 feet

Adjacent area management

24-A	*Full*	100%
24-B	*Manicured*	0%
24-C	*Bare*	0%

Adjacent area diversity/structure

25-A	*Native*	0%
25-B	*Mixed*	100%
25-C	*Sparse*	0%

Adjacent area slope

26-A	*Gentle*	35%
26-B	*Moderate*	65%
26-C	*Steep*	0%

27	*Downstream sens./WQ protect.*	A
28	*Nutrient loading*	B
29	*Shoreline wetland?*	No

Shoreline Wetland

30	*Rooted veg., % cover*	0%
31	*Wetland in-water width*	0 feet
32	*Emerg. veg. erosion resistance*	
33	*Erosion potential of site*	
34	*Upslope veg./bank protection*	
35	*Rare wildlife?*	No
36	*Scare/Rare/S1/S2 community*	No
37	*Vegetative cover*	C
38	*Veg. community interspersion*	C
39	*Wetland detritus*	B
40	*Interspersion on landscape*	B
41	*Wildlife barriers*	B

Amphibian-breeding potential

42	*Hydroperiod adequacy*	Adequate
43	*Fish presence*	A
44	*Overwintering habitat*	C
45	*Wildlife species (list)*	
46	*Fish habitat quality*	NA
47	*Fish species (list)*	
48	*Unique/rare opportunity*	No
49	*Wetland visibility*	C
50	*Proximity to population*	Yes
51	*Public ownership*	C
52	*Public access*	C
53	*Human influence on wetland*	A
54	*Human influence on viewshed*	B
55	*Spatial buffer*	B
56	*Recreational activity potential*	C

57	*Commercial crop--hydro impact*	NA

Groundwater-specific questions

58	*Wetland soils*	Discharge
59	*Subwatershed land use*	Discharge
60	*Wetland size/soil group*	Recharge
61	*Wetland hydroperiod*	Recharge
62	*Inlet/Outlet configuration*	Recharge
63	*Upland topo relief*	Discharge

Additional information

64	*Restoration potential*	No
65	*LO affected by restoration*	
66	*Existing size*	1.52
	Restorable size	0
	Potential new wetland	0
67	*Average width of pot. buffer*	0 feet
68	*Ease of potential restoration*	
69	*Hydrologic alterations*	0
70	*Potential wetland type*	0
71	*Stormwater sensitivity*	B
72	*Additional treatment needs*	C

Watershed: Mississippi (Metro)

WS# 20 Service Area: 7

For functional ratings, please run the Summary tab report.

This report printed on: 4/10/2024

Management Classification Report for 2023-249 Wetland 3 **215 North Arm Lane Site**

ID: 51

HENNEPIN County
Mississippi (Metro) Watershed, #20
Corps Bank Service Area 7

Based on the MnRAM data input from field and office review and using the classification settings as shown below, this wetland is classified as Preserve (formerly Manage 1)

Functional rank of this wetland based on MnRAM data	Functional Category	Self-defined classification value settings for this management level
Moderate	Vegetative Diversity/Integrity	High
Moderate	Habitat Structure (wildlife)	High
Low	Amphibian Habitat	Moderate
High	Fish Habitat	High
Not Applicable	Shoreline Protection	Moderate
Moderate	Aesthetic/Cultural/Rec/Ed and Habitat	High / Moderate
Moderate	Stormwater/Urban Sensitivity and Vegetative Diversity	High / Moderate
Moderate	Wetland Water Quality and Vegetative Diversity	High / Moderate
High	Characteristic Hydrology and Vegetative Diversity	High / Moderate
Moderate	Flood/Stormwater Attenuation*	-
Not Applicable	Commericial use*	High
Moderate	Downstream Water Quality*	-

The critical function that caused this wetland to rank as **Manage 1** was
Maintenance of Characteristic Fish Habitat

Details of the formula for this action are shown below:

Maintenance of Characteristic Fish Habitat **[Q46*2)+Q24+Q18+Q20R+Q28]/6**

Question	*Value*	*Description*
18	1	Sediment delivery
20	1	Stormwater runoff
24	1	Adjacent area Management
28	0.5	Nutrient loading
46	1	Fish habitat quality

This report was printed on: Wednesday, April 10, 2024

* The classification value settings for these functions are not adjustable

MnRAM: Site Response Record

For Wetland: 2023-249 Wetland 3

Location: 27-117-23-06-001

215 North Arm Lane Site

Plant Community: Shallow, Open Water C

Cowardin Classification: L2AB2H — Circular 39: Circular 39:

Plant Community: Shallow Marsh

Cowardin Classification: PEM1C — Circular 39: Type 3

Plant Community: Shallow, Open Water C

Cowardin Classification: L2AB2H — Circular 39: N/A

4	*Listed, rare, special species?*	No
5	*Rare community or habitat?*	No
6	*Pre-European-settlement condition?*	No

Hydrogeomorphology / topography:

7		Lacustrine
8-1	*Maximum water depth*	60 inches
8-2	*% inundated*	30%
9	*Immediate drainage--local WS*	8 acres
10	*Esimated size/existing site:*	*(see #66)*
11-Upland Soil		Lester-Kilkenny
11-Wetland Soil		Muskego, Blue Earth, Houghton soils

12	*Outlet for flood control*	NA
13	*Outlet for hydro regime*	A
14	*Dominant upland land use*	B
15	*Wetland soil condition*	A
16	*Vegetation (% cover)*	60%
17	*Emerg. veg flood resistance*	C
18	*Sediment delivery*	A
19	*Upland soils (soil group)*	B
20	*Stormwater runoff*	C
21	*Subwatershed wetland density*	B
22	*Channels/sheet flow*	B
23	*Adjacent buffer width*	250 feet

Adjacent area management

24-A	*Full*	100%
24-B	*Manicured*	0%
24-C	*Bare*	0%

Adjacent area diversity/structure

25-A	*Native*	0%
25-B	*Mixed*	100%
25-C	*Sparse*	0%

Adjacent area slope

26-A	*Gentle*	0%
26-B	*Moderate*	50%
26-C	*Steep*	50%

27	*Downstream sens./WQ protect.*	A
28	*Nutrient loading*	B
29	*Shoreline wetland?*	No

Shoreline Wetland

30	*Rooted veg., % cover*	0%
31	*Wetland in-water width*	0 feet
32	*Emerg. veg. erosion resistance*	
33	*Erosion potential of site*	
34	*Upslope veg./bank protection*	
35	*Rare wildlife?*	No
36	*Scare/Rare/S1/S2 community*	No
37	*Vegetative cover*	C
38	*Veg. community interspersion*	C
39	*Wetland detritus*	B
40	*Interspersion on landscape*	B
41	*Wildlife barriers*	B

Amphibian-breeding potential

42	*Hydroperiod adequacy*	Adequate
43	*Fish presence*	C
44	*Overwintering habitat*	C
45	*Wildlife species (list)*	
46	*Fish habitat quality*	A
47	*Fish species (list)*	
48	*Unique/rare opportunity*	No
49	*Wetland visibility*	C
50	*Proximity to population*	Yes
51	*Public ownership*	C
52	*Public access*	C
53	*Human influence on wetland*	A
54	*Human influence on viewshed*	B

55	*Spatial buffer*	B
56	*Recreational activity potential*	B
57	*Commercial crop--hydro impact*	NA

Groundwater-specific questions

58	*Wetland soils*	Recharge
59	*Subwatershed land use*	Discharge
60	*Wetland size/soil group*	Recharge
61	*Wetland hydroperiod*	Recharge
62	*Inlet/Outlet configuration*	Recharge
63	*Upland topo relief*	Discharge

Additional information

64	*Restoration potential*	No
65	*LO affected by restoration*	
66	*Existing size*	1.8
	Restorable size	0
	Potential new wetland	0
67	*Average width of pot. buffer*	0 feet
68	*Ease of potential restoration*	
69	*Hydrologic alterations*	0
70	*Potential wetland type*	0
71	*Stormwater sensitivity*	B
72	*Additional treatment needs*	B

Watershed: Mississippi (Metro)

WS# 20 Service Area: 7

For functional ratings, please run the Summary tab report.

This report printed on: 4/10/2024

BOARD OF WATER AND SOIL RESOURCES

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit: Minnehaha Creek Watershed District	**County:** Hennepin
Applicant Name: Bradley J. Pass	**Applicant Representative:** Ken Arndt, Midwest Natural Resources, Inc.
Project Name: Idyllvale Shores	**LGU Project No. (if any):** W24-061
Date Complete Application Received by LGU: 12/06/2024	
Date of LGU Decision: 12/16/2024	
Date this Notice was Sent: 12/17/2024	

WCA Decision Type - check all that apply

☐ Wetland Boundary/Type ☐ Sequencing ☐ Replacement Plan ☐ Bank Plan (not credit purchase)
☐ No-Loss (8420.0415) ☒ Exemption (8420.0420)
Part: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H Subpart: ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☒ 8 ☐ 9

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits: ☐ Bank Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☐ Approve ☐ Approve w/Conditions ☐ Deny ☒ No TEP Recommendation

LGU Decision

☐ Approved with Conditions (specify below)[1] ☒ Approved[1] ☐ Denied
List Conditions:

1. Must comply with all applicable local, state, and federal laws, regulations, and ordinances.

Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other:

Decision is valid for: ☒ 5 years (default) ☐ Other (specify):

[1] *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision[1].

☐ Attachment(s) (specify):
☒ Summary: The property owner, Bradley J. Pass, has applied for an exemption claiming de minimis for wetland impacts at 215 North Arm Lane (053-0611723240001) and 053-0611723230021. A wetland Boundary and Type application was reviewed and approved earlier in 2024 under W24-010 and identified three wetlands within the project area. Wetland 1 is a Type 2 fresh wet meadow, Wetland 2 is a Type 2/3 fresh wet meadow/shallow marsh, and Wetland 3 is a Type 3 shallow marsh. 90 square feet of impacts to the Type 2 Wetland 1 are proposed for the placement of a driveway to a proposed single family home. This wetland is a reed canary grass-dominated fresh meadow wetland and these 90 square feet of impacts are exempt under 8420.0420 Subpart 8 (b): "a replacement plan for wetlands is not required for up to 100 square feet of impacts to wetlands as part of a project within the shoreland wetland protection zone beyond the shoreland building

setback zone" (2024 WCA Statute Changes, 6-18-24). Wetland 1 lies within the shoreland wetland protection zone of Lake Minnetonka and is outside of the shoreland building setback zone in a less than 50% county. Therefore, allowable de minimis is 100 square feet.

[1] *Findings must consider any TEP recommendations.*

Attached Project Documents

☐ Site Location Map ☒ Project Plan(s)/Descriptions/Reports (specify): Joint Application Form

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for $500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☒ Yes[1] ☐ No

[1]*If yes, all appeals must first be considered via the local appeals process.*

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Send petition and $100 fee to:
Minnehaha Creek Watershed District
ATTN: Permitting
15320 Minnetonka BLVD
Minnetonka, MN 55345

Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: Stacey Lijewski – Stacey.lijewski@co.hennepin.mn.us
☒ BWSR TEP Member: Jed Chesnut – jed.chesnut@state.mn.us
☐ LGU TEP Member (if different than LGU contact):
☒ DNR Representative: Wes Saunders-Pearce – wes.saunders-pearce@state.mn.us
☐ Watershed District or Watershed Mgmt. Org.:
☒ Applicant: Bradley J. Pass – 1abjpass@gmail.com
☒ Agent/Consultant: Ken Arndt – ken.arndt@mnrinc.us

Optional or As Applicable:

☒ Corps of Engineers: usace_requests_mn@usace.army.mil
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):
☐ Members of the Public (notice only): ☒ Other: Melanie Curtis, City of Orono – mcurtis@ononomn.gov

Signature: Abigail Couture	**Date:** 12/17/24

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.

Idyllvale Shores Development
De-Minimis Exemption Request Application

Prepared for:
Bradley J. Pass
2536 18th Ave. S.
Minneapolis, MN 55404

November 25, 2024

MIDWEST NATURAL RESOURCES, INC.
1032 West 7th Street, Suite 150
St. Paul, Minnesota 55102

MNR
MIDWEST NATURAL RESOURCES

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name: Bradley J. Pass
Mailing Address: 2536 18th Ave. S., Minneapolis, MN 55404
Phone: 612-916-8478
E-mail Address: 1abjpass@gmail.com

Authorized Contact (do not complete if same as above):
Mailing Address:
Phone:
E-mail Address:

Agent Name: Ken Arndt, Midwest Natural Resources, Inc.
Mailing Address: 1032 W. 7th St. Suite 150, St. Paul, MN 55102
Phone: 651-788-0641
E-mail Address: ken.arndt@mnrinc.us

PART TWO: Site Location Information

County: Hennepin **City/Township:** Orono
Parcel ID and/or Address: 215 North Arm Lane & PINs 0611723240002 & 0611723230021

Legal Description (Section, Township, Range): Sec. 6, T117N, R23W
Lat/Long (decimal degrees): **44.976826, -93.640389**
Attach a map showing the location of the site in relation to local streets, roads, highways.
(See Figure 1 of attached wetland permit application)
Approximate size of site (acres) or if a linear project, length (feet): 25.4 acres

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

MN Wetland Conservation Act Notice of Decision by Minnehaha Creek Watershed District dated June 17, 2024

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

The site is proposed to be developed with a single-family residential development and associated infrastructure.

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource**[3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]
Wetland 1	wetland	fill	P	90 sq. ft. (0.002 ac.)	N/A	Type 2 - Fresh Wet Meadow	Hennepin, 20, 7

[1]If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

[1] The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.

Project Name: Idyllvale Shores, Orono, MN

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: _____ Date: _____

I hereby authorize **Ken Arndt** to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

Attachment B
Supporting Information for Applications Involving Exemptions, No Loss Determinations, and Activities Not Requiring Mitigation

Complete this part ***if*** you maintain that the identified aquatic resource impacts in Part Four do not require wetland replacement/compensatory mitigation OR ***if*** you are seeking verification that the proposed water resource impacts are either exempt from replacement or are not under CWA/WCA jurisdiction.

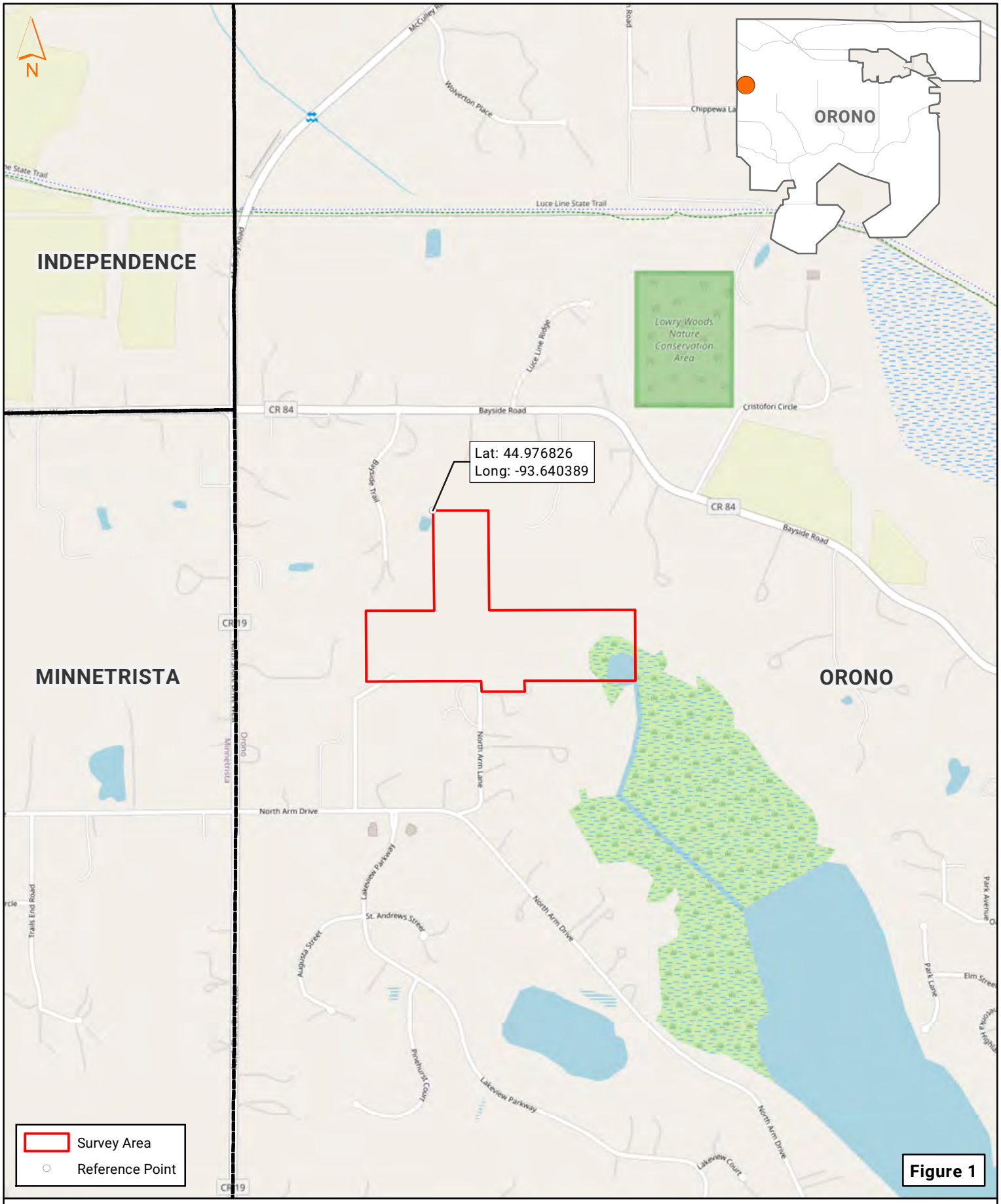
Identify the specific exemption or no-loss provision for which you believe your project or site qualifies:

8420.0420 Exemption Standards subp. 8 De minimis

Provide a detailed explanation of how your project or site qualifies for the above. Be specific and provide and refer to attachments and exhibits that support your contention. Applicants should refer to rules (e.g. WCA rules), guidance documents (e.g. BWSR guidance, Corps guidance letters/public notices), and permit conditions (e.g. Corps General Permit conditions) to determine the necessary information to support the application. Applicants are strongly encouraged to contact the WCA LGU and Corps Project Manager prior to submitting an application if they are unsure of what type of information to provide:

Under 8420.0420 Exemption Standards Subp. 8 De minimis, it states that a replacement plan is not required for projects that impact up to the following amounts of wetland: (2) in the less than 50 percent area: (C) 400 square feet of type 1, 2, or 6 wetland outside of the building setback zone, as defined in the local shoreland management ordinance, but within the shoreland wetland protection zone.

The proposed permanent wetland impact associated with the Idyllvale Shores development totals approximately 90 sq. ft. of Type 2, reed canary grass-dominated fresh meadow wetland. The applicant is proposing to impact a very small amount of wetland in order to reasonably access, with a driveway, the majority of Lot 4 within the proposed development. A grading plan for the Lot 4 Driveway Crossing for Idyllvale Shores is attached with this application. This grading plan depicts the location of the wetland impact within Lot 4 as well as the amount of fill associated with the placement of a culvert proposed to be located within the far southeastern part of Wetland 1. Due to the amount of wetland impact, this impact should qualify for an exemption from replacement since it is well below the de-minimis amount of 400 sq. ft. The applicant is requesting an exemption decision from the LGU.



Sources: OpenStreetMap, US Census Bureau, Date: 4/10/2024

0 400 800 Feet

Site Location
Bradley J. Pass
Idyllvale Shores
Orono, MN

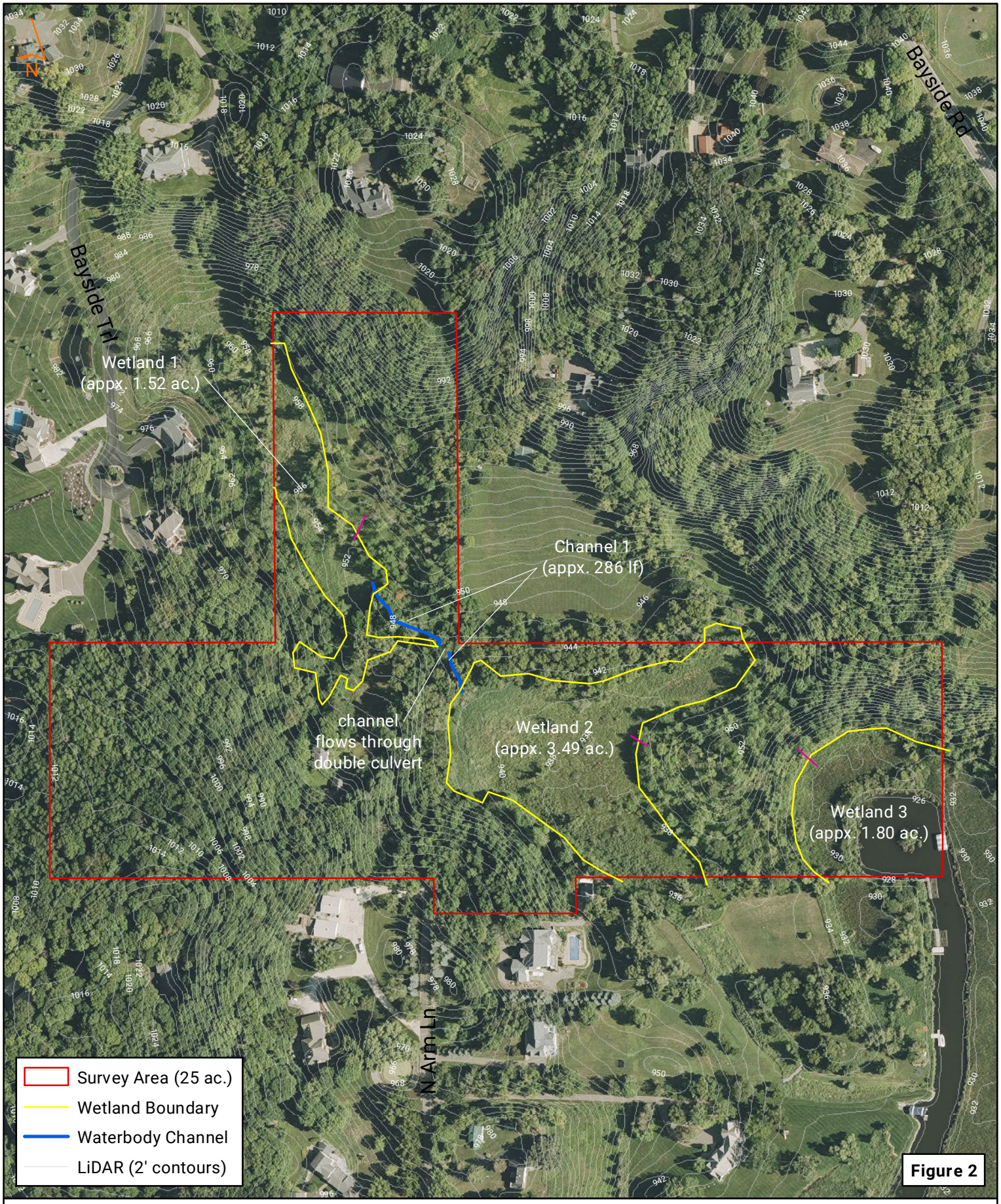
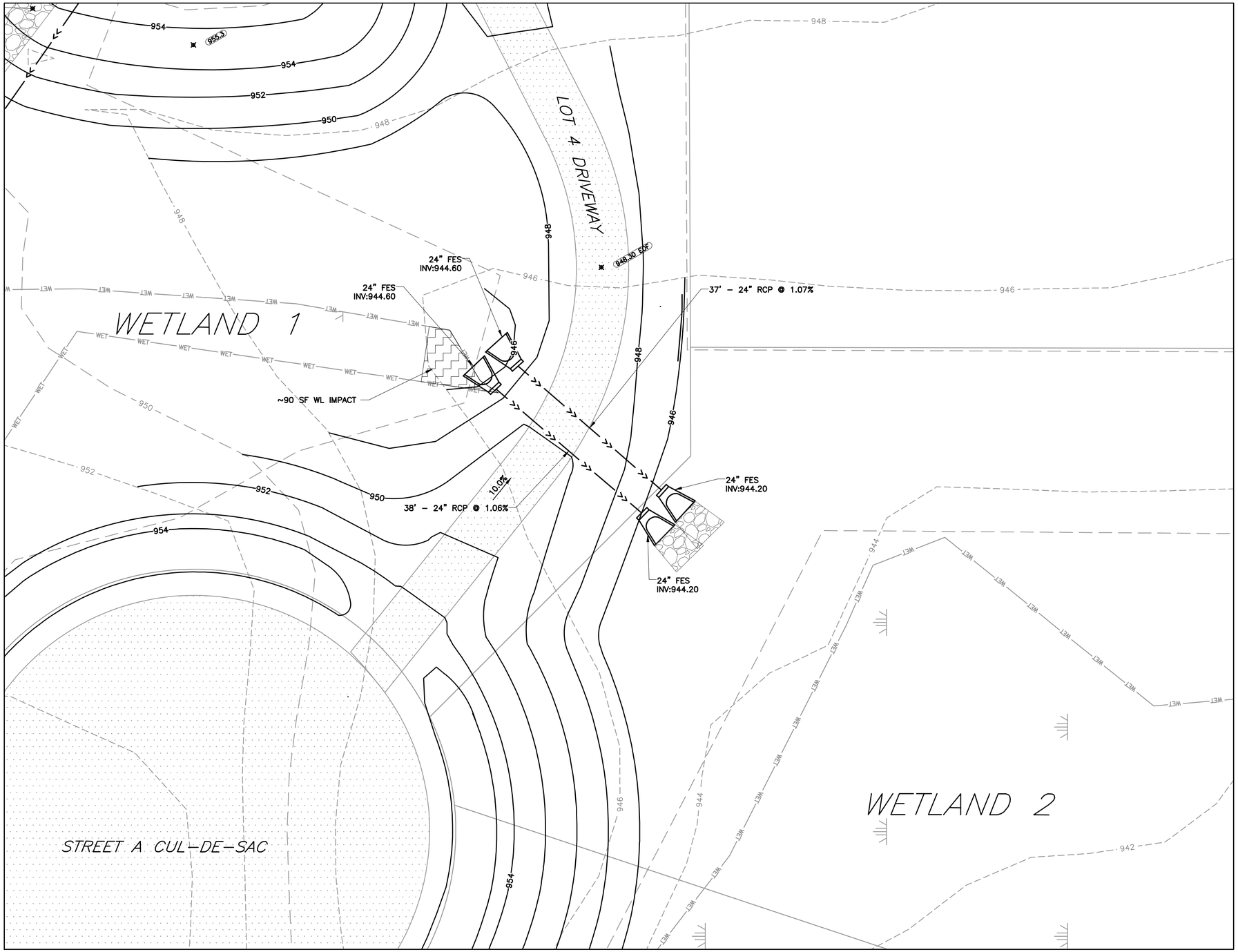


Figure 2

Sources: USDA Farm Service Agency NAIP Imagery, 2023, MnGeo, MN Department of Natural Resources, US Census Bureau, Date: 8/8/2024

0 200 400 Feet

Delineated Aquatic Resources
Bradley J. Pass
Idyllvale Shores
Orono, MN



N

0 10 20 Feet

BENCHMARK
SEE SURVEY DOCUMENTATION

LEGEND:

- PROPERTY LINE
- WETLAND BOUNDARY
- STORM SEWER/CULVERT
- CONTOUR
- BITUMINOUS SURFACE
- WETLAND IMPACT

CIVIL METHODS, INC.
P.O. Box 28038
St. Paul, MN 55128
o:763.210.5713 | www.civilmethods.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

KENT E. BRANDER DATE: LIC. NO.:

DESIGNED: KEB
DRAWN: KEB
CHECKED: DMP

DATE / REVISION:
11-18-2024 Wetland Permit Submittal. NOT FOR CONSTRUCTION.

PROJECT: **IDYLLVALE SHORES**
PROJ. LOCATION: 215 NORTH ARM LN, ORONO, MN 55364
PROJ. OWNER: BRADLEY J & CAROL A PASS

LOT 4 DRIVEWAY CROSSING

SHEET NO: 1

Print Date: 11/18/2024 5:11 PM
File Loc: C:\CM\Civil Methods Inc\CMI - Documents\7 Projects\24021_Idyllvale Shores Orono\08_DRAWINGS AND SPECIFICATIONS\C3D\Sheets\Wetland-App_Driveway-Culvert.dwg

Attachment E:
Public Notice

The Minnehaha Creek Watershed District (MCWD) is currently reviewing a permit application for at 215 North Arm Lane in Orono, MN. The project, proposed by the Pass Family Trust, involves creating a 5-parcel subdivision, each with a single family home, replacing a culvert, and providing associated stormwater facilities. You are receiving this notice because your property is located within 600 feet of the project site.

MCWD reviews for compliance only with applicable MCWD rules. The city, county, or another public agency may require other permits or approvals.

Site plans and additional information can be found on our website under Public Notices – Permit #24-544 or by following the QR code.

If you have questions or wish to request Board consideration regarding the project's compliance with MCWD rules, please contact Abigail Couture at acouture@minnehahacreek.org before June 9th at 4:30 p.m.

MINNEHAHA CREEK WATERSHED DISTRICT
QUALITY OF WATER QUALITY OF LIFE
www.minnehahacreek.org

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MINNEHAHA CREEK WATERSHED DISTRICT
QUALITY OF WATER QUALITY OF LIFE
www.minnehahacreek.org

Attachment F:
Public Comments

Outlook

Questions for Watershed Dist Re: Iddylvale Shores/Pass Development

From rnord@milwroad.org <rnord@milwroad.org>
Date Wed 6/11/2025 10:02 AM
To Abigail Couture <ACouture@minnehahacreek.org>

Abigail,

As you know, I could not attend the meeting last Tuesday at the MCWD offices where the you and your engineer went over the MCWD approval of the subject development. Mandy Little did attend and she said she read my questions to the engineer but didn't feel they really got answered.

The questions are not related to me trying to stop the MCWD approval, but rather are questions about monitoring the process during construction and in the future to assure the MCWD requirements are met and maintained. And, they are about future access to Lake Minnetonka for lots 4 and 5 over and/or around the wetlands to reach the shore in the North Arm.

So, I am submitting them here to you to see if you can answer them for me.

Thanks,

Randy Nord
763-559-0348

Begin forwarded message:

From: rnord@milwroad.org
Subject: Questions for Watershed Dist Mtg on Tue.
Date: June 1, 2025 at 13:06:04 CDT
To: Little Mandy <man104@aol.com>

Mandy,

Again, sorry I can't attend the meeting on Tue but here are my questions:

1) LOT 4 DRAINAGE ISSUES:

- Abigail told me that the issue over drainage from lot 4 down the hill into the wetland below and along the side of the driveway has been addressed by a swail between the driveway and the wetland below that keeps the runoff flowing down along the side of the driveway into a catch basin at the bottom of the driveway. This is fine and I can't dispute

it technically but I have 2 concerns/questions relating to this issue.

- First, will there be final, as built survey done to determine if the swail was indeed installed and IF it meets all the specs that the MCWD intends to approve AND will it be inspected periodically over time (maybe every 5 years or AT LEAST once after 5 years), to make sure the swail is still in place and has not itself been washed out?

- Second and maybe even more important, what is going to be done to prevent runoff into the wetland below lot 4 during home construction? My concern is that IF the driveway up to the lot 4 building site from North Arm Lane is not fully graded & compacted, and a sub layer of blacktop AND THE REQUIRED SWAIL are not installed prior to starting any construction on lot 4, that heavy equipment that will need to get up there for construction could even collapse or cause a landslide along the proposed driveway route up to the lot on the precipice of the slope down to the wetland. We are talking larger backhoes, cement trucks, flatbed trucks with heavy loads of lumber and trusses, etc. Without some prep, the driveway route up there will be virgin soil and susceptible to collapse or landslides from both heavy rains and heavy equipment. Is this prep mentioned here something that could be added to the specs?

2) LOT 5 DRAINAGE ISSUES:

- What language and specs are written in to the final LMWD approval to prevent runoff from behind the house in lot 5, both during construction and as built and complete. The home on this lot is SO close to the wetland behind it and the drawing shows a very steep slope in a very narrow area behind the home down into the wetland from an elevation of about 948' at the back of the home, to about 940' at the wetland. I would think there would have to be a swail behind the home (making the backyard essentially unusable) that guides the water down to the catch basin south of the home.

3) ACCESS TO NORTH ARM OF LAKE MTKA FROM LOTS 4 AND 5:

- Abigail told me once that their approval does NOT give buyers of lots 4 and 5 the authorization to construct raised walkways or docks down to the shore of the North Arm and that a separate approval woulds be needed from both the LMWD and the Lake Minnetonka Conservation District (LMCD) for this. ALSO, she said that roads or pathways for trucks, ATV's or snowmobiles would be specifically never allowed. Is this fully explained and written in to the final LMWD approval documents?

These are my questions Mandy. I appreciate you asking them of the engineer for me and letting me know what they say.

Thanks,

Randy

Attachment G:
Request for Board Consideration

June 2, 2025

Abigail Couture
Minnehaha Creek Watershed District
15320 Minnetonka Blvd.
Minnetonka, MN 55345

Dear Abigail,

On behalf fo the surrounding neighbors the Pass Property Development, we wish to request this permit be brought to the MCWD Board of Managers for consideration.

Thank you,

Mandy & Phil Little