



# **MCES Forest Lake Interceptor 7029 Rehabilitation Design**

Facility Plan





# MCES Forest Lake Interceptor 7029

## Rehabilitation Design

### Facility Plan

I hereby certify that this 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.



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# MCES Forest Lake Interceptor 7029

## Rehabilitation Design

## Facility Plan

### Facility Plan Executive Summary

The Forest Lake Interceptor 7029 was constructed in the early 1970s. This Facility Plan encompasses the section of existing 36-inch Interceptor 7029 in Forest Lake, from MH 113 (Lift Station L01) south to MH 77 (Lift Station L02) on the border of the city of Forest Lake and Hugo. This section of the Interceptor 7029 is routed north-south in a rural area within existing prescribed MCES permanent easements. A portion of this project runs through Tanners Brook Golf Course. Temporary easements will be procured to allow for necessary construction staging and access activities.

This section of Interceptor 7029 is in fair to poor condition and needs rehabilitation to extend its service life.

This recommended solution consists of:

- Trenchless structural rehabilitation of over 11,000 feet of 36-inch interceptor
- Trenchless cleaning only of over 7,000 feet of 36-inch interceptor
- Structural lining of twenty (20) existing manholes (MHs)
- Partial reconstruction of six (6) MHs

Multiple pipe and MH rehabilitation technologies were evaluated based on project characteristics and MCES familiarity with the products and methods.

The recommended rehabilitation methods include:

- Cured in Place Pipe (CIPP) rehabilitation for 36-inch interceptor
- Fiber Reinforced Pipe (FRP) MH structural liner inserts
- Partial reconstruct for the existing Type 4 “doghouse” MHs where base structure is larger than riser sections

Temporary conveyance of existing wastewater flows will be provided in a phased manner from a MH north of Headwaters Parkway to south of the project extents to facilitate cleaning and rehabilitation activities.

The design phase will be completed in 2024 with construction anticipated for 2025 into 2026.

## **1.0 Facility Plan Introduction and Demand Projections**

### **1.1 Problem Definition**

The Metropolitan Council owns and operates the Forest Lake Interceptor from Lift Station L01 to L78 in White Bear Lake. A 2018 condition assessment revealed approximately 1,000 linear feet (LF) upstream of L02 to be condition 4.5 and the remaining 7,000 LF between manholes (MH) 81 and 94 to be condition rating four (4) as defined by the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). This 11,000-foot section of 36-inch, single barrel, reinforced concrete pipe (RCP) was installed in the early 1970s and is in Fair to Poor condition. A 35-foot-wide permanent easement exists over the corridor.

Desktop and field analysis of the existing MHs in the 7029 corridor from MH 77A to MH 99 has been completed per Existing Conditions Tech Memo dated July 6, 2023, and Existing Conditions Tech Memo dated Feb 19, 2024. Both memorandums are found in Appendix A.

### **1.2 Flows and Organic Loads**

The Metropolitan Council provided TKDA with 10 years of flow rate data from flow meters near lift stations L01 and L02 along with a capacity analysis of the interceptor conducted in 2023. This analysis is in Appendix B: MCES Capacity Analysis. The capacity analysis determined that the 10-year average dry weather flow was 1.5 million gallons per day, and that the 10-year peak wet weather flow was 2.9 million gallons per day.

MCES also provided hourly flow data for the past 10-years. Based on an analysis of this data, the peak hourly wet weather flow was 5.65 million gallons per day for lift station L01, and 6.01 million gallons per day for lift station L02. The capacity analysis concluded that the hydraulic capacity of this section of Interceptor 7029 is adequate through 2040.

### **1.3 Impact on Existing Wastewater Facilities**

Interceptor 7029 flows to the south and discharges to MCES Interceptor 6901 which ultimately discharges to the MCES Metro WWTP. This project is not increasing the flow rates or organic loadings. This project will have minimal impact to downstream gravity interceptors, lift stations and wastewater treatment plant.

### **1.4 Project Description**

The Metropolitan Council owns and operates the Forest Lake Interceptor 7029 from Lift Station L01 to L78 in White Bear Lake. This project will consist of the following:

- Trenchless structural rehabilitation of 11,000 feet of 36-inch gravity interceptor
- Trenchless cleaning only of over 7,000 feet of 36-inch gravity interceptor
- Structural rehabilitation of 20 MHs
- Partial reconstruction of four (4) doghouse type MHs

Temporary conveyance of existing wastewater flows will be provided in a phased manner from a MH north of Headwaters Parkway to south of the project extents to facilitate cleaning and rehabilitation activities. The temporary conveyance system will consist of suction pits with two (2) pumps and dual 14-inch temporary conveyance pipes.

A 2018 condition assessment revealed approximately 1,000 linear feet (LF) upstream of L02 to be condition 4.5 and the remaining 7,000 LF between manholes (MH) 81 and 94 to be condition rating four (4) as defined by the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). The 36-inch, single barrel, reinforced concrete pipe (RCP) was installed in 1970. A 35-foot-wide permanent easement exists over the corridor.

As part of the initial work authorization for this project, TKDA completed desktop and field analysis of the existing MHs in the 7029 corridor from MH 77A to MH 99. As seen in the Existing Conditions Tech Memo dated July 6, 2023. The section of interceptor between MH 99 and MH 113 was the subject of a desktop and field analysis that can be seen in Existing Conditions Tech Memo dated Feb 19, 2024.

This report reflects a preliminary design stage of the rehabilitation project which will include lining of the interceptor pipe and MH's south of MH 99. Several MH's and a short portion of interceptor pipe at the downstream (southern) boundary of the site are proposed for replacement.

## **1.5 Location Drawings**

The location of Interceptor 7029 is shown in Appendix C: Location Drawings.

## **1.6 Engineering Criteria**

This section of interceptor is being rehabilitated and will not have increased function or capacity to existing conditions.

Engineering criteria to be used in design of the project shall be included.

## **1.7 Site Information**

Interceptor 7029 in the project area passes through mostly undeveloped rural agricultural area. The topography is mostly flat. Wetlands and other aquatic resources were identified and delineated by Anderson Engineering in October of 2023. A total of 28 wetlands, or portions thereof, were identified and delineated along this project corridor. The wetland delineations are captured in a Wetland Investigation report prepared by Anderson Engineering (this report is within Appendix A). The project alignment is outside of the 100-year flood plain.

According to the Geologic Atlas of Washington County (2016), bedrock geology of the area consists of Jordan Sandstone, St. Lawrence Formation, and Tunnel City Group. Jordan Sandstone is characterized by dominantly white to yellow, very fine- to coarse-grained, friable quartz sandstone. St. Lawrence Formation is principally light gray to yellowish-gray and pale yellowish-green, dolomitic, feldspathic siltstone with interbedded, very fine-grained sandstone and shale. Tunnel City Group is divided into two formations: the Mazomanie and Lone Rock Formations. The Mazomanie Formation is dominantly white to yellowish-gray, fine- to medium-grained, cross-stratified, generally friable, quartz sandstone. The Lone Rock Formation underlies the Mazomanie Formation and consists of pale yellowish green, very fine- to fine-grained glauconitic, feldspathic sandstone and siltstone, with thin, greenish-gray shale partings.

Elevation of the bedrock surface throughout the study area varies from approximately 651 to 850 feet above mean sea level. Depth from the land surface to the bedrock surface throughout the study area varies from approximately 101 to 300 feet. According to the

Minnesota Department of Natural Resources (DNR) Karst Feature Inventory, no sinkholes or karst conditions were identified in the project area.

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, there are ten soil types within the study area. The erosion hazard rating included in Table 1.7 indicates the hazard of soil loss from off-road areas after disturbance activities that expose the soil surface. Due to the location of the site and the classification of the soil, the soil types are not rated for an erosion hazard rating, meaning that there is not enough information to make a determination regarding soil erodibility. The soils information is included in Table 1. Project soils do not present any situations that will require unique soil stabilization methods, soil correction, or other measures.

**Table 1: Soil Types, per the NRCS Web Soil Survey**

<b>Map Unit Symbol</b>	<b>Map Unit Name</b>	<b>Erosion Hazard</b>	<b>Acres within Study area</b>	<b>Percent of Study area</b>
75	Bluffton loam	Not rated	99.4	22.0%
113	Webster loam	Not rated	33.4	7.4%
123	Dundas fine sandy loam	Not rated	227.1	50.2%
132C	Hayden fine sandy loam, 6 to 12 percent slopes	Not rated	0.3	0.1%
169B	Braham loamy fine sand, 1 to 6 percent slopes	Not rated	1.5	0.3%
170	Blomford loamy fine sand	Not rated	27.7	6.1%
225	Nessel fine sandy loam, 1 to 4 percent slopes	Not rated	26.1	5.8%
481	Kratka fine sandy loam	Not rated	4.4	1.0%
544	Cathro muck	Not rated	26.2	5.8%
1055	Aquolls and Histosols, ponded	Not rated	6.0	1.3%

## **1.8 Alternative Selection**

### **1.8.1 Pipe Rehabilitation Alternatives**

TKDA conducted an alternatives analysis for four (4) potential interceptor rehabilitation alternatives; Do Nothing Alternative, Cured in Place Pipe (CIPP) lining, Spiral Wound lining, Slip Lining. Each alternative was analyzed for capacity reduction, constructability, cost, and its effect on the environment. Fold and Form pipe lining is another technology available on the market. Based on limited local experience with the technology, and it likely requiring the same amount of excavation as slip-lining, the technology was not considered in detail for this project.

The recommended alternative for this project is Alternative 2 - CIPP lining due to its minimal hydraulic capacity reduction (1.5-3" interceptor diameter reduction), its wide adoption within the local construction industry, MCES's familiarity with the method, and its moderate cost and environmental impact compared to the other alternatives.

#### **1.8.1.1 Alternative 1 - Do Nothing**

Alternative 1 would utilize the existing interceptor without rehabilitation. This section of interceptor has a NASSCO rating ranging from 4 to 4.5 (poor condition). Not rehabilitating this interceptor at this time would allow this RCP interceptor to deteriorate further thus potentially posing a risk to public health and the environment.



#### **1.8.1.2 Alternative 2 - CIPP**

Cured in place pipe (CIPP) is a trenchless pipe rehabilitation method involving a resin impregnated felt or fiberglass liner inserted into a pipe via a MH. The liner is then pressurized to cause the liner to form a tight fit with the existing pipe. The resin is set via heat or ultraviolet (UV) light. Heat can come from heated water or steam used to pressurize the pipe, this requires the pipe be pressurized and heated over a set duration of time based on the chemical nature of the resin. UV curing of CIPP can be completed in less time, yet is more expensive, but may be a desirable alternative if water to use in curing the pipe proves difficult to source economically. CIPP Liners are watertight and corrosion resistant replacement pipe. This method requires 100% of the flow of the host pipe be diverted.

#### **1.8.1.3 Alternative 3 - Spiral Wound**

Spiral wound lining is a trenchless pipe rehabilitation method involving a continuous PVC or HDPE strip wound around the walls overlapping itself and forming a watertight seal creating the walls of a new pipe. The annular space between the new and old pipe must then be grouted. Spiral wound lining can be installed in an active pipe with minimal to no diversion of the flow via temporary conveyance. The method would require removing the cone from existing MHs to fit the lining machine setup. Spiral wound pipe varies in the amount of flow that can be handled during construction, with 25% pipe capacity being the typical maximum allowable during construction.

#### **1.8.1.4 Alternative 4 - Slip Lining**

Slip Lining is a pipe rehabilitation method involving inserting a smaller carrier pipe into an existing damaged pipe. Typically, in gravity sanitary sewer applications, this carrier pipe is made of HDPE, PVC, or FRP material. The carrier pipe is assembled in small sections of pipe that are inserted sequentially, each new section pushing the prior section deeper into the pipe. The annular space left between the host pipe, and the carrier pipe must be grouted. This method requires either digging insertion and receiving pits at each end of a repaired section or by inserting very small segments of pipe into the damaged pipe that are small enough to fit through the existing MH structures. This method requires 100% of the flow of the host pipe be diverted.

### **1.9 Environmental Review**

As noted in Section 1.7, 28 wetlands were identified in the site. The Local Government Unit, or LGU, responsible for implementing the state Wetland Conservation Act in this situation is the Rice Creek Watershed District. Any impacts due to construction would be temporary. No permanent impacts to wetlands are proposed as part of the project, so compensatory wetland mitigation will not be required. Any impacts to a wetland would be reviewed and permitted by the Rice Creek Watershed District.

The DNR Public Water Inventory does not show or identify any public waters within the site. The site is also not within any shoreland, floodplain, wild and scenic river, critical corridor, or agricultural preserve.

According to the DNR County Geologic Atlas Program, depth to groundwater within the site area is approximately 0-10 feet below surface. The site is not within any wellhead protection areas or any drinking water supply management areas. The 2024 EAW shows that there are eight wells near the project site.

Within a mile of the project site is Clear Lake and Hardwood Creek. Both are on the MPCA 303d Impaired Waters List. Nine unnamed DNR public water basins and 45 wetlands are within a mile of the site.

The MPCA's *What's in My Neighborhood* (WIMN) database identified two properties within the project site that are or may be contaminated. These were the Tanner's Brook Golf Course, and the intersection of Headwaters Parkway and Fenway Avenue.

Two state listed species (endangered, threatened, or special concern) may be found within the vicinity of the project site, the Blanding's Turtle, and Wilson's Phalarope. There are six species under the Federal Endangered Species Act expected or known to be in or near the project site: Northern Long-eared Bat, Tricolored Bat, Whooping Crane, Salamander Mussel, Monarch Butterfly, and the Rusty Patched Bumble Bee. An avoidance plan for the Blanding's Turtle will be adhered to, if needed. Disturbances to suitable nesting habitats for the Wilson's Phalarope will be avoided during construction in mid-May through July. Any disturbed soils will be reseeded with native seed grasses. No adverse effects to fish, wildlife, plant communities, or sensitive ecological resources are anticipated as a result of the project. Additionally, the project will not result in land cover changes and all land disturbance will be temporary in nature.

Per a search of the Minnesota State Historic Preservation Office's (SHPO) Statewide Inventory conducted in September 2023, there are no archaeological sites identified within the project site. If cultural materials are encountered, a qualified Professional Archaeologist will be contacted to assess the discovery and provide guidance. Due to the site being previously disturbed during the placement of the existing wastewater conveyance pipe, it is anticipated that no archaeological sites will be uncovered during the construction of the project.

## 2.0 Facility Planning

### 2.1 Problem Evaluation and Existing Facility Review

- a. As noted in Sections 1.1 and 1.4, a 2018 condition assessment revealed an approximately 8,000 linear foot section of 36-inch, single barrel, reinforced concrete pipe (RCP) to be in Poor to Very Poor condition. This section was installed in the early 1970s. Additionally, it was discovered that there is significant corrosion between Manhole (MH) 99 and Lift Station L02.
- b. Section VII of the city of Forest Lake's 2040 Comprehensive Plan, adopted in 2020, identifies the existing sanitary sewer system for the city. Forest Lake's 2040 Plan estimates that approximately 75% of the city's residents were served by sewer in 2020. The wastewater flow into Interceptor 7029 was 1.60 million gallons per day (MGD) in 2018, and 1.80 MGD in 2020. The city of Forest Lake's 2040 Plan estimates that flows would increase to 1.98 MGD in 2030, and 2.17 MGD by 2040. Further expansion of the Metropolitan Urban Service Area (MUSA) within the city of Forest Lake is identified in Figures 2-4 and 7-4 in the 2040 Plan.
- c. The southeast portion of the city of Columbus is also served by sewer; an intercommunity agreement between Columbus and Forest Lake was signed in 2001. The agreement requires a minimum available capacity from Forest Lake of 1.13 million gallons per day for flows from Columbus. As of 2020, the current quarterly unmetered data available from the Metropolitan Council was approximately 29,000 gal/day for the sewered areas of Columbus. Portions of Columbus within the Metropolitan Urban Services Area (MUSA) are primarily east of Rice Creek and south of Howard and Mud Lakes. The rest of Columbus is unsewered. The connection from Columbus to the regional sewer system is located near the intersection of 202nd Street and Fenway Avenue in Forest Lake. The city of Columbus' 2040 Comprehensive Plan (adopted in 2019) identifies the current and future sewer service areas in Figures 6.1 – 6.3. Table 6.3 in their 2040 Plan showed wastewater flow of 0.02 MGD in 2010, and estimated flows of 0.06 MGD in 2020, 0.07 in 2030, and 0.08 MGD in 2040. Other areas of the city of Columbus would have to be served by connections from elsewhere; the 2040 Plan for Columbus noted discussions with the cities of Lino Lakes and East Bethel and the Metropolitan Council regarding options for future service connections.
- d. The Metropolitan Council's 2040 Water Resources Plan (adopted in 2015 and amended in 2018) balances the demands of growth identified in Thrive 2040 (the Council's development framework for the seven-county metropolitan region) with the protection and management of lakes, rivers, streams, wetlands, and groundwater. The community forecasts of sewered populations are found in Table A-3, which are consistent with the forecasts in the 2040 comprehensive plans for Forest Lake and Columbus. Table A-4 includes wastewater flow projections, which are also consistent the projections in the 2040 comprehensive plans for Forest Lake and Columbus. Appendix F in the 2040 Water Resources Plan identifies the long-term service areas of the regional wastewater system within the metropolitan region; these are consistent with the future service areas identified in the 2040 comprehensive plans for Forest Lake and Columbus.

## 2.2 Planning and Service Area

Existing land uses around the interceptor includes agricultural, farmsteads and farmland, single family detached, golf course, and undeveloped land. Adjacent existing land uses are similar but include multifamily and retail/other commercial to the north, and the city of Hugo to the south. There are no parks, cemeteries, or trails within the vicinity of the study area; however, the study area runs through Tanners Brook Golf Course and Hardwood Creek Trail is located approximately one half-mile west of the study area.

The city of Forest Lake's 2040 Comprehensive Plan identifies future land uses for land within the city. Future land use designations of the land around the interceptor are identified in Figure 2-3 in their Plan. The designations include *Highway Business*, *Low-Medium Density Residential*, *Park and Recreation*, and *Mixed Use*. *Highway Business* is intended for businesses that require proximity to the regional transportation infrastructure. *Low-Medium Density Residential* is intended to provide one-family detached and attached homes as well as two-family homes. *Park and Recreation* is primarily intended for public active recreation activities. *Mixed Use* is intended to provide areas for compact, walkable, mixed-use development along key community corridors.

The 2040 Plan for Forest Lake also identifies staging areas for future development and expansion of the MUSA within the city limits on Figures 2-4 and 7-4 in their Plan. Development Stage 2 (areas to be developed by 2030) includes land near Interstate 35 and US Highway 61. Development Stage 3 (areas to be developed by 2040) identify development occurring in the southwest quadrant of the city near the Forest Lake Interceptor. This includes areas near Tanners Brook Golf Course, and on land near County Road 50 and Harrow Avenue North. Areas within the city south of County Road 50 and east of US Highway 61 are identified as being developed and served with sewer post-2040.

## 2.3 Population Projection and Planning Period

The 2020 decennial census reported the city of Forest Lakes's population at 20,611. The Metropolitan Council's annual population estimates for 2023 estimated the city's population at 21,502.

As part of the 2040 comprehensive planning cycle (Thrive 2040), the Metropolitan Council forecasted that the city of Forest Lake will have a population of 25,200 in 2030, and a population of 28,900 in 2040. The forecasts for 2030 also included a total population of 20,730 being sewered, while 4,470 would be unsewered. 2040 was forecasted to have 24,430 sewered, with 4,470 again being unsewered.

The Metropolitan Council's preliminary forecasts for the 2050 comprehensive planning cycle (Imagine 2050) estimate that population growth will continue in Forest Lake but will occur at a slower rate than previously thought, as shown in Table 2 below.

**Table 2: Population forecasts for Forest Lake**

Forecast Year	Thrive 2040	Imagine 2050
2030	25,200	23,832
2040	28,900	26,127
2050	N/A	29,601

The 2020 decennial census showed Columbus with a population of 4,159. The Metropolitan Council's annual population estimates for 2023 estimated the city's population at 4,151.

As part of the 2040 comprehensive planning cycle (Thrive 2040), the Metropolitan Council forecasted that the city of Columbus will have a population of 4,950 in 2030, and a population of 5,500 in 2040. The forecasts for 2030 estimated a total population of 680 being sewerred, while 4,270 would be unsewerred. 2040 was forecasted to have 830 residents sewerred, with 4,670 being unsewerred.

Similar to the preliminary forecast for Forest Lake, the Metropolitan Council's preliminary forecasts for the 2050 comprehensive planning cycle (Imagine 2050) estimate that population growth will continue in Columbus but will occur at a slower rate than previously thought, as shown in Table 3 below.

***Table 3: Population forecasts for Columbus***

Forecast Year	Thrive 2040	Imagine 2050
2030	4,950	4,636
2040	5,500	5,113
2050	N/A	5,670

## **2.4 Hydraulic Capacity**

Flow definitions and identification, hydraulic capacity to serve existing or new collection systems, and consideration of combined sewer interceptors does not apply to this project. The proposed project involves the replacement and rehabilitation of an existing interceptor. Lift Stations and WWTPs are not a part of this project.

### **2.4.1 Flow Definitions and Identification**

The following flows for the design year shall be identified and used as a basis of design for sewers, lift stations, wastewater treatment plants, treatment units, and other wastewater handling facilities. Where any of the terms defined in this Paragraph are used in these design standards, the definition contained in this Paragraph applies.

- a. Design Average Flow  
The design average flow is the average of the daily volumes to be received for a continuous 12-month period expressed as a volume per unit time. However, the design average flow for facilities having critical seasonal high hydraulic loading periods (e.g., recreational areas, campuses, industrial facilities) shall be based on the average of the daily volumes to be received during the seasonal period.
- b. Design Maximum Day Flow  
The design maximum day flow is the largest volume of flow to be received during a continuous 24-hour period expressed as a volume per unit time.
- c. Design Peak Hourly Flow  
The design peak hourly flow is the largest volume of flow to be received during a one-hour period expressed as a volume per unit time.

- d. Design Peak Instantaneous Flow

The design peak instantaneous flow is the instantaneous maximum flow rate to be received.

#### **2.4.2 *Hydraulic Capacity for Wastewater Facilities to Serve Existing and New Collection Systems***

- a. Not Applicable.

#### **2.4.3 *Combined Sewer Interceptors***

Interceptor 7029 is not a combined interceptor.

### **2.5 Organic Capacity**

This project is for the rehabilitation of an existing gravity interceptor with no treatment component. The waste stream consists of domestic and commercial wastewater with no industrial loading. Waste stream characteristics are not anticipated to change. Organic loadings were not evaluated.

### **2.6 Wastewater Treatment Facility Design Capacity**

This project is for the rehabilitation of an existing gravity interceptor with no treatment component.

### **2.7 Initial Alternative Development**

As noted in the Preliminary Design Report, the possibility of realigning this section of interceptor was considered at a conceptual level upon request of the city of Forest Lake. Said concept would involve building a new interceptor along Fenway Avenue North. Relocation would provide an expected lifespan of 80 years, while a rehabilitation of the existing interceptor would have a lifespan of 50 years. The predicted cost of relocation was approximately \$22 million, compared to an estimated cost of rehabilitation of approximately \$11 million. Due to costs, rehabilitation was determined to be the route to pursue.

Three potential interceptor rehabilitations were analyzed: cured in place pipe (CIPP) lining, spiral wound lining, and slip lining. The fourth alternative reviewed in Section 2.8 is to maintain status quo (do nothing). Fold and Form pipe lining, while an available technology on the market, was not considered in detail for this project due to limited local experience with this technology, and similar excavation requirements to slip lining.

CIPP lining, due to its minimal hydraulic capacity reduction (1.5-3" interceptor diameter reduction), its wide adoption within the local construction industry, MCES's familiarity with the method, and its moderate cost and environmental impact compared to the other alternatives, was then determined to be the best alternative for this project.

### **2.8 Detailed Alternative Evaluation**

The following shall be included for the alternatives to be evaluated in detail.

- a. Sewer System Revisions – Proposed revisions to the existing sewer system including adequacy of portions not being changed by the project shall be evaluated.
- b. Wet Weather Flows – Facilities to transport and treat wet weather flows in a manner that complies with federal, state, and local regulations shall be provided.
- c. Wet Weather Flow Equalization – If the ratio of design peak hourly flow to design average flow is 3:1 or more, flow equalization shall be considered. This may be



accomplished by either building a wet weather retention basin and gradually returning the excess flow to the treatment plant during off-peak periods or by providing a plant large enough to handle all flows.

- d. Site Evaluation – Site evaluation shall consider the following criteria. When a site must be used which is critical with respect to the following items, appropriate measures shall be taken to minimize adverse impacts.
  - 1. Compatibility of the treatment process with the present and planned future land use, including noise, potential odors, air quality, and anticipated sludge processing and disposal techniques, shall be considered. Non-aerated lagoons should not be used if excessive sulfate is present in the wastewater. Wastewater treatment facilities should be separate from habitation or any area likely to be built up within a reasonable future period and shall be separated in accordance with state and local requirements.
  - 2. Zoning and other land use restrictions shall be identified.
  - 3. The accessibility and topography of the site shall be evaluated.
  - 4. Area for future plant expansion shall be identified.
  - 5. Direction of prevailing wind shall be identified.
  - 6. Flood considerations, including the 25- and 100-year flood levels, impact on floodplain and floodway, and compliance with applicable regulations regarding construction in flood-prone areas, shall be evaluated. Paragraph 51.2 contains requirements for protection from flooding.
  - 7. Geologic information, depth to bedrock, karst features, or other geologic considerations of significance to the project shall be included. Lagoons shall not be in karst areas unless the specific geologic and construction details are acceptable.
  - 8. Protection of groundwater including public and private wells is of utmost importance. Demonstration that protection will be provided shall be included. The regulatory agency shall be contacted for required separation.
  - 9. Soil type and suitability for construction and depth to normal and seasonal high groundwater shall be determined.
  - 10. The location, depth, and discharge point of any field tile in the immediate area of the proposed site shall be identified. Present and known future effluent quality requirements as determined by the regulatory agency shall be included. Access to receiving stream for the outfall line shall be discussed and displayed.
  - 11. A preliminary assessment of site availability shall be included.
- e. Unit Sizing – Unit operation and unit process sizing and basis shall be provided.
- f. Flow Diagram – Flow diagram of treatment facilities including all recycle flows shall be included.
- g. Flexibility – Compliance with requirements of Paragraph 5.3.6 Arrangement of Units shall be assured.
- h. Removal Efficiencies – Loadings to and removal efficiencies through each unit operation shall be provided in addition to total removal efficiency and effluent quality (both concentrations and mass).

- i. Emergency Operation – Emergency operation requirements as outlined in Section 47 and Paragraph 56.1 shall be provided. MPCA and local agencies may have more stringent requirements.
- j. Technology Not Included In Ten States Standards – Paragraph 5.3.2 outlines procedures for introducing and obtaining approval to use technology not included in these standards. Proposals to use technology not included in these standards shall address the requirements of Paragraph 5.3.2. A contingency plan, in the event that such new technology fails to meet the expected performance, may be required by the reviewing authority in the absence of three separate and representative full-scale installations successfully using the same technology. Each representative full-scale installation should have sufficient monitoring and appropriate testing results that demonstrate reliable and effective compliance with the design performance criteria and have been operated for not less than three years at or near design capacity without major failure of either the process or equipment. Sludge
- k. The solids disposal options considered, and method selected shall be included. This is critical to completion of a successful project. Compliance with requirements of Chapter 80, Sludge Processing, Storage, and Disposal shall be assured.
- l. Treatment During Construction – A plan for the method and level of treatment (including sludge processing, storage, and disposal) to be achieved during construction shall be developed and included in the Facility Plan submitted to the regulatory agency for review and approval. This approved treatment plan shall be implemented by inclusion in the plans and specifications to be bid for the project. Refer to Paragraph 20.15 and Section 2.1.
- m. Operation and Maintenance – Portions of the project which involve complex operation or maintenance requirements shall be identified including laboratory requirements for operation, industrial sampling, and self-monitoring.
- n. Cost Estimates for capital, operation, and maintenance (including basis), shall be included.
- o. Environmental Review – Consideration shall be given to minimizing any potential adverse environmental effects of the proposed project. Compliance with planning requirements of federal, provincial, state, and local regulatory agencies shall be documented.

**Table 4: Alternative Criteria Review**

<b>Criteria to Review</b>	<b>Alternative #1 <i>Do Nothing/Status Quo</i></b>	<b>Alternative #2 <i>Cured in place pipe (CIPP)</i></b>	<b>Alternative #3 <i>Spiral Wound</i></b>	<b>Alternative #4 <i>Slip Lining</i></b>
<i>Sewer System Revisions</i>	N/A. Under this alternative, no revisions would be made to the existing interceptor.	Sewer cleaning would occur as a preparatory step prior to rehabilitation work.  CIPP would involve either a steam/hot water curing, or a UV curing process to rehab the existing pipe.	Sewer cleaning would occur as a preparatory step prior to rehabilitation work.  This would involve a continuous PVC or HDPE strip wound around the walls of the existing pipe.	Sewer cleaning would occur as a preparatory step prior to rehabilitation work.  This would involve inserting a smaller carrier pipe into the existing pipe sequentially.
<i>Wet Weather Flows</i>	Peak hourly: L1 – 5.65 MGD L2 – 6.01 MGD	N/A	N/A	N/A
<i>Wet Weather Flow Equalization</i>	N/A	N/A	N/A	N/A
<i>Site Evaluation</i>	Under this alternative, no revisions would be made to the existing interceptor.	A minimal construction footprint would be required for this alternative.  UV-cured CIPP is advantageous for reaching MHs with limited access to water.	A minimal construction footprint would be required for this alternative.  This would require less water than other alternatives and would not require 100% conveyance during construction.	This alternative would require significant excavation for insertion pits compared to other alternatives.
<i>Unit Sizing</i>	Inside Diameter: 36" Manning's N: 0.015 Flow Capacity: 10.33 MGD	Inside Diameter: 34.5" – 35.5" Manning's N: 0.010 Flow Capacity: 13.8 MGD (Steam/Hot Water), 14.4 MGD (UV)	Inside Diameter: 30" Manning's N: 0.010 Flow Capacity: 9.53 MGD	Inside Diameter: 29.5" Manning's N: 0.010 Flow Capacity: 7.6 MGD
<i>Flow Diagram</i>	N/A	N/A	N/A	N/A
<i>Flexibility</i>	N/A. Under this alternative, no revisions would be made to the existing interceptor.	N/A	N/A	N/A
<i>Removal Efficiencies</i>	N/A. Under this alternative, no revisions would be made to the existing interceptor.	N/A	N/A	N/A
<i>Emergency Operation</i>	N/A. Under this alternative, no revisions would be	N/A	N/A	N/A

	made to the existing interceptor.			
<i>'Tech not included in ten states' standards</i>	N/A. Under this alternative, no revisions would be made to the existing interceptor.	N/A	N/A	N/A
<i>Solids Disposal Options</i>	N/A. Under this alternative, no revisions would be made to the existing interceptor.	N/A	N/A	N/A
<i>Treatment During Construction</i>	N/A. Under this alternative, no revisions would be made to the existing interceptor.	Temporary conveyance pipes will be sized to provide the greater of 1.5 times the daily maximum flow or one half of the maximum system design capacity. Multiple alignment options for temporary conveyance routes are available to pursue.	Temporary conveyance pipes will be sized to provide the greater of 1.5 times the daily maximum flow or one half of the maximum system design capacity. Multiple alignment options for temporary conveyance routes are available to pursue.	Temporary conveyance pipes will be sized to provide the greater of 1.5 times the daily maximum flow or one half of the maximum system design capacity. Multiple alignment options for temporary conveyance routes are available to pursue.
<i>Operation &amp; Maintenance</i>	N/A	N/A	N/A	N/A
<i>Cost Estimates</i>	\$0/foot.  The possibility of relocation of this section of interceptor was considered at a conceptual level. The predicted cost of relocation was approximately \$22 million.	\$275/foot (Steam/Hot Water)  \$225/foot (UV)	\$400/foot	\$200/foot
<i>Environmental Review</i>	Maintaining status quo could allow the interceptor to deteriorate further, thus posing a potential risk to public health and the environment.	Minimal impact is anticipated for this alternative, beyond accessing MHs. Use of UV-cured CIPP could reduce water needs and transportation of water.	Minimal impact is anticipated for this alternative, beyond accessing MHs. This would require less water than other alternatives and would not require 100% conveyance during construction.	This alternative would be anticipated to create more ground disturbance and wetland impacts than other alternatives

## 2.9 Final Project Selection

Based on initial alternative development, and the detailed alternative evaluation, the recommendation is to pursue UV cured CIPP lining due to its increase in capacity compared to water or steam cured CIPP (Due to the thinner wall thickness of UV cured CIPP) and lower cost. The primary cost difference between these methods is the cost of removing and replacing MH cones, with quotes given by contractors making UV CIPP approximately \$50/linear foot cheaper than steam or water cured CIPP due to the ability for it to be installed through a smaller MH opening. Steam cured CIPP may be included in bidding documents as an alternative method.

Additionally, due to the need to move water to the project site the cost of moving water is a notable concern. While hot water cured CIPP allows for longer inversions, of up to 1,000 feet or more compared to 500 feet for UV and Steam cured. However, runs of up to 1,000 feet may be possible so long as a MH exists within 700 ft of the start and end MH, liner material could be inserted from either end of a 1,000-foot run, with a winch pulling from a central MH in each direction.

Water cured CIPP would potentially reduce the amount of site restoration required for this project. Based on analysis of a typical section of the project, it is assumed that costs saved due to not using water with UV curing outweighs the added restoration costs, making UV cured CIPP likely to be the most economical method for this project. This is demonstrated in the table below comparing the cost for each method between MH 90 and MH 94.

**Table 5: CIPP Curing Methods Cost Sample Area, MH 90-94**

Curing Method	UV	Steam	Hot Water
Length of Sample Area, in linear feet (LF)	1,650	1,650	1,650
Cost of Liner	\$365,000	\$450,000	\$450,000
Water Volume Required (gallons)	0	16,000	84,000
Water Cost	\$0	\$250	\$1,400
Water Trucking Cost	\$0	\$19,000	\$56,000
Restoration Cost	\$28,000	\$28,000	\$14,000
<b>Estimated Cost</b>	<b>\$393,000</b>	<b>\$497,250</b>	<b>\$605,400</b>

*\*Values are initial estimates used for comparison purposes, and may not be accurate for this project*

### **3.0 List of Report Tables and Appendices**

Table 1 – Soil Types – *Section 1.7*

Table 2 – Population Forecasts for Forest Lake – *Section 2.3*

Table 3 – Population Forecasts for Columbus – *Section 2.3*

Table 4 – Alternative Criteria Review – *Section 2.8*

Table 5 – CIPP Curing Methods – *Section 2.9*

Appendix A – Existing Conditions Memorandums

Appendix B – MCES Capacity Analysis

Appendix C – Location Drawing





# Appendix A

## Existing Conditions Memorandums



# Memorandum

**To:** Paul Herubin, PE

**Project Reference:** Contract 18P061D

Work Release Number 23002763

**Copies To:** Chris Remus, PE

Dan Nesler, PE

**TKDA Project No.:** 17060.013

**From:** Scott Frost, EIT,  
Ben Meemken, PE

**Client No.:** 808601: North Area Rehabilitation

**Date:** February 19, 2024

## Forest Lake Interceptor Existing Conditions Technical Memorandum

### Introduction and Background

The Forest Lake Interceptor 7029 was constructed in approximately 1971. The portion north of Headwaters Parkway to 210<sup>th</sup> St. North consists of a 36-inch reinforced concrete pipe (RCP). In 2018 a condition assessment was performed by MCES on the interceptor, and it was determined that approximately 2300-feet of the pipe in this reach had a condition rating of 3.5 and 4050-feet of pipe had a condition rating of 3.

To aid in determining alternatives for future rehabilitation of the interceptor, a desktop and field condition evaluation was performed on the section of the Forest Lake interceptor between maintenance holes 99 and 113. This memorandum will summarize the tasks performed and details of this evaluation. A prior analysis and condition evaluation of maintenance holes 77A to maintenance hole 99 was documented with a July 6, 2023, Technical Memorandum by TKDA. That memorandum can be viewed in Appendix B.

### Objectives

The objective of this memo is to summarize existing conditions of the site, and the preliminary data collected to date that will be used to inform the Preliminary design, and subsequent phases of the project. The intent is to proceed with sediment removal and cleaning of the interceptor from maintenance holes 99- 113, and full rehabilitation of MH 77A – MH 99. At this time, there does not appear to be any significant data gaps or additional information required to proceed with preliminary design. Limited additional data will be collected during the next design phases of the project as needed, including a geotechnical investigation.

Currently, the critical path is for MCES to initiate the land acquisition process for temporary construction easements. TKDA is assisting by preparing a detailed property acquisition work map and exhibits with legal descriptions of easement areas.

### Desktop Analysis

TKDA conducted a desktop review of existing utility locations provided by companies operating in the project area, MPCA pollution data, FEMA flood data and an original geotechnical report from the interceptor construction.

### **Gopher State One Call Utility Locate No. 232583177**

TKDA received utility request responses from companies as shown in Table 1. The information has been imported into the project's AutoCAD base files and will be used in the design going forward. No conflicts were found in this data that would significantly alter or inhibit the design of this project.

**Table 1. Utility Locate 232683177 Responses**

<b>Company</b>	<b>Utility(s) Provided</b>
Century Link	Phone/Internet
City of Forest Lake	Sanitary Sewer, Culverts, Storm, Watermain
Connexus Energy	Power
Consolidated Communications	Phone/Internet
KorTerra	Internet
Metropolitan Council	Sanitary Sewer
XCEL Energy	Power, Gas
Zayo Bandwidth	Internet

**City of Forest Lake:**

TDKA obtained record plans for the 2006 Headwaters – 1<sup>st</sup> Addition Utility and Street improvements project. Record plans are dated 2009 and 2012. This plan set has the most up to date location of existing Municipal sanitary and water, along with existing conditions of maintenance holes 98 to 107. Most notably the set contains the existing conditions in the vicinity of MH 99. This information will be used to locate and design the temporary conveyance pumping pit and temporarily connect the municipal sanitary connection to the interceptor.

**MPCA What's in my Neighborhood:**

TKDA reviewed the MPCA information on pollution in the project area. Appendix C contains all noted areas of pollution. No significant pollution was found such that it would inhibit or alter the project.

**FEMA National Flood Hazard Map:**

TKDA reviewed FEMA FIRMette panels 27163C0040E, 27163C0126E, 27163C0128E which contain the entirety of the project area. No flood risk areas were found within the project area. Appendix D-1, D-2, D-3 shows the FIRMette panels.

**Geotechnical Report #15054:**

TKDA reviewed geotechnical report #15054 dated March 11<sup>th</sup>, 1970, conducted by the Soil Exploration Company. Borings #33, #36, #38, #40, #42 are the borings closest to the relevant areas of the project. The borings reveal that the southern part of the project has an average of 1ft of lean clay (CL-OL) topsoil, with sandy clay (CL) lying underneath. The Northern portion of the project has a mixture of silty sand and sandy clay surface, with a mix of sandy clay, clayey sand, organic silty clay, and fine sand underneath. Borings averaged 25ft in depth, with a minimum depth of 12ft and a maximum depth of 32ft. Bedrock was not encountered in any of the borings. Appendix E includes the referenced boring logs. As part of the preliminary design phase TKDA will assess the need for additional boring locations. It is assumed a limited number of borings will be required to gain an understanding of existing groundwater conditions.

**Field Data Collection**

**Wetland Delineation:**

TKDA retained a subconsultant, Anderson Engineering, to conduct a wetland delineation in accordance with the USACE Wetland Delineation Manual. The study area was focused on an approximately 135-foot-wide corridor along the interceptor alignment. The area was based on the existing 35-foot-wide permanent easement, plus the 100-foot temporary construction easement to the east that was recorded on the original construction documents. Approximately 30 individual wetland bodies with a range of classifications were delineated. See Appendix F for the wetland delineation report.

### **Topographic Survey and Aerial Photography:**

TKDA's survey conducted by drone collected aerial imagery and point data via lidar that was converted into topography. The survey was conducted along an approximately 200-foot corridor of coverage between maintenance holes 77 and 102 with Forest Lake Interceptor 7029 as its centerline.

### **Additional Topographic and Imagery Data:**

TKDA also obtained and reviewed aerial imagery and topographic contour information that will be used for background data outside of the project data collection boundaries using Maxar arial imagery and MnTOPO Lidar.

All collected information has been imported into the AutoCAD base files and will be used for design.

### **Maintenance Hole Condition Assessment**

In December of 2023 an inspection of maintenance holes 101 to 113 was conducted. From this inspection it was determined that most of the MHs were found to be in fair condition. MH 102 showed signs of minor concrete deterioration, and MH 113 showed signs of erosion. Most manholes showed at least 4 inches of sediment. A sludge judge was used to determine sediment depth but had variable accuracy. A representative selection of maintenance holes were evaluated by making physical entry, inspection, and measurement of sediment depth. Physical sediment depth measurements were correlated with the sludge judge measurements, and estimations of total sediment depth were made for instances where the sludge judge was thought to be inaccurate. Table 2 displays the condition rating descriptions of existing sanitary sewer MHs. Table 3 summarizes the observations from the MH inspections including total sediment depth. Appendix G shows photos from the MH inspections and the MH inspection forms. Appendix A contains the report for MH 77A to MH 99.

**Table 2. MH Condition Ratings**

<b>Rating</b>	<b>Description</b>
1	<b>New</b> Newly installed, No significant defects Failure unlikely
2	<b>Good</b> Minor Defects, No Significant Deterioration Evident Rehabilitation not Recommended
3	<b>Fair</b> Moderate Defects, Deterioration Evident Rehabilitation Recommended
4	<b>Poor</b> Moderate to Severe Defects, Moderate Deterioration Rehabilitation Recommended
5	<b>Very Poor</b> Severe Defects, Severe Deterioration Failure Likely



**Table 3. MH Inspection Summary**

MH	Rating	Description	Sediment Depth
100	N/A	NOT INSPECTED	
101	3	Steps and walls in fair condition, root intrusion in upper maintenance hole, signs of erosion around pipe inlet and outlet	6"
102	2	Steps in fair condition, signs of seeping, concrete deteriorating	No Sediment
103	N/A	NOT INSPECTED	
104	2	Steps in fair condition, signs of minor deterioration and erosion	Sludge Judge: 4" By Feel 6-7"
105	2	Steps in fair condition, heavy debris on steps	No Sediment
106	2	Steps in fair condition, concrete casting shows minor signs of deterioration	10"
107	2	Steps in fair condition, concrete casting shows minor signs of deterioration.	4"
108	2	Steps in good condition concrete shows signs of infiltration	Sludge Judge: 5" By Feel: 8"
109	2	Steps in fair condition concrete shows signs of infiltration	Sludge Judge: 3" By Feel: 12"
110	2	Steps in fair condition, signs of erosion around pipes and bench	8"
111	2	Steps in fair condition, signs of erosion around pipe inlet and outlet	12"
112	2	Steps in fair condition casting appears to be in good condition	6"
113	3	Signs of deterioration around inlet pipe and around force main, signs of erosion near water level.	No Sediment

### **Condition Evaluation**

In 2018 the Metropolitan Council conducted a condition assessment that included televising the interceptor between MH 99 and MH 112. This inspection revealed consistent spalling across the pipe, regular signs of erosion and sediment buildup. And increased flow velocity between MH 102 and 106 due to a change in slope and sag in the pipe. This is consistent with the 2023 maintenance hole inspections conducted by TKDA.

### **Conclusion**

The data collected as part of this inspection and analysis generally aligns with and supplements the previously understood site conditions. The information gathered supports the need to clean and remove sediment from the section of interceptor between maintenance holes 99 and 113, but complete rehabilitation of the pipe and structures will not be considered for this portion of the project area. This information also seems to be adequate to begin preliminary design on such a rehabilitation project.

### **Attachments**

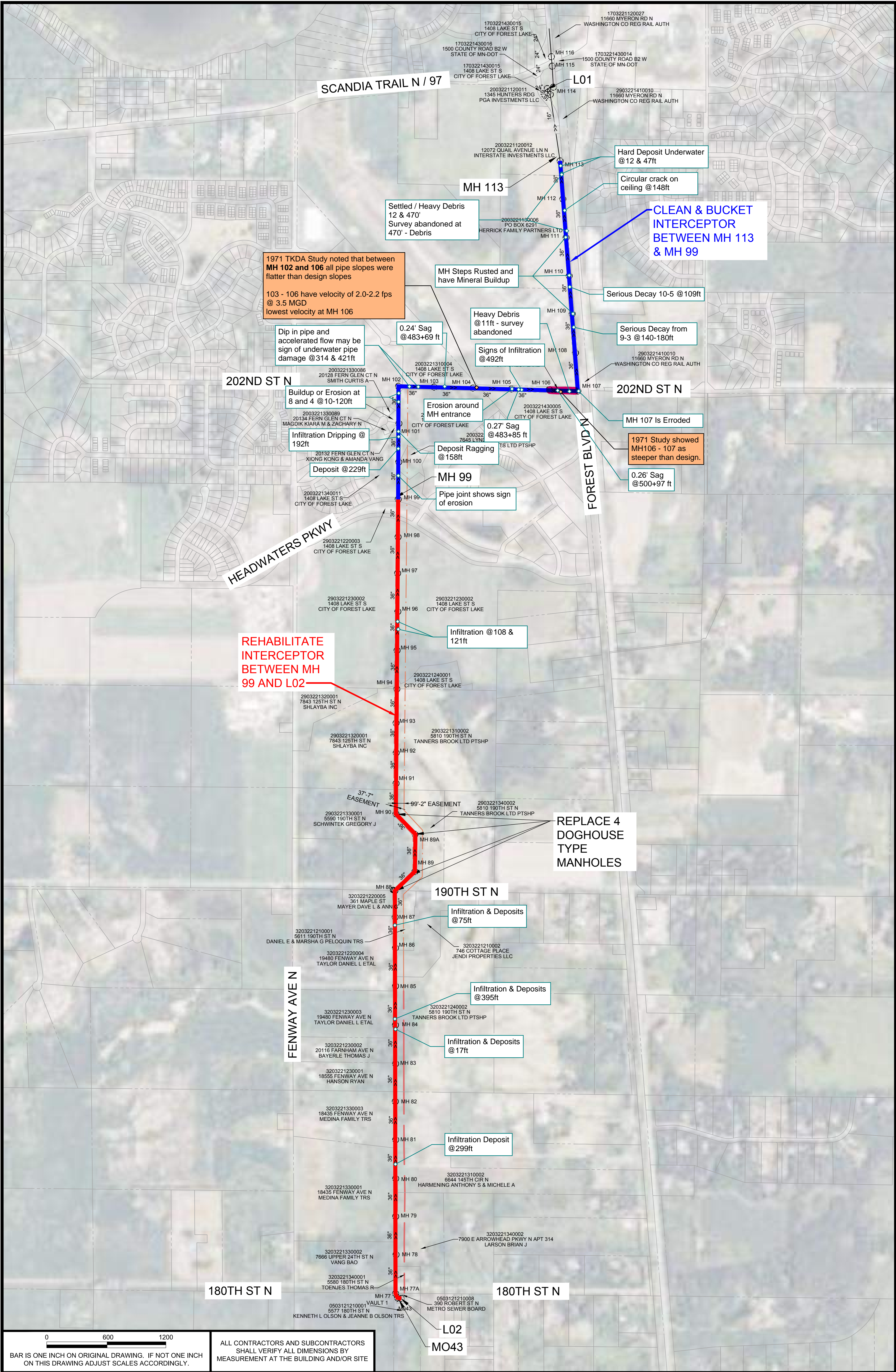
Appendix A – MCES Forest Lake Overall Site Exhibit  
Appendix B – 2023-07-06 7029 Analysis and Field Inspection Report  
Appendix C – MPCA Noted Spills  
Appendix D-1 – FEMA FIRMette  
Appendix D-2 – FEMA FIRMette  
Appendix D-3 – FEMA FIRMette  
Appendix E – Forest Lake Geotechnical Report  
Appendix F – TKDA\_MCES Forest Lake Wetland Report  
Appendix G – MH Assessment Forms

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WSF:BJM:add



PLOT DATE: Sep 22, 2023 - 8:56am  
FILE NAME: K:\g-m\MetCouncil\17060013\04\_Production\01\_CAD\03\_Concepts\MCES Forest Lake Overall Exhibit.dwg



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tkda.com

## MCES FOREST LAKE OVERALL EXHIBIT

XXXX  
ISSUE RECORD

XXX  
REFER TO DRAWING

DRAWING NO.  
XXX





## Memorandum

<b>To:</b> Paul Herubin, PE Amanda Mondor, PE	<b>Project Reference:</b> Contract 18P061D Work Release Number 23002763
<b>Copies To:</b> Chris Remus, PE Dan Nesler, PE	<b>TKDA Project No.:</b> 17060.011
<b>From:</b> Ian Johnson, PE, Ben Meemken, PE	<b>Client Project No.:</b> 808601: North Area Rehabilitation
<b>Date:</b> July 6, 2023	

### Forest Lake Interceptor 7029 North Area Rehabilitation Analysis and Field Inspection Report

The Forest Lake Interceptor 7029 was constructed in approximately 1971. The portion north of 180<sup>th</sup> Street, to what is now Headwaters Parkway consists of a 36-inch reinforced concrete pipe (RCP). In 2018 a condition assessment was performed by MCES on the interceptor and it was determined that approximately 1,000-feet of the pipe in this reach had a condition rating of 4.5 and 7,000-feet of pipe had a condition rating of 4. To aid in determining alternatives for future rehabilitation of the interceptor, a desktop and field analysis were performed. This memorandum will summarize the tasks performed and details the findings from these analyses.

#### Desktop Analysis

The analysis was completed along Interceptor 7029 between maintenance hole (MH) 99 and Lift Station 2 (L02), as shown on Figure 1. Upon reviewing the CCTV from 2018 it was determined that the condition ratings of the existing RCP interceptor pipe were accurate. Most of the segments appeared to have visible signs of corrosion presenting as surface spalling of the concrete pipe. Less corrosion is present upstream near MH 99 and more significant corrosion near L02.

Record drawings and a capacity analysis provided by MCES were also reviewed. While MCES has determined the current pipe capacity may not be sufficient for ultimate projected flows, this evaluation did not include deeper capacity analysis. It is assumed that rehabilitation of the interceptor will maintain or slightly improve the system capacity due to introducing smoother walled pipe, reducing the Manning's n value, and reducing inflow and infiltration.

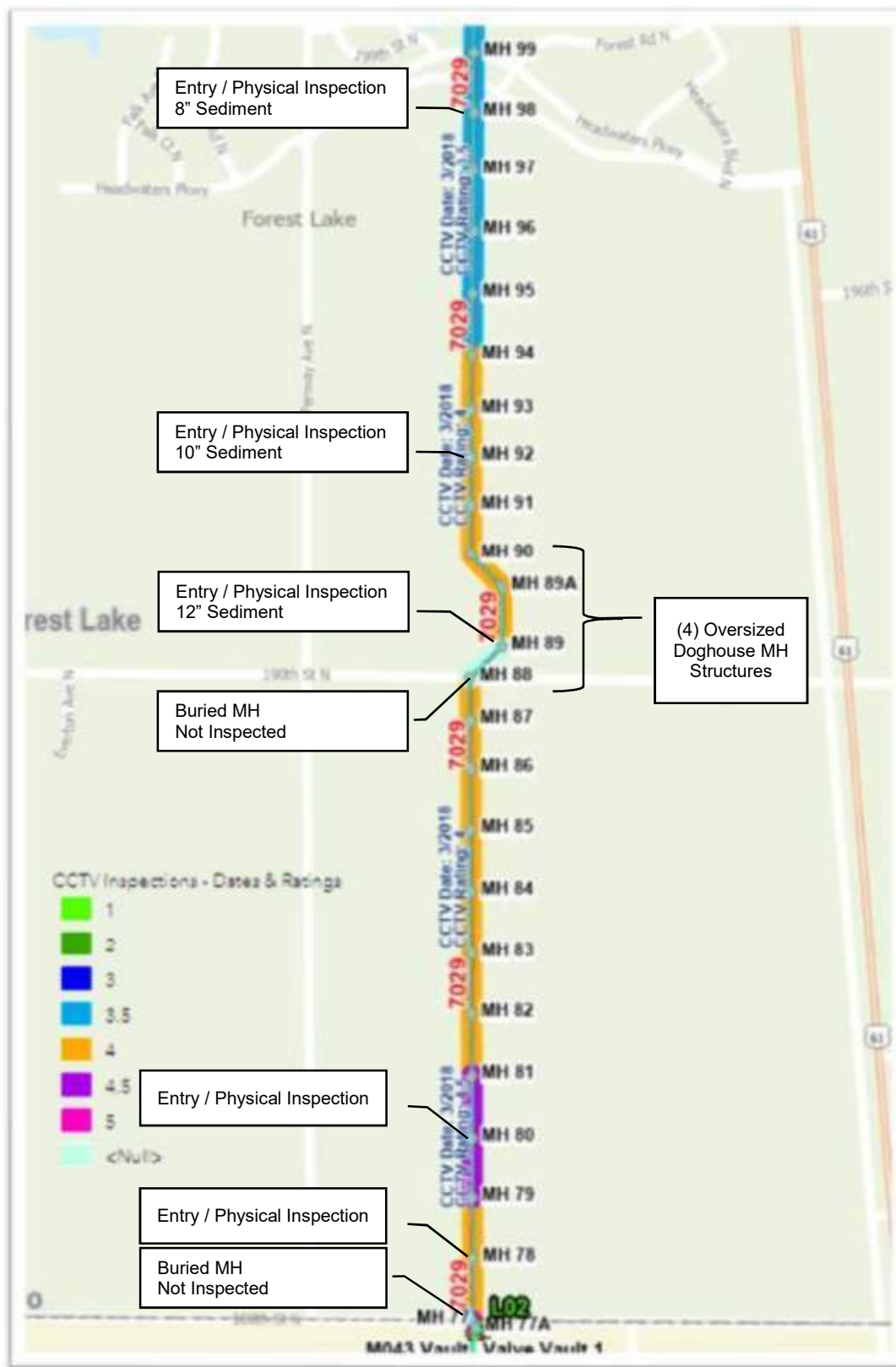


Figure 1 – Site Map & Inspection Highlights

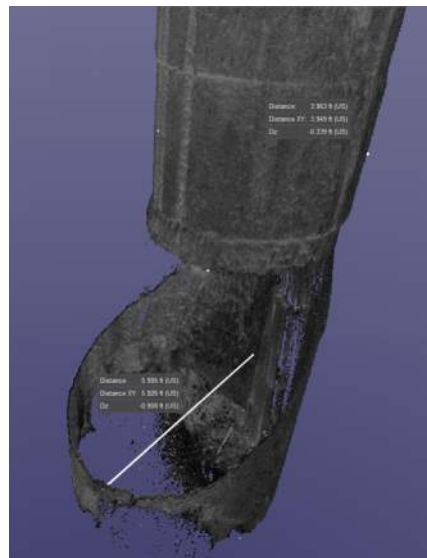


### Site Reconnaissance

TKDA conducted a site reconnaissance to locate, mark, and inspect the maintenance holes along Interceptor 7029 from MH 99 to L02 from April 27 through May 4. Prior to the field reconnaissance TKDA coordinated with MCES to inform impacted land owners including Tanners Brook Golf Course. The Interceptor lies within a 35 foot wide MCES easement that cuts through farmland, and heavily vegetated and wooded areas where access is limited to foot traffic. The maintenance holes within the golf course were accessed via golf cart. Each MH was first field located and marked with only MHs 88 and 77 not being unearthed as they lie under the road surface of 190<sup>th</sup> St, and 180<sup>th</sup> St., respectively. For the remaining structures, each structure was visually inspected from the surface, photographed using a 360° camera, and scanned using a 3D laser scanner. The casting, rings, cone section, riser sections, and sump were visually inspected and recorded in Appendix A. Overall the manholes appeared to be in fair to poor condition with moderate corrosion near the rings and casting and growth along the walls. Signs of micro-biological growth was noted in all MHs along with mineral deposits where water was entering the structure. The micro-biological growth along the cone and riser sections was more extreme the farther downstream (south) or closer to L02. The pipe appeared to be over 50% full inhibiting the view of any MH bench. The inspection confirmed the presence of a service connection at MH 99. The only other service connection was identified at MH 77A, where a 4" or 6" PVC lateral with a P-trap inside the MH was observed. It is undetermined at this point where this service lateral originates from, but it is suspected it may be an undocumented sump pump discharge from within the lift station dry well.

The MHs were photographed using a 360° camera with photos taken approximately every 5 feet down the structure as well as a photo at the casting and near the surface of the water at the bottom of the MH. 360° video was also captured at each located structure from invert to rim. These photos and video were used to help with the MH assessments as well as to help determine which structures were good candidates to make entry for physical inspections. These photos and video will be provided to MCES in an electronic submittal.

Each located structure was finally scanned using a 3D laser scanner, creating a point cloud of the inside surface of the MH from rim to the invert. These scans will be a valuable tool in any future rehabilitation projects as the data collected is a highly precise view of the MH that can more accurately display the conditions and measurements of the MH. These 3D laser scans will be provided to MCES in an electronic submittal. A screen shot of the laser scanner point cloud from MH 89 is presented below. This point cloud was used to confirm the diameter of the oversized 72" diameter doghouse structure at the bottom. An anomaly on the surface was also detected, which was confirmed with the 360 degree photos, and was later inspected by hand to reveal exposed rebar.



**Figure 2 - MH 89 Laser Scanning Point Cloud**

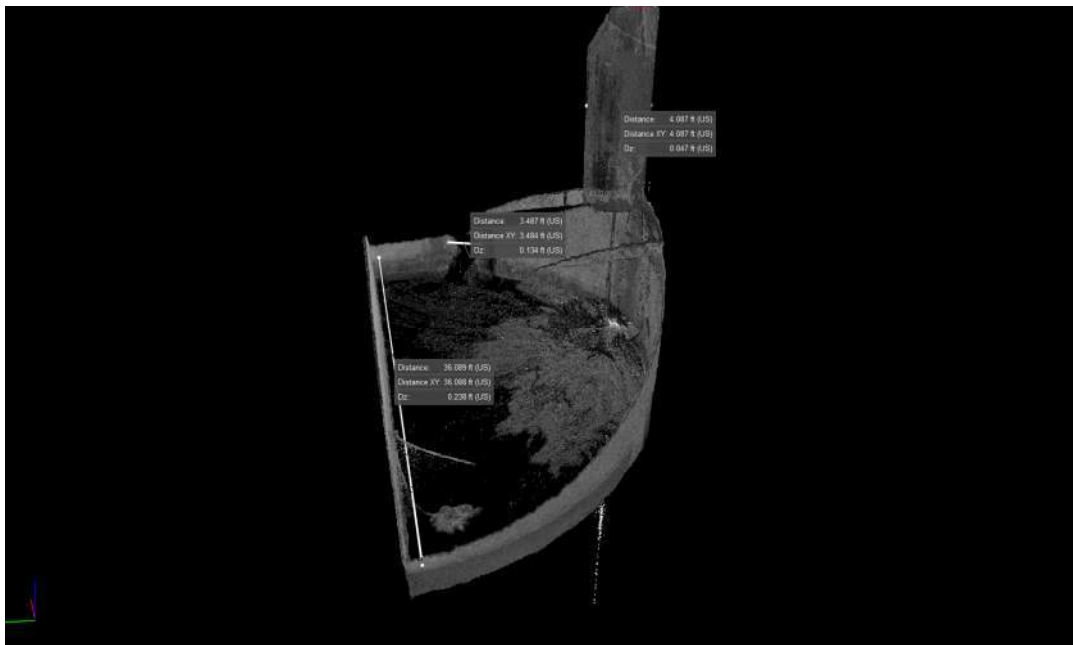


Generally, the laser scanning data compared well to the 360 degree imagery, and was useful in determining dimensions, as well as indicating anomalies that required more attention. A snip below is from within MH 92.



**Figure 3 - MH 92 Point Cloud and 360 Degree Imagery Comparison**

The Lift Station 2 wetwell was also accessed with the 360 camera, and laser scanner. The intent was to confirm the wetwell and influent pipe configuration to inform the future detailed design of a temporary conveyance connection. While the lighting was not sufficient in the 360 camera images to determine much, a partial laser scan of the wetwell was able to conclude the wetwell is a 36 foot diameter half-moon shape, which deviates from the original design drawings for the project. TKDA has located some drawings of a cast-in place concrete wetwell-dry well design that is assumed to be issued as an addendum to the original project. The original design drawings detailed a rectangular wetwell with a pre-manufactured dry well pump station. A screen capture of the wetwell laser scan point cloud is presented below. The scan was able to confirm the 36 foot diameter wetwell, the 42" diameter influent pipe, and the 48" diameter MH Riser.



**Figure 4 - MH 89 Laser Scanning Point Cloud**



### MH Entry and Physical Inspections

Once the initial site reconnaissance and MH inspections were completed, five structures along the interceptor were selected to be entered and inspected. The five structures that were entered were determined based on spacing out the inspections along the interceptor as well as observations from the visual inspections. Photographs from these inspections can be found in Appendix B. MH 98 and MH 92 were selected based on the ease of access and similarities to other structures upstream and downstream. MH 89 was selected based on ease of access and due to it being one of four oversized structures with a 72" diameter "Doghouse" structure with a top slab, dissimilar to the other typical 48-inch diameter concrete structures. MH 78 was selected based on the significance of micro-biological growth but was unable to be fully inspected due to high levels of hydrogen sulfide, lower explosive limit (LEL) gases, and low levels of oxygen. MH 80 was then selected as an alternative to MH 78 as it also was showing signs of significant micro-biological growth with having better air quality.

During the physical inspections, areas of micro-biological growth were scraped away to reveal the concrete underneath. In MH 92, MH 89, MH 80 and MH 78 exposed aggregate was found underneath this growth however the degradation of the concrete wall was not significant. A portion of the wall inside MH 89 had exposed rebar in the oversized dog house section. MH 98 had minimal concrete degradation under the micro-biological growth. The MH steps had significant mineral buildup without showing signs of surcharging. Large mineral deposits were also located near the bench of each MH. Each MH had signs of infiltration at the riser sections with moderate to significant mineral buildup at these locations. Overall it was found that the MHs were in fair shape and would be good candidates for future rehabilitation liners.

The interceptor pipe was visually inspected while entering the MHs and photographed. Signs of significant corrosion, consistent with those found in the 2018 condition assessment were confirmed during these entries. Sediment ranging from 8" to 12" was found at the invert of interceptor pipe at MH 98, MH 92, and MH 89. The invert at MH 80 was clear of any sediment.

### Conclusions

The data collected as part of this inspection and analysis effort generally aligns with, and supplements, previously understood information. Collectively, the information currently on file seems adequate to embark on an alternatives evaluation and preliminary design for a rehabilitation project on this segment of interceptor. While subsurface conditions are now well understood, updated topographic survey information may be beneficial to collect as the project design progresses.

---

### Attachments

Appendix A – MH Reconnaissance Inspection Reports  
Appendix B – MH Physical Inspection Photographs

IJJ:bjm:dan  
K:\g-m\MetCouncil\17060011\04\_Production\05\_Reports\Analysis and Field Inspection Report.docx







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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	4/27/2023	9:10am	Headwaters Pkwy	West of Forest Rd N
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
99	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other		_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6	Depth (Rim to Inv.) 15.34'	Clock Pos: 12	Depth (Rim to Inv.) 15.42'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos: 1:30	Depth (Rim to Inv.) 13.86'	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size: PVC 10"		Material/Size:	
Comments: Some flow surging occurred		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, Cloudy <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe:  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe:  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Steps in okay condition, couple of rungs were clean, most had buildup RCP Riser is good condition Cone in good condition Casting in good condition



Photo 1: MH 99 Rim and Casting



Photo 2: MH 99 Casting



Photo 3: MH 99



Photo 4: MH 99, 10" PVC inlet at lower left





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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	4/27/2023	11:00am	In grassy field	Next to standing water, 4 wooden posts
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
98	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	10.35'	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 11.77'	Clock Pos: 12	Depth (Rim to Inv.) 11.85'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input checked="" type="checkbox"/> Light Rain, Cloudy <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping on W side <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe:  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe:  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Steps in poor condition, lots of buildup RCP Riser is good condition Cone in good condition Casting in okay condition, rusted





Photo 1: MH 98 Rim and Casting



Photo 2: MH 98 Rings and Cone



Photo 3: MH 98



Photo 4: MH 98





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	4/27/2023	11:45am	In grassy field	4 wooden posts
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
97	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	13.64'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6	Depth (Rim to Inv.) 15.28	Clock Pos: 12	Depth (Rim to Inv.) 15.27
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, Cloudy <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping on W side <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

<b>MH Type</b>	<b>Evidence of Surchage</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Under steps</u>  Component: Chimney Cone Wall Bench <b>Channel</b> Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe:  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Steps in poor condition, lots of buildup RCP Riser is good condition Cone in good condition Casting in okay condition, rusted





Photo 1: MH 97 Rim and Casting



Photo 2: MH 97 Rings and Cone



Photo 3: MH 97



Photo 4: MH 97





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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	4/27/2023	1:25pm	In grassy field	3 wooden posts, 1 was laying on the ground
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
96	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	13.07'	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 14.60'	Clock Pos: 12	Depth (Rim to Inv.) 14.65
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, Cloudy 58° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input checked="" type="checkbox"/> Gushing <b>steady flow from 1st joint above inlet pipe</b> <input type="checkbox"/> Roots Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>diaper on east side and other debris</u> Component: Chimney Cone Wall Bench <b>Channel</b> Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Steps in poor condition, lots of buildup RCP Riser is good condition Cone in good condition Casting in okay condition, rusted





Photo 1: MH 96 Rim and Casting



Photo 2: MH 96 Rings and Cone



Photo 3: MH 96



Photo 4: MH 96 Light on the leaking joint





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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	4/27/2023	2:15pm	In woods	4 wooden posts, next to big tree
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
95	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	12.7'	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 14.21'	Clock Pos: 12	Depth (Rim to Inv.) 13.32'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input checked="" type="checkbox"/> Light Rain, Cloudy <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input checked="" type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input checked="" type="checkbox"/> Gushing <input checked="" type="checkbox"/> Roots <b>Casting pushed up and rings broken</b> Component: <b>Chimney Cone Wall Bench</b> <b>Channel Pipe Inlet / Outlet</b>

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>diaper on east side and other debris</u> Component: Chimney Cone Wall Bench <b>Channel</b> Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Strong sewer gas smell when first approached Steps in poor condition, RCP Riser is okay condition, very weathered concrete surface Cone in okay condition Casting in okay condition, rusted pushed up by roots



Photo 1: MH 95 Rim and Casting



Photo 2: MH 95 Broken Rings and Cone



Photo 3: MH 95 Weathered Concrete



Photo 4: MH 95 Pushed up Casting and Broken Rings





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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	5/1/2023	8:45am	In woods North of golf course	4 wooden posts next to barbed wire fence
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
94	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	15.22' (Rim 1' above ground)	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 16.74'	Clock Pos: 12	Depth (Rim to Inv.) 16.53'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, windy, sunny <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input checked="" type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input checked="" type="checkbox"/> Gushing on N wall over inlet pipe <input type="checkbox"/> Roots <p>Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet</p>

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>build up on North wall</u>  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>leaking joint between barrel sections</u> Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	Steady stream of water gushing in and also running down N wall Steps in poor condition, RCP Riser in poor condition, buildup on walls Cone in poor condition Casting in okay condition, rusted





Photo 1: MH 94 Rim and Casting



Photo 2: MH 94 Casting and Cone



Photo 3: MH 94 Leaking Joint and buildup on wall



Photo 4: MH 94 Image Capture From 360° Camera Showing Leak





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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	5/1/2023	9:30am	Next to trees between 2 fairways	N end of golf course
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
93	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	19.56 (Rim 2.1' above ground)	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 21.07'	Clock Pos: 12	Depth (Rim to Inv.) 20.93'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, windy 22 mph, sunny 45° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain 12:00 position <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input checked="" type="checkbox"/> Roots <p>Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet</p>

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>build up on bottom step</u>  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe:  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	Steps in poor condition, RCP Riser in poor condition, buildup on walls Cone in poor condition Casting in okay condition, rusted





Photo 1: MH 93 Rim and Casting



Photo 2: MH 93 Casting and Cone



Photo 3: MH 93 Roots on Cone Section



Photo 4: MH 93 Image Capture from 360° Camera Showing Roots





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/1/2023	10:20am	Next to trees	North of Hole 12 tee box
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
92	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	19.54'	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 21.07'	Clock Pos: 12	Depth (Rim to Inv.) 21.19
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, windy 22 mph, sunny 48° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>lower barrel sections</b> <input checked="" type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input checked="" type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>build up under steps</u>  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe:  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	Steps in poor condition, RCP Riser in poor condition, buildup on walls Cone in poor condition Casting in okay condition, rusted





Photo 1: MH 92 Riser, Rim, and Casting



Photo 2: MH 92 Casting, Riser, and Cone



Photo 3: MH 92



Photo 4: MH 92 Image Capture from 360° Camera, showing buildup





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/1/2023	11:11am	West of Hole 14 green	South of hole 15 tee
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
91	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	18.31'	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 19.89'	Clock Pos: 12	Depth (Rim to Inv.) 19.78'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, windy 22 mph, sunny 49° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>lower barrel sections</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>Steps side</b> <input type="checkbox"/> Gushing <input checked="" type="checkbox"/> Roots Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench <b>Channel</b> Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	Steps in poor condition, RCP Riser in poor condition, buildup on walls Cone in poor condition Casting in okay condition, rusted





Photo 1: MH 91 Cover Behind 14th Green



Photo 2: MH 91 Casting, and Cone



Photo 3: MH 91



Photo 4: MH 91 Image Capture from 360° Camera, Showing Steps





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/1/2023	11:55am	In woods	4 wooden posts (West of 14th Fairway)
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
90	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	16.99'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 4:30	Depth (Rim to Inv.) 18.56'	Clock Pos: 12	Depth (Rim to Inv.) 18.14'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy 22 mph, sunny 51° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>lower barrel sections</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>Above inlet and outlet pipes</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input checked="" type="checkbox"/> Other <b>larger bottom barrel section</b>  Steps 9:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Next to outlet pipe</u> Component: Chimney Cone Wall Bench <b>Channel</b> Pipe Inlet / <b>Outlet</b>	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	Steps in poor condition, RCP Riser in okay condition, buildup on walls, Cone in okay condition Casting in okay condition, rusted





Photo 1: MH 90 Rim and Casting



Photo 2: MH 90 Rim and Casting



Photo 3: MH 90





Photo 4: MH 90 Image Capture from 360° Camera, Showing inlet pipe on left and outlet pipe on right



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651.292.4400  
tkda.com

# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/1/2023	1:35pm	Right side of 14th Fairway (East)	Flush with grass
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
89A	4' upper, Larger bottom section	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	16.84'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6:00	Depth (Rim to Inv.) 18.64'	Clock Pos: 11	Depth (Rim to Inv.) 18.65'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy 22 mph, sunny 53° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>lower barrel section</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>Across from steps</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

<b>MH Type</b>	<b>Evidence of Surchage</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input checked="" type="checkbox"/> Other <b>larger bottom barrel section</b>  Steps 9:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>under steps</u> Component: Chimney Cone Wall <b>Bench</b> Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	Steps in poor condition 2:30 position, RCP Riser in okay condition, buildup on walls, Cone in okay condition Casting in okay condition, rusted





Photo 1: MH 89A Cover (14th Fairway to the left)



Photo 2: MH 89A Rim and Casting



Photo 3: MH 89A





Photo 4: MH 89A Image Capture from 360° Camera, Showing inlet pipe and stained walls





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/1/2023	2:20pm	Left side of 14th tee (West)	Surrounded by tall grass
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
89	4' upper, Larger bottom section	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	17.26'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 7:30	Depth (Rim to Inv.) 19.44'	Clock Pos: 12:30	Depth (Rim to Inv.) 19.45'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy 22 mph, sunny 53° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>lower barrel section</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>Under steps</b> <input checked="" type="checkbox"/> Gushing <input type="checkbox"/> Roots Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input checked="" type="checkbox"/> Other <b>larger bottom barrel section</b>  Steps 4:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: _____ Component: <b>Chimney Cone Wall</b> <b>Bench</b> Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Concrete Spalling on wall above inlet pipe</u> Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet	Steps in poor condition, RCP Riser in poor condition, milky like substance on walls, Cone in okay condition Casting in okay condition, rusted



Photo 1: MH 89 Rim and Cover



Photo 2: MH 89 Rim and Casting



Photo 3: MH 89





Photo 4: MH 89 Image Capture from 360° Camera, Showing inlet pipe, concrete spalling and stained walls





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/1/2023	3:00pm	South side of 190th St	West of 5611 190th St
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
88 (Did Not Inspect)		<input type="checkbox"/> Brick <input type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other		_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#:	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#:	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, windy 22 mph, sunny 53° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Did not inspect. Per Homeowner there is no top structure here. Just a post with manhole on it. Could not locate with metal detector.





Photo 1: Manhole sign, but no top structure per homeowner





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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	5/2/2023	8:50am	In grassy field	South of 190th St, 3 wooden posts
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
87	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	15.79'	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6:00	Depth (Rim to Inv.) 17.30'	Clock Pos: 12:00	Depth (Rim to Inv.) 17.42'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, windy, sunny 43° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>At joint behind steps</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>under steps</u> Component: Chimney Cone <b>Wall Bench</b> Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Standing water around structure, grass was wet Steps in poor condition, RCP Riser in poor condition, milky like substance on walls, Cone in okay condition Casting in okay condition, rusted





Photo 1: MH 87 Posts



Photo 2: MH 87 Rim and Cover



Photo 3: MH 87



Photo 4: MH 87





Photo 5: MH 87 Image Capture from 360° Camera, Showing stained walls



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/2/2023	9:30am	In grassy field	SW of Grey house South of 190th St, 2 wooden posts (2 laying on the ground)
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
86	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	17.68'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6:00	Depth (Rim to Inv.) 19.61'	Clock Pos: 12:00	Depth (Rim to Inv.) 19.69'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy, sunny 46° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>At joint behind steps</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

	<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall <b>Bench</b> Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Steps in poor condition, RCP Riser in poor condition, milky like substance on walls, Cone in okay condition Casting in okay condition, rusted





Photo 1: MH 86 Posts



Photo 2: MH 86 Rim and Cover



Photo 3: MH 86 Casting



Photo 4: MH 86





Photo 5: MH 86 Image Capture from 360° Camera, Showing stained walls and dripping coming the steps



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/2/2023	10:00am	In woods (about 6')	South of grey house grass field
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
85	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	23.56'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6:00	Depth (Rim to Inv.) 25.18'	Clock Pos: 12:00	Depth (Rim to Inv.) 25.12'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy, sunny 49° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input checked="" type="checkbox"/> Weeping <b>on upper East Side</b> <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

	<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Steps in poor condition, RCP Riser in poor condition, milky like substance on walls, Cone in poor condition Casting in okay condition, rusted





Photo 1: MH 85 Posts



Photo 2: MH 85 Casting



Photo 3: MH 85 Cone



Photo 4: MH 85





Photo 5: MH 85 Image Capture from 360° Camera, Showing stained walls



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/2/2023	11:50am	In clearing in woods	4 wooden posts
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
84	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	23.23'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6:00	Depth (Rim to Inv.) 24.85'	Clock Pos: 12:00	Depth (Rim to Inv.) 24.84'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy, sunny 53° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>under steps at joint</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone <b>Wall</b> Bench Channel Pipe Inlet / Outlet

	<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover .5' above grade Steps in poor condition, RCP Riser in poor condition, milky like substance on walls, Cone in poor condition Casting in okay condition, rusted





Photo 1: MH 84 Cover and Casting



Photo 2: MH 84 Casting



Photo 3: MH 84 Cone



Photo 4: MH 84





Photo 5: MH 84 Image Capture from 360° Camera, Showing stained walls and weeping walls



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/2/2023	12:35pm	In clearing in woods	Surrounded by trees 4 wooden posts
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
83	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	23.88'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6:00	Depth (Rim to Inv.) 25.55'	Clock Pos: 12:00	Depth (Rim to Inv.) 25.55'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy, sunny 54° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <b>standing water to the West of the structure, but not at the structure when inspected</b> <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>under steps above cone/barrel joint</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots Component: Chimney <b>Cone Wall</b> Bench Channel Pipe Inlet / Outlet

	<b>MH Type</b>	<b>Evidence of Surcharge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover 2.07' above grade. Lots of sewer gas when cover removed Steps in poor condition, RCP Riser in poor condition, Cone in poor condition Casting in okay condition, rusted





Photo 1: MH 83 Cover and Casting



Photo 2: MH 83 Casting



Photo 3: MH 83 Cone



Photo 4: MH 83



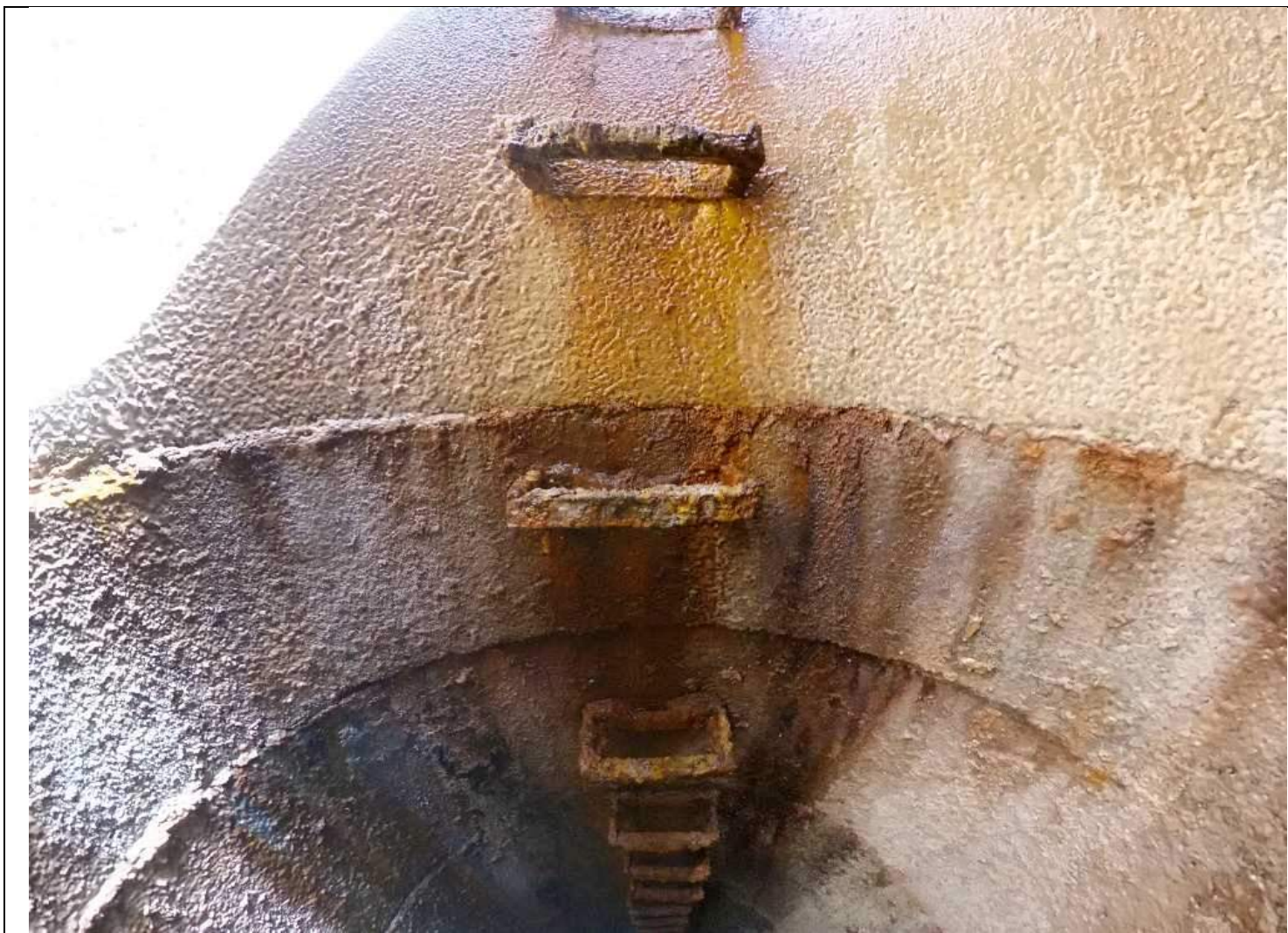


Photo 5: MH 83 Image Capture from 360° Camera, Showing stained walls and weeping walls





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/2/2023	1:20pm	In clearing in woods	4 wooden posts Barbed wire to the West
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
82	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	23.90'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6:00	Depth (Rim to Inv.) 25.56'	Clock Pos: 12:00	Depth (Rim to Inv.) 25.53'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, windy, sunny 55° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <b>standing water to the West of the structure, but not at the structure when inspected</b> <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <input checked="" type="checkbox"/> Gushing <b>Between barrel sections, heavy flow</b> <input type="checkbox"/> Roots Component: Chimney <b>Cone Wall</b> Bench Channel Pipe Inlet / Outlet

	<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover 1.86' above grade. Steps in poor condition, RCP Riser in poor condition and very weathered, Cone in poor condition Casting in okay condition, rusted.



Photo 1: MH 82 Cover and Casting



Photo 2: MH 82 Casting



Photo 3: MH 82 Cone



Photo 4: MH 82



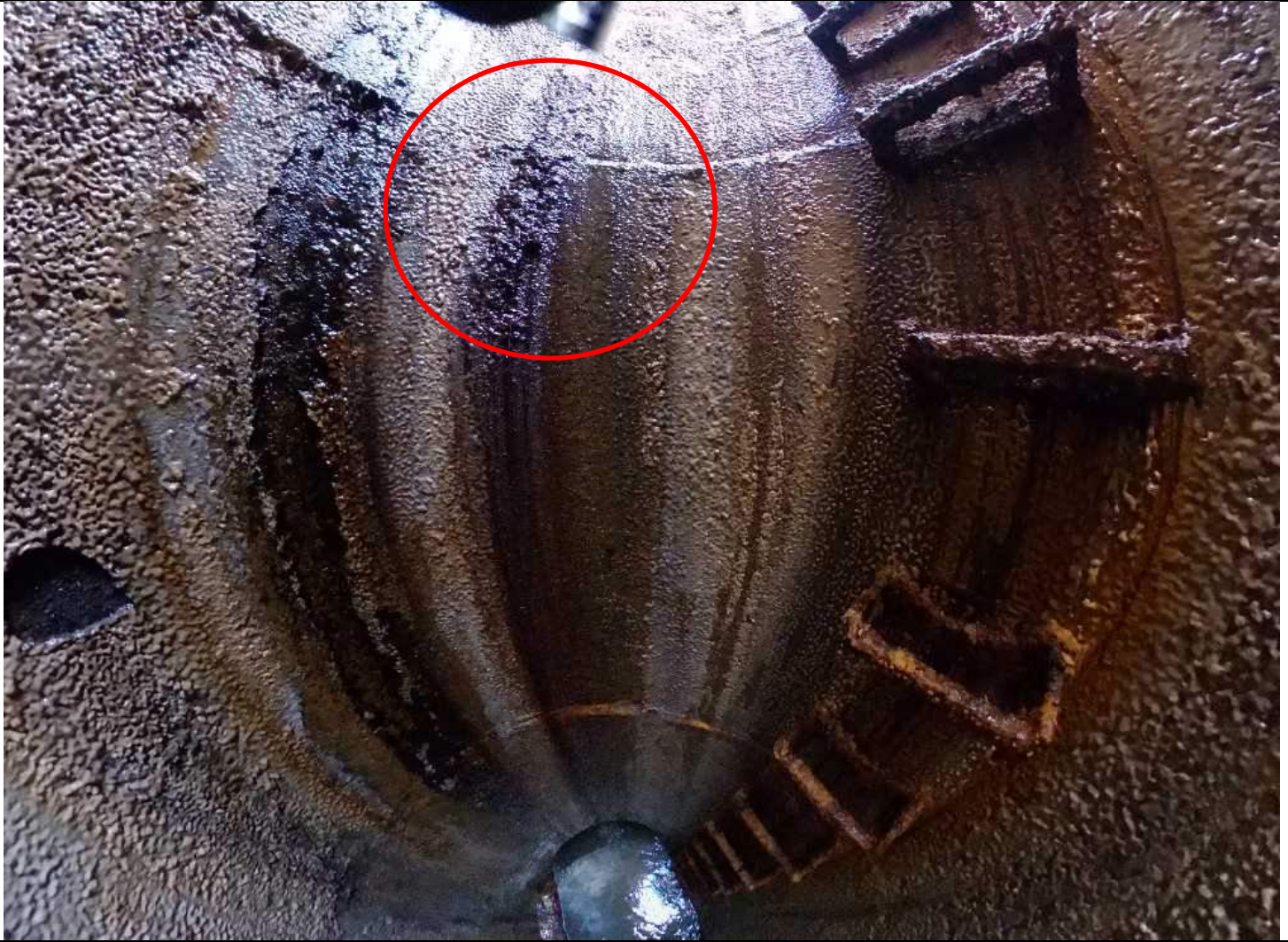


Photo 5: MH 82 Image Capture from 360° Camera, Showing stained, wet walls. The red circle shows where water is gushing is as infiltration



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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	5/3/2023	9:15am	In grassy area	4 wooden posts
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
81	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	22.82'	_____ through _____

Outlet Pipe	Influent Pipe 1
Clock Pos: 6:00      Depth (Rim to Inv.) 24.54'	Clock Pos: 12:00      Depth (Rim to Inv.) 24.68'
Pipe ID#:	Pipe ID#
Material/Size: Concrete 36"	Material/Size: Concrete 36"
Comments:	Comments:
Flow (% full): 0% <b>25%</b> 50% 75% 100%	Flow (% full): 0% <b>25%</b> 50% 75% 100%
Influent Pipe 2	Influent Pipe 3
Clock Pos:      Depth (Rim to Inv.)	Clock Pos:      Depth (Rim to Inv.)
Pipe ID#:	Pipe ID#
Material/Size:	Material/Size:
Comments:	Comments:
Flow (% full): 0% 25% 50% 75% 100%	Flow (% full): 0% 25% 50% 75% 100%

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, sunny 49° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input checked="" type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney <b>Cone Wall</b> Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 9:00 Clock Position	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>under</u> <u>steps</u> Component: Chimney Cone Wall <b>Bench</b> Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover 1.37' above grade. Steps in poor condition, RCP Riser in poor condition, Cone in poor condition Casting in okay condition, rusted.





Photo 1: MH 81 Cover and Casting



Photo 2: MH 81 Casting



Photo 3: MH 81 Cone



Photo 4: MH 81





Photo 5: MH 81 Image Capture from 360° Camera, Showing stained, wet walls.





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# MH ASSESSMENT FORM

Inspector(s):	Date:	Time:	Street:	Cross Street/House #
ME DP	5/3/2023	10:00am	In tall grassy area	4 wooden posts
MH ID#	MH Dia. (ft)	Material	Rim to Bench (ft):	Photo's
80	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	23.69'	_____ through _____

Outlet Pipe	Influent Pipe 1
Clock Pos: 6:00      Depth (Rim to Inv.) 25.32'	Clock Pos: 12:00      Depth (Rim to Inv.) 25.33'
Pipe ID#:	Pipe ID#
Material/Size: Concrete 36"	Material/Size: Concrete 36"
Comments:	Comments:
Flow (% full): 0% <b>25%</b> 50% 75% 100%	Flow (% full): 0% <b>25%</b> 50% 75% 100%
Influent Pipe 2	Influent Pipe 3
Clock Pos:      Depth (Rim to Inv.)	Clock Pos:      Depth (Rim to Inv.)
Pipe ID#:	Pipe ID#
Material/Size:	Material/Size:
Comments:	Comments:
Flow (% full): 0% 25% 50% 75% 100%	Flow (% full): 0% 25% 50% 75% 100%

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, sunny 57° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls, milky substance</b> <input checked="" type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney <b>Cone Wall</b> Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 9:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>across from steps</u> Component: Chimney Cone Wall <b>Bench</b> Channel <b>Pipe Inlet</b> / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover .87' above grade. Steps in poor condition, RCP Riser in poor condition, Cone in poor condition Casting in okay condition, rusted.





Photo 1: MH 80 Cover and Casting



Photo 2: MH 80 Casting



Photo 3: MH 80 Cone



Photo 4: MH 80





Photo 5: MH 80 Image Capture from 360° Camera, Showing stained, weathered concrete



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/3/2023	10:45am	Row of small trees	3 wooden posts 1 post laying on ground NW of tan pole shed
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
79	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	24.17'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6:00	Depth (Rim to Inv.) 25.92'	Clock Pos: 12:00	Depth (Rim to Inv.) 25.65'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% <b>25%</b> 50% 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, sunny 58° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <b>to the west of structure</b> <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>on steps side</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney <b>Cone Wall</b> Bench Channel Pipe Inlet / Outlet

	<b>MH Type</b>	<b>Evidence of Surchage</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 9:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover at grade. Steps in poor condition, RCP Riser in poor condition, Cone in poor condition Casting in okay condition, rusted.





Photo 1: MH 79 Wooden Posts



Photo 2: MH 79 Cover and Casting



Photo 3: MH 79 Cone



Photo 4: MH 79





Photo 5: MH 79 Image Capture from 360° Camera, Showing stained, milky like substance on walls





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/3/2023	11:30am	In woods	4 wooden posts West of brown house with long driveway
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
78	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	24.70'	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6:00	Depth (Rim to Inv.) 26.28'	Clock Pos: 12:00	Depth (Rim to Inv.) 25.26'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments:		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% <b>25%</b> 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, sunny 60° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input checked="" type="checkbox"/> Weeping <input checked="" type="checkbox"/> Dripping <b>on steps side and also above both pipes, higher up</b> <input type="checkbox"/> Gushing <input type="checkbox"/> Roots <p style="text-align: right;">Component: Chimney <b>Cone Wall</b> Bench Channel Pipe Inlet / Outlet</p>

	MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 3:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover .5' above grade. Steps in poor condition, RCP Riser in poor condition, Cone in poor condition Casting in okay condition, rusted.





Photo 1: MH 78 Cover and Casting



Photo 2: MH 78 Casting



Photo 3: MH 78 Cone



Photo 4: MH 78





Photo 5: MH 78 Image Capture from 360° Camera, Showing stained, wet and milky like substance on walls



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/4/2023	8:30am	Inside fence of LS 02 in grass	South of 180th Street
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
77A	4'	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	24.70'	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 4:00	Depth (Rim to Inv.) Could not measure	Clock Pos: 11:30	Depth (Rim to Inv.) 24.86'
Pipe ID#:		Pipe ID#	
Material/Size: Concrete 36"		Material/Size: Concrete 36"	
Comments: too far away from MH cover to measure		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos: 7:00	Depth 13.31' to top of pipe	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size: PVC 4" or 6"		Material/Size:	
Comments: Could not determine where it was coming from		Comments:	
Flow (% full): 0% <b>less than 25%</b> 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry, sunny 61° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheetting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <b>walls</b> <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney <b>Cone Wall</b> Bench Channel Pipe Inlet / Outlet

	<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
	<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other  Steps 9:00 Clock Position	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: <b>Chimney Cone Wall</b> Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Cover at grade. Steps in poor condition, RCP Riser in poor condition, Cone in poor condition Casting in okay condition, rusted.





Photo 1: MH 77A Cover and Casting



Photo 2: MH 77A PVC inlet pipe (unknown source)



Photo 3: MH 77A



Photo 4: MH 77A Looking North at 180th Street





Photo 5: MH 77A Image Capture from 360° Camera, showing unknown PVC pipe with a trap





Photo 6: MH 77A Casting



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
ME DP	5/4/2023	8:00am	180th Street	NW of Lift Station 02
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
77 (Did Not Inspect)		<input type="checkbox"/> Brick <input type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other		_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#:	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#:	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry, sunny 61° <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Did not inspect. Buried under 6" of gravel per MCES Operator. The road has been built up with more gravel.



## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report



**Photo 1** – MH 78 Cone Section Wall Condition – Growth Removed



**Photo 2** – MH 78 Steps

## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 3 – MH 78 Rings**



**Photo 4 – MH 80 Top Riser Section Wall Condition – Growth Removed**



## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 5 – MH 80 Steps**



**Photo 6 – MH 80 Wall Condition**

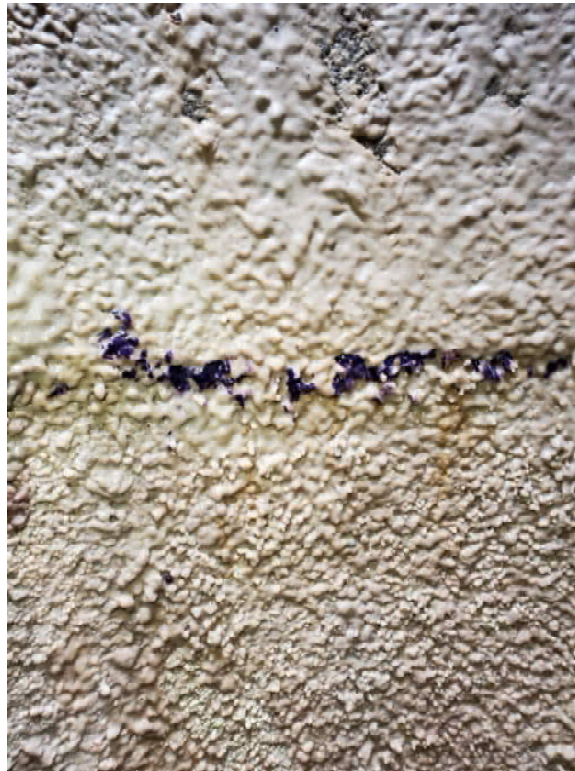


## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 7 – MH 80 Growth at Riser Joint**



**Photo 8 – MH 80 Wall Condition at Riser Joint – Growth Removed**



## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 9 – MH 80 Mineral Buildup**



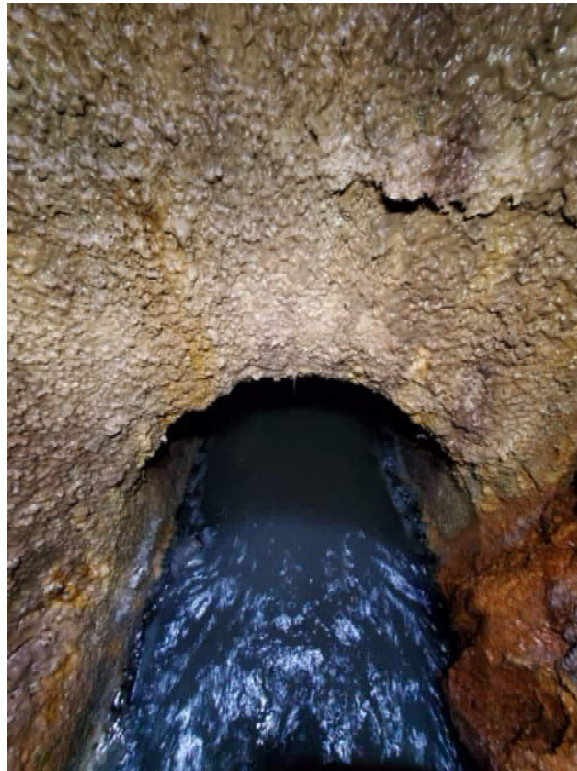
**Photo 10 – Interceptor Pipe Looking North at MH 80**

## **Appendix B – Maintenance Hole Physical Inspection Photographs**

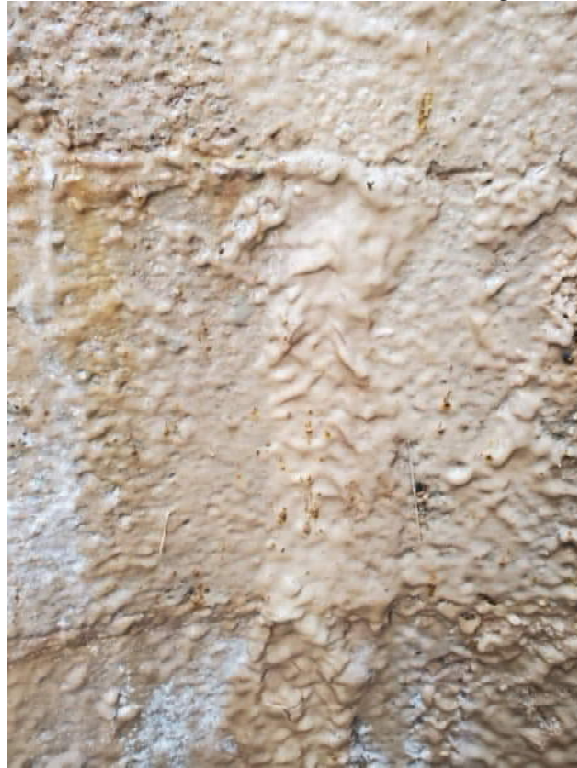
Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 11 – MH 80 Bottom Section Looking South**



**Photo 12 – MH 89 Wall Condition**



## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 13 – MH 89 Wall Condition – Growth Removed**



**Photo 14 – MH 89 Wall Condition - Exposed Rebar**

## **Appendix B – Maintenance Hole Physical Inspection Photographs**

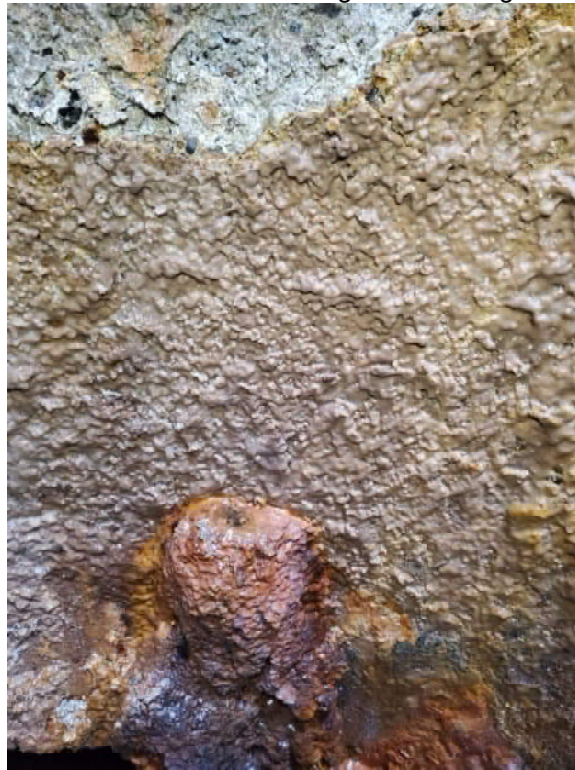
Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 15 – MH 89 Doghouse Ceiling**



**Photo 16 – MH 89 Wall Condition**



## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 17 – MH 92 Wall Condition**



**Photo 18 – MH 92 Wall Condition at Interceptor Pipe**



## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 19** – Interceptor Pipe Looking North at MH 92



**Photo 20** – MH 98 Steps

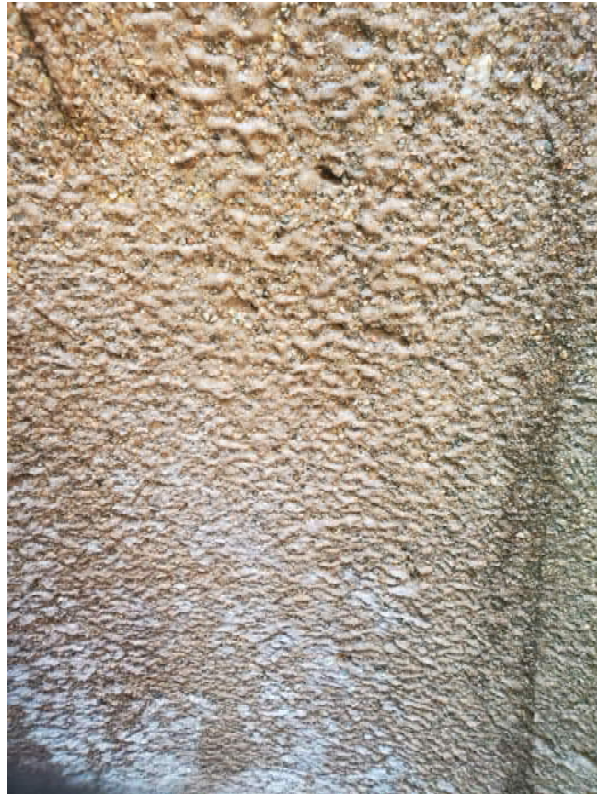


## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 21 – MH 98 Wall Condition**



**Photo 22 – MH 98 Wall Condition – Growth Removed**



## **Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

5/25/2023



**Photo 23 – MH 98 Infiltration Buildup**



**Photo 24 – MH 98 Wall Condition at Interceptor Pipe**



**Appendix B – Maintenance Hole Physical Inspection Photographs**

Forest Lake Interceptor 7029

Analysis and Field Inspection Report

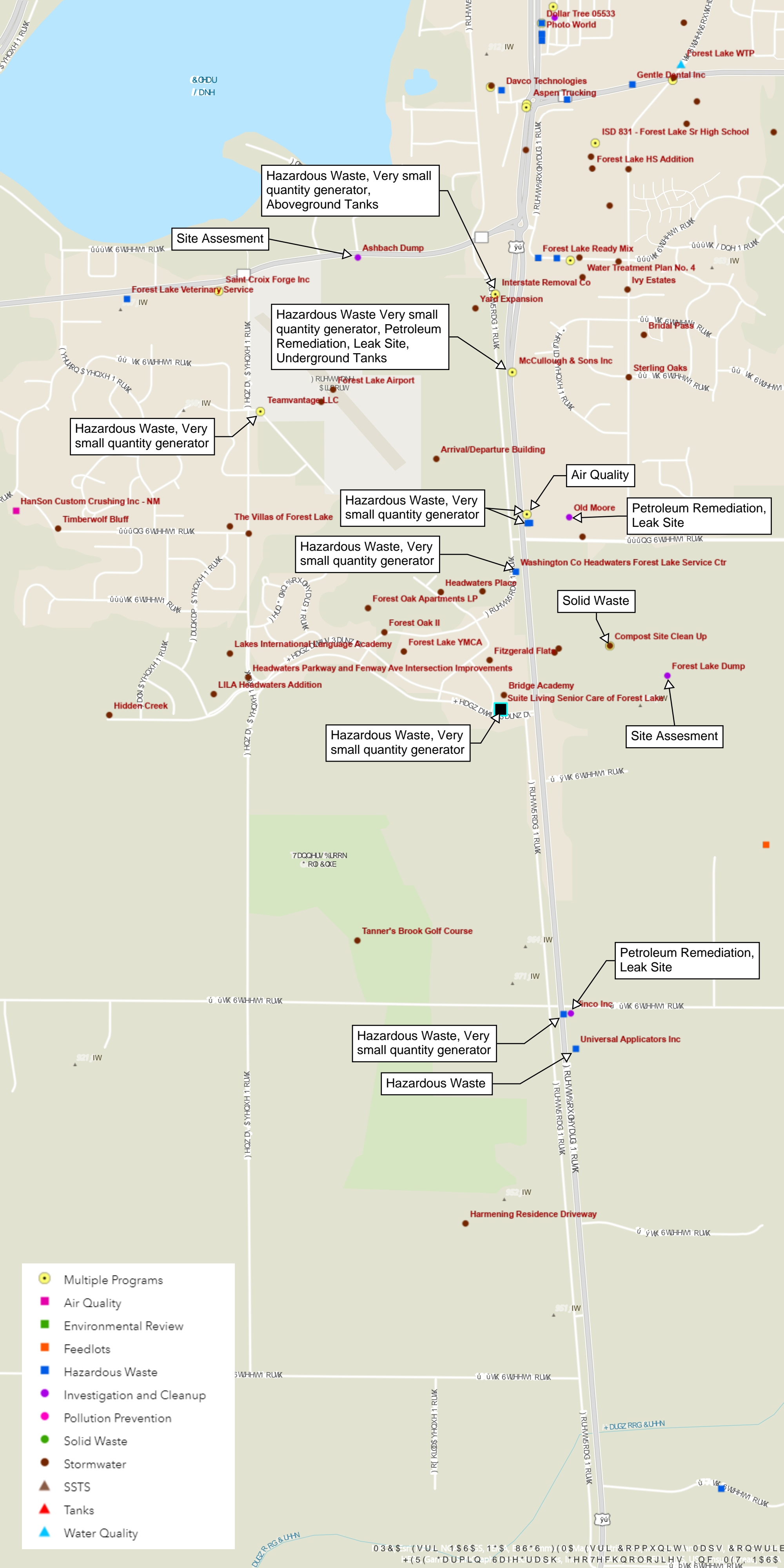
5/25/2023



**Photo 25 – MH 98 Bench**



**Photo 26 – Interceptor Pipe Looking South at MH 98**



Multiple Programs

Air Quality

Environmental Review

Feedlots

Hazardous Waste

Investigation and Cleanup

Pollution Prevention

Solid Waste

Stormwater

SSTS

Tanks

Water Quality



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Silver Spring Metro Center  
1315 East-West Highway  
Silver Spring, Maryland 20910  
(301) 713-3191

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If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1- 877- FEMA MAP** (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/business/nfip>.



 SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.


ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that has subsequently determined. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); No Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.


 FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS	
<b>ZONE X</b>	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS	
<b>ZONE X</b>	Areas determined to be outside the 0.2% annual chance floodplain.
<b>ZONE D</b>	Areas in which flood hazards are undetermined, but possible.

 COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

 OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

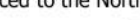
Base Flood Elevation line and value; elevation in feet\*


Base Flood Elevation value where uniform within zone; elevation in feet\*

513

(EL 987)


\*Referenced to the North American Vertical Datum of 1988

 Cross section line


 Transect line

45° 02' 08", 93° 02' 12"

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

 1000-meter Universal Transverse Mercator grid values, zone 15

Bench mark (see explanation in Notes to Users section of this FIRM panel)

 M1.5

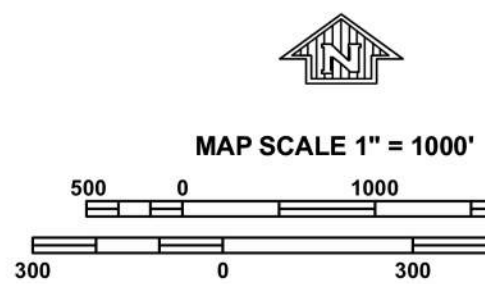
MAP REPOSITORIES  
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE  
FLOOD INSURANCE RATE MAP  
FEBRUARY 3, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



**PANEL 0040E**

## FIRM

## FLOOD INSURANCE RATE MAP

**WASHINGTON COUNTY,  
MINNESOTA  
AND INCORPORATED AREAS**

PANEL 40 OF 456

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

<u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUF</u>
FOREST LAKE, CITY OF	270693	0040	

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER

27163C0040

EFFECTIVE DATE:

**Federal Emergency Management Agen**



NOTES TO USERS

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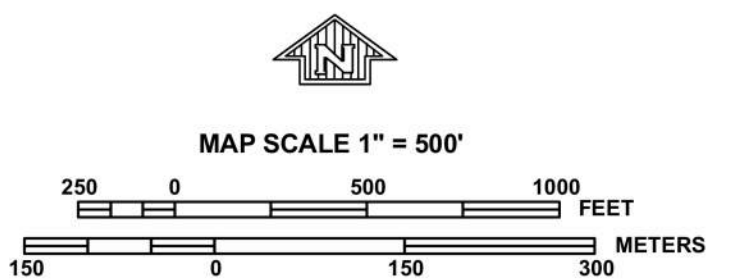
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LEGEND

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- (EL 987)
- \*Referenced to the North American Vertical Datum of 1988
- MAP REPOSITORIES**
- Refer to listing of Map Repositories on Map Index
- EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**
- FEBRUARY 3, 2010
- EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL**
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**NATIONAL FLOOD INSURANCE PROGRAM**

**PANEL 0126E**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**WASHINGTON COUNTY, MINNESOTA AND INCORPORATED AREAS**

**PANEL 126 OF 456**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

COMMUNITY	NUMBER	PANEL	SUFFIX
FOREST LAKE, CITY OF	270693	0126	E

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**MAP NUMBER**  
27163C0126E

**EFFECTIVE DATE**  
FEBRUARY 3, 2010

**Federal Emergency Management Agency**



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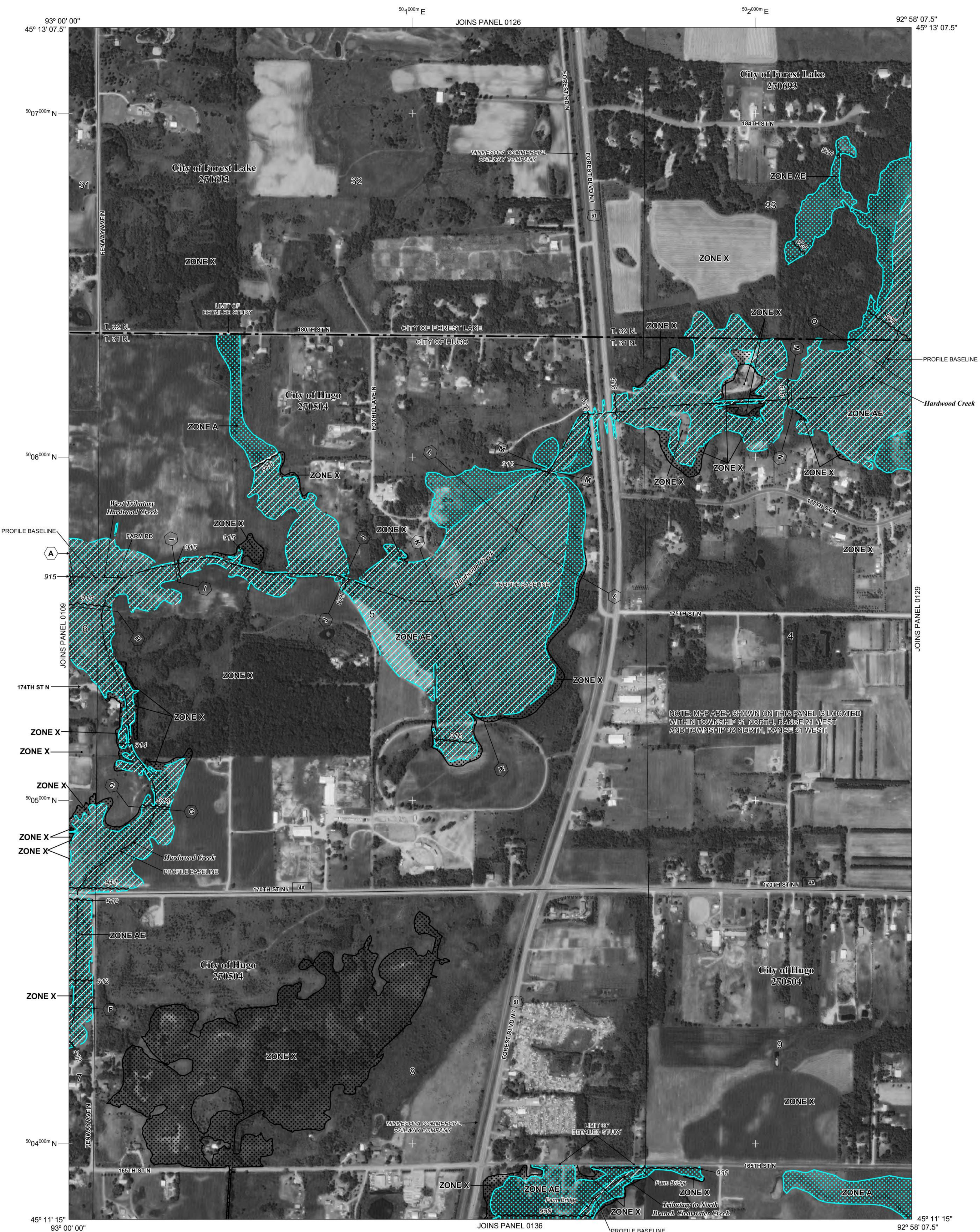
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**OTHER FLOOD AREAS**

**ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

**OTHER AREAS**

**ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.

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**COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS**

**OTHERWISE PROTECTED AREAS (OPAs)**

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- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
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- Base Flood Elevation line and value; elevation in feet\*
- Base Flood Elevation value where uniform within zone; elevation in feet\*

\*Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 15
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- ML5510
- M1.5
- River Mile

**MAP REPOSITORIES**  
Refer to listing of Map Repositories on Map Index

**EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP**  
FEBRUARY 3, 2010

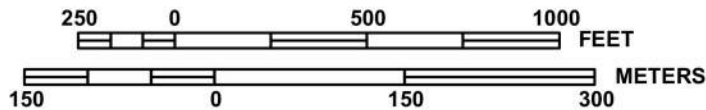
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**MAP SCALE 1" = 500'**



**NFIP**

**NATIONAL FLOOD INSURANCE PROGRAM**

**PANEL 0128E**

**FIRM**

**FLOOD INSURANCE RATE MAP**

**WASHINGTON COUNTY, MINNESOTA AND INCORPORATED AREAS**

**PANEL 128 OF 456**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

COMMUNITY	NUMBER	PANEL	SUFFIX
FOREST LAKE, CITY OF	270693	0128	E
HUGO, CITY OF	270504	0128	E

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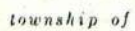


**MAP NUMBER**  
**27163C0128E**  
**EFFECTIVE DATE**  
**FEBRUARY 3, 2010**

**Federal Emergency Management Agency**



## SOIL TEST BORINGS



WASHINGTON CO





# Soil Exploration Company

JOB NO. 15931 VERTICAL SCALE 1" = 4' LOG OF TEST BORING NO. 33  
 PROJECT FOREST LAKE INTERCEPTOR SEWER Sta. 388+50 400' Left

DEPTH IN FEET	DESCRIPTION OF MATERIAL ↓ SURFACE ELEVATION <u>924'</u>	GEOLOGIC ORIGIN	N	WL	SAMPLE		LABORATORY TESTS			
					NO.	TYPE	W	D	L.L. P.L.	Qu
1½	LEAN CLAY, a trace of gravel, black, soft (CL-OL)	TOPSOIL			1	FA				
	SANDY CLAY, a little gravel, brown and brownish gray mottled, medium (CL)	TILL			2	FA				
6	SANDY CLAY, a little gravel, grayish brown, rather stiff (CL)				3	FA				
10	SANDY CLAY, a little gravel, gray, medium to rather stiff (CL)				4	FA				
					5	FA				
					6	FA				
					7	FA				
					8	FA				
31	End of Boring									

WATER LEVEL MEASUREMENTS							START	11-16-70	COMPLETE	11-16-70	
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL	METHOD 6FA 0 - 31'		@ 10:30		
11-16	10:30	31'		29½'	to	None					
					to						
					to						
					to						
							CREW CHIEF Hegland				



# Soil Exploration Company

JOB NO. 15931

VERTICAL SCALE 1" = 4'

LOG OF TEST BORING NO. 36

PROJECT FOREST LAKE INTERCEPTOR SEWER

Sta. 44+30

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N	WL	SAMPLE		LABORATORY TESTS			
					NO.	TYPE	W	D	L.L. P.L.	Qu
	<div style="border-bottom: 1px solid black; padding-bottom: 5px;">                     SURFACE ELEVATION 918'                 </div>									
1	LEAN CLAY, a trace of gravel, black soft (CL-OL)	TOPSOIL			1	FA				
	SANDY CLAY, a little gravel, brown, soft (CL)	TILL			2	FA				
4										
	SANDY CLAY, a little gravel, grayish brown, medium (CL)				3	FA				
					4	FA				
11					5	FA				
	SANDY CLAY, a little gravel, gray, medium to stiff (CL)				6	FA				
					7	FA				
					8	FA				
					9	FA				
32	*Note: Water level may rise higher than shown. Additional rechecks would be required for verification.									
	End of Boring									

WATER LEVEL MEASUREMENTS							START	11-16-70	COMPLETE	11-16-70
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL	METHOD	6FA	0 - 32'	@ 12:00
11-16	12:00	32'		32'	to	31'				
11-16	12:40	32'		31½'	to	28'*				
					to					
					to					
CREW CHIEF							Hegland			



# Soil Exploration Company

JOB NO. 15931 VERTICAL SCALE 1" = 4' LOG OF TEST BORING NO. 38  
 PROJECT FOREST LAKE INTERCEPTOR SEWER Sta. 471+80

DEPTH IN FEET	DESCRIPTION OF MATERIAL ↓ SURFACE ELEVATION <u>912'</u>	GEOLOGIC ORIGIN	N	WL	SAMPLE		LABORATORY TESTS			
					NO.	TYPE	W	D	L.L. P.L.	Qu
1	SANDY CLAY, a trace of gravel, dark grayish brown, soft (CL)	TOPSOIL			1	FA				
	LEAN CLAY, a little gravel, grayish brown, soft (CL)	TILL			2	FA				
					3	FA				
4	SANDY CLAY, a little gravel, brown, medium (CL)									
					4	FA				
8	CLAYEY SAND, a little gravel, brown, medium, a few lenses of waterbearing sand (SC)				5	FA				
12	End of Boring									

WATER LEVEL MEASUREMENTS							START	COMPLETE
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL		
11-16	11:20	12'		11½'	to	11'	METHOD 6FA 0 - 12'	@ 11:20
11-16	1:15	12'		10'	to	6'		
					to			
					to			
CREW CHIEF Hegland								



# Soil Exploration Company

JOB NO. 15931 VERTICAL SCALE 1" = 4' LOG OF TEST BORING NO. 40  
 PROJECT FOREST LAKE INTERCEPTOR SEWER Sta. 515+10

DEPTH IN FEET	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N	WL	SAMPLE		LABORATORY TESTS			
					NO.	TYPE	W	D	L.L. P.L.	Qu
	↓ SURFACE ELEVATION <u>929'</u>									
1	FILL, mixture of SILTY SAND and SANDY CLAY, a little gravel, grayish brown	FILL			1	FA				
	SAND, fine to medium grained, a little gravel, brown, moist (SP-SM)	ALLUVIUM			2	FA				
6										
8	SANDY CLAY, a little gravel, brown, medium (CL)	TILL			3	FA				
	SILTY SAND, a little gravel, brown, moist (SM)				4	FA				
10										
	CLAYEY SAND, a little gravel, brown, medium (SC)				5	FA				
14										
	SANDY CLAY, a little gravel, gray, rather stiff, some lenses of water-bearing sand below 17' (CL)				6	FA				
26										
	End of Boring									

WATER LEVEL MEASUREMENTS							START	COMPLETE
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL	10-28-70	10-28-70
10-28	1:45	26'		17'	to	16½'	METHOD 6FA 0 - 26'	@ 1:45
					to			
					to			
					to			
CREW CHIEF Nelson								



# Soil Exploration Company

JOB NO. 15931 VERTICAL SCALE 1" = 4' LOG OF TEST BORING NO. 42  
 PROJECT FOREST LAKE INTERCEPTOR SEWER Sta. 545+50

DEPTH IN FEET	DESCRIPTION OF MATERIAL ↓ SURFACE ELEVATION <u>902'</u>	GEOLOGIC ORIGIN	N	WL	SAMPLE		LABORATORY TESTS			
					NO.	TYPE	W	D	L.L. P.L.	Qu
4	FILL, mixture of SAND, SILTY SAND and SANDY CLAY, a little gravel, brown and dark brown	FILL			1	FA				
	ORGANIC SILTY CLAY, black, soft, lenses of waterbearing sand (OL)	SWAMP DEPOSIT			2	FA				
7½	SILTY SAND, gray, wet (SM)				3	FA				
9	Samples not suitable for accurate classification.  (May be muck with lenses of silty sand and waterbearing sand)				4	FA				
					5	FA				
17	SANDY CLAY, a little gravel, brownish gray, medium (CL)	TILL			6	FA				
21	CLAYEY SAND, a little gravel, gray, medium, lenses of waterbearing sand (SC)				7	FA				
24	End of Boring									

## WATER LEVEL MEASUREMENTS

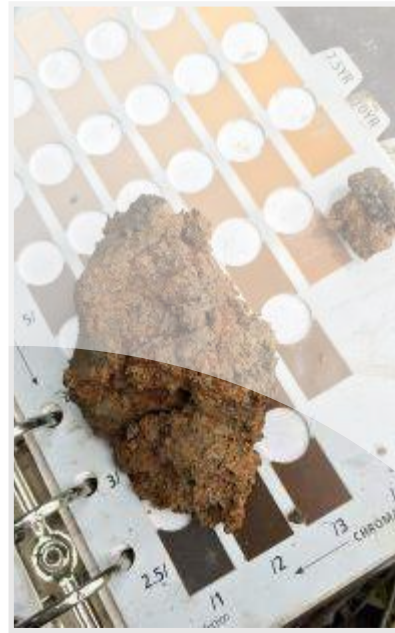
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED DEPTHS	WATER LEVEL
10-28	11:55	24'		13'	to	4½'
10-28	1:20	24'		8½'	to	3½'
					to	
					to	

START 10-28-70 COMPLETE 10-28-70

METHOD 6FA 0 - 24' @ 11:55

CREW CHIEF Nelson





## WETLAND INVESTIGATION

### METROPOLITAN COUNCIL ENVIRONMENTAL SERVICES SANITARY SEWER INTERCEPTOR

FOREST LAKE, MINNESOTA

NOVEMBER 17, 2023  
AE JOB NO. 17628



# ANDERSON

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[ae-mn.com](http://ae-mn.com)



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Appendix B	ROUTINE ON-SITE DETERMINATION METHOD DATASHEETS
Appendix C	ANTECEDENT PRECIPITATION RECORD
Appendix D	CREDENTIALS



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## EXECUTIVE SUMMARY

Anderson Engineering of Minnesota, LLC was retained to provide professional wetland services using the 1987 United States Army Corps of Engineers Wetland Delineation Manual (Technical Report Y-87-1; January 1987) and all supplemental guidance documents to identify areas meeting wetland criteria starting south of Scandia Trail North (45.21079, -92.99373) to 202nd Street North (45.24310, -92.99416) located in Forest Lake, Washington County, Minnesota. This project area is in Sections 20, 29 and 32, Township 32 North, Range 21 West.

Delineated aquatic resources or, portions thereof, were identified and delineated within the project area and summarized in Table 1 and depicted in Appendix A, Figure 5.

*Table 1. Summary of delineated aquatic resources, corresponding sizes, and wetland type classifications.*

RESOURCE	RESOURCE TYPE	APPROXIMATE SIZE <sup>1</sup>	RESOURCE TYPE CLASSIFICATION		
			CIRCULAR 39	COWARDIN	EGGERS & REED
1	Wetland	0.02 Ac	Type 1	PEM1Ad	Seasonally Flooded Basin
2	Wetland	0.06 Ac	Type 1	PFO1A	Floodplain Forest
3	Wetland	0.05 Ac	Type 1	PEM1Ad	Seasonally Flooded Basin
4	Wetland	0.01 Ac	Type 1	PEM1Ad	Seasonally Flooded Basin
5	Wetland	0.11 Ac	Type 1	PEM1Ad	Seasonally Flooded Basin
6	Wetland	0.05 Ac	Type 1/3	PEM1C/A	Seasonally Flooded Basin/Shallow Marsh
7	Wetland	4.62 Ac	Type 1/3/6	PEM1C/SS1/FO1/Af	Seasonally Flooded Basin/Floodplain Forest/Shallow Marsh/Shrub-Carr
8	Wetland	0.11 Ac	Type 1	PEM1Ad	Seasonally Flooded Basin
9	Wetland	0.04 Ac	Type 6	PSS1A	Shrub-Carr
10	Wetland	0.02 Ac	Type 1	PFO1A	Floodplain Forest
11	Wetland	0.49 Ac	Type 1/3	PEM1C/A	Seasonally Flooded Basin/Floodplain Forest/Shallow Marsh
12	Wetland	0.48 Ac	Type 1/3	PEM1C/A	Seasonally Flooded Basin/Shallow Marsh
13	Wetland	0.08 Ac	Type 1	PEM1A	Seasonally Flooded Basin
14	Wetland	0.39 Ac	Type 3	PEM1Cx	Shallow Marsh
15	Wetland	0.03 Ac	Type 1/2	PEM1B/Ad	Seasonally Flooded Basin/Fresh Wet Meadow
16	Wetland	0.02 Ac	Type 1/2	PEM1B/Ad	Seasonally Flooded Basin/Fresh Wet Meadow
17	Wetland	0.33 Ac	Type 3/4/6	PABH/EM1C/SS1A	Shallow Marsh/Deep Marsh/Shrub-Carr
18	Wetland	0.14 Ac	Type 1	PFO1A	Floodplain Forest



19	Wetland	0.47 Ac	Type 1	PFO1A	Floodplain Forest
20	Wetland	0.26 Ac	Type 1	PEM1Af	Seasonally Flooded Basin
21	Wetland	0.22 Ac	Type 1	PEM1Af	Seasonally Flooded Basin
22	Wetland	0.13 Ac	Type 1	PEM1A	Seasonally Flooded Basin
23	Wetland	0.55 Ac	Type 1	PEM1Af	Seasonally Flooded Basin
24	Wetland	0.01 Ac	Type 1	PEM1Ax	Seasonally Flooded Basin
25	Wetland	0.58 Ac	Type 3	PEM1Cx	Shallow Marsh
26	Wetland	3.68 Ac	Type 1/3/5	PABH/EM1C/Ax	Seasonally Flooded Basin/Shallow Marsh/Open Water
27	Wetland	0.22 Ac	Type 5	PUBHx	Open Water
28	Wetland	0.32 Ac	Type 5	PUBHx	Open Water



## **BACKGROUND**

As requested by TKDA, Anderson Engineering of Minnesota, LLC completed a wetland investigation at Washington County starting south of Scandia Trail North (45.21079, -92.99373) to 202nd Street North (45.24310, -92.99416) located in Forest Lake, Washington County, Minnesota (Appendix A, Figure 1). This project area is in Sections 20, 29 and 32, Township 32 North, Range 21 West.

The wetland delineation was completed in accordance with the 1987 United States Army Corps of Engineers Wetland Delineation Manual and the published regional supplement to the Army Corps Wetland Delineation Manual, North central northeast Regional Supplement.

The purpose of this study was to identify areas meeting the technical criteria for wetlands, delineate the jurisdictional extent of the wetland basins, and classify the wetland habitats in the project area.

Fieldwork for this site investigation was completed by Dylan Kruzel and Garrett Wee, on October 12 and October 19, 2023. The weather was cloudy both days and approximately 50 degrees Fahrenheit.

## **METHODOLOGY**

U.S. Geologic Service 7.5" Topographic Quadrangle maps, U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps, Minnesota Department of Natural Resources Public Water Inventory (PWI) maps, U.S. Department of Agriculture Natural Resources Conservation Service Soil Survey, and available aerial photographs were consulted to initially locate potential wetland habitats.

Routine On-site Determination Method was used during this investigation. In this method, the following procedures were used:

1. The vegetative community was sampled in all present strata to determine whether it met hydrophytic vegetation criteria based on the indicators identified in the North central northeast Regional Supplement.
2. Soil pits were dug using a Dutch auger to depths of twenty-four to forty-two inches. The soil profile was noted in addition to any hydric soil characteristics.
3. Signs of wetland hydrology were noted and compared to field criteria such as depth to shallow water table and depth of soil saturation found in the soil pits.

Data from sample points were recorded on Army Corps of Engineers North central northeast Region Wetland Determination Data Forms (Appendix B). At least one sample point transect crosses the delineated wetland edge. This transect consists of an upland sample point and a wetland sample point. Other sample points may be in areas which have one or more other wetland criteria present; where questionable conditions exist; or to verify the absence of wetland criteria. Photographs of each resource is included in the resource review summary pages.

Sample points were marked in the field with orange flags. The identified aquatic resource was marked with sequentially numbered pink flags. All sample points and the delineated aquatic resource extent were located using a Trimble Geo XH sub-meter GPS unit.

## RESOURCE REVIEW

The below described data were reviewed as part of the aquatic resource field delineation. A summary of each resource contained within the project area follows.

### NATIONAL WETLANDS INVENTORY

The National Wetlands Inventory identifies nine PEM1A, five PEM1C, four PUBHx, two PEM1F, and one PUBFx, PFO1/EM1C, PSS1/EM1C, and R2UBFx in the project area (Appendix A, Figure 2).

### USDA – NATURAL RESOURCES CONSERVATION SERVICE SOIL SURVEY

Soil survey data for Washington County was obtained and reviewed prior to the delineation. Table 2 provides a list of the mapped soils in the project area. Figure 3 in Appendix A depicts USDA Natural Resources Conservation Service mapped soils within the project categorized by total percentage of hydric components.

Table 2. Summary of mapped soil units in the project area.

MAP UNIT SYMBOL	MAP UNIT NAME	HYDRIC STATUS	HYDRIC RATING	DRAINAGE CLASSIFICATION	PERCENT COVER
123	Dundas fine sandy loam	Non-Hydric Soil Unit	95%	Poorly drained	61%
75	Bluffton loam	Hydric Soil Unit	100%	Very poorly drained	20%
225	Nessel fine sandy loam, 1 to 4 percent slopes	Non-Hydric Soil Unit	3%	Moderately well drained	7%
113	Webster loam	Hydric Soil Unit	100%	Poorly drained	5%
544	Cathro muck	Hydric Soil Unit	97%	Very poorly drained	3%
1055	Aquolls and Histosols, ponded	Hydric Soil Unit	100%	Very poorly drained	2%
169B	Braham loamy fine sand, 1 to 6 percent slopes	Non-Hydric Soil Unit	7%	Well drained	2%

Hydric soils are defined in the *Field Indicators of Hydric Soils in the United States: Guide for Identifying and Delineating Hydric Soils, version 8.2, 2018*; *The 1987 United States Army Corps of Engineers Wetlands Delineation Manual*; and *The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North central Northeast Region (Version 2.0)*.

### MINNESOTA DEPARTMENT OF NATURAL RESOURCES PUBLIC WATER INVENTORY

The Minnesota Department of Natural Resources Public Water Inventory for Washington County does not identify public water in the project extent (Appendix A, Figure 4).

### 30-DAY ROLLING PRECIPITATION DATA

A review of the 30-day rolling precipitation data collected from the University of Minnesota Climatology Working Group (Appendix C) indicates that precipitation totals for the weeks prior to the site visit were above the range of average in the general project area. The overall hydrologic conditions were suitable for completing an accurate wetland determination and boundary delineation.



## RESOURCE 1

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing Southeast | Moderate Transition to Wetland

Wetland	RESOURCE TYPE
0.02-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Ad	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Acer negundo</i>	Boxelder
<i>Sambucus nigra</i>	Black elderberry
<i>Cornus alba</i>	Red osier
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Circaea alpina</i>	Small enchanter's nightshade
<i>Vitis riparia</i>	River-bank grape
<b>HYDRIC SOIL INDICATORS</b>	
Sandy Redox	S5
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Drainage Patterns	B10
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Cathro muck, 97% (258)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type connected to resource 3 to the north via a culvert. The resource receives hydrology via overland flow and surface flow from resource 3. Overall, the resource was delineated based on a lack of wetland hydrology forming a moderate boundary in most areas. Upland vegetation communities are generally dominated by smooth brome ( <i>Bromus inermis</i> ), reed canary, common burdock ( <i>Arctium minus</i> ), black elderberry and boxelder.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was well above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is not consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 1A  
Up Point(s): 1B

## RESOURCE 2

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing West | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.06-Acre	TOTAL AREA WITHIN ECB
Floodplain Forest	EGGERS & REED
Type 1	CIRCULAR 39
PFO1A	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Ulmus americana</i>	American elm
<i>Rhamnus cathartica</i>	European buckthorn
<i>Acer negundo</i>	Box elder
<i>Vitis riparia</i>	River-bank grape
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
Redox Dark Surface	F6
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Sparsely Vegetated Concave Surface	B8
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type as an isolated basin generally containing bare ground in a mature forest. The resource receives hydrology via overland flow and appears to only receive hydrology seasonally. Overall, the resource was delineated based on a lack of wetland hydrology forming a gradual boundary in most areas. Upland tree vegetation communities are generally green ash and eastern cottonwood ( <i>Populus deltoides</i> ); however, the understory of most areas is sparsely vegetated with FAC-FACU species.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was well above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is not consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 2A  
Up Point(s): 2B



# RESOURCE 3

FIELD DELINEATED 10/12/2023

## FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.05-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Ad	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Populus deltoides</i> <i>Fraxinus pennsylvanica</i>	Eastern cottonwood Green Ash
HYDRIC SOIL INDICATORS	
Redox Dark Surface	F6
WETLAND HYDROLOGY DETERMINATION	
Sparsely Vegetated Concave Surface	B8
Water-Stained Leaves	B9
Drainage Patterns	B10
Geomorphic Position	D2
FAC-Neutral Test	D5

## DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

## DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type generally containing bare ground. The resource contributes hydrology to resource 1 to the south via a culvert under the road. The resource receives hydrology via overland flow and lateral flow from resource 4 via a culvert. Overall, the resource was delineated based on a lack of hydric soil profile and a lack of wetland hydrology forming an abrupt boundary in most areas. Upland vegetation communities are generally dominated by quaking aspen ( <i>Populus tremuloides</i> ), green ash, eastern cottonwood, European buckthorn, and toothache tree ( <i>Zanthoxylum Americanum</i> ).
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition. The investigated soil profile at 3B revealed a restrictive layer, but the profile was determined non-hydric based on an absence of a wetland hydrology and located in a mapped non-hydric soil unit.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 3A  
Up Point(s): 3B

## RESOURCE 4

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing Southeast | Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.01-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Ad	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Cornus racemosa</i>	Gray dogwood
<i>Vitis riparia</i>	River-bank grape
<b>HYDRIC SOIL INDICATORS</b>	
Redox Dark Surface	F6
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Sparsely Vegetated Concave Surface	B8
Water-Stained Leaves	B9
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type generally containing bare ground. The resource contributes hydrology to resource 3 to the west via a culvert. The resource receives hydrology via overland flow and the continuation of the drainage system offsite. Overall, the resource was delineated based on a lack of wetland hydrology forming an abrupt boundary in most areas. Upland vegetation communities are generally dominated by silver maple ( <i>Acer saccharinum</i> ), European buckthorn, smooth goldenrod ( <i>Solidago gigantea</i> ) and northern meadow sedge ( <i>Carex praticola</i> ).
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 4A  
Up Point(s): 4B



## RESOURCE 5

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing West | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.11-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Ad	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Phalaris arundinacea</i>	Reed canary grass
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
Redox Dark Surface	F6
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type connected and is part of a larger wetland complex that continues to the west outside the Environmental Clearance Boundary (ECB). The resource receives hydrology via overland flow and discharges to the west. Overall, the resource was delineated based on a lack of wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by green ash, peachleaf willow ( <i>Salix amygdaloides</i> ), European buckthorn, toothache tree, American elm, common red raspberry ( <i>Rubus idaeus</i> ) and river-bank grape.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 5A  
Up Point(s): 5B

## RESOURCE 6

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing Northwest | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.05-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin/Shallow Marsh	EGGERS & REED
Type 1/3	CIRCULAR 39
PEM1C/A	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Rhamnus cathartica</i>	European buckthorn
<i>Populus tremuloides</i>	Quaking aspen
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Solidago gigantea</i>	Smooth goldenrod
<i>Phalaris arundinacea</i>	Reed canary grass
<b>HYDRIC SOIL INDICATORS</b>	
Thick Dark Surface	A12
Redox Dark Surface	F6
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types and is part of a larger wetland complex that continues to the west outside the ECB. The resource receives hydrology via overland flow and discharges to the west. Overall, the resource was delineated based on a lack of wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by quaking aspen, European buckthorn, smooth goldenrod, Canada goldenrod ( <i>Solidago altissima</i> ) and reed canary grass.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 6A  
Up Point(s): 6B



## RESOURCE 7

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing West | Gradual to Moderate Transition to Wetland

Wetland	RESOURCE TYPE
4.62-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin/Floodplain Forest/Shallow Marsh/Shrub-Carr	EGGERS & REED
Type 1/3/6	CIRCULAR 39
PEM1C/SS1/FO1/Af	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Salix interior</i> <i>Fraxinus pennsylvanica</i> <i>Solidago gigantea</i>	Sandbar willow Green ash Smooth goldenrod
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface Depleted Matrix	A11 F3
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Saturation	A3
Dry-Season Water Table	C2
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING – SOIL UNIT(S)	Hydric – Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	PFO1/EM1C
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types and is part of a much larger wetland complex continuing to the west. The resource receives hydrology via overland flow, primarily from the surrounding agricultural fields. Overall, the resource was delineated based on a lack of hydric soil profile and wetland hydrology forming a gradual to moderate boundary in most areas. Upland vegetation communities are generally dominated by reed canary, smooth goldenrod, and Canada goldenrod.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally smaller than depicted; however, it appears to match the mapped hydric soil unit.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 7A  
Up Point(s): 7B

## RESOURCE 7

### FIELD INVESTIGATION PHOTOS



**Viewing Southeast** | A portion of the type 6 wetland found within resource 7



**Viewing North** | Agricultural field abutting resource 7



**Viewing South** | Resource 7 continuing beyond the ECB to the west where much of the shrub and tree stratum has been removed



**Viewing North** | Small amounts of hydrophytic vegetation emerging in the agricultural field where the ECB ends. Soil cracking was observed.



## RESOURCE 8

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing South | Gradual Transition to Wetland at 8-1

Wetland	RESOURCE TYPE
0.11-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Ad	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Populus tremuloides</i>	Quaking aspen
<i>Cornus racemose</i>	Gray dogwood
<i>Cornus alba</i>	Red osier
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Vitis riparia</i>	Riverbank grape
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Thick Dark Surface	A12
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Saturation	A3
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type and are part of a larger wetland complex to the west. The resource receives hydrology via overland flow. A low-lying area resembling a drainage ditch was investigated and was determined to be a portion of resource 8 continuing to the north bordering the ECB. Overall, the resource was delineated based on a lack of hydric soil profile and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by green ash, bur oak ( <i>Quercus macrocarpa</i> ) European buckthorn, nannyberry ( <i>Viburnum lentago</i> ), gray dogwood ( <i>Cornus racemose</i> ) and river-bank grape.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 8A  
Up Point(s): 8B

## RESOURCE 8

### FIELD INVESTIGATION PHOTOS



**Viewing South** | Area resembling a drainage ditch from resource 8-1 to resource 8-2



**Viewing Northwest** | Resource 8-2



## RESOURCE 9

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing Northeast | Moderate Transition to Wetland

Wetland	RESOURCE TYPE
0.04-Acre	TOTAL AREA WITHIN ECB
Shrub-carr	EGGERS & REED
Type 6	CIRCULAR 39
PSS1A	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Salix amygdaloides</i>	Peachleaf willow
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Carex bebbii</i>	Bebb's sedge
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Matrix	F3
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Water-Stained Leaves	B9
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type and the resource receives hydrology via overland flow. Overall, the resource was delineated based on a lack of wetland hydrology forming a moderate boundary in most areas. Upland vegetation communities are generally dominated by smooth goldenrod and reed canary grass.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 9A  
Up Point(s): 9B

RESOURCE 10

FIELD DELINEATED 10/12/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing Northeast | Moderate Transition to Wetland

Wetland	RESOURCE TYPE
0.02-Acre	TOTAL AREA WITHIN ECB
Floodplain Forest	EGGERS & REED
Type 1	CIRCULAR 39
PFO1A	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Ulmus americana</i>	American elm
<i>Tilia americana</i>	American basswood
<i>Rhamnus cathartica</i>	European buckthorn
<i>Fraxinus nigra</i>	Black ash
HYDRIC SOIL INDICATORS	
Thick Dark Surface	A12
WETLAND HYDROLOGY DETERMINATION	
Sparsely Vegetated Concave Surface	B8
Geomorphic Position	D2
Microtopographic Relief	D4
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type generally containing bare ground. The resource receives hydrology via overland flow. Overall, the resource was delineated based on a lack of hydric soil profile and wetland hydrology forming a moderate boundary in most areas. Upland vegetation communities are generally dominated by green ash, quaking aspen, European buckthorn and American basswood.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 10A  
Up Point(s): 10B



RESOURCE 11

FIELD DELINEATED 10/12/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing East | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.49-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin/Floodplain Forest/Shallow Marsh	EGGERS & REED
Type 1/3	CIRCULAR 39
PEM1C/A	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Fraxinus pennsylvanica</i> <i>Rhamnus cathartica</i> <i>Phalaris arundinacea</i>	Green ash European buckthorn Reed canary grass
HYDRIC SOIL INDICATORS	
Redox Dark Surface	F6
WETLAND HYDROLOGY DETERMINATION	
Water-Stained Leaves	B9
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Aquolls and Histosols, ponded, 100% (1055)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types and are part of a larger wetland complex to the south. The resource receives hydrology via overland flow. Overall, the resource was delineated based on a lack of hydric soil profile and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by green ash, red oak ( <i>Quercus rubra</i> ), American elm, European buckthorn, eastern prickly gooseberry ( <i>Ribes cynosbati</i> ) and toothache tree.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally smaller then depicted; however, it seems that the boundary matches the mapped hydric soil unit.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 11A  
Up Point(s): 11B

## RESOURCE 12

FIELD DELINEATED 10/12/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing Northeast | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.48-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin/Shallow Marsh	EGGERS & REED
Type 1/3	CIRCULAR 39
PEM1C/A	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Solanum ptychanthum</i>	Eastern black nightshade
<i>Cirsium arvense</i>	Canada thistle
<i>Myosoton aquaticum</i>	Giant-chickweed
<b>HYDRIC SOIL INDICATORS</b>	
Redox Dark Surface	F6
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Saturation	A3
Geomorphic Position	D2

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric – Cathro Muck, 97% (544)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types and is part of a larger wetland complex to the west. The resource receives hydrology via overland flow. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by peachleaf willow, European buckthorn, common red raspberry, reed canary, foxtail bristlegass ( <i>Setaria italica</i> ), and hairy crab grass ( <i>Digitaria sanguinalis</i> ).
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.  Wetland appeared to be previously tilled and cropped for wildlife and/or hunting activities. Turnips were found around sample point.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 12A  
Up Point(s): 12B



# RESOURCE 13

FIELD DELINEATED 10/19/2023

## FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.08-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1A	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Ulmus americana</i>	American elm
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Echinocystis lobata</i>	Wild cucumber
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
WETLAND HYDROLOGY DETERMINATION	
Geomorphic Position	D2
FAC-Neutral Test	D5

## DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

## DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type and is part of a larger wetland complex to the west. The resource receives hydrology via overland flow. Overall, the resource was delineated based on a lack of wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by green ash and reed canary and are adjacent to the golf course trail.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 13A  
Up Point(s): 13B

RESOURCE 14

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing East | Gradual to Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.39-Acre	TOTAL AREA WITHIN ECB
Shallow Marsh	EGGERS & REED
Type 3	CIRCULAR 39
PEM1Cx	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Salix bebbiana</i>	Gray willow
<i>Salix interior</i>	Sandbar willow
<i>Cornus alba</i>	Red osier
<i>Carex lacustris</i>	Lakebank sedge
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Poa pratensis</i>	Kentucky blue grass
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
Redox Dark Surface	F6
WETLAND HYDROLOGY DETERMINATION	
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Nessel fine sandy loam, 1 to 4 percent slopes, 3% (225)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type where the wetland exists in the fairway of the golf course where portions of the wetland are actively mowed. The resource receives hydrology via overland flow from the surrounding golf course. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming a gradual to abrupt boundary in most areas. Upland vegetation communities are generally dominated by birds-foot trefoil ( <i>Lotus tenuis</i> ), and Kentucky blue grass.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct; however, they are combined in the northernmost area.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 14A  
Up Point(s): 14B



## RESOURCE 15

FIELD DELINEATED 10/19/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.03-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin/Fresh Wet Meadow	EGGERS & REED
Type 1/2	CIRCULAR 39
PEM1B/Ad	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Salix interior</i>	Sandbar willow
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Poa pratensis</i>	Kentucky blue grass
<i>Solidago altissima</i>	Canada goldenrod
<i>Solidago gigantea</i>	Smooth goldenrod
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	R2UBFx
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types where the wetland exists near the fairway of the golf course and the resource receives hydrology via overland flow from the surrounding golf course and discharges into resource 16 via a culvert under a bituminous trail. Overall, the resource was delineated based on a lack of hydrophytic vegetation and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by boxelder, American elm, Canada goldenrod, Canada thistle, reed canary grass, Kentucky blue grass and smooth brome.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI maps R2UBFx at the sampled location, our assessment of the wetland determined the wetland to be a PEM1B/Ad.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 15A  
Up Point(s): 15B

RESOURCE 16

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing West | Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.02-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin/Fresh Wet Meadow	EGGERS & REED
Type 1/2	CIRCULAR 39
PEM1B/Ad	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Populus deltoides</i>	Eastern cottonwood
<i>Populus tremuloides</i>	Quaking aspen
<i>Prunus serotina</i>	Black cherry
<i>Rhamnus cathartica</i>	European buckthorn
<i>Phalaris arundinacea</i>	Reed canary grass
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
WETLAND HYDROLOGY DETERMINATION	
Surface Water	A1
High Water Table	A2
Saturation	A3
Drainage Patterns	B10
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	R2UBFx
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types where the wetland exists in the fairway of the golf course and the resource receives hydrology via overland flow from the surrounding golf course and resource 15 via a culvert under a bituminous trail. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming an abrupt boundary in most areas. Upland vegetation communities are generally dominated by quaking aspen, European buckthorn, toothachetree, red-seeded dandelion ( <i>Taraxacum officinale</i> ), spreading dogbane ( <i>Apocynum androsaemifolium</i> ), and smooth brome.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI maps R2UBFx at the sampled location, our assessment of the wetland determined the wetland to be a PEM1B/Ad.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 16A  
Up Point(s): 16B



RESOURCE 17

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Gradual to Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.33-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Shallow/Marsh/Deep Marsh/Shrub-Carr	EGGERS & REED
Type 3/4/6	CIRCULAR 39
PABH/EM1C/SS1A	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Salix bebbiana</i>	Gray willow
<i>Salix interior</i>	Sandbar willow
<i>Salix amygdaloides</i>	Peachleaf willow
<i>Rhamnus cathartica</i>	European buckthorn
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Vitis riparia</i>	River-bank grape
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
WETLAND HYDROLOGY DETERMINATION	
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	PEM1C
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types where the wetland exists near the fairway of the golf course where portions of the wetland are actively mowed. The resource receives hydrology via overland flow from the surrounding golf course. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming a gradual to abrupt boundary in most areas. Upland vegetation communities are generally dominated by sandbar willow and Kentucky bluegrass.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 17A  
Up Point(s): 17B

# RESOURCE 18

FIELD DELINEATED 10/19/2023

## FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing East | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.14-Acre	TOTAL AREA WITHIN ECB
Floodplain Forest	EGGERS & REED
Type 1	CIRCULAR 39
PFO1A	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Ulmus americana</i>	American elm
<i>Salix bebbiana</i>	Gray willow
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Rhamnus cathartica</i>	European buckthorn
<i>Ribes cynosbati</i>	Eastern prickly gooseberry
<i>Solanum ptychanthum</i>	Eastern black nightshade
<i>Vitis riparia</i>	River-bank grape
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Microtopographic Relief	D4
Geomorphic Position	D2
FAC-Neutral Test	D5

## DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

## DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type and is part of a larger wetland complex to the southwest and the resource receives hydrology via overland flow from the surrounding landscape. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by green ash, European buckthorn, eastern poison ivy ( <i>Toxicodendron radicans</i> ), Robert's geranium ( <i>Geranium robertianum</i> ), king solomon's-seal ( <i>Polygonatum biflorum</i> ) and Virginia creeper ( <i>Parthenocissus quinquefolia</i> ).
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 18A  
Up Point(s): 18B



## RESOURCE 19

FIELD DELINEATED 10/19/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing East | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.47-Acre	TOTAL AREA WITHIN ECB
Floodplain Forest	EGGERS & REED
Type 1	CIRCULAR 39
PFO1A	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Ulmus americana</i>	American elm
<i>Fraxinus pennsylvanica</i>	Green ash
<i>Rhamnus cathartica</i>	European buckthorn
<i>Boehmeria cylindrica</i>	Smallspike false nettle
<i>Vitis riparia</i>	River-bank grape
<i>Echinocystis lobata</i>	Wild cucumber
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Geomorphic Position	D2
Microtopographic Relief	D4
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type and is part of a larger wetland complex to the west and the resource receives hydrology via overland flow from the surrounding landscape. Overall, the resource was delineated based on a lack of hydric soil and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by boxelder, green ash, European buckthorn, Robert's geranium, yellow avens ( <i>Geum aleppicum</i> ), eastern woodland sedge ( <i>Carex blanda</i> ), and Virginia creeper ( <i>Parthenocissus quinquefolia</i> ).
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 19A  
Up Point(s): 19B



## RESOURCE 19

### FIELD INVESTIGATION PHOTOS



**Viewing Northeast** | Near wetland A sample point



**Viewing East** | A sparsely vegetated concave surface near the north end of resource 19



**Viewing Northwest** | An upland berm in the background, located on the far north end of the resource dominated by non-hydrophytic vegetation



**Viewing East** | Several tree species tolerant of hydrophytic conditions were sampled in resource 19.



RESOURCE 20

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing South | Gradual to Moderate Transition to Wetland

Wetland	RESOURCE TYPE
0.26-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Af	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Echinochloa crus-galli</i> <i>Nasturtium officinale</i>	Barnyard grass Water cress
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
WETLAND HYDROLOGY DETERMINATION	
Algal Mat or Crust	B4
Sparsely Vegetated Concave Surface	B8
Stunted or Stressed Plants	D1
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single farmed wetland community type and is part of a larger wetland complex to the east and the resource receives hydrology via overland flow from the surrounding landscape. Overall, the resource was delineated based on a lack of hydrophytic vegetation and wetland hydrology indicators forming a gradual to moderate boundary in most areas. Reviewed historical aerials identify saturation/inundations is present throughout the years. Upland vegetation communities are generally dominated by woolly mullein ( <i>Verbascum thapsus</i> ) and field thistle ( <i>Cirsium discolor</i> ).
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition. The resource occurs in an actively farmed agricultural field with vegetation and soils in the resource being heavily manipulated.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location. A mapped hydric soil map unit is found adjacent to wetland to the south.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 20A  
Up Point(s): 20B

## RESOURCE 21

FIELD DELINEATED 10/19/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.22-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Af	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Echinochloa crus-galli</i>	Barnyard grass
<i>Nasturtium officinale</i>	Water cress
<i>Phalaris arundinacea</i>	Reed canary grass
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Sparsely Vegetated Concave Surface	B8
Stunted or Stressed Plants	D1
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type and receives hydrology via overland flow from the surrounding landscape. Overall, the resource was delineated based on a lack of hydrophytic vegetation and wetland hydrology indicators forming a gradual to moderate boundary in most areas. Reviewed historical aerials identify saturation/inundations is present throughout the years. Upland vegetation communities are generally dominated by woolly mullein, field thistle, and red clover.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition. The resource occurs in an actively farmed agricultural field with vegetation and soils in the resource being heavily manipulated.
CONSISTENCY WITH DESKTOP REVIEW	NWI does not map any wetlands at the sampled location.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 21A  
Up Point(s): 21B



RESOURCE 22

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.13-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1A	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Populus deltoides</i>	Eastern cottonwood
<i>Salix amygdaloides</i>	Peachleaf willow
<i>Phalaris arundinacea</i>	Reed canary grass
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
Redox Dark Surface	F6
WETLAND HYDROLOGY DETERMINATION	
Drainage Patterns	B10
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community types where the wetland exists near the agricultural field and the resource receives hydrology via overland flow from the surrounding landscape. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation, and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by eastern cottonwood, yellow sweet clover ( <i>Melilotus officinalis</i> ), red clover, and bird's foot trefoil.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 22A  
Up Point(s): 22B

## RESOURCE 23

FIELD DELINEATED 10/19/2023

### FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Gradual Transition to Wetland

Wetland	RESOURCE TYPE
0.55-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Af	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Populus deltoides</i>	Eastern cottonwood
<i>Salix amygdaloides</i>	Peachleaf willow
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Poa pratensis</i>	Kentucky blue grass
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
Redox Dark Surface	F6
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Geomorphic Position	D2
FAC-Neutral Test	D5

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type and is part of a larger wetland complex to the west and the resource receives hydrology via overland flow from the surrounding landscape. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming a gradual boundary in most areas. Upland vegetation communities are generally dominated by Kentucky blue grass and red clover.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be smaller than depicted and all combined as one wetland.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 23A  
Up Point(s): 23B



RESOURCE 24

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.01-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin	EGGERS & REED
Type 1	CIRCULAR 39
PEM1Ax	COWARDIN
<b>DOMINANT HYDROPHYTIC VEGETATION</b>	
<i>Populus deltoides</i>	Eastern cottonwood
<i>Salix interior</i>	Sandbar willow
<i>Phalaris arundinacea</i>	Reed canary grass
<b>HYDRIC SOIL INDICATORS</b>	
Depleted Below Dark Surface	A11
Redox Dark Surface	F6
<b>WETLAND HYDROLOGY DETERMINATION</b>	
Sparsely Vegetated Concave Surface	B8
Water-Stained Leaves	B9
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam, 95% (123)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type where the wetland continues to the west and the resource receives hydrology via overland flow from the surrounding area. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming an abrupt boundary in most areas. Upland vegetation communities are generally dominated by smooth brome.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 24A  
Up Point(s): 24B

RESOURCE 25

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing East | Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.58-Acre	TOTAL AREA WITHIN ECB
Shallow Marsh	EGGERS & REED
Type 3	CIRCULAR 39
PEM1Cx	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Typha angustifolia</i> <i>Phalaris arundinacea</i>	Narrow-leaved cattail Reed canary grass
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
WETLAND HYDROLOGY DETERMINATION	
Drainage Patterns	B10
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Braham loamy fine sand, 1 to 6 percent slopes, 7% (169B)
NATIONAL WETLAND INVENTORY	PEM1C
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type where the wetland continues to the west and the resource receives hydrology via overland flow from the surrounding area and resource 26 via a culvert under Headwaters Boulevard North road. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming an abrupt boundary in most areas. Upland vegetation communities are generally dominated by smooth brome and Kentucky blue grass.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 25A  
Up Point(s): 25B



RESOURCE 26

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing Northeast | Moderate Transition to Wetland

Wetland	RESOURCE TYPE
3.68-Acre	TOTAL AREA WITHIN ECB
Seasonally Flooded Basin/Shallow Marsh/Open Water	EGGERS & REED
Type 1/3/5	CIRCULAR 39
PABH/EM1C/Ax	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Phalaris arundinacea</i>	Reed canary grass
<i>Solidago gigantea</i>	Smooth goldenrod
<i>Typha angustifolia</i>	Narrow-leaved cattail
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
Redox Dark Surface	F6
WETLAND HYDROLOGY DETERMINATION	
Drainage Patterns	B10
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Webster loam, 1 to 6 percent slopes, 100% (113)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of multiple wetland community types where the wetland continues to the west and east where the resource receives hydrology via overland flow from the surrounding residential development and resource 28 via a culvert/control structure system. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming a moderate boundary in most areas. Upland vegetation communities are generally dominated by smooth brome, smooth goldenrod, Canada goldenrod, reed canary and Kentucky blue grass.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI maps PEM1A at the sampled location, our assessment of the wetland determined the wetland to be a PABH/EM1C/Ax.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 26A  
Up Point(s): 26B

## RESOURCE 26

### FIELD INVESTIGATION PHOTOS



**Viewing West** | Overlooking type 5 area



**Viewing South** | Upland-wetland transition near residential complex after resource 27



**Viewing South** | Upland-wetland transition near residential complex at Fern Glen Court North



**Viewing South** | Type 3 area near resource 28



RESOURCE 27

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing West | Moderate Transition to Wetland

Wetland (Incidental)	RESOURCE TYPE
0.22-Acre	TOTAL AREA WITHIN ECB
Open Water	EGGERS & REED
Type 5	CIRCULAR 39
PUBHx	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Salix amygdaloides</i>	Peachleaf willow
<i>Typha angustifolia</i>	Narrow-leaved cattail
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
Depleted Matrix	F3
Redox Dark Surface	F6
WETLAND HYDROLOGY DETERMINATION	
Saturation	A3
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING – SOIL UNIT(S)	Hydric – Webster loam, 1 to 6 percent slopes, 100% (113)
NATIONAL WETLAND INVENTORY	PUBHx
PUBLIC WATER INVENTORY	None

DISCUSSION

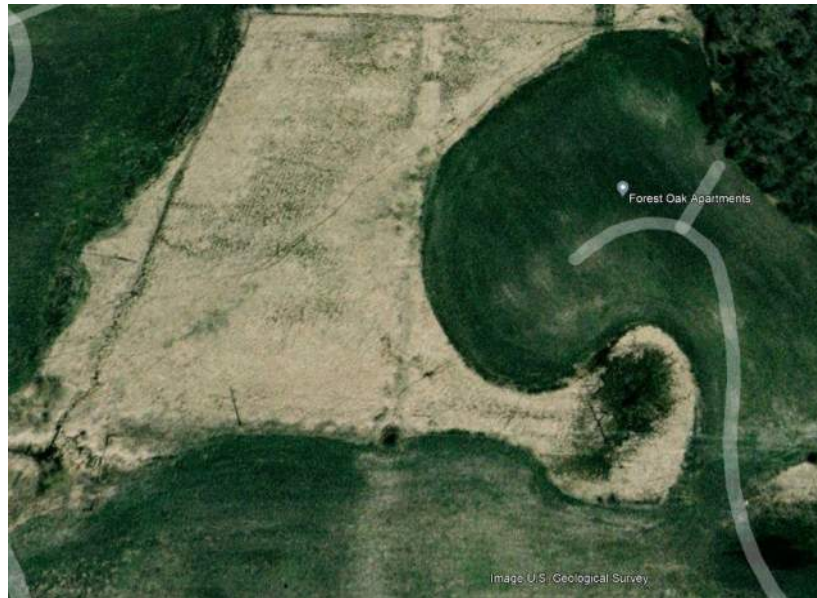
RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type where the wetland continues to the east where the resource receives hydrology via overland flow from the surrounding area. The resource appears to be created sometime between 2006-2008 for the intended use as a stormwater retention pond for the residential building (see historic aerials below). Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation, and wetland hydrology forming a moderate boundary in most areas. Upland vegetation communities are generally dominated by reed canary and Canada thistle.
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 27A  
Up Point(s): 27B

## RESOURCE 27

### HISTORIC INVESTIGATION PHOTOS



Google Earth May 2006 | No Stormwater Pond constructed



Google Earth May 2008 | Stormwater Pond constructed due to residential development



RESOURCE 28

FIELD DELINEATED 10/19/2023

FIELD INVESTIGATION CONCLUSION<sup>1</sup>



Viewing North | Abrupt Transition to Wetland

Wetland	RESOURCE TYPE
0.32-Acre	TOTAL AREA WITHIN ECB
Open Water	EGGERS & REED
Type 5	CIRCULAR 39
PUBHx	COWARDIN
DOMINANT HYDROPHYTIC VEGETATION	
<i>Typha angustifolia</i>	Narrow-leaved cattail
HYDRIC SOIL INDICATORS	
Depleted Below Dark Surface	A11
Redox Dark Surface	F6
WETLAND HYDROLOGY DETERMINATION	
Geomorphic Position	D2
FAC-Neutral Test	D5

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Webster loam, 1 to 6 percent slopes, 100% (113)
NATIONAL WETLAND INVENTORY	PUBHx
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The resource consists of a single wetland community type where the wetland continues to the east where the resource receives hydrology via a culvert connected to resource 26 and overland flow from the surrounding area. Overall, the resource was delineated based on a lack of hydric soil, hydrophytic vegetation and wetland hydrology forming an abrupt boundary in most areas. Upland vegetation communities are generally dominated by smooth brome and white clover ( <i>Trifolium repens</i> ).
ATYPICAL/PROBLEMATIC CONDITIONS	Analysis of antecedent precipitation revealed that the area was above average at the time of the field investigation, however, surface hydrology was not observed in most areas. This is consistent with the time of year and preceding months' drought condition.
CONSISTENCY WITH DESKTOP REVIEW	NWI inventoried areas were found to be generally correct.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource:

Wet Point(s): 28A  
Up Point(s): 28B

INVESTIGATION AREA – A

FIELD DELINEATED 10/19/2023



Viewing Northwest | Sampled area between golf course turf and sidewalk

DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Hydric - Bluffton loam, 100% (75)
NATIONAL WETLAND INVENTORY	None
PUBLIC WATER INVENTORY	None

DISCUSSION

RATIONALE FOR DETERMINATION	The investigation area exists near the fairway of the golf course between the golf course turf and sidewalk. The investigation area has hydrophytic vegetation and hydric soils, however, it does not meet the criteria for wetland hydrology. The investigation area has a 2 percent slope and has a gradual slope across a paved path to resource 13.
CONSISTENCY WITH DESKTOP REVIEW	Reviewed desktop resources are consistent with field validation.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource: Wet Point(s): N/A  
Up Point(s): IA-A



## INVESTIGATION AREA – B

FIELD DELINEATED 10/19/2023



Viewing East | Sampled area in turf golf course

### DESKTOP REVIEW

HYDRIC RATING - SOIL UNIT(S)	Non-Hydric - Dundas fine sandy loam (123)
NATIONAL WETLAND INVENTORY	PEM1A
PUBLIC WATER INVENTORY	None

### DISCUSSION

RATIONALE FOR DETERMINATION	The investigation area exists within the golf course. The investigation area does not meet criteria for hydrophytic vegetation, hydric soils (best professional judgement), and wetland hydrology; however, there was stunted or stressed vegetation at the time of field investigation. The investigation area has a 1-2 percent slope towards resource 13.
CONSISTENCY WITH DESKTOP REVIEW	NWI identifies a PEM1A; however, site investigation did not identify wetland criteria.

<sup>1</sup> Appendix B contains wetland determination data forms supporting this investigated resource: Wet Point(s): N/A  
Up Point(s): IA-B

## CONCLUSION

A total of 28 wetlands, or portions thereof, were identified and delineated within the project area and in accordance with the 1987 United States Army Corps of Engineers Wetland Delineation Manual.

Project area aquatic resources may be regulated by several agencies at the local, state, and/or federal level. Activities which may potentially impact wetlands should be discussed in advance with the appropriate regulating agency regarding potential permit requirements. The Local Government Unit (LGU) responsible for implementing the Minnesota Wetland Conservation Act at this project location is the Rice Creek Watershed District (RCWD).

The RCWD and the City of Forest Lake may require vegetated buffers around all regulated wetland areas. Wetland buffers must meet the standards specified by the RCWD and the City for any project that is regulated under the Wetland Conservation Act.

This wetland investigation meets the standards and criteria described in the 1987 United States Army Corps of Engineers Wetland Delineation Manual and all applicable subsequent guidance for an on-site determination. The results reflect the conditions present at the time of the delineation.

*I certify that I performed the field analysis and/or wrote the report for this wetland determination.*



Garrett Wee  
Environmental Scientist

November 17, 2023

Date

*I certify that I performed the field analysis and/or wrote the report for this wetland determination.*



Dylan Kruzel  
Environmental Scientist  
Certified MN Wetland Delineator #1406

November 17, 2023

Date

*I certify that I performed the field analysis and/or reviewed work completed by above staff.*



Benjamin J. Hodapp  
Environmental Services Manager  
MN Certified Wetland Delineator #1016

November 17, 2023

Date





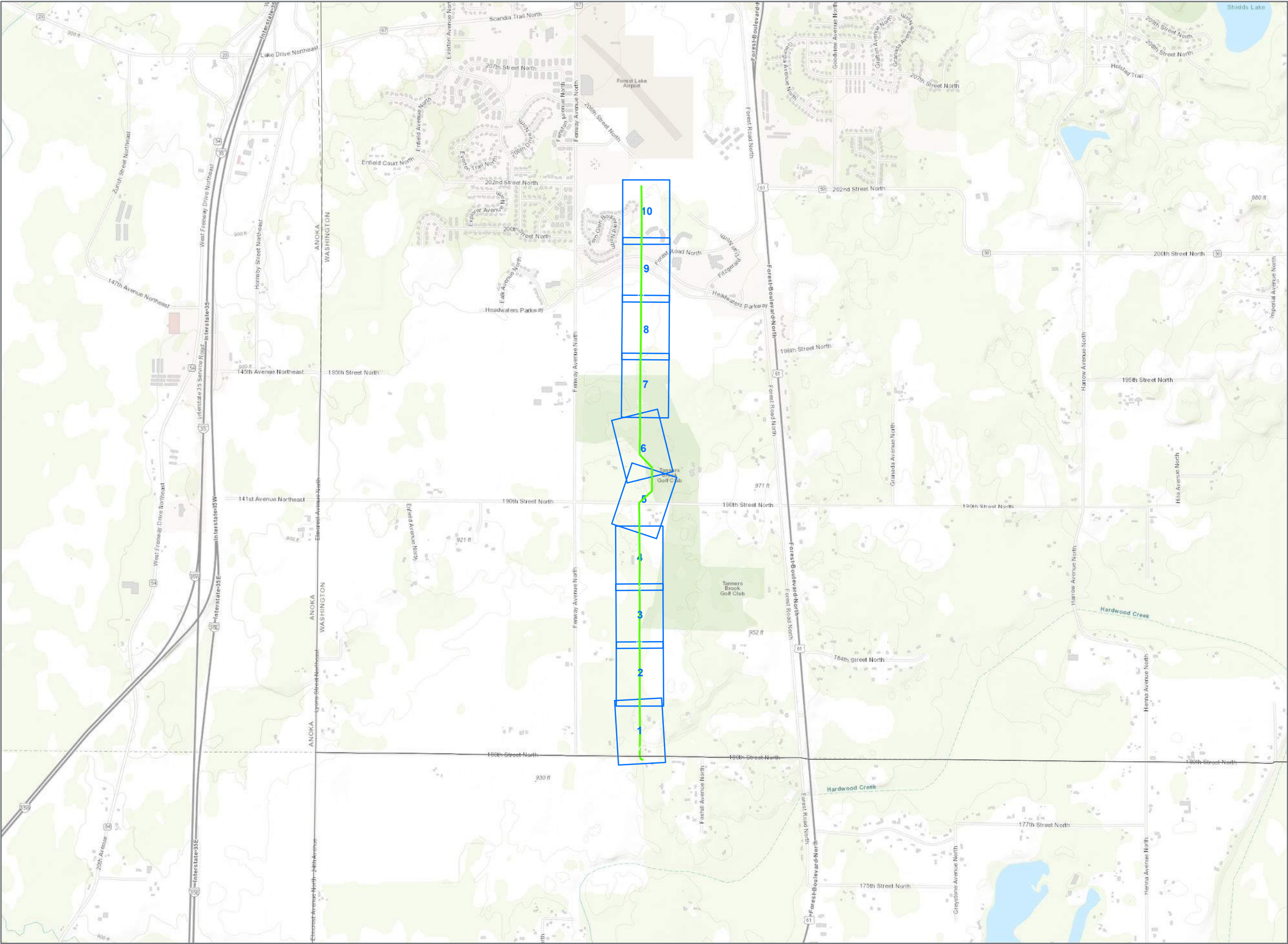
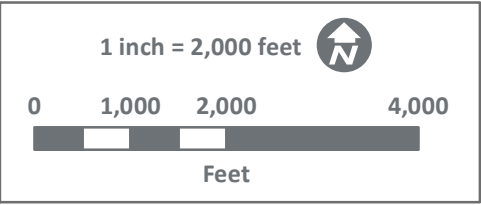
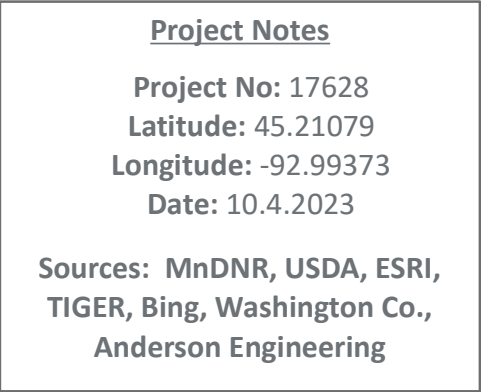
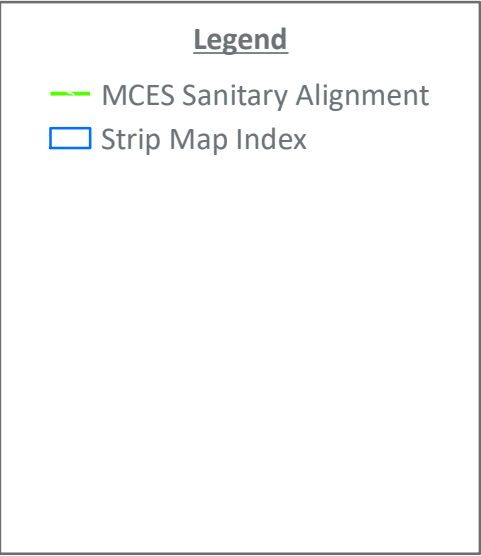
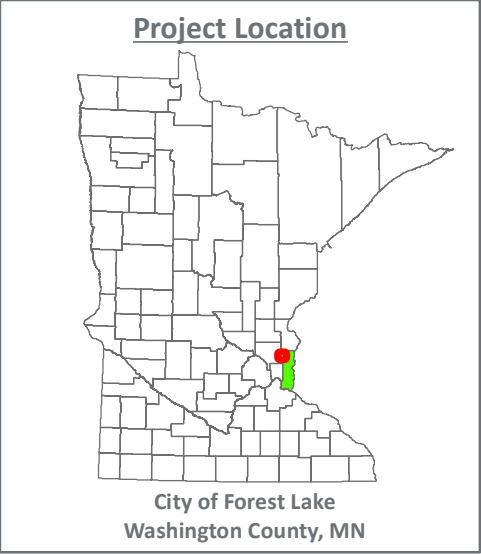
**Appendix A**

**FIGURES**

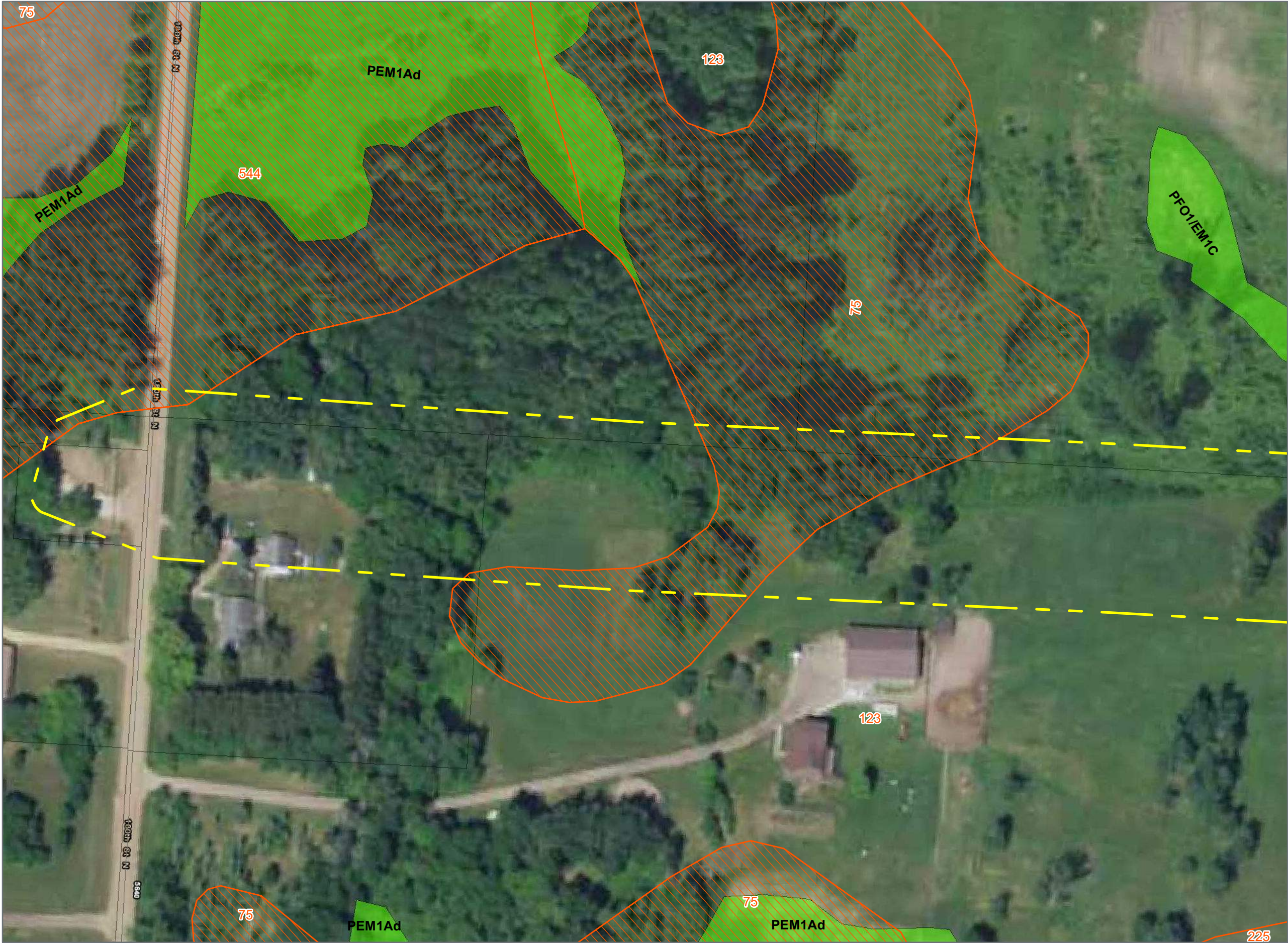
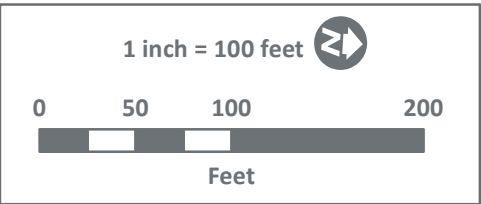
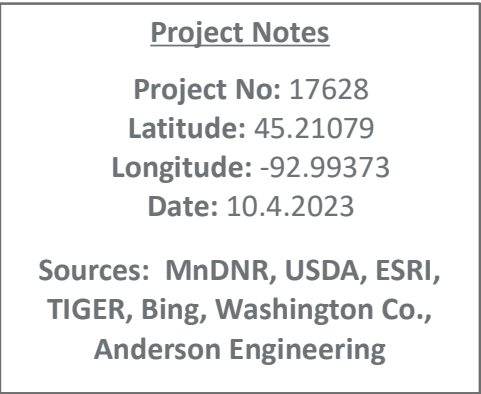
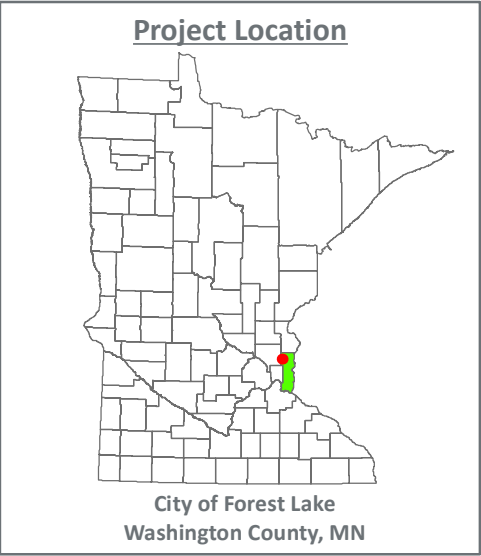
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MCES Sanitary Sewer Maintenance  
Forest Lake, Minnesota

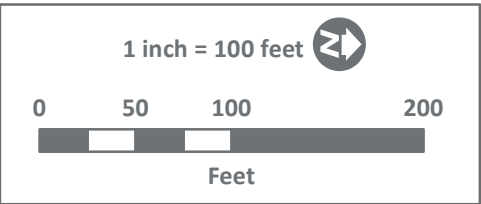
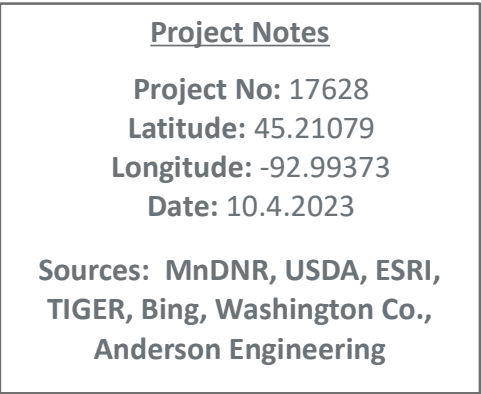
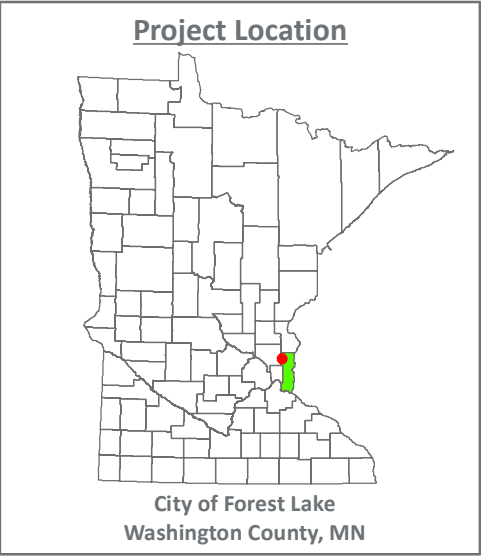
Figure 1  
Location





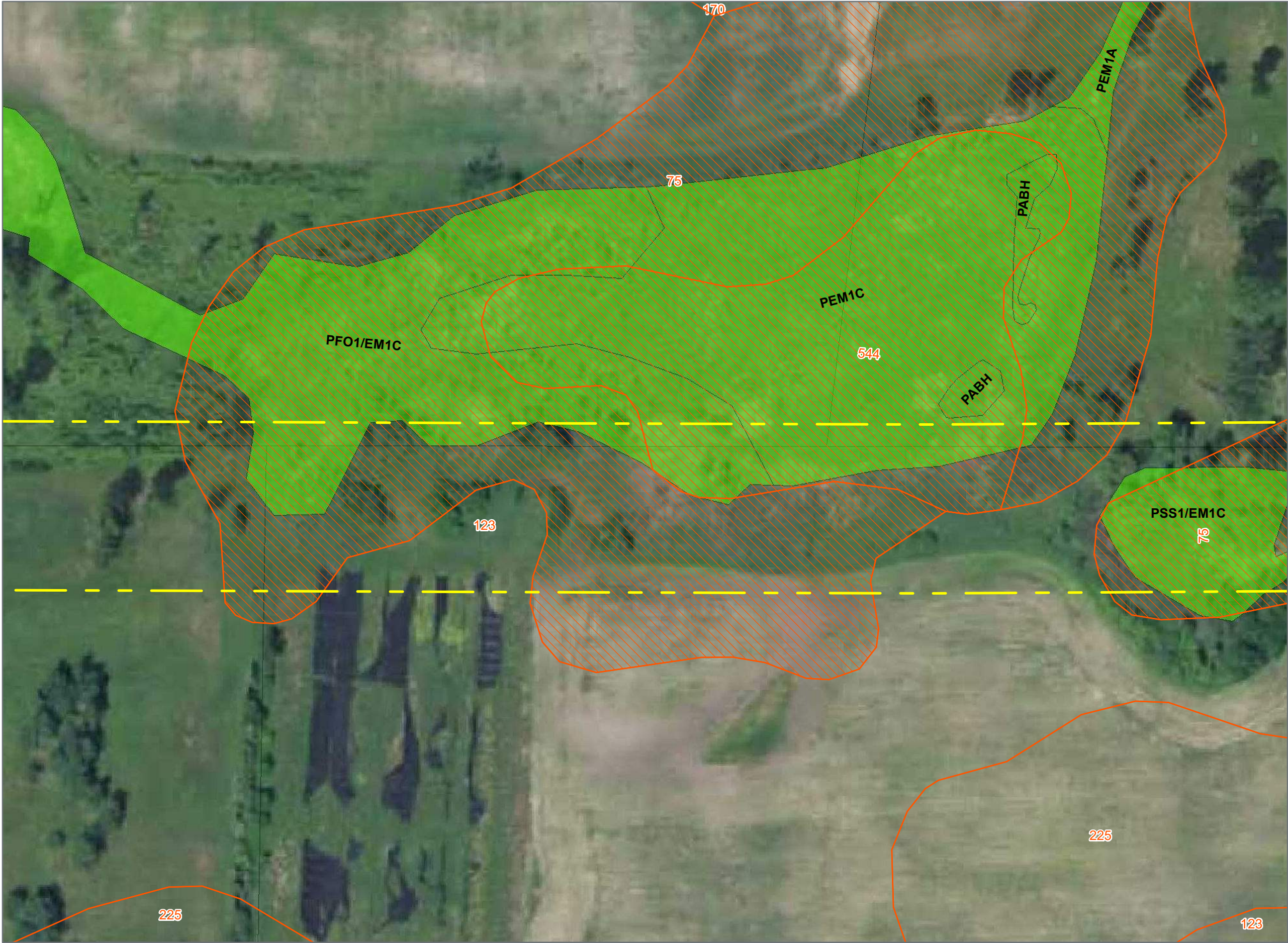




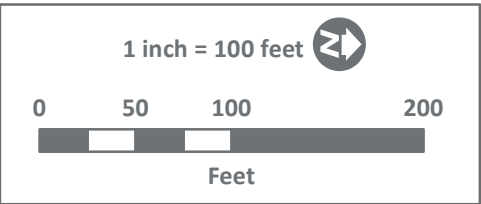
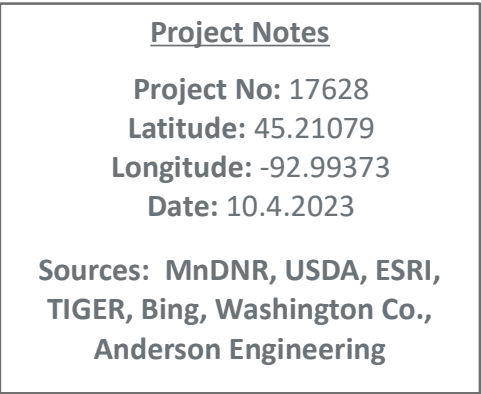
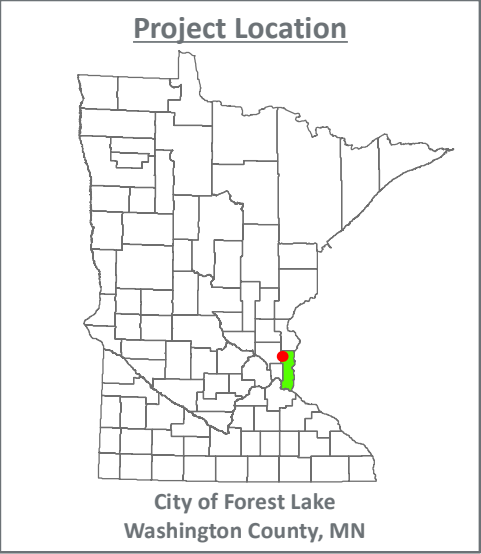


**ANDERSON**

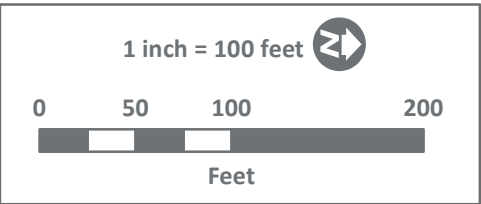
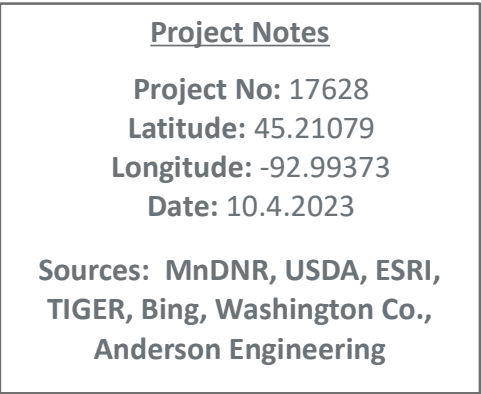
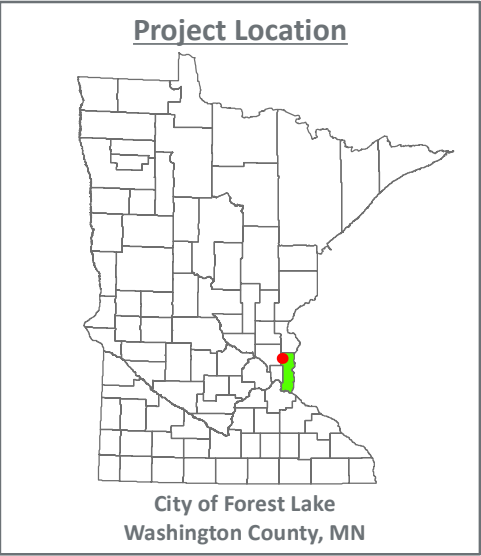
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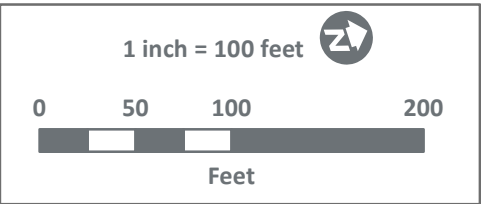
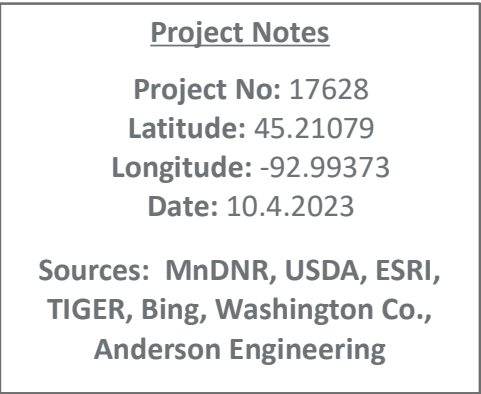
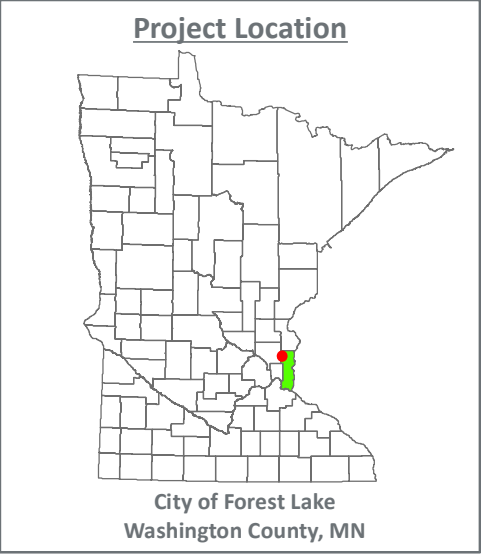




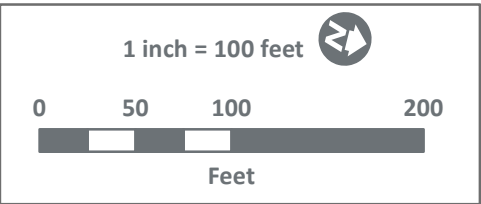
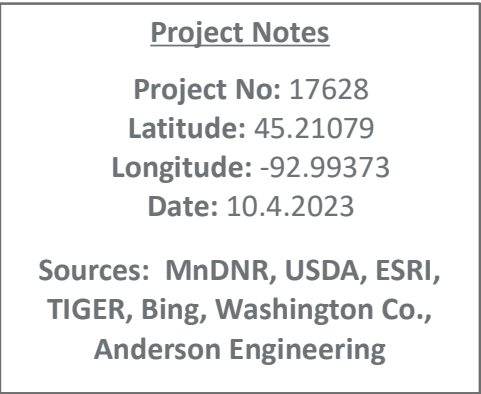
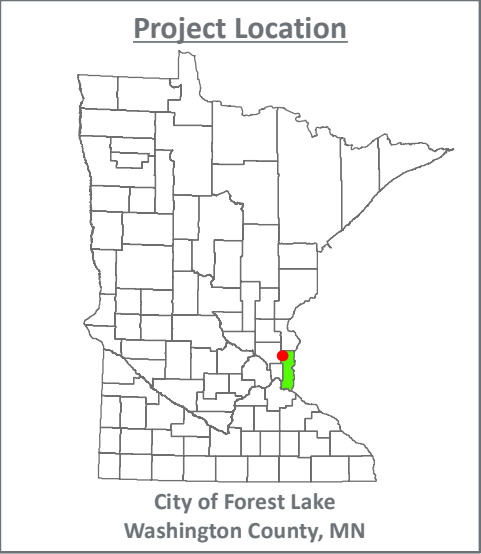








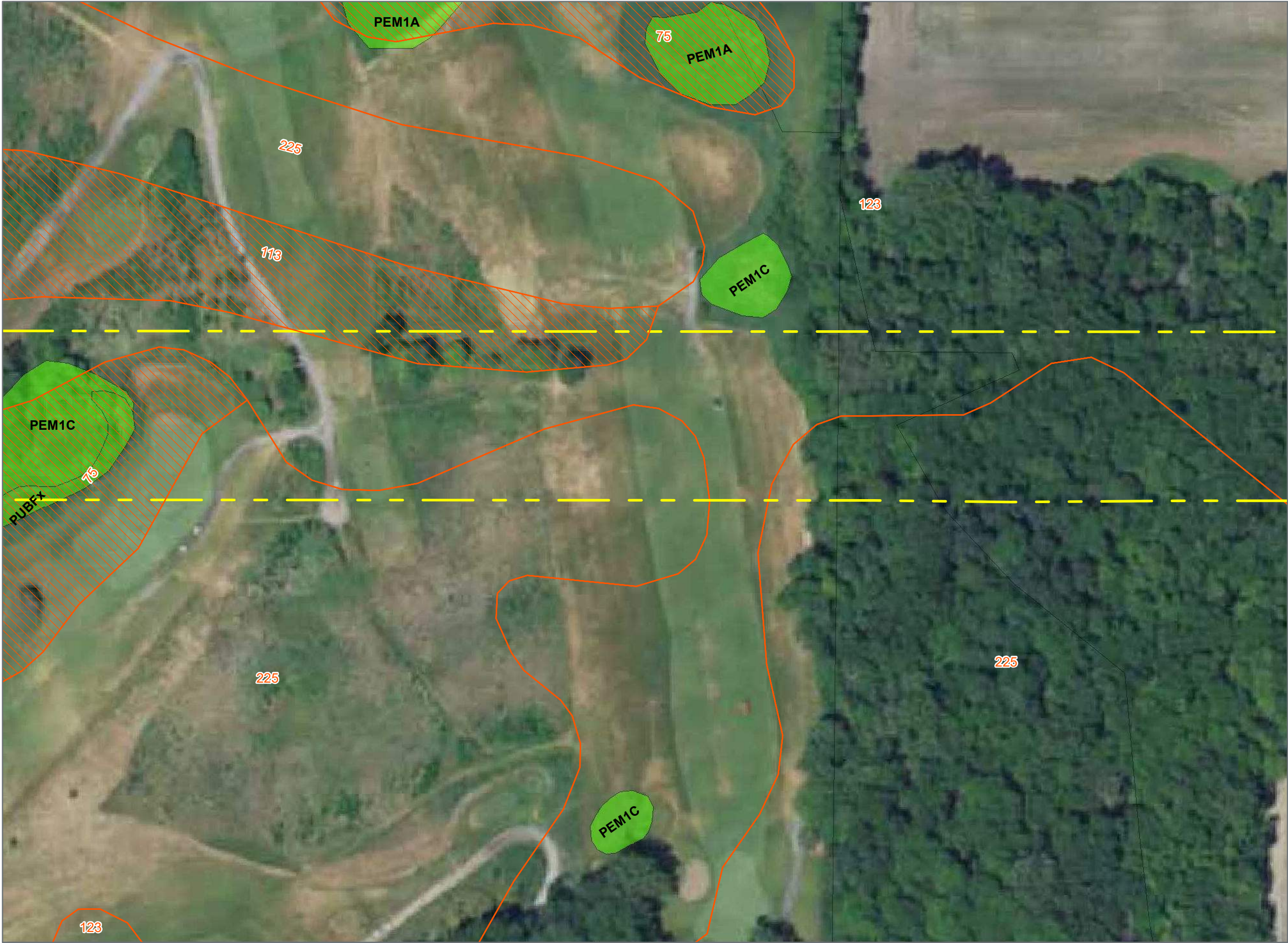
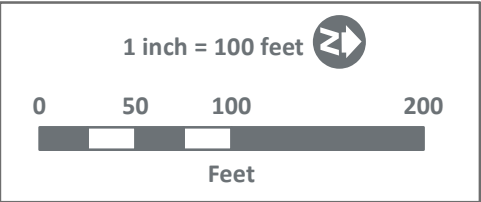
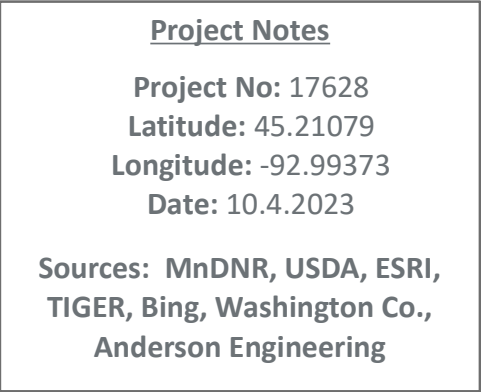
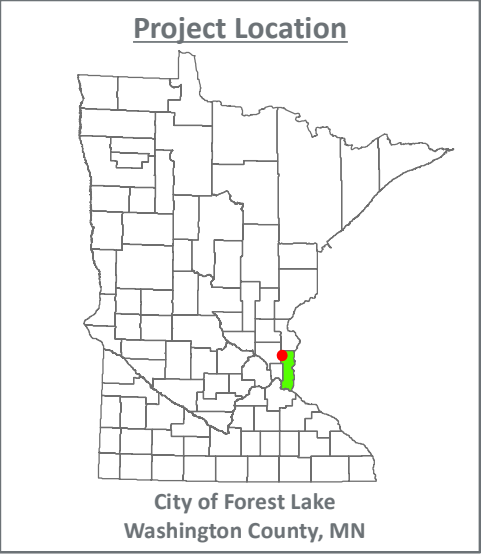




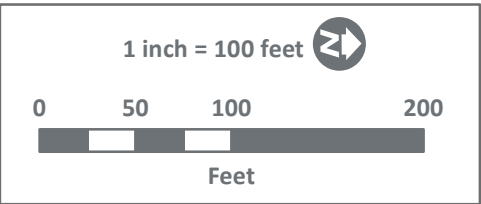
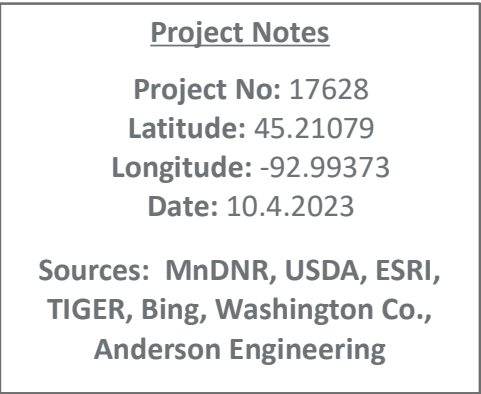
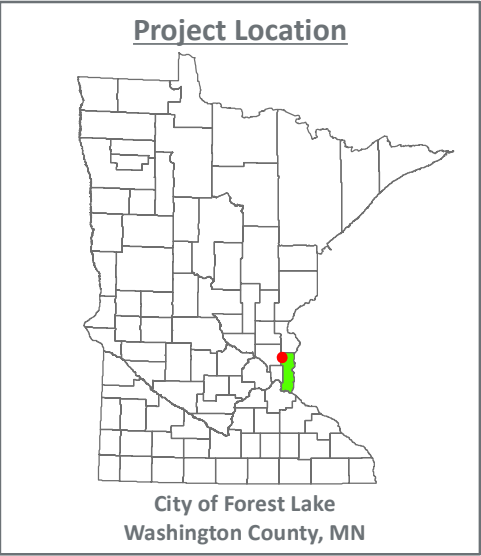
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-  Environmental Clearance Boundary
-  County Parcels
-  National Wetland Inventory
-  Non-Hydric Soil Unit
-  Hydric Soil Unit
-  MN DNR Inventoried Public Watercourse
-  MN DNR Inventoried Public Waterbasin

## Project Notes

**Project No: 17628**

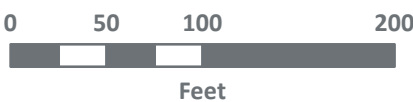
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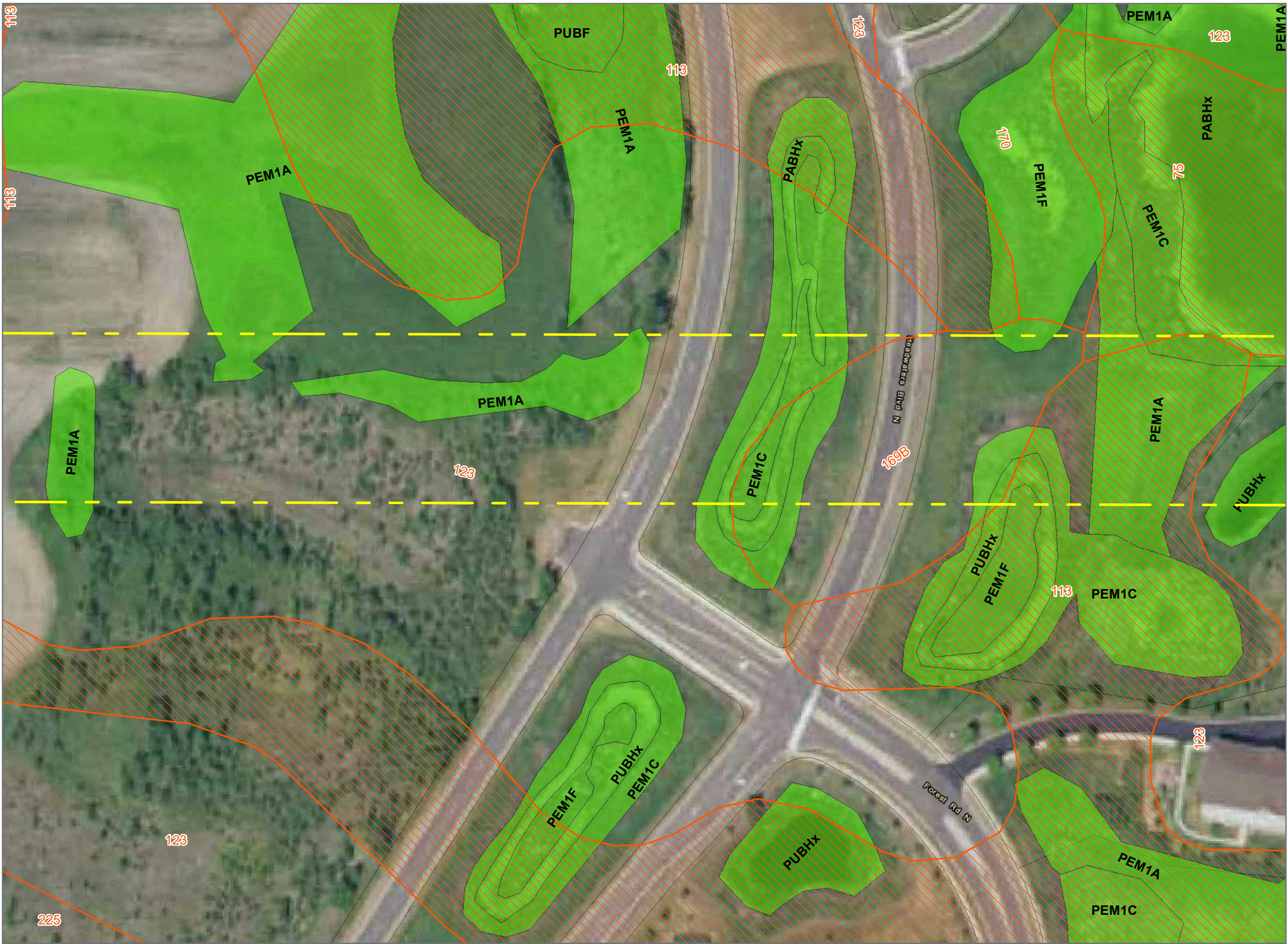
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1 inch = 100 feet 

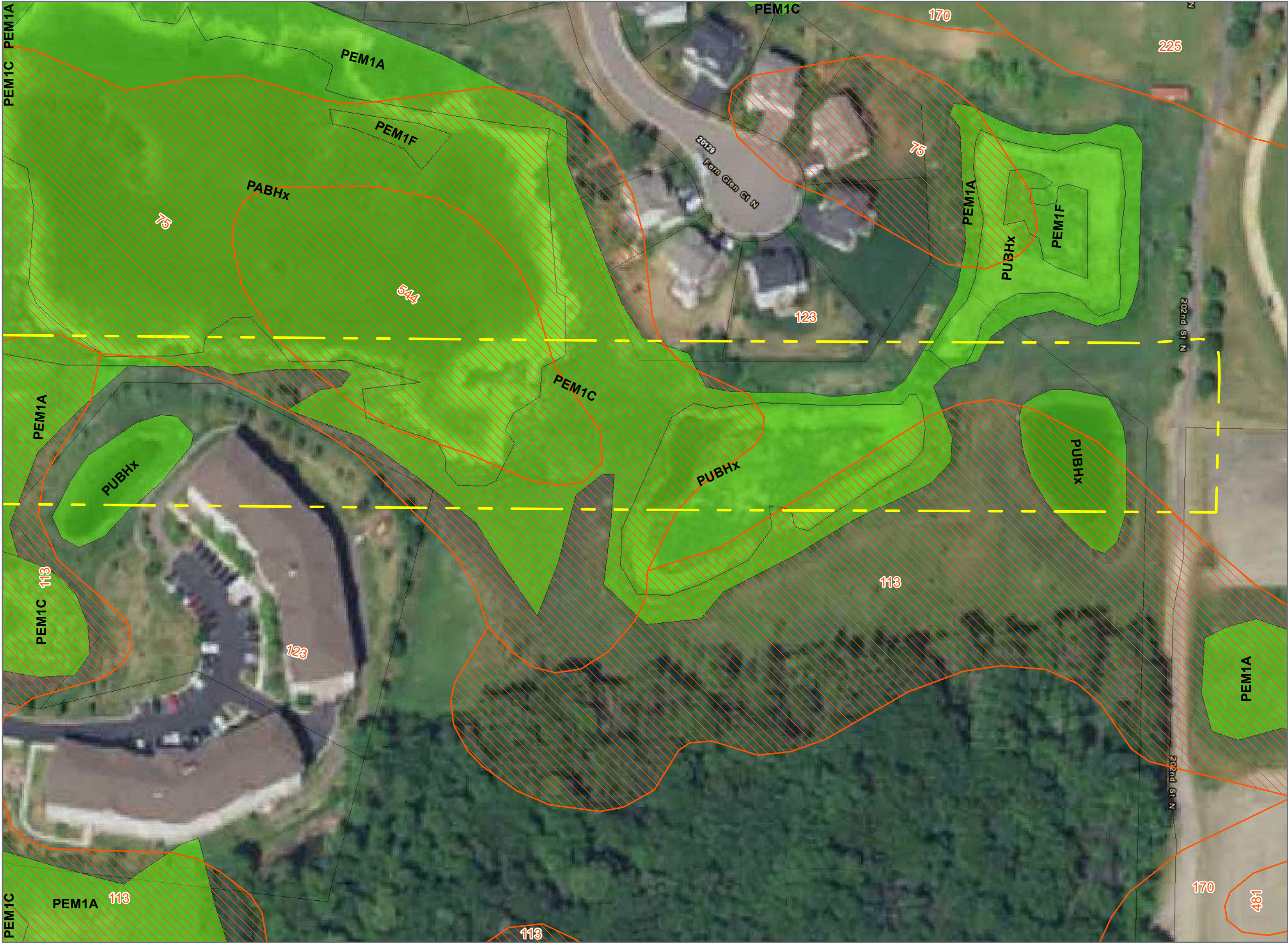
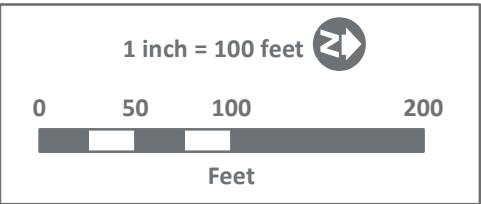
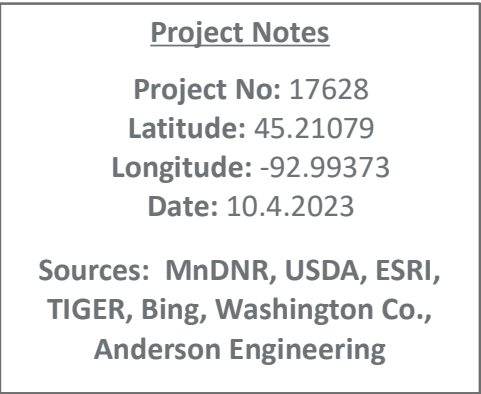
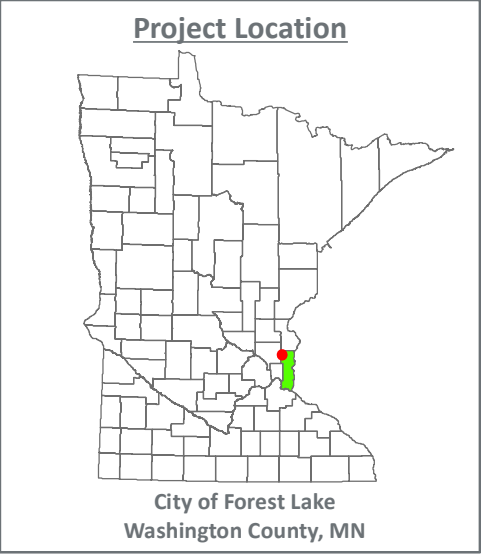


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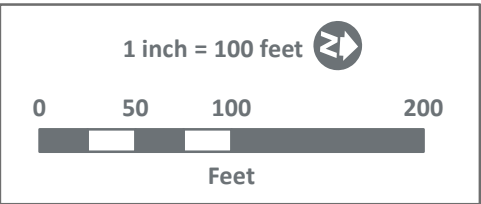
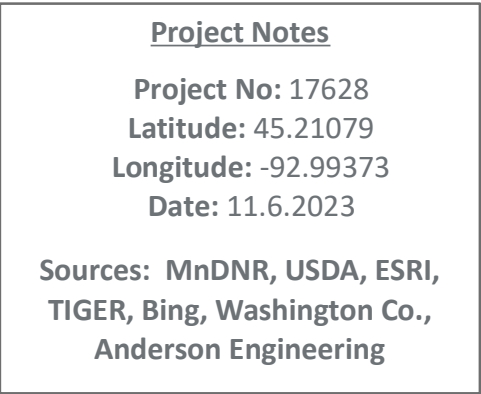
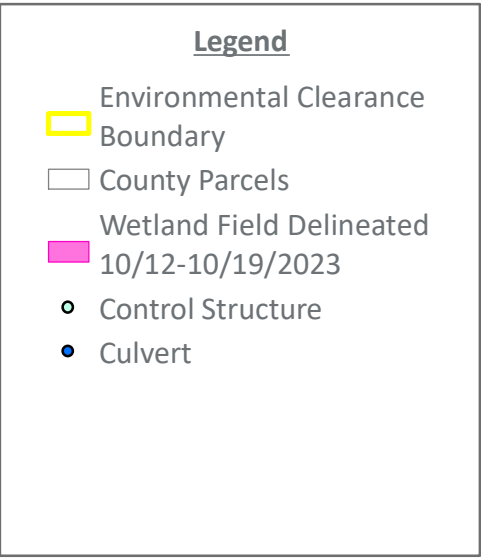
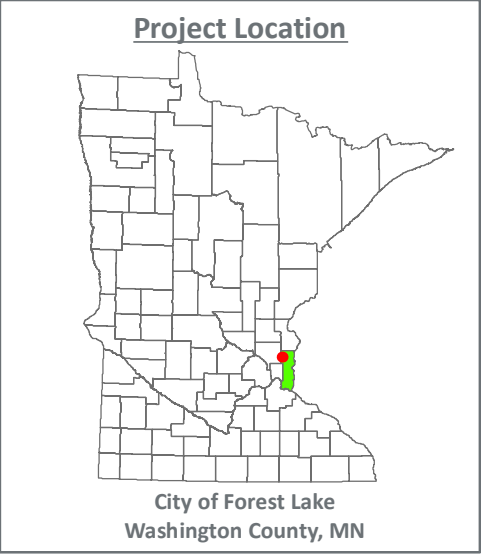
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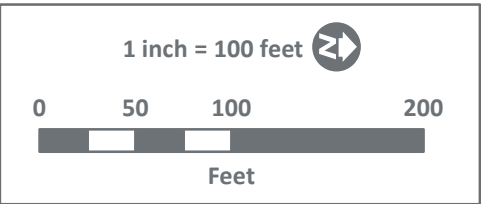
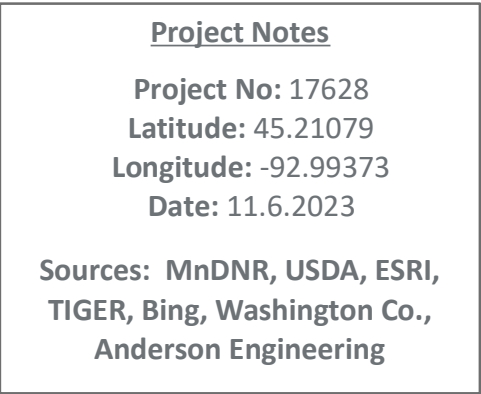
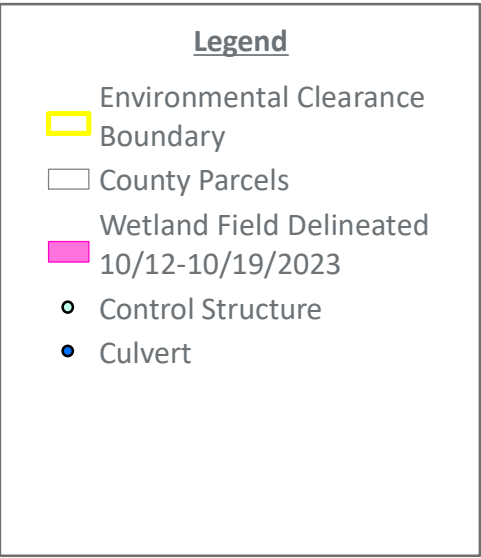
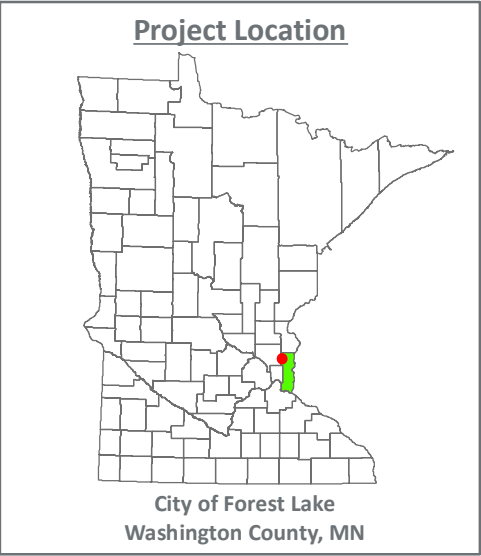




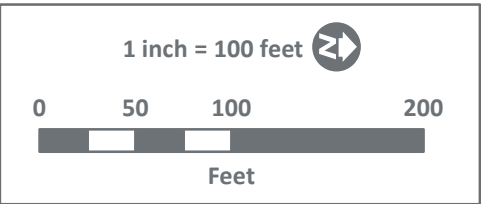
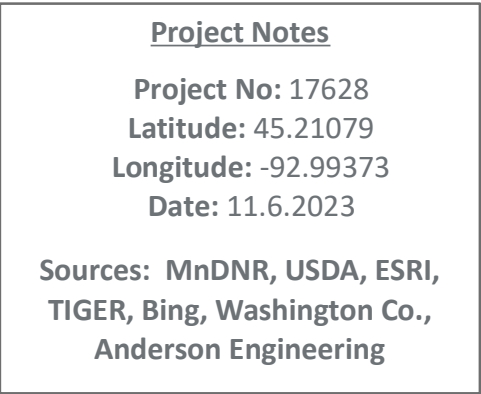
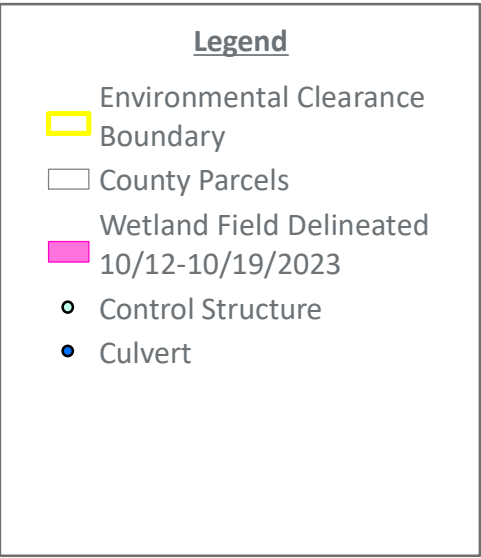
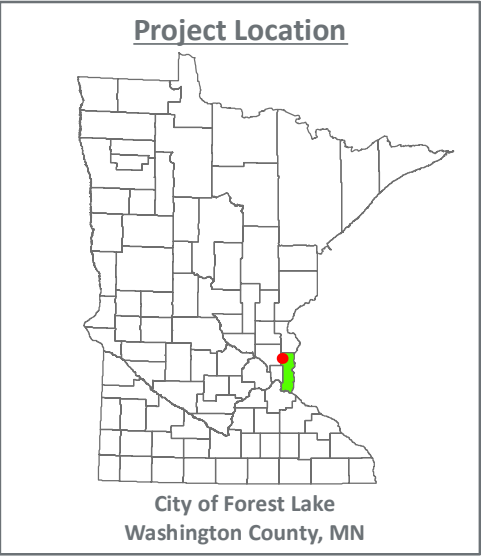




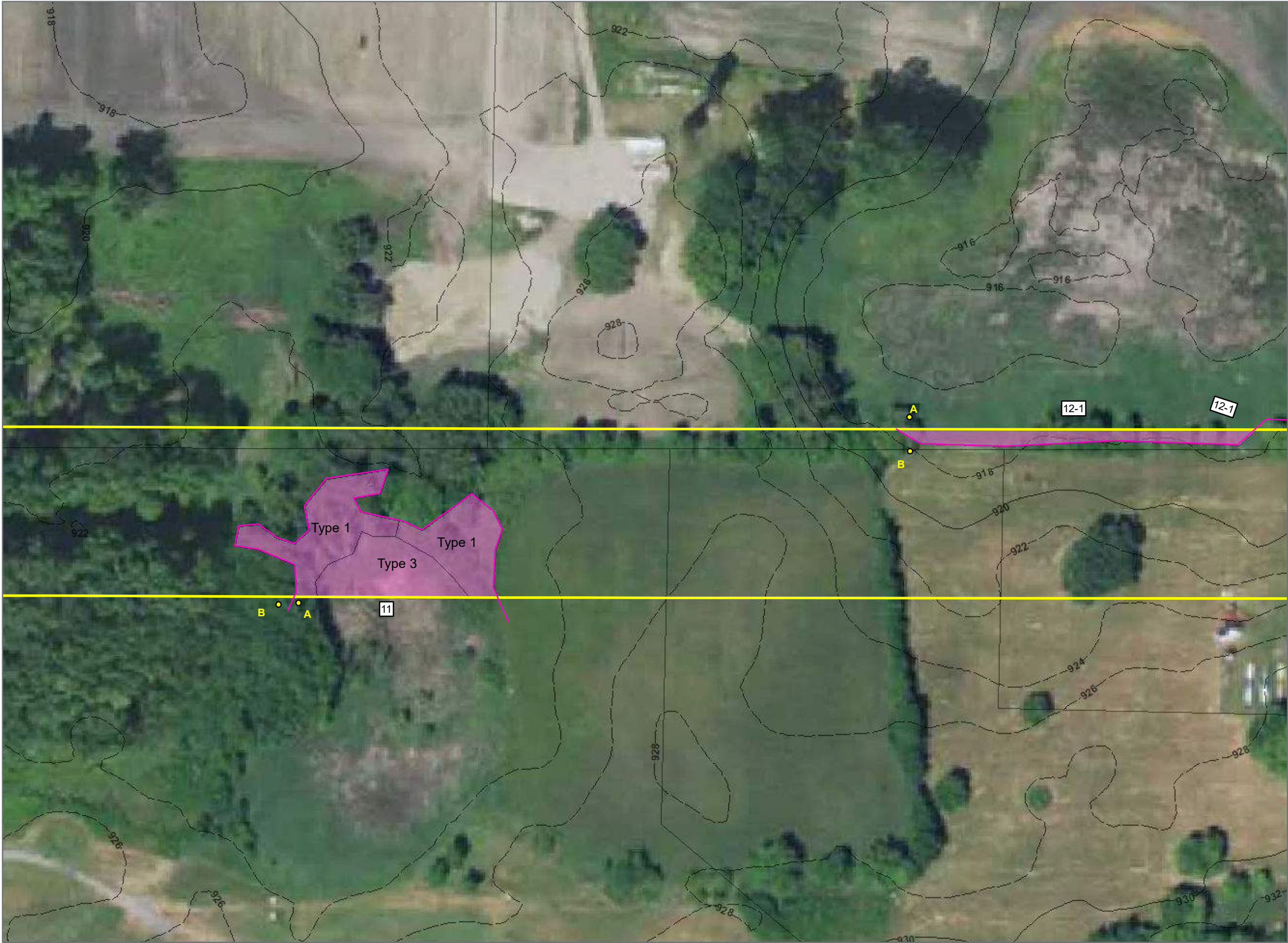
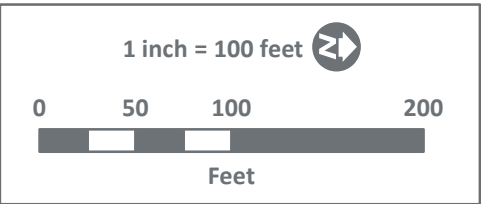
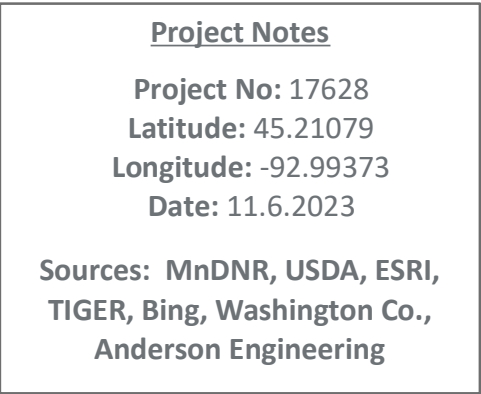
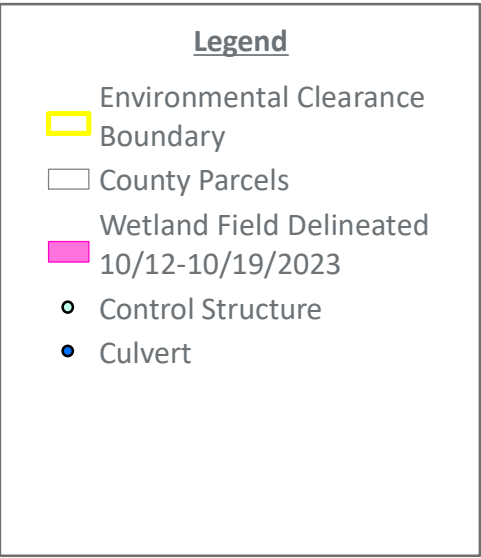
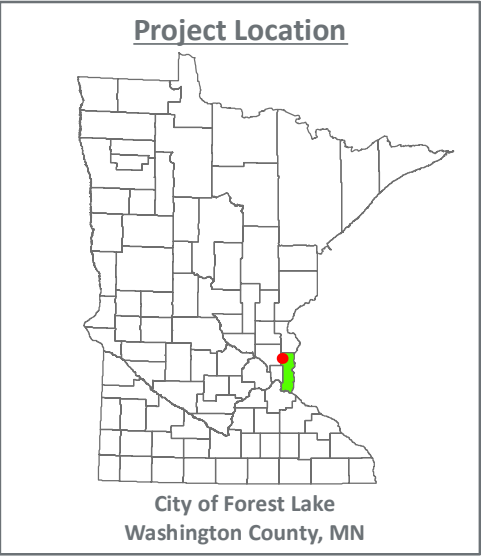




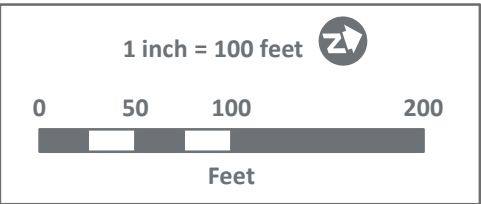
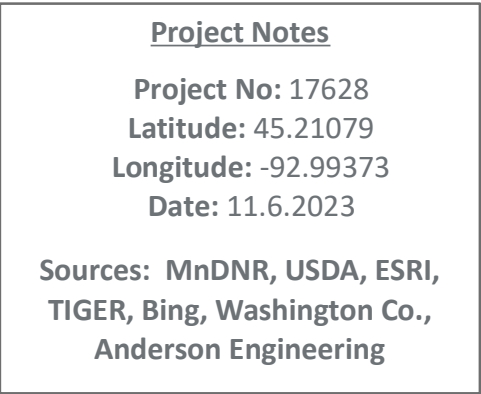
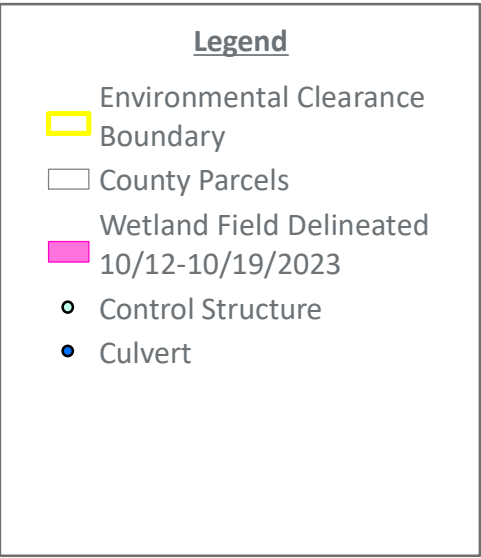
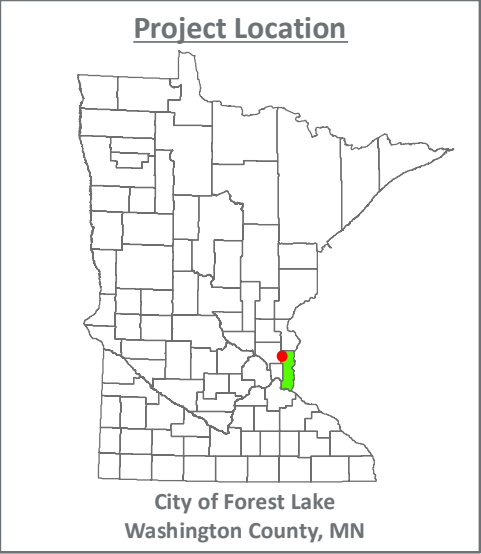




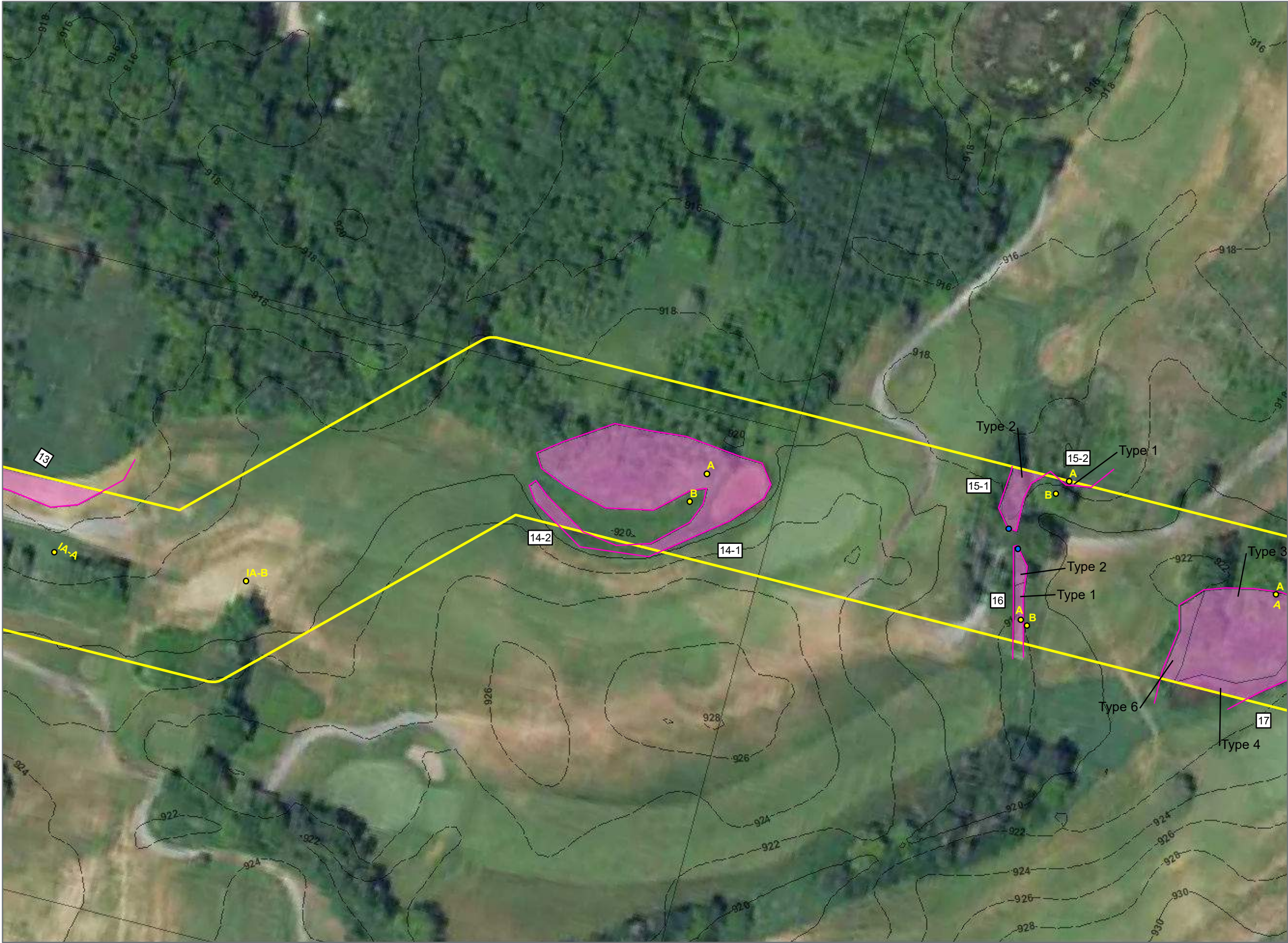
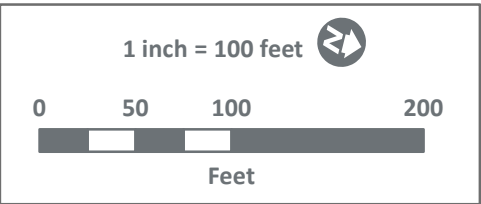
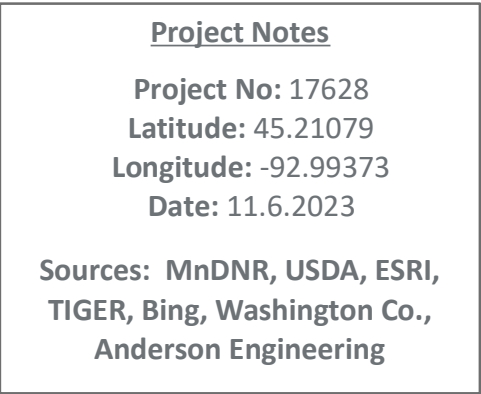
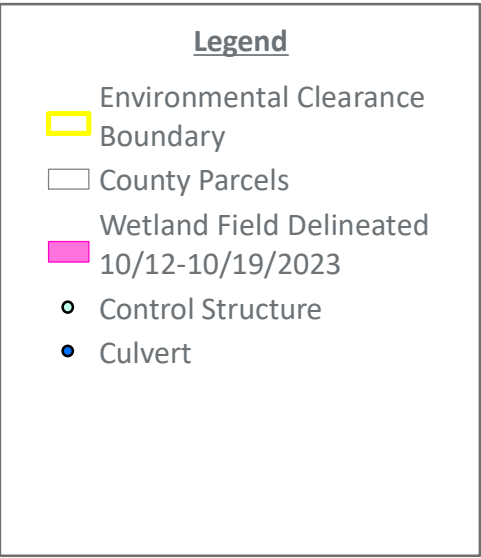
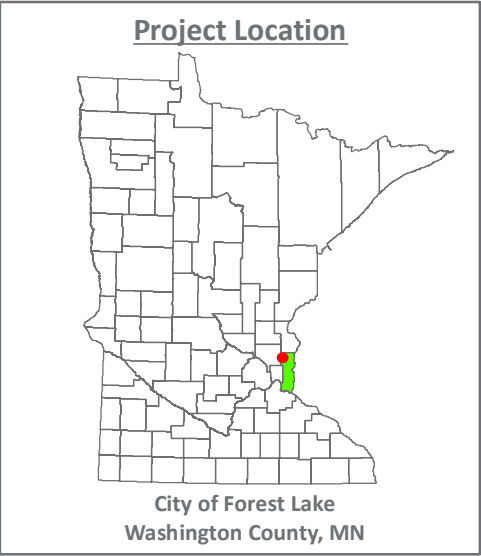




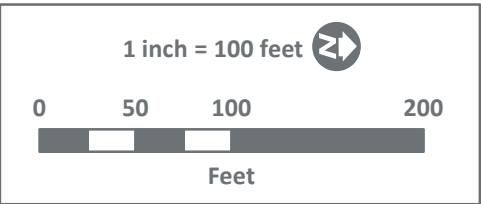
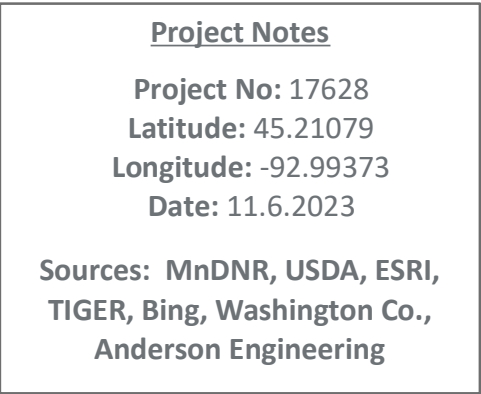
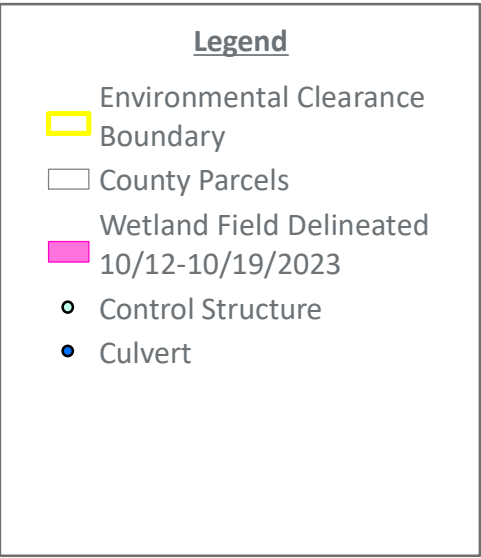
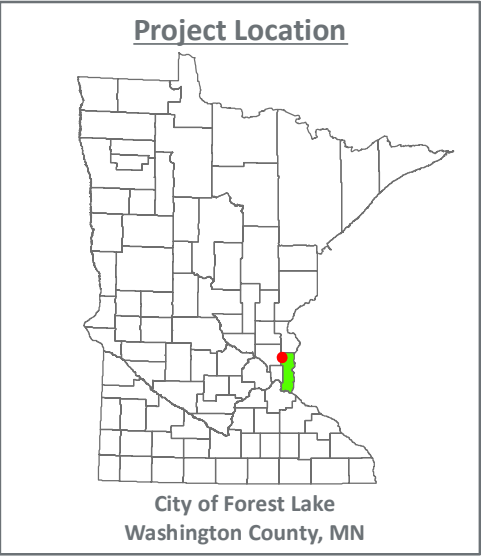




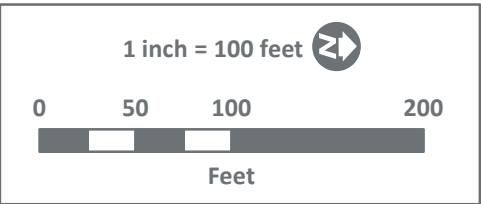
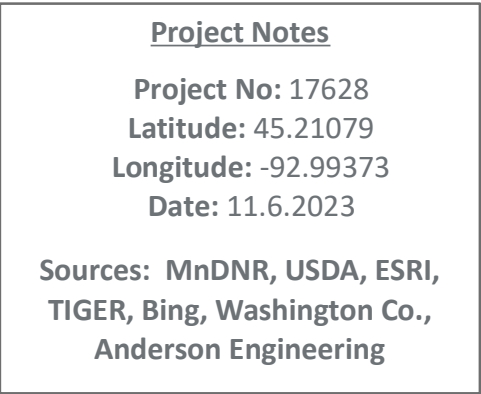
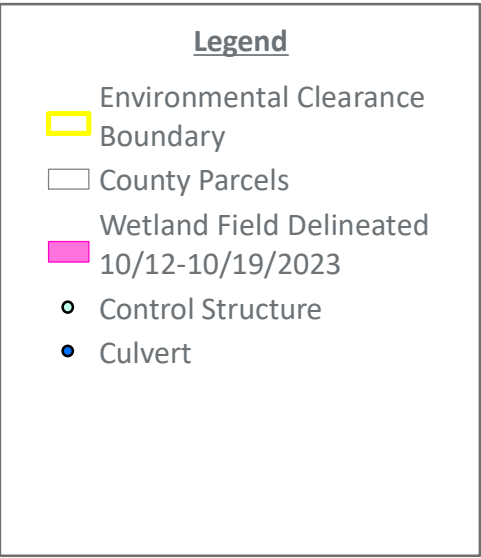
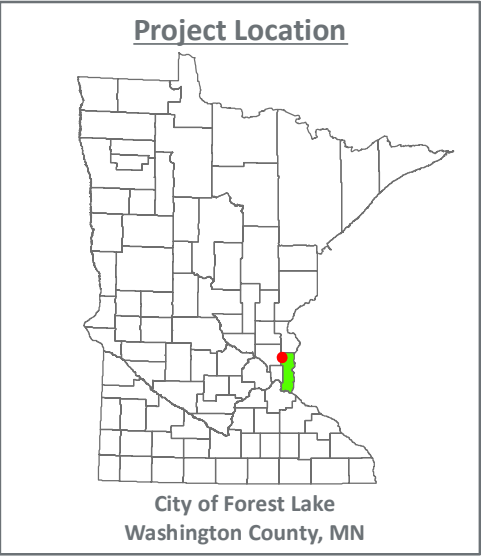




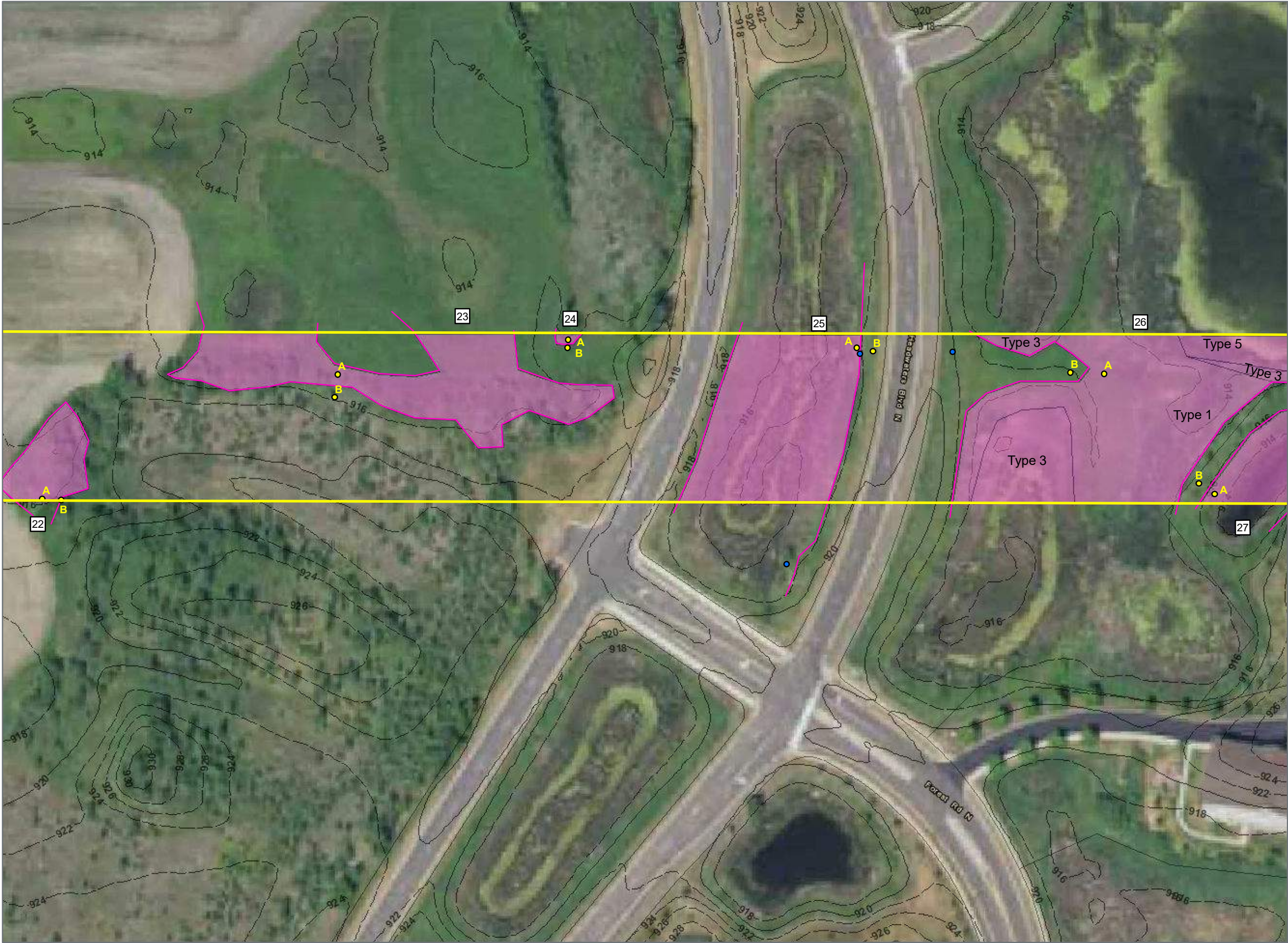
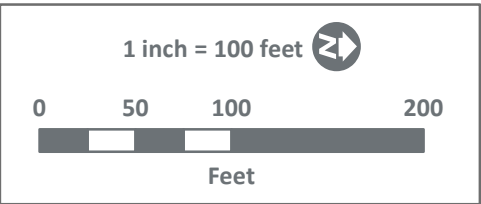
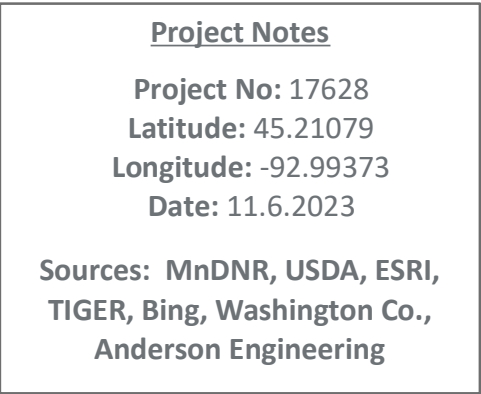
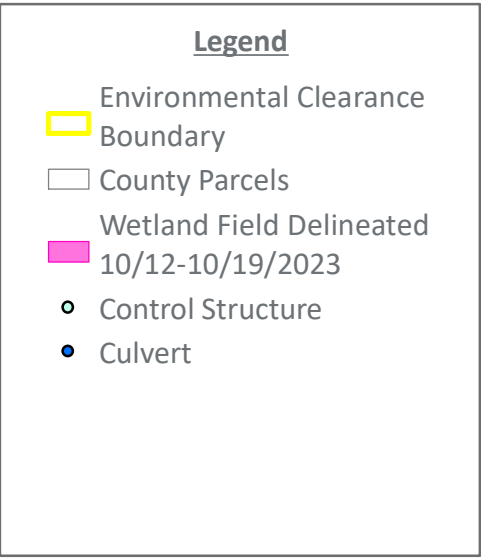
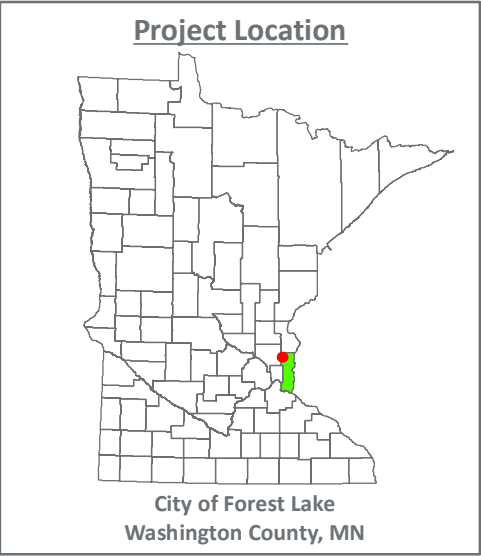




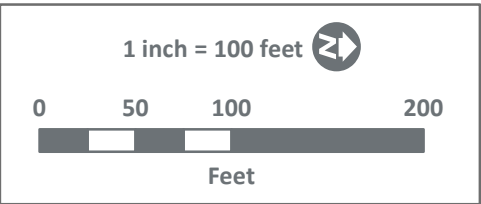
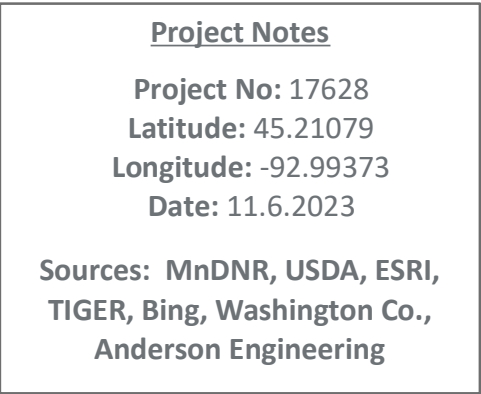
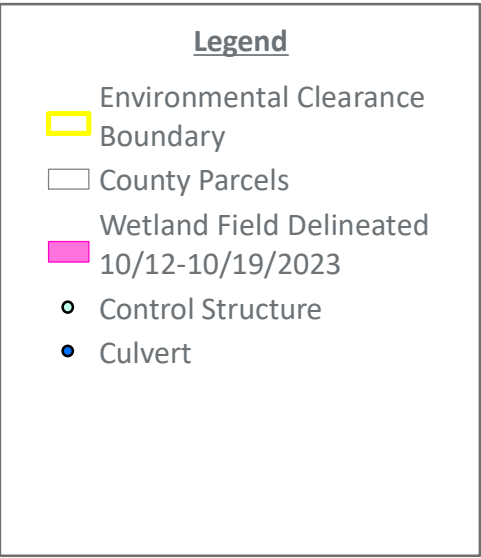
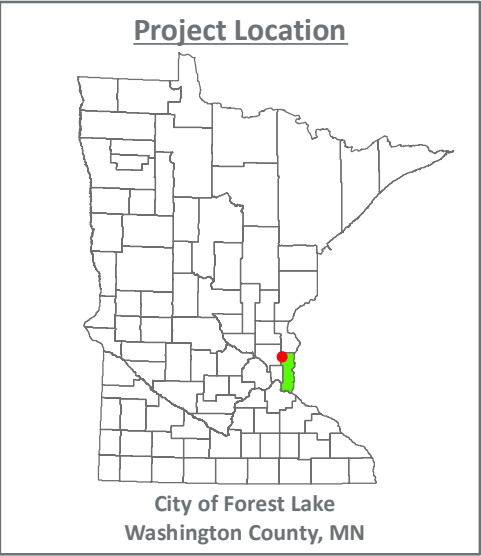














## **Appendix B**

### **ROUTINE ON-SITE DETERMINATION METHOD DATASHEETS**

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# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 01A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.21066041 Long: -92.9939312 Datum: WGS 84  
 Soil Map Unit Name: 544 - Cathro muck - Hydric Soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent precipitation is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 01A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Acer negundo</i> / Boxelder, Box elder	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	25	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Sambucus nigra</i> / Black elderberry	15	Yes	FACW
2. <i>Cornus alba</i> / Red osier	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	25	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Phalaris arundinacea</i> / Reed canary grass	45	Yes	FACW
2. <i>Circaea alpina</i> / Small enchanter's nightshade	30	Yes	FACW
3. <i>Cirsium arvense</i> / Canada thistle	5	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. <i>Vitis riparia</i> / River-bank grape	15	Yes	FAC
2.			
3.			
4.			
	15	= Total Cover	

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	100	x 2 =	200	
FAC species	40	x 3 =	120	
FACU species	5	x 4 =	20	
UPL species	0	x 5 =	0	
Column Totals:	145	(A)	340	(B)

Prevalence Index = B/A = 2.34

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 01A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 01B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 4  
 Subregion (LRR or MLRA): LRR K Lat: 45.21065339 Long: -92.99384582 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, Non-hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Hydric Soil Present? Yes <u>X</u> No <u>      </u>	
Wetland Hydrology Present? Yes <u>      </u> No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent precipitation is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<u>      </u> Surface Water (A1)	<u>      </u> Water-Stained Leaves (B9)	<u>      </u> Surface Soil Cracks (B6)
<u>      </u> High Water Table (A2)	<u>      </u> Aquatic Fauna (B13)	<u>      </u> Drainage Patterns (B10)
<u>      </u> Saturation (A3)	<u>      </u> Marl Deposits (B15)	<u>      </u> Moss Trim Lines (B16)
<u>      </u> Water Marks (B1)	<u>      </u> Hydrogen Sulfide Odor (C1)	<u>      </u> Dry-Season Water Table (C2)
<u>      </u> Sediment Deposits (B2)	<u>      </u> Oxidized Rhizospheres on Living Roots (C3)	<u>      </u> Crayfish Burrows (C8)
<u>      </u> Drift Deposits (B3)	<u>      </u> Presence of Reduced Iron (C4)	<u>      </u> Saturation Visible on Aerial Imagery (C9)
<u>      </u> Algal Mat or Crust (B4)	<u>      </u> Recent Iron Reduction in Tilled Soils (C6)	<u>      </u> Stunted or Stressed Plants (D1)
<u>      </u> Iron Deposits (B5)	<u>      </u> Thin Muck Surface (C7)	<u>      </u> Geomorphic Position (D2)
<u>      </u> Inundation Visible on Aerial Imagery (B7)	<u>      </u> Other (Explain in Remarks)	<u>      </u> Shallow Aquitard (D3)
<u>      </u> Sparsely Vegetated Concave Surface (B8)		<u>      </u> Microtopographic Relief (D4)
		<u>      </u> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 01B

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	0	= Total Cover		
Herb Stratum (Plot size: 5-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	15	Yes	UPL	
2. <i>Phalaris arundinacea</i> / Reed canary grass	15	Yes	FACW	
3. <i>Arctium minus</i> / Common burdock	10	Yes	FACU	
4. <i>Sambucus nigra</i> / Black elderberry	10	Yes	FACW	
5. <i>Acer negundo</i> / Boxelder, Box elder	10	Yes	FAC	
6. <i>Urtica dioica</i> / Stinging nettle	5	No	FAC	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	65	= Total Cover		
Woody Vine Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	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: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	25	x 2 =	50	
FAC species	15	x 3 =	45	
FACU species	10	x 4 =	40	
UPL species	15	x 5 =	75	
Column Totals:	65	(A)	210	(B)

Prevalence Index = B/A = 3.23

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 01B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

- ☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ☐ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 02A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.21156813 Long: -92.99387948 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, Non-hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent precipitation is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 02A

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum (Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1. <i>Fraxinus pennsylvanica</i> / Green ash</td><td style="text-align: center;">30</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>2. <i>Ulmus americana</i> / American elm</td><td style="text-align: center;">10</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">40</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum (Plot size: 15-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> </tr> <tr><td>1. <i>Rhamnus cathartica</i> / European buckthorn</td><td style="text-align: center;">10</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FAC</td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">10</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum (Plot size: 5-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> </tr> <tr><td>1. <i>Acer negundo</i> / Boxelder, Box elder</td><td style="text-align: center;">5</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FAC</td></tr> <tr><td>2. <i>Ulmus americana</i> / American elm</td><td style="text-align: center;">5</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>3. <i>Fraxinus pennsylvanica</i> / Green ash</td><td style="text-align: center;">5</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr><td>8. _____</td><td></td><td></td><td></td></tr> <tr><td>9. _____</td><td></td><td></td><td></td></tr> <tr><td>10. _____</td><td></td><td></td><td></td></tr> <tr><td>11. _____</td><td></td><td></td><td></td></tr> <tr><td>12. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">15</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum (Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> </tr> <tr><td>1. <i>Vitis riparia</i> / River-bank grape</td><td style="text-align: center;">5</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FAC</td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">5</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table>	Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1. <i>Fraxinus pennsylvanica</i> / Green ash	30	Yes	FACW	2. <i>Ulmus americana</i> / American elm	10	Yes	FACW	3. _____				4. _____				5. _____				6. _____				7. _____					40	= Total Cover		Sapling/Shrub Stratum (Plot size: 15-ft)				1. <i>Rhamnus cathartica</i> / European buckthorn	10	Yes	FAC	2. _____				3. _____				4. _____				5. _____				6. _____				7. _____					10	= Total Cover		Herb Stratum (Plot size: 5-ft)				1. <i>Acer negundo</i> / Boxelder, Box elder	5	Yes	FAC	2. <i>Ulmus americana</i> / American elm	5	Yes	FACW	3. <i>Fraxinus pennsylvanica</i> / Green ash	5	Yes	FACW	4. _____				5. _____				6. _____				7. _____				8. _____				9. _____				10. _____				11. _____				12. _____					15	= Total Cover		Woody Vine Stratum (Plot size: 30-ft)				1. <i>Vitis riparia</i> / River-bank grape	5	Yes	FAC	2. _____				3. _____				4. _____					5	= Total Cover		<p><b>Dominance Test worksheet:</b>                  Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>7</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0</u> (A/B)</p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Total % Cover of:</th> <th style="text-align: left; border-bottom: 1px solid black;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>20</u></td> <td>x 3 = <u>60</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>70</u> (A)</td> <td><u>160</u> (B)</td> </tr> </table> <p style="text-align: center;">Prevalence Index = B/A = <u>2.29</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>  </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u>X</u> 2 - Dominance Test is &gt;50%</p> <p><u>X</u> 3 - Prevalence Index ≤3.0<sup>1</sup></p> <p><u>  </u> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Vegetation Strata</b></p> <p><b>Tree</b> - Woody plants 3 in. 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## SOIL

Sampling Point: 02A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R,MLRA 149B)</b>
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b>	

### Indicators for Problematic Hydric Soils<sup>3</sup>:

\_\_\_ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
 \_\_\_ Coast Prairie Redox (A16) (**LRR K, L, R**)  
 \_\_\_ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
 \_\_\_ Dark Surface (S7) (**LRR K, L**)  
 \_\_\_ Polyvalue Below Surface (S8) (**LRR K, L**)  
 \_\_\_ Thin Dark Surface (S9) (**LRR K, L**)  
 \_\_\_ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
 \_\_\_ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
 \_\_\_ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
 \_\_\_ Red Parent Material (F21)  
 \_\_\_ Very Shallow Dark Surface (TF12)  
 \_\_\_ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 02B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 2  
 Subregion (LRR or MLRA): LRR K Lat: 45.21157031 Long: -92.99385732 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, Non-hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Hydric Soil Present?	Yes <u>X</u> No <u>      </u>	
Wetland Hydrology Present?	Yes <u>      </u> No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is absent. Antecedent is above average for the time of year		

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<u>      </u> Surface Water (A1)	<u>      </u> Water-Stained Leaves (B9)	<u>      </u> Surface Soil Cracks (B6)
<u>      </u> High Water Table (A2)	<u>      </u> Aquatic Fauna (B13)	<u>      </u> Drainage Patterns (B10)
<u>      </u> Saturation (A3)	<u>      </u> Marl Deposits (B15)	<u>      </u> Moss Trim Lines (B16)
<u>      </u> Water Marks (B1)	<u>      </u> Hydrogen Sulfide Odor (C1)	<u>      </u> Dry-Season Water Table (C2)
<u>      </u> Sediment Deposits (B2)	<u>      </u> Oxidized Rhizospheres on Living Roots (C3)	<u>      </u> Crayfish Burrows (C8)
<u>      </u> Drift Deposits (B3)	<u>      </u> Presence of Reduced Iron (C4)	<u>      </u> Saturation Visible on Aerial Imagery (C9)
<u>      </u> Algal Mat or Crust (B4)	<u>      </u> Recent Iron Reduction in Tilled Soils (C6)	<u>      </u> Stunted or Stressed Plants (D1)
<u>      </u> Iron Deposits (B5)	<u>      </u> Thin Muck Surface (C7)	<u>      </u> Geomorphic Position (D2)
<u>      </u> Inundation Visible on Aerial Imagery (B7)	<u>      </u> Other (Explain in Remarks)	<u>      </u> Shallow Aquitard (D3)
<u>      </u> Sparsely Vegetated Concave Surface (B8)		<u>      </u> Microtopographic Relief (D4)
		<u>      </u> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 02B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Fraxinus pennsylvanica</i> / Green ash	20	Yes	FACW
2. <i>Populus deltoides</i> / Eastern cottonwood	20	Yes	FAC
3. <i>Quercus macrocarpa</i> / Bur oak	5	No	FACU
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	45	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	75	Yes	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	75	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	5	Yes	FAC
2. <i>Geranium robertianum</i> / Robert's geranium	5	Yes	FACU
3. <i>Toxicodendron radicans</i> / Eastern poison ivy	5	Yes	FAC
4. <i>Polygonatum biflorum</i> / King Solomon's-seal	5	Yes	FACU
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	20	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. <i>Vitis riparia</i> / River-bank grape	15	Yes	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	15	= Total Cover	

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 20	x 2 = 40
FAC species 120	x 3 = 360
FACU species 15	x 4 = 60
UPL species 0	x 5 = 0
Column Totals: 155 (A)	460 (B)

Prevalence Index = B/A = 2.97

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 02B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |  |  |
|--|--|
| <input type="checkbox"/> Histosol (A1)                               | <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R,MLRA 149B)</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                        | <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>      |
| <input type="checkbox"/> Black Histic (A3)                           | <input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                              |
| <input type="checkbox"/> Stratified Layers (A5)                      | <input type="checkbox"/> Depleted Matrix (F3)                                  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)           | <input type="checkbox"/> Redox Dark Surface (F6)                               |
| <input checked="" type="checkbox"/> Thick Dark Surface (A12)         | <input type="checkbox"/> Depleted Dark Surface (F7)                            |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                    | <input type="checkbox"/> Redox Depressions (F8)                                |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                    |  |
| <input type="checkbox"/> Sandy Redox (S5)                            |  |
| <input type="checkbox"/> Stripped Matrix (S6)                        |  |
| <input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b> |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
Applicant/Owner: TKDA State: MN Sampling Point: 03A  
Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
Subregion (LRR or MLRA): LRR K Lat: 45.21107426 Long: -92.99383646 Datum: WGS 84  
Soil Map Unit Name: 123 - Dundas fine sandy loam, non-hydric soil unit NWI classification: None

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 ☐  
Hydric Soil Present? Yes ☒ No ☐  
Wetland Hydrology Present? Yes ☒ No ☐

#### Is the Sampled Area

within a Wetland? Yes ☒ No ☐

If yes, optional Wetland Site ID: \_\_\_\_\_

Remarks: (Explain alternative procedures here or in a separate report.)

Wetland criteria is met. Antecedent precipitation is above average for the time of year.

### HYDROLOGY

#### Wetland Hydrology Indicators:

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

☐ Surface Water (A1) ☒ Water-Stained Leaves (B9)  
☐ High Water Table (A2) ☐ Aquatic Fauna (B13)  
☐ Saturation (A3) ☐ Marl Deposits (B15)  
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)  
☐ Sediment Deposits (B2) ☐ Oxidized Rhizospheres on Living Roots (C3)  
☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4)  
☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6)  
☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7)  
☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks)  
☒ Sparsely Vegetated Concave Surface (B8)

Secondary Indicators (minimum of two required)

☐ Surface Soil Cracks (B6)  
☒ Drainage Patterns (B10)  
☐ Moss Trim Lines (B16)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☒ Geomorphic Position (D2)  
☐ Shallow Aquitard (D3)  
☐ Microtopographic Relief (D4)  
☒ FAC-Neutral Test (D5)

#### Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
Water Table Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
Saturation Present? Yes ☐ No ☒ Depth (inches): \_\_\_\_\_  
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:



**VEGETATION - Use scientific names of plants.**

Sampling Point: 03A

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum (Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr> <td>1. <i>Populus deltoides</i> / Eastern cottonwood</td> <td style="text-align: center;">40</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FAC</td> </tr> <tr> <td>2. <i>Fraxinus pennsylvanica</i> / Green ash</td> <td style="text-align: center;">10</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACW</td> </tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">50</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum (Plot size: 15-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum (Plot size: 5-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr><td>8. _____</td><td></td><td></td><td></td></tr> <tr><td>9. _____</td><td></td><td></td><td></td></tr> <tr><td>10. _____</td><td></td><td></td><td></td></tr> <tr><td>11. _____</td><td></td><td></td><td></td></tr> <tr><td>12. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum (Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table>	Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1. <i>Populus deltoides</i> / Eastern cottonwood	40	Yes	FAC	2. <i>Fraxinus pennsylvanica</i> / Green ash	10	Yes	FACW	3. _____				4. _____				5. _____				6. _____				7. _____					50	= Total Cover		Sapling/Shrub Stratum (Plot size: 15-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1. _____				2. _____				3. _____				4. _____				5. _____				6. _____				7. _____					0	= Total Cover		Herb Stratum (Plot size: 5-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1. _____				2. _____				3. _____				4. _____				5. _____				6. _____				7. _____				8. _____				9. _____				10. _____				11. _____				12. _____					0	= Total Cover		Woody Vine Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1. _____				2. _____				3. _____				4. _____					0	= Total Cover		<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>2</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0</u> (A/B)</p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Total % Cover of:</th> <th style="text-align: center; border-bottom: 1px solid black;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>40</u></td> <td>x 3 = <u>120</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>50</u> (A)</td> <td><u>140</u> (B)</td> </tr> </table> <p style="text-align: center;">Prevalence Index = B/A = <u>2.8</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>  </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u>X</u> 2 - Dominance Test is &gt;50%</p> <p><u>X</u> 3 - Prevalence Index ≤3.0<sup>1</sup></p> <p><u>  </u> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Vegetation Strata</b></p> <p><b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No <u>  </u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>40</u>	x 3 = <u>120</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>50</u> (A)	<u>140</u> (B)
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## SOIL

Sampling Point: 03A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10YR 2/2	70	10YR 3/6	30	C	M	Fine Sndy Lm	PRC
12-15	10YR 5/1	80	10YR 3/6	20	C	M	Fine Sndy Lm	PRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils<sup>3</sup>:

<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)
<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)
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<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: Rocks and gravel  
Depth (inches): 15

Hydric Soil Present? Yes ☒ No ☐

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/12/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	03B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none			Slope (%):	4
Subregion (LRR or MLRA):	LRR K		Lat:	45.21108593		Long:	-92.99376709	
Soil Map Unit Name:	123 - Dundas fine sandy loam, non-hydric soil unit			NWI classification:	None			

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

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

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

Hydrophytic Vegetation Present?	Yes	<u>X</u>	No	<u>      </u>
Hydric Soil Present?	Yes	<u>      </u>	No	<u>X</u>
Wetland Hydrology Present?	Yes	<u>      </u>	No	<u>X</u>

**Is the Sampled Area within a Wetland?**      Yes             No X

If yes, optional Wetland Site ID: \_\_\_\_\_

Remarks: (Explain alternative procedures here or in a separate report.)  
Antecedent is above average for the time of year

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
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|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 03B

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(7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No <u>  </u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>15</u>	x 2 = <u>30</u>	FAC species <u>60</u>	x 3 = <u>180</u>	FACU species <u>15</u>	x 4 = <u>60</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>90</u> (A)	<u>270</u> (B)
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## SOIL

Sampling Point: 03B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
 Coast Prairie Redox (A16) (**LRR K, L, R**)  
 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
 Dark Surface (S7) (**LRR K, L**)  
 Polyvalue Below Surface (S8) (**LRR K, L**)  
 Thin Dark Surface (S9) (**LRR K, L**)  
 Iron-Manganese Masses (F12) (**LRR K, L, R**)  
 Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
 Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
 Red Parent Material (F21)  
 Very Shallow Dark Surface (TF12)  
 Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: Tree roots

Depth (inches): 6

**Hydric Soil Present?**      Yes      No      X

Remarks:

Located in mapped non-hydric soils unit. Assumed non hydric profile in upland area.

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/County:	Forest Lake/Washington		Sampling Date:	10/12/2023			
Applicant/Owner:	TKDA			State:	MN		Sampling Point:	04A		
Investigator(s):	Dylan Kruzel, Garrett Wee			Section, Township, Range:	S28, T163, R36W					
Landform (hillslope, terrace, etc):	Toe Slope		Local relief (concave, convex, none):	concave			Slope (%):	1		
Subregion (LRR or MLRA):	LRR K		Lat:	45.21146814		Long:	-92.99344865		Datum:	WGS 84
Soil Map Unit Name:	123 - Dundas fine sandy loam, non-hydric soil unit				NWI classification:	None				

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is met. Antecedent is above average for the time of year.

**Wetland Hydrology Indicators:**

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

- |                                     |   |                                     |  |
|-------------------------------------|---|-------------------------------------|--|
| <input type="checkbox"/>            | Surface Water (A1)                        | <input checked="" type="checkbox"/> | Water-Stained Leaves (B9)                  |
| <input type="checkbox"/>            | High Water Table (A2)                     | <input type="checkbox"/>            | Aquatic Fauna (B13)                        |
| <input type="checkbox"/>            | Saturation (A3)                           | <input type="checkbox"/>            | Marl Deposits (B15)                        |
| <input type="checkbox"/>            | Water Marks (B1)                          | <input type="checkbox"/>            | Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/>            | Sediment Deposits (B2)                    | <input type="checkbox"/>            | Oxidized Rhizospheres on Living Roots (C3) |
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| <input type="checkbox"/>            | Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/>            | Other (Explain in Remarks)                 |
| <input checked="" type="checkbox"/> | Sparsely Vegetated Concave Surface (B8)   |                                     |  |

Secondary Indicators (minimum of two required)

- |     |   |
|-----|---|
| ___ | Surface Soil Cracks (B6)                  |
| ___ | Drainage Patterns (B10)                   |
| ___ | Moss Trim Lines (B16)                     |
| ___ | Dry-Season Water Table (C2)               |
| ___ | Crayfish Burrows (C8)                     |
| ___ | Saturation Visible on Aerial Imagery (C9) |
| ___ | Stunted or Stressed Plants (D1)           |
| X   | Geomorphic Position (D2)                  |
| ___ | Shallow Aquitard (D3)                     |
| ___ | Microtopographic Relief (D4)              |
| X   | FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      X      No

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

Remarks:



**VEGETATION - Use scientific names of plants.**

Sampling Point: 04A

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum (Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1. <i>Fraxinus pennsylvanica</i> / Green ash</td><td style="text-align: center;">30</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">30</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum (Plot size: 15-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> </tr> <tr><td>1. <i>Cornus racemosa</i> / Gray dogwood</td><td style="text-align: center;">10</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FAC</td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">10</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum (Plot size: 5-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> </tr> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr><td>8. _____</td><td></td><td></td><td></td></tr> <tr><td>9. _____</td><td></td><td></td><td></td></tr> <tr><td>10. _____</td><td></td><td></td><td></td></tr> <tr><td>11. _____</td><td></td><td></td><td></td></tr> <tr><td>12. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum (Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> <th style="text-align: center; border-bottom: 1px solid black;"></th> </tr> <tr><td>1. <i>Vitis riparia</i> / River-bank grape</td><td style="text-align: center;">20</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FAC</td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">20</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table>	Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1. <i>Fraxinus pennsylvanica</i> / Green ash	30	Yes	FACW	2. _____				3. _____				4. _____				5. _____				6. _____				7. _____					30	= Total Cover		Sapling/Shrub Stratum (Plot size: 15-ft)				1. <i>Cornus racemosa</i> / Gray dogwood	10	Yes	FAC	2. _____				3. _____				4. _____				5. _____				6. _____				7. _____					10	= Total Cover		Herb Stratum (Plot size: 5-ft)				1. _____				2. _____				3. _____				4. _____				5. _____				6. _____				7. _____				8. _____				9. _____				10. _____				11. _____				12. _____					0	= Total Cover		Woody Vine Stratum (Plot size: 30-ft)				1. <i>Vitis riparia</i> / River-bank grape	20	Yes	FAC	2. _____				3. _____				4. _____					20	= Total Cover		<p><b>Dominance Test worksheet:</b>                  Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>3</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0</u> (A/B)</p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Total % Cover of:</th> <th style="text-align: left; border-bottom: 1px solid black;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>30</u></td> <td>x 2 = <u>60</u></td> </tr> <tr> <td>FAC species <u>30</u></td> <td>x 3 = <u>90</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>60</u> (A)</td> <td><u>150</u> (B)</td> </tr> </table> <p style="text-align: center;">Prevalence Index = B/A = <u>2.5</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>  </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u>X</u> 2 - Dominance Test is &gt;50%</p> <p><u>X</u> 3 - Prevalence Index ≤3.0<sup>1</sup></p> <p><u>  </u> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Vegetation Strata</b></p> <p><b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No <u>  </u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>30</u>	x 2 = <u>60</u>	FAC species <u>30</u>	x 3 = <u>90</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>60</u> (A)	<u>150</u> (B)
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## SOIL

Sampling Point: 04A

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

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

### Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R, MLRA 149B)</b>
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b>	

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 04B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 4  
 Subregion (LRR or MLRA): LRR K Lat: 45.21141447 Long: -92.9933389 Datum: WGS 84  
 Soil Map Unit Name: 123- Dundas fine sandy loam, non-hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>      </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

**VEGETATION - Use scientific names of plants.**

Sampling Point: 04B

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: 30-ft )				
1. <i>Acer saccharinum</i> / Silver maple	100	Yes	FACW	
2.				
3.				
4.				
5.				
6.				
7.				
	100	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )				
1. <i>Rhamnus cathartica</i> / European buckthorn	20	Yes	FAC	
2.				
3.				
4.				
5.				
6.				
7.				
	20	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5-ft )				
1. <i>Solidago gigantea</i> / Smooth goldenrod	15	Yes	FACW	
2. <i>Carex praticola</i> / Meadow sedge, Northern meadow sedge	10	Yes	FAC	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
	25	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 30-ft )				
1.				
2.				
3.				
4.				
	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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	115	x 2 =	230	
FAC species	30	x 3 =	90	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	145	(A)	320	(B)

Prevalence Index = B/A = 2.21

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 04B

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 2/1	100					Loam	
4-12	10YR 2/1	98	7.5YR 3/4	2	C	M	Clay Loam	PRC
12-24	10YR 4/1	90	7.5YR 3/4	10	C	M	Clay Loam	PRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input checked="" type="checkbox"/> Redox Dark Surface (F6)              |
| <input checked="" type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     |  |
| <input type="checkbox"/> Sandy Redox (S5)                             |  |
| <input type="checkbox"/> Stripped Matrix (S6)                         |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)         |  |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Red Parent Material (F21)                   |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>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:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 05A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.21247468 Long: -92.99391769 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton loam, Hydric soil unit NWI classification: None

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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 05A

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: right; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: 15-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: right; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: 5-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr> <td>1.</td> <td><i>Phalaris arundinacea</i> / Reed canary grass</td> <td style="text-align: center;">50</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACW</td> </tr> <tr> <td>2.</td> <td><i>Circaea alpina</i> / Small enchanter's nightshade</td> <td style="text-align: center;">10</td> <td style="text-align: center;">No</td> <td style="text-align: center;">FACW</td> </tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr><td>8.</td><td></td><td></td><td></td><td></td></tr> <tr><td>9.</td><td></td><td></td><td></td><td></td></tr> <tr><td>10.</td><td></td><td></td><td></td><td></td></tr> <tr><td>11.</td><td></td><td></td><td></td><td></td></tr> <tr><td>12.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center; border-top: 1px solid black;">60</td> <td colspan="2" style="text-align: right; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: right; border-top: 1px solid black;">= Total Cover</td> </tr> </table>	Tree Stratum	(Plot size: 30-ft)	Absolute % Cover	Dominant Species?	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Indicator Status	1.					2.					3.					4.							0	= Total Cover		<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <span style="float: right;">1 (A)</span></p> <p>Total Number of Dominant Species Across All Strata: <span style="float: right;">1 (B)</span></p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <span style="float: right;">100.0 (A/B)</span></p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Total % Cover of:</th> <th style="text-align: left; border-bottom: 1px solid black;">Multiply by:</th> </tr> <tr> <td>OBL species <span style="float: right;">0</span></td> <td>x 1 = <span style="float: right;">0</span></td> </tr> <tr> <td>FACW species <span style="float: right;">60</span></td> <td>x 2 = <span style="float: right;">120</span></td> </tr> <tr> <td>FAC species <span style="float: right;">0</span></td> <td>x 3 = <span style="float: right;">0</span></td> </tr> <tr> <td>FACU species <span style="float: right;">0</span></td> <td>x 4 = <span style="float: right;">0</span></td> </tr> <tr> <td>UPL species <span style="float: right;">0</span></td> <td>x 5 = <span style="float: right;">0</span></td> </tr> <tr> <td>Column Totals: <span style="float: right;">60 (A)</span></td> <td><span style="float: right;">120 (B)</span></td> </tr> </table> <p style="text-align: right; margin-top: 10px;">Prevalence Index = B/A = <span style="float: right;">2.0</span></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><input checked="" type="checkbox"/> 2 - Dominance Test is &gt;50%</p> <p><input checked="" type="checkbox"/> 3 - Prevalence Index ≤3.0<sup>1</sup></p> <p><input type="checkbox"/> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Vegetation Strata</b></p> <p><b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b>      Yes <input checked="" type="checkbox"/>      No <input type="checkbox"/></p>	Total % Cover of:	Multiply by:	OBL species <span style="float: right;">0</span>	x 1 = <span style="float: right;">0</span>	FACW species <span style="float: right;">60</span>	x 2 = <span style="float: right;">120</span>	FAC species <span style="float: right;">0</span>	x 3 = <span style="float: right;">0</span>	FACU species <span style="float: right;">0</span>	x 4 = <span style="float: right;">0</span>	UPL species <span style="float: right;">0</span>	x 5 = <span style="float: right;">0</span>	Column Totals: <span style="float: right;">60 (A)</span>	<span style="float: right;">120 (B)</span>
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## SOIL

Sampling Point: 05A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	10YR 2/1	98	10YR 3/4	2	C	M	Clay Loam	DRC
8-14	10YR 4/2	90	10YR 3/4	10	C	M	Clay Loam	DRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils<sup>3</sup>:

<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)
<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)
<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)
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<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)
<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_ Rock \_\_\_\_\_  
Depth (inches): \_\_\_\_\_ 14 \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 05B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 2  
 Subregion (LRR or MLRA): LRR K Lat: 45.21246869 Long: -92.99374269 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton Loam, Hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>      </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:          		
Remarks:		

**VEGETATION - Use scientific names of plants.**

Sampling Point: 05B

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: 30-ft )				
1. <i>Fraxinus pennsylvanica</i> / Green ash	40	Yes	FACW	
2. <i>Salix amygdaloides</i> / Peachleaf willow	10	Yes	FACW	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	50	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )				
1. <i>Rhamnus cathartica</i> / European buckthorn	10	Yes	FAC	
2. <i>Zanthoxylum americanum</i> / Toothachetree	10	Yes	FACU	
3. <i>Ulmus americana</i> / American elm	10	Yes	FACW	
4. _____				
5. _____				
6. _____				
7. _____				
	30	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5-ft )				
1. <i>Rubus idaeus</i> / Common red raspberry	25	Yes	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	25	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 30-ft )				
1. <i>Vitis riparia</i> / River-bank grape	10	Yes	FAC	
2. _____				
3. _____				
4. _____				
	10	= Total Cover		

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 60	x 2 = 120
FAC species 20	x 3 = 60
FACU species 35	x 4 = 140
UPL species 0	x 5 = 0
Column Totals: 115 (A)	320 (B)

Prevalence Index = B/A = 2.78

**Hydrophytic Vegetation Indicators:**

1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index ≤3.0<sup>1</sup>

4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 05B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) (**LRR R, MLRA 149B**)

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

\_\_\_ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
 \_\_\_ Coast Prairie Redox (A16) (**LRR K, L, R**)  
 \_\_\_ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
 \_\_\_ Dark Surface (S7) (**LRR K, L**)  
 \_\_\_ Polyvalue Below Surface (S8) (**LRR K, L**)  
 \_\_\_ Thin Dark Surface (S9) (**LRR K, L**)  
 \_\_\_ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
 \_\_\_ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
 \_\_\_ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
 \_\_\_ Red Parent Material (F21)  
 \_\_\_ Very Shallow Dark Surface (TF12)  
 \_\_\_ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 06A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.21337648 Long: -92.99388398 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton Loam, Hydric soil unit NWI classification: None

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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 06A

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	0	= Total Cover		
<b>Sapling/Shrub Stratum (Plot size: 15-ft)</b>				
1. <i>Rhamnus cathartica</i> / European buckthorn	20	Yes	FAC	
2. <i>Populus tremuloides</i> / Quaking aspen	10	Yes	FAC	
3. <i>Fraxinus pennsylvanica</i> / Green ash	10	Yes	FACW	
4. <i>Cornus alba</i> / Red osier	5	No	FACW	
5. <i>Cornus racemosa</i> / Gray dogwood	5	No	FAC	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	50	= Total Cover		
<b>Herb Stratum (Plot size: 5-ft)</b>				
1. <i>Solidago gigantea</i> / Smooth goldenrod	30	Yes	FACW	
2. <i>Phalaris arundinacea</i> / Reed canary grass	15	Yes	FACW	
3. <i>Typha angustifolia</i> / Narrow leaf cattail, Narrow-leaved cattai	5	No	OBL	
4. <i>Cirsium arvense</i> / Canada thistle	5	No	FACU	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	55	= Total Cover		
<b>Woody Vine Stratum (Plot size: 30-ft)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	0	= Total Cover		

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <span style="float: right;">5</span>	x 1 = <span style="float: right;">5</span>
FACW species <span style="float: right;">60</span>	x 2 = <span style="float: right;">120</span>
FAC species <span style="float: right;">35</span>	x 3 = <span style="float: right;">105</span>
FACU species <span style="float: right;">5</span>	x 4 = <span style="float: right;">20</span>
UPL species <span style="float: right;">0</span>	x 5 = <span style="float: right;">0</span>
Column Totals: <span style="float: right;">105 (A)</span>	<span style="float: right;">250 (B)</span>

Prevalence Index = B/A = 2.38

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 06A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)  
☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)  
☐ Loamy Mucky Mineral (F1) (**LRR K, L**)  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☒ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 06B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 2  
 Subregion (LRR or MLRA): LRR K Lat:  Long:  Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton Loam, Hydric Soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No X (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u></u> Hydric Soil Present? Yes <u>X</u> No <u></u> Wetland Hydrology Present? Yes <u></u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u></u> No <u>X</u> If yes, optional Wetland Site ID: <u></u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u></u> No <u>X</u> Depth (inches): <u></u> Water Table Present? Yes <u></u> No <u>X</u> Depth (inches): <u></u> Saturation Present? Yes <u></u> No <u>X</u> Depth (inches): <u></u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u></u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

**VEGETATION - Use scientific names of plants.**

Sampling Point: 06B

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1.				
2.				
3.				
4.				
5.				
6.				
7.				
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15-ft)				
1. <i>Rhamnus cathartica</i> / European buckthorn	20	Yes		FAC
2. <i>Populus tremuloides</i> / Quaking aspen	10	Yes		FAC
3. <i>Ribes cynosbati</i> / Eastern prickly gooseberry	5	No		FACU
4.				
5.				
6.				
7.				
	35	= Total Cover		
Herb Stratum (Plot size: 5-ft)				
1. <i>Solidago gigantea</i> / Smooth goldenrod	40	Yes		FACW
2. <i>Solidago altissima</i> / Canada goldenrod	20	Yes		FACU
3. <i>Phalaris arundinacea</i> / Reed canary grass	20	Yes		FACW
4. <i>Cirsium arvense</i> / Canada thistle	10	No		FACU
5. <i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion	5	No		FACU
6. <i>Poa pratensis</i> / Kentucky blue grass	5	No		FACU
7. <i>Zanthoxylum americanum</i> / Toothachetree	5	No		FACU
8. <i>Aquilegia canadensis</i> / Red columbine	2	No		FACU
9.				
10.				
11.				
12.				
	107	= Total Cover		
Woody Vine Stratum (Plot size: 30-ft)				
1.				
2.				
3.				
4.				
	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: 80.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 60	x 2 = 120
FAC species 30	x 3 = 90
FACU species 52	x 4 = 208
UPL species 0	x 5 = 0
Column Totals: 142 (A)	418 (B)

Prevalence Index = B/A = 2.94

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 06B

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/1	100					Loam	
6-13	10YR 2/1	95	7.5R 3/4	5	C	M	Crse Sndy Lm	PRC
13-24	10YR 6/1	90	10YR 3/6	10	C	M	Lm Crse Sand	PRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)               | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input checked="" type="checkbox"/> Redox Dark Surface (F6)              |
| <input checked="" type="checkbox"/> Thick Dark Surface (A12)  | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             |  |
| <input type="checkbox"/> Sandy Redox (S5)                     |  |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Red Parent Material (F21)                   |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>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:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/12/2023			
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	07A			
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W						
Landform (hillslope, terrace, etc):	Toe Slope		Local relief (concave, convex, none):	concave				Slope (%):	1	
Subregion (LRR or MLRA):	LRR K		Lat:	45.21762565		Long:	-92.99343084		Datum:	WGS 84
Soil Map Unit Name:	75 - Bluffton loam, Hydric Soil unit				NW1 classification:		PFO1/EM1C			

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is met. Antecedent is above average for the time of year.

**Wetland Hydrology Indicators:**

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

<input type="checkbox"/>	Surface Soil Cracks (B6)
<input type="checkbox"/>	Drainage Patterns (B10)
<input type="checkbox"/>	Moss Trim Lines (B16)
<input checked="" type="checkbox"/>	Dry-Season Water Table (C2)
<input type="checkbox"/>	Crayfish Burrows (C8)
<input type="checkbox"/>	Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/>	Stunted or Stressed Plants (D1)
<input checked="" type="checkbox"/>	Geomorphic Position (D2)
<input type="checkbox"/>	Shallow Aquitard (D3)
<input type="checkbox"/>	Microtopographic Relief (D4)
<input checked="" type="checkbox"/>	FAC-Neutral Test (D5)

Surface Water Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Water Table Present?	Yes	<u>  X  </u>	No	<u>      </u>	Depth (inches):	<u>          24          </u>
Saturation Present?	Yes	<u>  X  </u>	No	<u>      </u>	Depth (inches):	<u>          12          </u>
(includes capillary fringe)						

**Wetland Hydrology Present?**      Yes      X      No

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

Remarks:



**VEGETATION - Use scientific names of plants.**

Sampling Point: 07A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	0	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Salix interior</i> / Sandbar willow	25	Yes	FACW
2. <i>Fraxinus pennsylvanica</i> / Green ash	10	Yes	FACW
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	35	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Solidago gigantea</i> / Smooth goldenrod	60	Yes	FACW
2. <i>Phalaris arundinacea</i> / Reed canary grass	15	No	FACW
3. <i>Carex lacustris</i> / Lakebank sedge	5	No	OBL
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	80	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. _____			
2. _____			
3. _____			
4. _____			
	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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <span style="float: right;">5</span>	x 1 = <span style="float: right;">5</span>
FACW species <span style="float: right;">110</span>	x 2 = <span style="float: right;">220</span>
FAC species <span style="float: right;">0</span>	x 3 = <span style="float: right;">0</span>
FACU species <span style="float: right;">0</span>	x 4 = <span style="float: right;">0</span>
UPL species <span style="float: right;">0</span>	x 5 = <span style="float: right;">0</span>
Column Totals: <span style="float: right;">115 (A)</span>	<span style="float: right;">225 (B)</span>

Prevalence Index = B/A = 1.96

**Hydrophytic Vegetation Indicators:**

☒ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 07A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/1	100					Loam	
6-14	10YR 4/2	95	7.5R 3/4	5	C	M	Sndy Clay Lm	DRC
14-24	10YR 4/2	95	7.5R 3/4	5	C	M	Sandy Clay	DRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input checked="" type="checkbox"/> Depleted Matrix (F3)                 |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)                         |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     |  |
| <input type="checkbox"/> Sandy Redox (S5)                             |  |
| <input type="checkbox"/> Stripped Matrix (S6)                         |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)         |  |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Red Parent Material (F21)                   |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>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:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 07B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 3  
 Subregion (LRR or MLRA): LRR K Lat: 45.2176364 Long: -92.99331482 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton Loam, Hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>      </u> No <u>X</u> Wetland Hydrology Present? Yes <u>      </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

**VEGETATION - Use scientific names of plants.**

Sampling Point: 07B

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;">0</td> <td colspan="2">= Total Cover</td> </tr> </table> <table style="width: 100%; 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border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: 30-ft)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;">0</td> <td colspan="2">= Total Cover</td> </tr> </table>	Tree Stratum	(Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.					5.					6.					7.							0	= Total Cover		Sapling/Shrub Stratum	(Plot size: 15-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.					5.					6.					7.							0	= Total Cover		Herb Stratum	(Plot size: 5-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1.	<i>Phalaris arundinacea</i> / Reed canary grass	20	Yes	FACW	2.	<i>Solidago altissima</i> / Canada goldenrod	20	Yes	FACU	3.	<i>Solidago gigantea</i> / Smooth goldenrod	20	Yes	FACW	4.	<i>Thalictrum dasycarpum</i> / Purple meadow-rue	5	No	FACW	5.	<i>Asclepias syriaca</i> / Common milkweed	5	No	UPL	6.	<i>Poa pratensis</i> / Kentucky blue grass	5	No	FACU	7.					8.					9.					10.					11.					12.							75	= Total Cover		Woody Vine Stratum	(Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.							0	= Total Cover		<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>3</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7</u> (A/B)</p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Total % Cover of:</th> <th style="text-align: left; border-bottom: 1px solid black;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>45</u></td> <td>x 2 = <u>90</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>25</u></td> <td>x 4 = <u>100</u></td> </tr> <tr> <td>UPL species <u>5</u></td> <td>x 5 = <u>25</u></td> </tr> <tr> <td>Column Totals: <u>75</u> (A)</td> <td><u>215</u> (B)</td> </tr> </table> <p style="text-align: center;">Prevalence Index = B/A = <u>2.87</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>  </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u>X</u> 2 - Dominance Test is &gt;50%</p> <p><u>X</u> 3 - Prevalence Index ≤3.0<sup>1</sup></p> <p><u>  </u> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Vegetation Strata</b></p> <p><b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No <u>  </u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>45</u>	x 2 = <u>90</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>25</u>	x 4 = <u>100</u>	UPL species <u>5</u>	x 5 = <u>25</u>	Column Totals: <u>75</u> (A)	<u>215</u> (B)
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## SOIL

Sampling Point: 07B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

- ☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ☐ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/12/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	08A	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Toe Slope		Local relief (concave, convex, none):	concave			Slope (%):	0
Subregion (LRR or MLRA):	LRR K		Lat:	45.21839774		Long:	-92.99400655	
Soil Map Unit Name:	75 - Bluffton Loam, Hydric Soil unit			NW1 classification:			PEM1A	

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is met. Antecedent is above average for the time of year

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input checked="" type="checkbox"/> Geomorphic Position (D2)       |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input checked="" type="checkbox"/> FAC-Neutral Test (D5)          |

**Field Observations:**

Surface Water Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Water Table Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Saturation Present?	Yes	<u>  X  </u>	No	<u>      </u>	Depth (inches):	<u>          25          </u>
(includes capillary fringe)						

**Wetland Hydrology Present?**      Yes      ☒      No      ☐

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

Remarks:



**VEGETATION - Use scientific names of plants.**

Sampling Point: 08A

	Absolute % Cover	Dominant Species?	Indicator Status																													
<b>Tree Stratum</b> (Plot size: 30-ft )																																
1. <i>Populus tremuloides</i> / Quaking aspen	30	Yes	FAC	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)  Total Number of Dominant Species Across All Strata: 5 (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)																												
2. <i>Fraxinus pennsylvanica</i> / Green ash	5	No	FACW																													
3.																																
4.																																
5.																																
6.																																
7.																																
	35	= Total Cover																														
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )																																
1. <i>Cornus racemosa</i> / Gray dogwood	30	Yes	FAC	<b>Prevalence Index worksheet:</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 20%;"></th> <th style="width: 20%;">Multiply by:</th> <th style="width: 20%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td>0</td> <td>x 1 =</td> <td>0</td> </tr> <tr> <td>FACW species</td> <td>120</td> <td>x 2 =</td> <td>240</td> </tr> <tr> <td>FAC species</td> <td>80</td> <td>x 3 =</td> <td>240</td> </tr> <tr> <td>FACU species</td> <td>0</td> <td>x 4 =</td> <td>0</td> </tr> <tr> <td>UPL species</td> <td>0</td> <td>x 5 =</td> <td>0</td> </tr> <tr> <td>Column Totals:</td> <td>200</td> <td>(A)</td> <td>480 (B)</td> </tr> </tbody> </table> Prevalence Index = B/A = 2.4	Total % Cover of:		Multiply by:		OBL species	0	x 1 =	0	FACW species	120	x 2 =	240	FAC species	80	x 3 =	240	FACU species	0	x 4 =	0	UPL species	0	x 5 =	0	Column Totals:	200	(A)	480 (B)
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FACU species	0	x 4 =	0																													
UPL species	0	x 5 =	0																													
Column Totals:	200	(A)	480 (B)																													
2. <i>Cornus alba</i> / Red osier	15	Yes	FACW																													
3. <i>Rhamnus cathartica</i> / European buckthorn	10	No	FAC																													
4.																																
5.																																
6.																																
7.																																
	55	= Total Cover																														
<b>Herb Stratum</b> (Plot size: 5-ft )																																
1. <i>Phalaris arundinacea</i> / Reed canary grass	100	Yes	FACW	<b>Hydrophytic Vegetation Indicators:</b> ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index ≤3.0 <sup>1</sup> ___ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation <sup>1</sup> (Explain )  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																												
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<b>Woody Vine Stratum</b> (Plot size: 30-ft )																																
1. <i>Vitis riparia</i> / River-bank grape	10	Yes	FAC	<b>Definitions of Vegetation Strata</b>  <b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. <b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. <b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. <b>Woody vines</b> - All woody vines greater than 3.28 ft in height.																												
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Remarks: (Explain alternative procedures here or in a separate report.)																																

## SOIL

Sampling Point: 08A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10YR 2/1	100					Fine Sndy Lm	
12-20	10YR 4/2	70	10YR 3/6	5	C	M	Fine Sndy Lm	PRC
	10YR 2/1	25					Sndy Clay Lm	Mixed matrix
20-26	10YR 5/2	90	10YR 3/6	10	C	M	Sndy Clay Lm	PRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)                         |
| <input checked="" type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     |  |
| <input type="checkbox"/> Sandy Redox (S5)                             |  |
| <input type="checkbox"/> Stripped Matrix (S6)                         |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)         |  |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Red Parent Material (F21)                   |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>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:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 08B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none):  Slope (%): 3  
 Subregion (LRR or MLRA): LRR K Lat: 45.21840914 Long: -92.99388374 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton Loam, Hydric Soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No X (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u></u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u></u> No <u>X</u> If yes, optional Wetland Site ID: <u></u>
Hydric Soil Present? Yes <u></u> No <u>X</u>	
Wetland Hydrology Present? Yes <u></u> No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.) <u>Antecedent is above average for the time of year</u>	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u></u> No <u>X</u> Depth (inches): <u></u> Water Table Present? Yes <u></u> No <u>X</u> Depth (inches): <u></u> Saturation Present? Yes <u></u> No <u>X</u> Depth (inches): <u></u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u></u> No <u>X</u>

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 08B

Tree Stratum (Plot size: 30-ft )				Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Fraxinus pennsylvanica</i> / Green ash				50	Yes	FACW
2. <i>Quercus macrocarpa</i> / Bur oak				20	Yes	FACU
3.						
4.						
5.						
6.						
7.						
				70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15-ft )						
1. <i>Rhamnus cathartica</i> / European buckthorn				35	Yes	FAC
2. <i>Viburnum lentago</i> / Nanny-berry				20	Yes	FAC
3. <i>Cornus racemosa</i> / Gray dogwood				15	Yes	FAC
4.						
5.						
6.						
7.						
				70	= Total Cover	
Herb Stratum (Plot size: 5-ft )						
1. <i>Rhamnus cathartica</i> / European buckthorn				25	Yes	FAC
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
				25	= Total Cover	
Woody Vine Stratum (Plot size: 30-ft )						
1. <i>Vitis riparia</i> / River-bank grape				10	Yes	FAC
2.						
3.						
4.						
				10	= Total Cover	

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)  
  
 Total Number of Dominant Species Across All Strata: 7 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:	Multiply by:
OBL species <span style="float: right;">0</span>	x 1 = <span style="float: right;">0</span>
FACW species <span style="float: right;">50</span>	x 2 = <span style="float: right;">100</span>
FAC species <span style="float: right;">105</span>	x 3 = <span style="float: right;">315</span>
FACU species <span style="float: right;">20</span>	x 4 = <span style="float: right;">80</span>
UPL species <span style="float: right;">0</span>	x 5 = <span style="float: right;">0</span>
Column Totals: <span style="float: right;">175 (A)</span>	<span style="float: right;">495 (B)</span>

Prevalence Index = B/A = 2.83

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**  
  
**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  
**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?**
Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 08B

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

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

### Hydric Soil Indicators:

- |   |  |
|---|--|
| ___ Histosol (A1)                                 | ___ Polyvalue Below Surface (S8) ( <b>LRR R, MLRA 149B</b> ) |
| ___ Histic Epipedon (A2)                          | ___ Thin Dark Surface (S9) ( <b>LRR R, MLRA 149B</b> )       |
| ___ Black Histic (A3)                             | ___ Loamy Mucky Mineral (F1) ( <b>LRR K, L</b> )             |
| ___ Hydrogen Sulfide (A4)                         | ___ Loamy Gleyed Matrix (F2)                                 |
| ___ Stratified Layers (A5)                        | ___ Depleted Matrix (F3)                                     |
| ___ Depleted Below Dark Surface (A11)             | ___ Redox Dark Surface (F6)                                  |
| ___ Thick Dark Surface (A12)                      | ___ Depleted Dark Surface (F7)                               |
| ___ Sandy Mucky Mineral (S1)                      | ___ Redox Depressions (F8)                                   |
| ___ Sandy Gleyed Matrix (S4)                      |  |
| ___ Sandy Redox (S5)                              |  |
| ___ Stripped Matrix (S6)                          |  |
| ___ Dark Surface (S7) ( <b>LRR R, MLRA 149B</b> ) |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 09A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.21832451 Long: -92.99371564 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, Non-hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year.	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 09A

Tree Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	0	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Salix amygdaloides</i> / Peachleaf willow	50	Yes	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	50	= Total Cover		

Herb Stratum (Plot size: 5-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Phalaris arundinacea</i> / Reed canary grass	30	Yes	FACW	
2. <i>Carex bebbii</i> / Bebb's sedge	10	Yes	OBL	
3. <i>Scirpus atrovirens</i> / Green bulrush	5	No	OBL	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	45	= Total Cover		

Woody Vine Stratum (Plot size: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	15	x 1 =	15	
FACW species	80	x 2 =	160	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	95	(A)	175	(B)

Prevalence Index = B/A = 1.84

**Hydrophytic Vegetation Indicators:**

☒ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 09A

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

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

### Hydric Soil Indicators:

- |  |   |
|--|---|
| <input type="checkbox"/> Histosol (A1)                               | <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R, MLRA 149B)</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                        | <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>       |
| <input type="checkbox"/> Black Histic (A3)                           | <input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                               |
| <input type="checkbox"/> Stratified Layers (A5)                      | <input checked="" type="checkbox"/> Depleted Matrix (F3)                        |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)           | <input type="checkbox"/> Redox Dark Surface (F6)                                |
| <input type="checkbox"/> Thick Dark Surface (A12)                    | <input type="checkbox"/> Depleted Dark Surface (F7)                             |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                    | <input type="checkbox"/> Redox Depressions (F8)                                 |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                    |   |
| <input type="checkbox"/> Sandy Redox (S5)                            |   |
| <input type="checkbox"/> Stripped Matrix (S6)                        |   |
| <input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b> |   |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 09B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): convex Slope (%): 3  
 Subregion (LRR or MLRA): LRR K Lat: 45.2183413 Long: -92.99375501 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, non-hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>      </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is absent. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:          		
Remarks:		

**VEGETATION - Use scientific names of plants.**

Sampling Point: 09B

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: 30-ft )				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
	0	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
	0	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5-ft )				
1. <i>Solidago gigantea</i> / Smooth goldenrod	25	Yes		FACW
2. <i>Phalaris arundinacea</i> / Reed canary grass	25	Yes		FACW
3. <i>Poa pratensis</i> / Kentucky blue grass	10	No		FACU
4. <i>Panicum amarum</i> / Bitter panic grass	5	No		FACU
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
	65	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 30-ft )				
1.				
2.				
3.				
4.				
	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: 100.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	50	x 2 =	100	
FAC species	0	x 3 =	0	
FACU species	15	x 4 =	60	
UPL species	0	x 5 =	0	
Column Totals:	65	(A)	160	(B)

Prevalence Index = B/A = 2.46

**Hydrophytic Vegetation Indicators:**  
☒ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 09B

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

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

### Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R,MLRA 149B)</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>      |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                              |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input checked="" type="checkbox"/> Depleted Matrix (F3)                       |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)                               |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7)                            |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)                                |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     |  |
| <input type="checkbox"/> Sandy Redox (S5)                             |  |
| <input type="checkbox"/> Stripped Matrix (S6)                         |  |
| <input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b>  |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
Applicant/Owner: TKDA State: MN Sampling Point: 10A  
Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
Subregion (LRR or MLRA): LRR K Lat: 45.21991168 Long: -92.99330383 Datum: WGS 84  
Soil Map Unit Name: 123 - Dundas fine sandy loam, Non-hydric soil unit NWI classification: None

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

Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X No         
Hydric Soil Present? Yes X No         
Wetland Hydrology Present? Yes X No       

#### Is the Sampled Area

within a Wetland? Yes X No       

If yes, optional Wetland Site ID:       

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is met. Antecedent is above average for the time of year

### HYDROLOGY

#### Wetland Hydrology Indicators:

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

       Surface Water (A1)        Water-Stained Leaves (B9)  
       High Water Table (A2)        Aquatic Fauna (B13)  
       Saturation (A3)        Marl Deposits (B15)  
       Water Marks (B1)        Hydrogen Sulfide Odor (C1)  
       Sediment Deposits (B2)        Oxidized Rhizospheres on Living Roots (C3)  
       Drift Deposits (B3)        Presence of Reduced Iron (C4)  
       Algal Mat or Crust (B4)        Recent Iron Reduction in Tilled Soils (C6)  
       Iron Deposits (B5)        Thin Muck Surface (C7)  
       Inundation Visible on Aerial Imagery (B7)        Other (Explain in Remarks)  
X Sparsely Vegetated Concave Surface (B8)

Secondary Indicators (minimum of two required)

       Surface Soil Cracks (B6)  
       Drainage Patterns (B10)  
       Moss Trim Lines (B16)  
       Dry-Season Water Table (C2)  
       Crayfish Burrows (C8)  
       Saturation Visible on Aerial Imagery (C9)  
       Stunted or Stressed Plants (D1)  
X Geomorphic Position (D2)  
       Shallow Aquitard (D3)  
X Microtopographic Relief (D4)  
X FAC-Neutral Test (D5)

#### Field Observations:

Surface Water Present? Yes        No X Depth (inches):         
Water Table Present? Yes        No X Depth (inches):         
Saturation Present? Yes X No        Depth (inches): 23  
(includes capillary fringe)

Wetland Hydrology Present? Yes X No       

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

Remarks:



**VEGETATION - Use scientific names of plants.**

Sampling Point: 10A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Fraxinus pennsylvanica</i> / Green ash	40	Yes	FACW
2. <i>Ulmus americana</i> / American elm	20	Yes	FACW
3. <i>Tilia americana</i> / American basswood	15	Yes	FACU
4. _____			
5. _____			
6. _____			
7. _____			
	75	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	30	Yes	FAC
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	30	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	10	Yes	FAC
2. <i>Fraxinus pennsylvanica</i> / Green ash	5	Yes	FACW
3. <i>Fraxinus nigra</i> / Black ash	5	Yes	FACW
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	20	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. _____			
2. _____			
3. _____			
4. _____			
	0	= Total Cover	

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	40	x 3 =	120
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	125	(A)	320 (B)

Prevalence Index = B/A = 2.56

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 10A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-16	10YR 2/1	98	10YR 3/4	2	C	M	Sndy Clay Lm	DRC
16-20	10YR 2/2	98	10YR 3/6	2	C	M	Clay Loam	PRC
20-24	10YR 3/3	98	7.5YR 3/4	2	C	M	Clay	FRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)               | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input type="checkbox"/> Redox Dark Surface (F6)                         |
| <input checked="" type="checkbox"/> Thick Dark Surface (A12)  | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             |  |
| <input type="checkbox"/> Sandy Redox (S5)                     |  |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Red Parent Material (F21)                   |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>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:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 10B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.21989165 Long: -92.99338829 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, Non-hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>      </u> No <u>X</u> Wetland Hydrology Present? Yes <u>      </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is absent. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:          		
Remarks:		

**VEGETATION - Use scientific names of plants.**

Sampling Point: 10B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Fraxinus pennsylvanica</i> / Green ash	30	Yes	FACW
2. <i>Populus tremuloides</i> / Quaking aspen	15	Yes	FAC
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	45	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	40	Yes	FAC
2. <i>Fraxinus pennsylvanica</i> / Green ash	10	Yes	FACW
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	50	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	5	Yes	FAC
2. <i>Tilia americana</i> / American basswood	5	Yes	FACU
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	10	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. _____			
2. _____			
3. _____			
4. _____			
	0	= Total Cover	

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)  
  
 Total Number of Dominant Species Across All Strata: 6 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	40	x 2 =	80	
FAC species	60	x 3 =	180	
FACU species	5	x 4 =	20	
UPL species	0	x 5 =	0	
Column Totals:	105	(A)	280	(B)

Prevalence Index = B/A = 2.67

**Hydrophytic Vegetation Indicators:**  
   1 - Rapid Test for Hydrophytic Vegetation  
X 2 - Dominance Test is >50%  
X 3 - Prevalence Index ≤3.0<sup>1</sup>  
   4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 10B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

- ☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ☐ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/12/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 11A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.22104475 Long: -92.99321148 Datum: WGS 84  
 Soil Map Unit Name: 1055 - Aquolls and Histosols, Hydric soil unit NWI classification: PEM1A/PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year.	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: Wetland criteria is met. Antecedent is above average for the time of year		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 11A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft)			
1. <i>Fraxinus pennsylvanica</i> / Green ash	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft)			
1. <i>Rhamnus cathartica</i> / European buckthorn	60	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft)			
1. <i>Phalaris arundinacea</i> / Reed canary grass	50	Yes	FACW
2. <i>Persicaria hydropiper</i> / Common smartweed, Waterpepper	10	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft)			
1.			
2.			
3.			
4.			
	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: 3 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	10	x 1 =	10	
FACW species	80	x 2 =	160	
FAC species	60	x 3 =	180	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	150	(A)	350	(B)

Prevalence Index = B/A = 2.33

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 11A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/1	98	7.5YR 3/4	2	C	M	Sandy Loam	PRC
6-9	10YR 3/3	95	7.5YR 3/4	5	C	M	Sandy Loam	PRC
9-12	10YR 5/4	95	7.5YR 3/4	10	C	M	Silty Clay Loam	PRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                        | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                 | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                    | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)               | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)    | <input checked="" type="checkbox"/> Redox Dark Surface (F6)              |
| <input type="checkbox"/> Thick Dark Surface (A12)             | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)             | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)             |  |
| <input type="checkbox"/> Sandy Redox (S5)                     |  |
| <input type="checkbox"/> Stripped Matrix (S6)                 |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) |  |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Red Parent Material (F21)                   |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: Rock/roots  
Depth (inches): 12

Hydric Soil Present? Yes ☒ No ☐

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/12/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	11B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none		Slope (%):	2	
Subregion (LRR or MLRA):	LRR K		Lat:	45.22095317		Long:	-92.9932956	
Soil Map Unit Name:	1055 - Aquolls and Histosols, Hydric Soil unit		NWI classification:	None				

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is not met. Antecedent is above average for the time of year

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 11B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Fraxinus pennsylvanica</i> / Green ash	20	Yes	FACW
2. <i>Quercus rubra</i> / Northern red oak	15	Yes	FACU
3. <i>Ulmus americana</i> / American elm	15	Yes	FACW
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	50	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	80	Yes	FAC
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	80	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Ribes cynosbati</i> / Eastern prickly gooseberry	10	Yes	FACU
2. <i>Zanthoxylum americanum</i> / Toothachetree	10	Yes	FACU
3. <i>Rhamnus cathartica</i> / European buckthorn	10	Yes	FAC
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	30	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	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: 7 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 57.1 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 35	x 2 = 70
FAC species 90	x 3 = 270
FACU species 35	x 4 = 140
UPL species 0	x 5 = 0
Column Totals: 160 (A)	480 (B)

Prevalence Index = B/A = 3.0

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
 X 2 - Dominance Test is >50%  
 X 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )  
  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**  
  
**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  
**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 11B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: Rock

Depth (inches): 14

**Hydric Soil Present?**      Yes      No      X

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/County:	Forest Lake/Washington		Sampling Date:	10/12/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	12A	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Toe Slope		Local relief (concave, convex, none):	concave			Slope (%):	0
Subregion (LRR or MLRA):	LRR K		Lat:	45.22273825		Long:	-92.99399738	
Soil Map Unit Name:	75 - Bluffton Loam, Hydric soil unit			NW1 classification:			PEM1A	

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

Wetland criteria is met. Antecedent is above average for the time of year. Wetland appeared to be tilled and cropped for wildlife and hunting. Turnips were found

**Wetland Hydrology Indicators:**

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input checked="" type="checkbox"/> Geomorphic Position (D2)       |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

**Wetland Hydrology Present?**      Yes      X      No

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 12A

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: right; 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(7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b>      Yes <u>X</u>      No <u>    </u></p>	Total % Cover of:	Multiply by:	OBL species <u>5</u>	x 1 = <u>5</u>	FACW species <u>35</u>	x 2 = <u>70</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>20</u>	x 4 = <u>80</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>70</u> (A)	<u>185</u> (B)
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## SOIL

Sampling Point: 12A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |  |  |
|--|--|
| <input type="checkbox"/> Histosol (A1)                               | <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R,MLRA 149B)</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                        | <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>      |
| <input type="checkbox"/> Black Histic (A3)                           | <input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                              |
| <input type="checkbox"/> Stratified Layers (A5)                      | <input type="checkbox"/> Depleted Matrix (F3)                                  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)           | <input checked="" type="checkbox"/> Redox Dark Surface (F6)                    |
| <input type="checkbox"/> Thick Dark Surface (A12)                    | <input type="checkbox"/> Depleted Dark Surface (F7)                            |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                    | <input type="checkbox"/> Redox Depressions (F8)                                |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                    |  |
| <input type="checkbox"/> Sandy Redox (S5)                            |  |
| <input type="checkbox"/> Stripped Matrix (S6)                        |  |
| <input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b> |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/12/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	12B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none			Slope (%):	2
Subregion (LRR or MLRA):	LRR K		Lat:	45.22275814		Long:	-92.99389921	
Soil Map Unit Name:	123 - Dundas fine sandy loam, Non-hydric soil unit			NW1 classification:		None		

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

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is not met. Antecedent is above average for the time of year

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 12B

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: 30-ft )				
1. <i>Salix amygdaloides</i> / Peachleaf willow	30	Yes	FACW	
2.				
3.				
4.				
5.				
6.				
7.				
	30	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )				
1. <i>Rhamnus cathartica</i> / European buckthorn	20	Yes	FAC	
2.				
3.				
4.				
5.				
6.				
7.				
	20	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5-ft )				
1. <i>Rubus idaeus</i> / Common red raspberry	20	Yes	FAC	
2. <i>Phalaris arundinacea</i> / Reed canary grass	20	Yes	FACW	
3. <i>Setaria italica</i> / Foxtail bristlegrass	15	Yes	FACU	
4. <i>Digitaria sanguinalis</i> / Crabgrass, Hairy crab grass	15	Yes	FACU	
5. <i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion	10	No	FACU	
6. <i>Trifolium pratense</i> / Red clover	5	No	FACU	
7.				
8.				
9.				
10.				
11.				
12.				
	85	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 30-ft )				
1.				
2.				
3.				
4.				
	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: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 50	x 2 = 100
FAC species 40	x 3 = 120
FACU species 45	x 4 = 180
UPL species 0	x 5 = 0
Column Totals: 135 (A)	400 (B)

Prevalence Index = B/A = 2.96

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 12B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) (**LRR R, MLRA 149B**)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- |   |   |
|---|---|
| <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R, MLRA 149B)</b> | <input type="checkbox"/> 2 cm Muck (A10) <b>(LRR K, L, MLRA 149B)</b>       |
| <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>       | <input type="checkbox"/> Coast Prairie Redox (A16) <b>(LRR K, L, R)</b>     |
| <input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>             | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) <b>(LRR K, L, R)</b>  |
| <input type="checkbox"/> Loamy Gleyed Matrix (F2)                               | <input type="checkbox"/> Dark Surface (S7) <b>(LRR K, L)</b>                |
| <input type="checkbox"/> Depleted Matrix (F3)                                   | <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR K, L)</b>     |
| <input type="checkbox"/> Redox Dark Surface (F6)                                | <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR K, L)</b>           |
| <input type="checkbox"/> Depleted Dark Surface (F7)                             | <input type="checkbox"/> Iron-Manganese Masses (F12) <b>(LRR K, L, R)</b>   |
| <input type="checkbox"/> Redox Depressions (F8)                                 | <input type="checkbox"/> Piedmont Floodplain Soils (F19) <b>(MLRA 149B)</b> |
|   | <input type="checkbox"/> Mesic Spodic (TA6) <b>(MLRA 144A, 145, 149B)</b>   |
|   | <input type="checkbox"/> Red Parent Material (F21)                          |
|   | <input type="checkbox"/> Very Shallow Dark Surface (TF12)                   |
|   | <input type="checkbox"/> Other (Explain in Remarks)                         |

<sup>3</sup>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      X

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 13A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.22646325 Long: -92.99299857 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton Loam, hydric soil unit NWI classification: PEM1A

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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 13A

Tree Stratum (Plot size: 30-ft )				Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Ulmus americana</i> / American elm		15	Yes	FACW		
2. <i>Fraxinus pennsylvanica</i> / Green ash		15	Yes	FACW		
3.						
4.						
5.						
6.						
7.						
		30	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15-ft )						
1.						
2.						
3.						
4.						
5.						
6.						
7.						
		0	= Total Cover			
Herb Stratum (Plot size: 5-ft )						
1. <i>Phalaris arundinacea</i> / Reed canary grass		80	Yes	FACW		
2. <i>Urtica dioica</i> / Stinging nettle		10	No	FAC		
3. <i>Sambucus nigra</i> / Black elderberry		5	No	FACW		
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
		95	= Total Cover			
Woody Vine Stratum (Plot size: 30-ft )						
1. <i>Echinocystis lobata</i> / Wild cucumber		2	Yes	FACW		
2.						
3.						
4.						
		2	= 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: 4 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	117	x 2 =	234
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	127	(A)	264 (B)

Prevalence Index = B/A = 2.08

**Hydrophytic Vegetation Indicators:**  
☒ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**  
  
**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  
**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 13A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 13B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 2  
 Subregion (LRR or MLRA): LRR K Lat: 45.22635367 Long: -92.99299897 Datum: WGS 84  
 Soil Map Unit Name: 75 - Blufftom Loam, Hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No        (If no, explain in Remarks.)  
 Are Vegetation       , Soil X, or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes        No X  
 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>      </u> No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>      </u> No <u>X</u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Vegetation located near or on a golf course; manicured environment. Wetland criteria is not met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>      </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

**VEGETATION - Use scientific names of plants.**

 Sampling Point: 13B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )			
1. <i>Fraxinus pennsylvanica</i> / Green ash	25	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	25	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )			
1. <i>Fraxinus pennsylvanica</i> / Green ash	10	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )			
1. <i>Phalaris arundinacea</i> / Reed canary grass	60	Yes	FACW
2. <i>Stellaria media</i> / Chickweed, Common chickweed	15	No	FACU
3. <i>Poa pratensis</i> / Kentucky blue grass	10	No	FACU
4. <i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion	10	No	FACU
5. <i>Plantago major</i> / Common plantain	5	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )			
1.			
2.			
3.			
4.			
	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: 3 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	95	x 2 =	190	
FAC species	0	x 3 =	0	
FACU species	40	x 4 =	160	
UPL species	0	x 5 =	0	
Column Totals:	135	(A)	350	(B)

Prevalence Index = B/A = 2.59

**Hydrophytic Vegetation Indicators:**  
☒ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 13B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

soils appear to be manipulated due to the proximity to the golf course.

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 14A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.22850208 Long: -92.99366617 Datum: WGS 84  
 Soil Map Unit Name: 225 - Nessel fine sandy loam, 1 to 4 percent slopes NWI classification: PEM1F/PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>X</u> No <u>      </u> Depth (inches): <u>22</u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 14A

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: 30-ft )				
1. <i>Salix bebbiana</i> / Gray willow, Bebb's willow	40	Yes	FACW	
2. <i>Salix interior</i> / Sandbar willow	20	Yes	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	60	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )				
1. <i>Salix interior</i> / Sandbar willow	30	Yes	FACW	
2. <i>Cornus alba</i> / Red osier	15	Yes	FACW	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	45	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5-ft )				
1. <i>Carex lacustris</i> / Lakebank sedge	15	Yes	OBL	
2. <i>Phalaris arundinacea</i> / Reed canary grass	15	Yes	FACW	
3. <i>Poa pratensis</i> / Kentucky blue grass	10	Yes	FACU	
4. <i>Persicaria hydropiper</i> / Common smartweed, Waterpepper	5	No	OBL	
5. <i>Ribes cynosbati</i> / Eastern prickly gooseberry	5	No	FACU	
6. <i>Fraxinus pennsylvanica</i> / Green ash	5	No	FACW	
7. <i>Solidago altissima</i> / Canada goldenrod	5	No	FACU	
8. <i>Solidago gigantea</i> / Smooth goldenrod	5	No	FACW	
9. <i>Carex brunnescens</i> / Brownish sedge	5	No	FACW	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	70	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 30-ft )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	0	= Total Cover		

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species 20	x 1 = 20
FACW species 135	x 2 = 270
FAC species 0	x 3 = 0
FACU species 20	x 4 = 80
UPL species 0	x 5 = 0
Column Totals: 175 (A)	370 (B)

Prevalence Index = B/A = 2.11

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 14A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

___	Polyvalue Below Surface (S8) <b>(LRR R, MLRA 149B)</b>
___	Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>
___	Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>
___	Loamy Gleyed Matrix (F2)
<u>X</u>	Depleted Matrix (F3)
<u>X</u>	Redox Dark Surface (F6)
___	Depleted Dark Surface (F7)
___	Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	14B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none		Slope (%):	2	
Subregion (LRR or MLRA):	LRR K		Lat:	45.22850729		Long:	-92.99351198	
Soil Map Unit Name:	225 - Nessel fine sandy loam, 1 to 4 percent slopes				NWI classification:	None		

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Manicured golf course. Wetland criteria is not met. Antecedent is above average for the time of year

**Wetland Hydrology Indicators:**

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

- Field Observations:**

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:

**VEGETATION - Use scientific names of plants.**

 Sampling Point: 14B

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>15-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>5-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr> <td>1.</td> <td><u><i>Lotus tenuis</i> / Narrow-leaf bird's-foot trefoil</u></td> <td style="text-align: center;">50</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACU</td> </tr> <tr> <td>2.</td> <td><u><i>Poa pratensis</i> / Kentucky blue grass</u></td> <td style="text-align: center;">20</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACU</td> </tr> <tr> <td>3.</td> <td><u><i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion</u></td> <td style="text-align: center;">10</td> <td style="text-align: center;">No</td> <td style="text-align: center;">FACU</td> </tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr><td>8.</td><td></td><td></td><td></td><td></td></tr> <tr><td>9.</td><td></td><td></td><td></td><td></td></tr> <tr><td>10.</td><td></td><td></td><td></td><td></td></tr> <tr><td>11.</td><td></td><td></td><td></td><td></td></tr> <tr><td>12.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>80</u></td> <td colspan="2">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </table>	Tree Stratum	(Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	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## SOIL

Sampling Point: 14B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

- ☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ☐ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
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☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

soils heavily manipulated due to the proximity to golf course.

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 15A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.22954383 Long: -92.99398583 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, non-hydric soil unit NWI classification: R2UBFx

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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 15A

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>30-ft</u> )			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>0</u>	= Total Cover	

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>15-ft</u> )			
1. <u>Salix interior</u> / Sandbar willow	25	Yes	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>25</u>	= Total Cover	

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>5-ft</u> )			
1. <u>Poa pratensis</u> / Kentucky blue grass	20	Yes	FACU
2. <u>Phalaris arundinacea</u> / Reed canary grass	20	Yes	FACW
3. <u>Solidago altissima</u> / Canada goldenrod	15	Yes	FACU
4. <u>Solidago gigantea</u> / Smooth goldenrod	15	Yes	FACW
5. <u>Sonchus asper</u> / Spiny sowthistle	5	No	FACU
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	<u>75</u>	= Total Cover	

Woody Vine Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>30-ft</u> )			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	<u>0</u>	= 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: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>60</u>	x 2 = <u>120</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>40</u>	x 4 = <u>160</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>100</u> (A)	<u>280</u> (B)

Prevalence Index = B/A = 2.8

**Hydrophytic Vegetation Indicators:**

   1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index ≤3.0<sup>1</sup>

   4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No   

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 15A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

\_\_\_ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
 \_\_\_ Coast Prairie Redox (A16) (**LRR K, L, R**)  
 \_\_\_ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
 \_\_\_ Dark Surface (S7) (**LRR K, L**)  
 \_\_\_ Polyvalue Below Surface (S8) (**LRR K, L**)  
 \_\_\_ Thin Dark Surface (S9) (**LRR K, L**)  
 \_\_\_ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
 \_\_\_ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
 \_\_\_ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
 \_\_\_ Red Parent Material (F21)  
 \_\_\_ Very Shallow Dark Surface (TF12)  
 \_\_\_ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/County:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	15B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none			Slope (%):	2
Subregion (LRR or MLRA):	LRR K		Lat:	45.22947577		Long:	-92.99394148	
Soil Map Unit Name:	123 - Dundas fine sandy loam, Non-hydric soil unit			NW1 classification:		None		

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is not met. Antecedent is above average for the time of year.

**Wetland Hydrology Indicators:**

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

Wetland Hydrology Present?      Yes      No      X

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 15B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Acer negundo</i> / Boxelder, Box elder	15	Yes	FAC
2. <i>Ulmus americana</i> / American elm	10	Yes	FACW
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	25	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	0	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Solidago altissima</i> / Canada goldenrod	25	Yes	FACU
2. <i>Cirsium arvense</i> / Canada thistle	10	Yes	FACU
3. <i>Phalaris arundinacea</i> / Reed canary grass	10	Yes	FACW
4. <i>Poa pratensis</i> / Kentucky blue grass	10	Yes	FACU
5. <i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	10	Yes	UPL
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	65	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. _____			
2. _____			
3. _____			
4. _____			
	0	= Total Cover	

**Remarks:** (Explain alternative procedures here or in a separate report.)

**Dominance Test worksheet:**

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

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <span style="float: right;">0</span>	x 1 = <span style="float: right;">0</span>
FACW species <span style="float: right;">20</span>	x 2 = <span style="float: right;">40</span>
FAC species <span style="float: right;">15</span>	x 3 = <span style="float: right;">45</span>
FACU species <span style="float: right;">45</span>	x 4 = <span style="float: right;">180</span>
UPL species <span style="float: right;">10</span>	x 5 = <span style="float: right;">50</span>
Column Totals: <span style="float: right;">90 (A)</span>	<span style="float: right;">315 (B)</span>

Prevalence Index = B/A = 3.5

**Hydrophytic Vegetation Indicators:**

\_\_\_ 1 - Rapid Test for Hydrophytic Vegetation

\_\_\_ 2 - Dominance Test is >50%

\_\_\_ 3 - Prevalence Index ≤3.0<sup>1</sup>

\_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No   X



## SOIL

Sampling Point: 15B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/County:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	16A	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Toe Slope		Local relief (concave, convex, none):	concave			Slope (%):	0
Subregion (LRR or MLRA):	LRR K		Lat:	45.2294687		Long:	-92.99341587	
Soil Map Unit Name:	75 - Bluffton Loam, Hydric soil unit			NW1 classification:			R2UBFx	

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

Hydrophytic Vegetation Present?	Yes	X	No		Is the Sampled Area within a Wetland? Yes X No If yes, optional Wetland Site ID:
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year					

**Wetland Hydrology Indicators:**

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

<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators (minimum of two required)

<input type="checkbox"/>	Surface Soil Cracks (B6)
<input checked="" type="checkbox"/>	Drainage Patterns (B10)
<input type="checkbox"/>	Moss Trim Lines (B16)
<input type="checkbox"/>	Dry-Season Water Table (C2)
<input type="checkbox"/>	Crayfish Burrows (C8)
<input type="checkbox"/>	Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/>	Stunted or Stressed Plants (D1)
<input checked="" type="checkbox"/>	Geomorphic Position (D2)
<input type="checkbox"/>	Shallow Aquitard (D3)
<input type="checkbox"/>	Microtopographic Relief (D4)
<input checked="" type="checkbox"/>	FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present?	Yes	<u>X</u>	No	<u>      </u>	Depth (inches):	<u>      4      </u>
Water Table Present?	Yes	<u>X</u>	No	<u>      </u>	Depth (inches):	<u>      0      </u>
Saturation Present?	Yes	<u>X</u>	No	<u>      </u>	Depth (inches):	<u>      0      </u>
(includes capillary fringe)						

**Wetland Hydrology Present?**      Yes      ☒      No      ☐

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

Remarks:



**VEGETATION - Use scientific names of plants.**

Sampling Point: 16A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Populus deltoides</i> / Eastern cottonwood	30	Yes	FAC
2. <i>Populus tremuloides</i> / Quaking aspen	20	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Prunus serotina</i> / Black cherry	10	Yes	FACU
2. <i>Rhamnus cathartica</i> / European buckthorn	10	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Phalaris arundinacea</i> / Reed canary grass	35	Yes	FACW
2. <i>Solidago gigantea</i> / Smooth goldenrod	10	No	FACW
3. <i>Persicaria hydropiper</i> / Common smartweed, Waterpepper	10	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	55	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1.			
2.			
3.			
4.			
	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: 80.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	10	x 1 =	10	
FACW species	45	x 2 =	90	
FAC species	60	x 3 =	180	
FACU species	10	x 4 =	40	
UPL species	0	x 5 =	0	
Column Totals:	125	(A)	320	(B)

Prevalence Index = B/A = 2.56

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 16A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)  
☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)  
☐ Loamy Mucky Mineral (F1) (**LRR K, L**)  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 16B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.22939203 Long: -92.99363496 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton loam, Hydric soil unit NWI classification: None

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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent is above average for the time of year			

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

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

Remarks:

**VEGETATION - Use scientific names of plants.**

 Sampling Point: 16B

	Absolute % Cover	Dominant Species?	Indicator Status																																				
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )																																							
1. <i>Populus tremuloides</i> / Quaking aspen	50	Yes	FAC	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>7</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>42.9</u> (A/B)																																			
2.																																							
3.																																							
4.																																							
5.																																							
6.																																							
7.																																							
	50	= Total Cover																																					
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )																																							
1. <i>Rhamnus cathartica</i> / European buckthorn	30	Yes	FAC	<b>Prevalence Index worksheet:</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>OBL species</td> <td>0</td> <td>x 1 =</td> <td>0</td> <td></td> </tr> <tr> <td>FACW species</td> <td>5</td> <td>x 2 =</td> <td>10</td> <td></td> </tr> <tr> <td>FAC species</td> <td>90</td> <td>x 3 =</td> <td>270</td> <td></td> </tr> <tr> <td>FACU species</td> <td>25</td> <td>x 4 =</td> <td>100</td> <td></td> </tr> <tr> <td>UPL species</td> <td>20</td> <td>x 5 =</td> <td>100</td> <td></td> </tr> <tr> <td>Column Totals:</td> <td>140</td> <td>(A)</td> <td>480</td> <td>(B)</td> </tr> </tbody> </table> Prevalence Index = B/A = <u>3.43</u>	Total % Cover of:		Multiply by:			OBL species	0	x 1 =	0		FACW species	5	x 2 =	10		FAC species	90	x 3 =	270		FACU species	25	x 4 =	100		UPL species	20	x 5 =	100		Column Totals:	140	(A)	480	(B)
Total % Cover of:		Multiply by:																																					
OBL species	0	x 1 =	0																																				
FACW species	5	x 2 =	10																																				
FAC species	90	x 3 =	270																																				
FACU species	25	x 4 =	100																																				
UPL species	20	x 5 =	100																																				
Column Totals:	140	(A)	480	(B)																																			
2. <i>Zanthoxylum americanum</i> / Toothachetree	10	Yes	FACU																																				
3.																																							
4.																																							
5.																																							
6.																																							
7.																																							
	40	= Total Cover																																					
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )																																							
1. <i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion	10	Yes	FACU	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation <sup>1</sup> (Explain )  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																			
2. <i>Apocynum androsaemifolium</i> / Spreading dogbane, Bitter do	10	Yes	UPL																																				
3. <i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	10	Yes	UPL																																				
4. <i>Poa pratensis</i> / Kentucky blue grass	5	No	FACU																																				
5. <i>Phalaris arundinacea</i> / Reed canary grass	5	No	FACW																																				
6.																																							
7.																																							
8.																																							
9.																																							
10.																																							
11.																																							
12.																																							
	40	= Total Cover																																					
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )																																							
1. <i>Vitis riparia</i> / River-bank grape	10	Yes	FAC	<b>Definitions of Vegetation Strata</b>  <b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. <b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. <b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. <b>Woody vines</b> - All woody vines greater than 3.28 ft in height.																																			
2.																																							
3.																																							
4.																																							
	10	= Total Cover																																					

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 16B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

- ☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ☐ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 17A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.23017338 Long: -92.99376788 Datum: WGS 84  
 Soil Map Unit Name: 75- Bluffton Loam, Hydric soil unit NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>X</u> No <u>      </u> Depth (inches): <u>20</u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 17A

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )				
1. <i>Salix bebbiana</i> / Gray willow, Bebb's willow	30	Yes	FACW	
2. <i>Salix interior</i> / Sandbar willow	15	Yes	FACW	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	45	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )				
1. <i>Salix bebbiana</i> / Gray willow, Bebb's willow	20	Yes	FACW	
2. <i>Rhamnus cathartica</i> / European buckthorn	15	Yes	FAC	
3. <i>Salix amygdaloides</i> / Peachleaf willow	15	Yes	FACW	
4. <i>Cornus alba</i> / Red osier	10	No	FACW	
5. _____				
6. _____				
7. _____				
	60	= Total Cover		
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )				
1. <i>Phalaris arundinacea</i> / Reed canary grass	5	Yes	FACW	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	5	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )				
1. <i>Vitis riparia</i> / River-bank grape	10	Yes	FAC	
2. _____				
3. _____				
4. _____				
	10	= Total Cover		

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)  
  
 Total Number of Dominant Species Across All Strata: 7 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120	(A)	265 (B)

Prevalence Index = B/A = 2.21

**Hydrophytic Vegetation Indicators:**  
   1 - Rapid Test for Hydrophytic Vegetation  
X 2 - Dominance Test is >50%  
X 3 - Prevalence Index ≤3.0<sup>1</sup>  
   4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )  
  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**  
  
**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  
**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 17A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/County:	Forest Lake/Washington		Sampling Date:	10/19/2023		
Applicant/Owner:	TKDA			State:	MN		Sampling Point:	17B	
Investigator(s):	Dylan Kruzel, Garrett Wee			Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none		Slope (%):	3		
Subregion (LRR or MLRA):	LRR K		Lat:	45.23022873		Long:	-92.99381712		
Soil Map Unit Name:	123 - Dundas fine sandy loam, non-hydric soil unit			NWI classification:	PEM1C				

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

Hydrophytic Vegetation Present?	Yes _____	No <u>  X  </u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>  X  </u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____	No <u>  X  </u>	
Wetland Hydrology Present?	Yes _____	No <u>  X  </u>	
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent is above average for the time of year			

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present?	Yes _____	No <u>X</u>	Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes _____      No <u>X</u>
Water Table Present?	Yes _____	No <u>X</u>	Depth (inches): _____	
Saturation Present?	Yes _____	No <u>X</u>	Depth (inches): _____	
(includes capillary fringe)				

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 17B

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## SOIL

Sampling Point: 17B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) (**LRR R, MLRA 149B**)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
 Coast Prairie Redox (A16) (**LRR K, L, R**)  
 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
 Dark Surface (S7) (**LRR K, L**)  
 Polyvalue Below Surface (S8) (**LRR K, L**)  
 Thin Dark Surface (S9) (**LRR K, L**)  
 Iron-Manganese Masses (F12) (**LRR K, L, R**)  
 Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
 Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
 Red Parent Material (F21)  
 Very Shallow Dark Surface (TF12)  
 Other (Explain in Remarks)

<sup>3</sup>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      ☒ X

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	18A	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Toe Slope		Local relief (concave, convex, none):	concave			Slope (%):	1
Subregion (LRR or MLRA):	LRR K		Lat:	45.23261108		Long:	-92.99342193	
Soil Map Unit Name:	123 - Dundas fine sandy loam			NWI classification:	None			

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

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

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

Hydrophytic Vegetation Present?	Yes	X	No		<b>Is the Sampled Area within a Wetland?</b>  If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year					

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Surface Water Present?      Yes \_\_\_\_\_ No   X        Depth (inches): \_\_\_\_\_

Water Table Present?      Yes \_\_\_\_\_ No   X        Depth (inches): \_\_\_\_\_

Saturation Present?      Yes \_\_\_\_\_ No   X        Depth (inches): \_\_\_\_\_

(includes capillary fringe)

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



**VEGETATION - Use scientific names of plants.**

Sampling Point: 18A

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: 30-ft )				
1. <i>Ulmus americana</i> / American elm	30	Yes	FACW	
2. <i>Salix bebbiana</i> / Gray willow, Bebb's willow	25	Yes	FACW	
3. <i>Fraxinus pennsylvanica</i> / Green ash	15	Yes	FACW	
4. _____				
5. _____				
6. _____				
7. _____				
	70	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )				
1. <i>Rhamnus cathartica</i> / European buckthorn	40	Yes	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	40	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5-ft )				
1. <i>Rhamnus cathartica</i> / European buckthorn	10	Yes	FAC	
2. <i>Ribes cynosbati</i> / Eastern prickly gooseberry	10	Yes	FACU	
3. <i>Solanum ptychanthum</i> / Eastern black nightshade	5	Yes	FACU	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	25	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 30-ft )				
1. <i>Vitis riparia</i> / River-bank grape	20	Yes	FAC	
2. _____				
3. _____				
4. _____				
	20	= Total Cover		

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	70	x 2 =	140	
FAC species	70	x 3 =	210	
FACU species	15	x 4 =	60	
UPL species	0	x 5 =	0	
Column Totals:	155	(A)	410	(B)

Prevalence Index = B/A = 2.65

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 18A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
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☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/County:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	18B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none		Slope (%):	3	
Subregion (LRR or MLRA):	LRR K		Lat:	45.23254757		Long:	-92.99357321	
Soil Map Unit Name:	123 - Dundas fine sandy loam, non-hydric soil unit		NWI classification:	None				

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent is above average for the time of year			

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present?	Yes _____	No <u>X</u>	Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes _____ No <u>X</u>
Water Table Present?	Yes _____	No <u>X</u>	Depth (inches): _____	
Saturation Present?	Yes _____	No <u>X</u>	Depth (inches): _____	
(includes capillary fringe)				

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 18B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Fraxinus pennsylvanica</i> / Green ash	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	40	Yes	FAC
2. <i>Rhus copallinum</i> / Winged sumac	5	No	UPL
3.			
4.			
5.			
6.			
7.			
	45	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Toxicodendron radicans</i> / Eastern poison ivy	10	Yes	FAC
2. <i>Geranium robertianum</i> / Robert's geranium	5	Yes	FACU
3. <i>Polygonatum biflorum</i> / King solomon's-seal	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. <i>Parthenocissus quinquefolia</i> / Virginia creeper	25	Yes	FACU
2.			
3.			
4.			
	25	= 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: 50.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	30	x 2 =	60	
FAC species	50	x 3 =	150	
FACU species	35	x 4 =	140	
UPL species	5	x 5 =	25	
Column Totals:	120	(A)	375	(B)

Prevalence Index = B/A = 3.13

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 18B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |  |  |
|--|--|
| <input type="checkbox"/> Histosol (A1)                               | <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R,MLRA 149B)</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                        | <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>      |
| <input type="checkbox"/> Black Histic (A3)                           | <input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                       | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                              |
| <input type="checkbox"/> Stratified Layers (A5)                      | <input type="checkbox"/> Depleted Matrix (F3)                                  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)           | <input type="checkbox"/> Redox Dark Surface (F6)                               |
| <input type="checkbox"/> Thick Dark Surface (A12)                    | <input type="checkbox"/> Depleted Dark Surface (F7)                            |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                    | <input type="checkbox"/> Redox Depressions (F8)                                |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                    |  |
| <input type="checkbox"/> Sandy Redox (S5)                            |  |
| <input type="checkbox"/> Stripped Matrix (S6)                        |  |
| <input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b> |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      ☒ X

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 19A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.23327569 Long: -92.99394154 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam, non-hydric soil unit NWI classification: None

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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year.	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

Sampling Point: 19A

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: 30-ft )				
1. <i>Ulmus americana</i> / American elm	40	Yes	FACW	
2. <i>Fraxinus pennsylvanica</i> / Green ash	15	Yes	FACW	
3.				
4.				
5.				
6.				
7.				
	55	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )				
1. <i>Rhamnus cathartica</i> / European buckthorn	30	Yes	FAC	
2.				
3.				
4.				
5.				
6.				
7.				
	30	= Total Cover		
<b>Herb Stratum</b> (Plot size: 5-ft )				
1. <i>Boehmeria cylindrica</i> / Smallspike false nettle	25	Yes	OBL	
2. <i>Solanum ptychanthum</i> / Eastern black nightshade	5	No	FACU	
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
	30	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: 30-ft )				
1. <i>Vitis riparia</i> / River-bank grape	15	Yes	FAC	
2. <i>Echinocystis lobata</i> / Wild cucumber	10	Yes	FACW	
3.				
4.				
	25	= Total Cover		

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)  
  
 Total Number of Dominant Species Across All Strata: 6 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	25	x 1 =	25	
FACW species	65	x 2 =	130	
FAC species	45	x 3 =	135	
FACU species	5	x 4 =	20	
UPL species	0	x 5 =	0	
Column Totals:	140	(A)	310	(B)

Prevalence Index = B/A = 2.21

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 19A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	19B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none			Slope (%):	2
Subregion (LRR or MLRA):	LRR K		Lat:	45.2332902		Long:	-92.99378408	
Soil Map Unit Name:	123 - Dundas fine sandy loam			NW1 classification:			None	

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

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

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

Hydrophytic Vegetation Present?	Yes	<u>X</u>	No	<u>      </u>
Hydric Soil Present?	Yes	<u>      </u>	No	<u>X</u>
Wetland Hydrology Present?	Yes	<u>      </u>	No	<u>X</u>

**Is the Sampled Area within a Wetland?**      Yes             No X

If yes, optional Wetland Site ID: \_\_\_\_\_

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is not met. Antecedent is above average for the time of year

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:

**VEGETATION - Use scientific names of plants.**

Sampling Point: 19B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: 30-ft )			
1. <i>Acer negundo</i> / Boxelder, Box elder	30	Yes	FAC
2. <i>Fraxinus pennsylvanica</i> / Green ash	20	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: 15-ft )			
1. <i>Rhamnus cathartica</i> / European buckthorn	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	
<b>Herb Stratum</b> (Plot size: 5-ft )			
1. <i>Geranium robertianum</i> / Robert's geranium	25	Yes	FACU
2. <i>Geum aleppicum</i> / Aleppo avens, Aleppo or yellow avens	10	Yes	FAC
3. <i>Carex blanda</i> / Eastern woodland sedge	10	Yes	FAC
4. <i>Ribes cynosbati</i> / Eastern prickly gooseberry	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: 30-ft )			
1. <i>Parthenocissus quinquefolia</i> / Virginia creeper	10	Yes	FACU
2.			
3.			
4.			
	10	= Total Cover	

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <span style="float: right;">0</span>	x 1 = <span style="float: right;">0</span>
FACW species <span style="float: right;">20</span>	x 2 = <span style="float: right;">40</span>
FAC species <span style="float: right;">70</span>	x 3 = <span style="float: right;">210</span>
FACU species <span style="float: right;">40</span>	x 4 = <span style="float: right;">160</span>
UPL species <span style="float: right;">0</span>	x 5 = <span style="float: right;">0</span>
Column Totals: <span style="float: right;">130 (A)</span>	<span style="float: right;">410 (B)</span>

Prevalence Index = B/A = 3.15

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 19B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	20A	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Landscape depression		Local relief (concave, convex, none):	concave			Slope (%):	0
Subregion (LRR or MLRA):	LRR K		Lat:	45.23469872		Long:	-92.99317432	
Soil Map Unit Name:	123		NWI classification:	None				

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

Hydrophytic Vegetation Present?	Yes	X	No		<b>Is the Sampled Area within a Wetland?</b>  If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes	X	No		
Wetland Hydrology Present?	Yes	X	No		
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Wetland is located in a ag field. The wetland appeared to not be tilled or planted at the time of site investigation. Hydrophytic vegetation and hydric soils were present in field. Antecedent is above average for the time of year.					

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)
		<input checked="" type="checkbox"/> FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Water Table Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Saturation Present?	Yes	<u>  X  </u>	No	<u>      </u>	Depth (inches):	<u>          22          </u>
(includes capillary fringe)						
<b>Wetland Hydrology Present?</b>						Yes <u>  X  </u> No <u>      </u>

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 20A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )			
1. <i>Echinochloa crus-galli</i> / Barnyard grass	40	Yes	FAC
2. <i>Nasturtium officinale</i> / Watercress, Water cress	15	Yes	OBL
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	<u>55</u>	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
	<u>0</u>	= 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: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>15</u>	x 1 = <u>15</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>40</u>	x 3 = <u>120</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>55</u>	(A) <u>135</u> (B)

Prevalence Index = B/A = 2.45

**Hydrophytic Vegetation Indicators:**

   1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index ≤3.0<sup>1</sup>

   4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 20A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10	10YR 2/1	100					Clay Loam	
10-16	10YR 4/2	98	7.5R 4/6	2	C	M	Sndy Clay Lm	PRC
16-24	10YR 6/2	95	10YR 3/6	5	C	M	Clay Loam	PRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |   |  |
|---|--|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)       |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                        |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Depleted Matrix (F3)                            |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)                         |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7)                      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)                          |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     |  |
| <input type="checkbox"/> Sandy Redox (S5)                             |  |
| <input type="checkbox"/> Stripped Matrix (S6)                         |  |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)         |  |

Indicators for Problematic Hydric Soils<sup>3</sup>:

- |  |
|--|
| <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)       |
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)  |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L)                |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)     |
| <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)           |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)   |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)   |
| <input type="checkbox"/> Red Parent Material (F21)                   |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12)            |
| <input type="checkbox"/> Other (Explain in Remarks)                  |

<sup>3</sup>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:



Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	20B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Landscape depression		Local relief (concave, convex, none):	None		Slope (%):	3	
Subregion (LRR or MLRA):	LRR K		Lat:	45.23469872		Long:	-92.99317432	
Soil Map Unit Name:	123		NWI classification:	None				

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b>  If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Wetland criteria is absent. upland area is located in ag field. Vegetation was available to identify. Antecedent precipitation is above average.

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:

**VEGETATION - Use scientific names of plants.**

 Sampling Point: 20B

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	<u>0</u>	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	<u>0</u>	= Total Cover		
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )				
1. <i>Verbascum thapsus</i> / Woolly mullein	10	Yes		UPL
2. <i>Cirsium discolor</i> / Field thistle	10	Yes		UPL
3. <i>Trifolium pratense</i> / Red clover	5	No		FACU
4. <i>Bromus arvensis</i> / Soft brome, Field brome	5	No		FACU
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>30</u>	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
	<u>0</u>	= Total Cover		

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
  
 Total Number of Dominant Species Across All Strata: 2 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	<u>0</u>	x 1 =	<u>0</u>	
FACW species	<u>0</u>	x 2 =	<u>0</u>	
FAC species	<u>0</u>	x 3 =	<u>0</u>	
FACU species	<u>10</u>	x 4 =	<u>40</u>	
UPL species	<u>20</u>	x 5 =	<u>100</u>	
Column Totals:	<u>30</u>	(A)	<u>140</u>	(B)

Prevalence Index = B/A = 4.67

**Hydrophytic Vegetation Indicators:**

     1 - Rapid Test for Hydrophytic Vegetation

     2 - Dominance Test is >50%

     3 - Prevalence Index ≤3.0<sup>1</sup>

     4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?**      Yes           No   X

Remarks: (Explain alternative procedures here or in a separate report.)



## SOIL

Sampling Point: 20B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

- \_\_\_ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- \_\_\_ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- \_\_\_ Loamy Mucky Mineral (F1) **(LRR K, L)**
- \_\_\_ Loamy Gleyed Matrix (F2)
- \_\_\_ Depleted Matrix (F3)
- \_\_\_ Redox Dark Surface (F6)
- \_\_\_ Depleted Dark Surface (F7)
- \_\_\_ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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   X   No       

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	21A	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Landscape depression		Local relief (concave, convex, none):	concave			Slope (%):	0
Subregion (LRR or MLRA):	LRR K		Lat:	45.23469872		Long:	-92.99317432	
Soil Map Unit Name:	113		NWI classification:	None				

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

Hydrophytic Vegetation Present?	Yes <u>  X  </u>	No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>  X  </u> No <u>      </u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <u>  X  </u>	No <u>      </u>	
Wetland Hydrology Present?	Yes <u>  X  </u>	No <u>      </u>	

Wetland criteria is met. Wetland is located in a ag field. The wetland appeared to not be tilled or planted at the time of site investigation. Hydrophytic vegetation and hydric soils were present in field. Antecedent is above average for the time of year.

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Surface Water (A1)                                 | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                   |
| <input type="checkbox"/> High Water Table (A2)                              | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                    |
| <input type="checkbox"/> Saturation (A3)                                    | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                      |
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| <input type="checkbox"/> Algal Mat or Crust (B4)                            | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input checked="" type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input type="checkbox"/> Iron Deposits (B5)                                 | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input checked="" type="checkbox"/> Geomorphic Position (D2)        |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)          | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                      |
| <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |   | <input type="checkbox"/> Microtopographic Relief (D4)               |
|   |   | <input checked="" type="checkbox"/> FAC-Neutral Test (D5)           |

**Field Observations:**

Surface Water Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Water Table Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Saturation Present?	Yes	<u>  X  </u>	No	<u>      </u>	Depth (inches):	<u>          20          </u>
(includes capillary fringe)						

**Wetland Hydrology Present?**      Yes      X      No

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 21A

Tree Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
<b>Sapling/Shrub Stratum (Plot size: <u>15-ft</u>)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
<b>Herb Stratum (Plot size: <u>5-ft</u>)</b>				
1. <i>Echinochloa crus-galli</i> / Barnyard grass	20	Yes	FAC	
2. <i>Nasturtium officinale</i> / Watercress, Water cress	15	Yes	OBL	
3. <i>Phalaris arundinacea</i> / Reed canary grass	15	Yes	FACW	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>50</u>	= Total Cover		
<b>Woody Vine Stratum (Plot size: <u>30-ft</u>)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= 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: 3 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>15</u>	x 1 = <u>15</u>
FACW species <u>15</u>	x 2 = <u>30</u>
FAC species <u>20</u>	x 3 = <u>60</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>50</u>	(A) <u>105</u> (B)

Prevalence Index = B/A = 2.1

**Hydrophytic Vegetation Indicators:**  
   1 - Rapid Test for Hydrophytic Vegetation  
X 2 - Dominance Test is >50%  
X 3 - Prevalence Index ≤3.0<sup>1</sup>  
   4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 21A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)  
☐ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)  
☐ Loamy Mucky Mineral (F1) (**LRR K, L**)  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

\_\_\_ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
 \_\_\_ Coast Prairie Redox (A16) (**LRR K, L, R**)  
 \_\_\_ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
 \_\_\_ Dark Surface (S7) (**LRR K, L**)  
 \_\_\_ Polyvalue Below Surface (S8) (**LRR K, L**)  
 \_\_\_ Thin Dark Surface (S9) (**LRR K, L**)  
 \_\_\_ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
 \_\_\_ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
 \_\_\_ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
 \_\_\_ Red Parent Material (F21)  
 \_\_\_ Very Shallow Dark Surface (TF12)  
 \_\_\_ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	21B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Landscape depression		Local relief (concave, convex, none):	none			Slope (%):	3
Subregion (LRR or MLRA):	LRR K		Lat:	45.23469872		Long:	-92.99317432	
Soil Map Unit Name:	123		NWI classification:	None				

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Wetland criteria is absent. upland area is located in ag field. Vegetation was available to identify. Antecedent precipitation is above average.

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
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| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
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| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 21B

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>15-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>5-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr> <td>1.</td> <td><i>Verbascum thapsus</i> / Woolly mullein</td> <td style="text-align: center;">15</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">UPL</td> </tr> <tr> <td>2.</td> <td><i>Cirsium discolor</i> / Field thistle</td> <td style="text-align: center;">15</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">UPL</td> </tr> <tr> <td>3.</td> <td><i>Trifolium pratense</i> / Red clover</td> <td style="text-align: center;">10</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACU</td> </tr> <tr> <td>4.</td> <td><i>Abutilon theophrasti</i> / Velvet leaf, Velvet-leaf</td> <td style="text-align: center;">5</td> <td style="text-align: center;">No</td> <td style="text-align: center;">FACU</td> </tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr><td>8.</td><td></td><td></td><td></td><td></td></tr> <tr><td>9.</td><td></td><td></td><td></td><td></td></tr> <tr><td>10.</td><td></td><td></td><td></td><td></td></tr> <tr><td>11.</td><td></td><td></td><td></td><td></td></tr> <tr><td>12.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>45</u></td> <td colspan="2">= Total Cover</td> </tr> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </table>	Tree Stratum	(Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	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## SOIL

Sampling Point: 21B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☐ Depleted Below Dark Surface (A11)  
☒ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 22A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 1  
 Subregion (LRR or MLRA): LRR K Lat: 45.23663583 Long: -92.99313161 Datum: WGS 84  
 Soil Map Unit Name: 75 - Bluffton Loam, Hydric soil unit NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 22A

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum (Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1. <i>Salix amygdaloides</i> / Peachleaf willow</td><td style="text-align: center;">20</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FACW</td></tr> <tr><td>2. <i>Populus deltoides</i> / Eastern cottonwood</td><td style="text-align: center;">10</td><td style="text-align: center;">Yes</td><td style="text-align: center;">FAC</td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; 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(7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No <u>  </u></p>	Total % Cover of:	Multiply by:	OBL species <u>10</u>	x 1 = <u>10</u>	FACW species <u>80</u>	x 2 = <u>160</u>	FAC species <u>10</u>	x 3 = <u>30</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>100</u>	(A) <u>200</u> (B)
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## SOIL

Sampling Point: 22A

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	10YR 2/1	98	10YR 3/4	2	C	M	Sndy Clay Lm	PRC
8-16	10YR 5/2	95	10YR 3/4	5	C	M	Sndy Clay Lm	PRC
16-24	10YR 6/3	95	10YR 3/6	5	C	M	Sndy Clay Lm	PRC

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B)	

Indicators for Problematic Hydric Soils<sup>3</sup>:

<input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B)
<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
<input type="checkbox"/> Dark Surface (S7) (LRR K, L)
<input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L)
<input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L)
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B)
<input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

<sup>3</sup>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:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 22B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): convex Slope (%): 4  
 Subregion (LRR or MLRA): LRR K Lat: 45.23669685 Long: -92.99318362 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam NWI classification: None

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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)			Secondary Indicators (minimum of two required)		
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)			
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)			<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks:					



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 22B

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )				
1. <u>Populus deltoides / Eastern cottonwood</u>	15	Yes	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	15	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	0	= Total Cover		
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )				
1. <u>Melilotus officinalis / Yellow sweetclover</u>	20	Yes	FACU	
2. <u>Trifolium pratense / Red clover</u>	15	Yes	FACU	
3. <u>Trifolium dubium / Shamrock, Little hop clover</u>	15	Yes	FACU	
4. <u>Solidago altissima / Canada goldenrod</u>	10	No	FACU	
5. <u>Plantago major / Common plantain</u>	5	No	FACU	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	65	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
	0	= Total Cover		

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	15	x 3 =	45	
FACU species	65	x 4 =	260	
UPL species	0	x 5 =	0	
Column Totals:	80	(A)	305	(B)

Prevalence Index = B/A = 3.81

**Hydrophytic Vegetation Indicators:**

   1 - Rapid Test for Hydrophytic Vegetation

   2 - Dominance Test is >50%

   3 - Prevalence Index ≤3.0<sup>1</sup>

   4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes    No   X

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 22B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

- \_\_\_ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- \_\_\_ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- \_\_\_ Loamy Mucky Mineral (F1) (**LRR K, L**)
- \_\_\_ Loamy Gleyed Matrix (F2)
- \_\_\_ Depleted Matrix (F3)
- \_\_\_ Redox Dark Surface (F6)
- \_\_\_ Depleted Dark Surface (F7)
- \_\_\_ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 23A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.23750137 Long: -92.99362542 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 23A

	Absolute % Cover	Dominant Species?	Indicator Status																																									
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )																																												
1. <i>Populus deltoides</i> / Eastern cottonwood	10	Yes	FAC	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75.0</u> (A/B)																																								
2. _____	_____	_____	_____																																									
3. _____	_____	_____	_____																																									
4. _____	_____	_____	_____																																									
5. _____	_____	_____	_____																																									
6. _____	_____	_____	_____																																									
7. _____	_____	_____	_____																																									
	10	= Total Cover		<b>Prevalence Index worksheet:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;"></th> <th style="width: 10%;">Multiply by:</th> <th style="width: 10%;"></th> <th style="width: 10%;"></th> </tr> <tr> <td>OBL species</td> <td>7</td> <td>x 1 =</td> <td>7</td> <td></td> </tr> <tr> <td>FACW species</td> <td>47</td> <td>x 2 =</td> <td>94</td> <td></td> </tr> <tr> <td>FAC species</td> <td>10</td> <td>x 3 =</td> <td>30</td> <td></td> </tr> <tr> <td>FACU species</td> <td>55</td> <td>x 4 =</td> <td>220</td> <td></td> </tr> <tr> <td>UPL species</td> <td>0</td> <td>x 5 =</td> <td>0</td> <td></td> </tr> <tr> <td>Column Totals:</td> <td>119</td> <td>(A)</td> <td>351</td> <td>(B)</td> </tr> <tr> <td colspan="5">Prevalence Index = B/A = <u>2.95</u></td> </tr> </table>	Total % Cover of:		Multiply by:			OBL species	7	x 1 =	7		FACW species	47	x 2 =	94		FAC species	10	x 3 =	30		FACU species	55	x 4 =	220		UPL species	0	x 5 =	0		Column Totals:	119	(A)	351	(B)	Prevalence Index = B/A = <u>2.95</u>				
Total % Cover of:		Multiply by:																																										
OBL species	7	x 1 =	7																																									
FACW species	47	x 2 =	94																																									
FAC species	10	x 3 =	30																																									
FACU species	55	x 4 =	220																																									
UPL species	0	x 5 =	0																																									
Column Totals:	119	(A)	351	(B)																																								
Prevalence Index = B/A = <u>2.95</u>																																												
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )																																												
1. <i>Salix amygdaloides</i> / Peachleaf willow	20	Yes	FACW	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input checked="" type="checkbox"/> 3 - Prevalence Index ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation <sup>1</sup> (Explain )																																								
2. _____	_____	_____	_____																																									
3. _____	_____	_____	_____																																									
4. _____	_____	_____	_____																																									
5. _____	_____	_____	_____																																									
6. _____	_____	_____	_____																																									
7. _____	_____	_____	_____																																									
	20	= Total Cover		<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																								
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )																																												
1. <i>Poa pratensis</i> / Kentucky blue grass	30	Yes	FACU		<b>Definitions of Vegetation Strata</b>  <b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. <b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. <b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. <b>Woody vines</b> - All woody vines greater than 3.28 ft in height.																																							
2. <i>Phalaris arundinacea</i> / Reed canary grass	20	Yes	FACW																																									
3. <i>Trifolium dubium</i> / Shamrock, Little hop clover	15	No	FACU																																									
4. <i>Solidago altissima</i> / Canada goldenrod	10	No	FACU																																									
5. <i>Scirpus atrovirens</i> / Green bulrush	5	No	OBL																																									
6. <i>Solidago gigantea</i> / Smooth goldenrod	5	No	FACW																																									
7. <i>Carex brunnescens</i> / Brownish sedge	2	No	FACW																																									
8. <i>Typha angustifolia</i> / Narrow leaf cattail, Narrow-leaved cattail	2	No	OBL																																									
9. _____	_____	_____	_____																																									
10. _____	_____	_____	_____																																									
11. _____	_____	_____	_____																																									
12. _____	_____	_____	_____																																									
	89	= Total Cover																																										
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )																																												
1. _____	_____	_____	_____	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																																								
2. _____	_____	_____	_____																																									
3. _____	_____	_____	_____																																									
4. _____	_____	_____	_____																																									
	0	= Total Cover																																										

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 23A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

___	Polyvalue Below Surface (S8) <b>(LRR R, MLRA 149B)</b>
___	Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>
___	Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>
___	Loamy Gleyed Matrix (F2)
<u>X</u>	Depleted Matrix (F3)
<u>X</u>	Redox Dark Surface (F6)
___	Depleted Dark Surface (F7)
___	Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023		
Applicant/Owner:	TKDA			State:	MN		Sampling Point:	23B	
Investigator(s):	Dylan Kruzel, Garrett Wee			Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	none		Slope (%):	2		
Subregion (LRR or MLRA):	LRR K		Lat:	45.23752775		Long:	-92.99361848		
Soil Map Unit Name:	123 - Dundas fine sandy loam, Non hydric soil unit			NWI classification:	None				

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

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No X

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

Hydrophytic Vegetation Present?	Yes _____	No <u>  X  </u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>  X  </u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____	No <u>  X  </u>	
Wetland Hydrology Present?	Yes _____	No <u>  X  </u>	

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is not met. Antecedent is above average for the time of year.

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |   |  |   |
|---|--|---|
| ___ Surface Water (A1)                        | ___ Water-Stained Leaves (B9)                  | ___ Surface Soil Cracks (B6)                  |
| ___ High Water Table (A2)                     | ___ Aquatic Fauna (B13)                        | ___ Drainage Patterns (B10)                   |
| ___ Saturation (A3)                           | ___ Marl Deposits (B15)                        | ___ Moss Trim Lines (B16)                     |
| ___ Water Marks (B1)                          | ___ Hydrogen Sulfide Odor (C1)                 | ___ Dry-Season Water Table (C2)               |
| ___ Sediment Deposits (B2)                    | ___ Oxidized Rhizospheres on Living Roots (C3) | ___ Crayfish Burrows (C8)                     |
| ___ Drift Deposits (B3)                       | ___ Presence of Reduced Iron (C4)              | ___ Saturation Visible on Aerial Imagery (C9) |
| ___ Algal Mat or Crust (B4)                   | ___ Recent Iron Reduction in Tilled Soils (C6) | ___ Stunted or Stressed Plants (D1)           |
| ___ Iron Deposits (B5)                        | ___ Thin Muck Surface (C7)                     | ___ Geomorphic Position (D2)                  |
| ___ Inundation Visible on Aerial Imagery (B7) | ___ Other (Explain in Remarks)                 | ___ Shallow Aquitard (D3)                     |
| ___ Sparsely Vegetated Concave Surface (B8)   |  | ___ Microtopographic Relief (D4)              |
|   |  | ___ FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

Wetland Hydrology Present?      Yes      No      ☒ X

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 23B

Tree Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	<u>0</u>	= Total Cover		
Herb Stratum (Plot size: <u>5-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Poa pratensis</i> / Kentucky blue grass	30	Yes	FACU	
2. <i>Trifolium pratense</i> / Red clover	15	Yes	FACU	
3. <i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion	5	No	FACU	
4. <i>Solidago gigantea</i> / Smooth goldenrod	2	No	FACW	
5. <i>Typha angustifolia</i> / Narrow leaf cattail, Narrow-leaved cattail	2	No	OBL	
6. <i>Phalaris arundinacea</i> / Reed canary grass	2	No	FACW	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>56</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
	<u>0</u>	= Total Cover		

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
  
 Total Number of Dominant Species Across All Strata: 2 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:		
OBL species	<u>2</u>	x 1 =	<u>2</u>	
FACW species	<u>4</u>	x 2 =	<u>8</u>	
FAC species	<u>0</u>	x 3 =	<u>0</u>	
FACU species	<u>50</u>	x 4 =	<u>200</u>	
UPL species	<u>0</u>	x 5 =	<u>0</u>	
Column Totals:	<u>56</u>	(A)	<u>210</u>	(B)

Prevalence Index = B/A = 3.75

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
 \_\_\_ 2 - Dominance Test is >50%  
 \_\_\_ 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes        No   X

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 23B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☐ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      **X**

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 24A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.23813866 Long: -92.99380615 Datum: WGS 84  
 Soil Map Unit Name: 123 - Dundas fine sandy loam NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is present. Antecedent precipitation is above average for time of year.	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 24A

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum (Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr> <td>1. <u>Populus deltoides / Eastern cottonwood</u></td> <td style="text-align: center;">30</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FAC</td> </tr> <tr> <td>2. <u>Salix interior / Sandbar willow</u></td> <td style="text-align: center;">15</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACW</td> </tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">45</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Sapling/Shrub Stratum (Plot size: <u>15-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr> <td>1. <u>Salix interior / Sandbar willow</u></td> <td style="text-align: center;">10</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACW</td> </tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">10</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Herb Stratum (Plot size: <u>5-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr> <td>1. <u>Phalaris arundinacea / Reed canary grass</u></td> <td style="text-align: center;">5</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACW</td> </tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr><td>5. _____</td><td></td><td></td><td></td></tr> <tr><td>6. _____</td><td></td><td></td><td></td></tr> <tr><td>7. _____</td><td></td><td></td><td></td></tr> <tr><td>8. _____</td><td></td><td></td><td></td></tr> <tr><td>9. _____</td><td></td><td></td><td></td></tr> <tr><td>10. _____</td><td></td><td></td><td></td></tr> <tr><td>11. _____</td><td></td><td></td><td></td></tr> <tr><td>12. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">5</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Woody Vine Stratum (Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1. _____</td><td></td><td></td><td></td></tr> <tr><td>2. _____</td><td></td><td></td><td></td></tr> <tr><td>3. _____</td><td></td><td></td><td></td></tr> <tr><td>4. _____</td><td></td><td></td><td></td></tr> <tr> <td></td> <td style="text-align: center; border-top: 1px solid black;">0</td> <td colspan="2" style="text-align: center; border-top: 1px solid black;">= Total Cover</td> </tr> </table>	Tree Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	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Indicator Status	1. _____				2. _____				3. _____				4. _____					0	= Total Cover		<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>4</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0</u> (A/B)</p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Total % Cover of:</th> <th style="text-align: left; border-bottom: 1px solid black;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>30</u></td> <td>x 2 = <u>60</u></td> </tr> <tr> <td>FAC species <u>30</u></td> <td>x 3 = <u>90</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>60</u> (A)</td> <td><u>150</u> (B)</td> </tr> </table> <p style="text-align: center;">Prevalence Index = B/A = <u>2.5</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>  </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u>X</u> 2 - Dominance Test is &gt;50%</p> <p><u>X</u> 3 - Prevalence Index ≤3.0<sup>1</sup></p> <p><u>  </u> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Vegetation Strata</b></p> <p><b>Tree</b> - Woody plants 3 in. 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Remarks: (Explain alternative procedures here or in a separate report.)																																																																																																																																																																							

## SOIL

Sampling Point: 24A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
Applicant/Owner: TKDA State: MN Sampling Point: 24B  
Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): 7  
Subregion (LRR or MLRA): LRR K Lat: 45.23813295 Long: -92.99378725 Datum: WGS 84  
Soil Map Unit Name: \_\_\_\_\_ NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is not met. Antecedent precipitation is above average for the time of year

### HYDROLOGY

#### Wetland Hydrology Indicators:

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

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> FAC-Neutral Test (D5)

#### Field Observations:

Surface Water Present?	Yes _____ No <u>X</u>	Depth (inches): _____
Water Table Present?	Yes _____ No <u>X</u>	Depth (inches): _____
Saturation Present?	Yes _____ No <u>X</u>	Depth (inches): _____
(includes capillary fringe)		

**Wetland Hydrology Present?** Yes \_\_\_\_\_ No X

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 24B

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Tree Stratum</th> <th style="text-align: left; border-bottom: 1px solid black;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center; border-bottom: 1px solid black;">Absolute % Cover</th> <th style="text-align: center; border-bottom: 1px solid black;">Dominant Species?</th> <th style="text-align: center; border-bottom: 1px solid black;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center; border-top: 1px solid black;"><u>0</u></td> <td colspan="2" style="text-align: center; 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(7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b>      Yes <u>    </u>      No <u>  X  </u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>15</u>	x 2 = <u>30</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>10</u>	x 4 = <u>40</u>	UPL species <u>75</u>	x 5 = <u>375</u>	Column Totals: <u>100</u> (A)	<u>445</u> (B)
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## SOIL

Sampling Point: 24B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
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- \_\_\_ Depleted Below Dark Surface (A11)
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- \_\_\_ Dark Surface (S7) (**LRR R, MLRA 149B**)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
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☐ Thin Dark Surface (S9) (**LRR K, L**)  
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☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      **X**

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 25A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.23886386 Long: -92.99372638 Datum: WGS 84  
 Soil Map Unit Name: 169B - Braham loamy fine sand, 1 to 6 percent slopes, Non-hydric soil unit NWI classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent precipitation is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>X</u> No <u>      </u> Depth (inches): <u>16</u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 25A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )			
1. <u><i>Typha angustifolia</i> / Narrow leaf cattail, Narrow-leaved cattail</u>	<u>50</u>	Yes	OBL
2. <u><i>Phalaris arundinacea</i> / Reed canary grass</u>	<u>15</u>	Yes	FACW
3. <u><i>Solidago gigantea</i> / Smooth goldenrod</u>	<u>10</u>	No	FACW
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	<u>75</u>	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
	<u>0</u>	= 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: 100.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:		
OBL species <u>50</u>	x 1 =	<u>50</u>		
FACW species <u>25</u>	x 2 =	<u>50</u>		
FAC species <u>0</u>	x 3 =	<u>0</u>		
FACU species <u>0</u>	x 4 =	<u>0</u>		
UPL species <u>0</u>	x 5 =	<u>0</u>		
Column Totals: <u>75</u>	(A)	<u>100</u>	(B)	

Prevalence Index = B/A = 1.33

**Hydrophytic Vegetation Indicators:**  
☒ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 25A

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

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

### Hydric Soil Indicators:

- |   |   |
|---|---|
| <input type="checkbox"/> Histosol (A1)                                | <input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R, MLRA 149B)</b> |
| <input type="checkbox"/> Histic Epipedon (A2)                         | <input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>       |
| <input type="checkbox"/> Black Histic (A3)                            | <input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>             |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                        | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                               |
| <input type="checkbox"/> Stratified Layers (A5)                       | <input type="checkbox"/> Depleted Matrix (F3)                                   |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)                                |
| <input type="checkbox"/> Thick Dark Surface (A12)                     | <input type="checkbox"/> Depleted Dark Surface (F7)                             |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)                     | <input type="checkbox"/> Redox Depressions (F8)                                 |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                     |   |
| <input type="checkbox"/> Sandy Redox (S5)                             |   |
| <input type="checkbox"/> Stripped Matrix (S6)                         |   |
| <input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b>  |   |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 25B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): convex Slope (%): 2  
 Subregion (LRR or MLRA): LRR K Lat: 45.23891922 Long: -92.9938007 Datum: WGS 84  
 Soil Map Unit Name: 169B - Braham loamy fine sand, 1 to 6 percent slopes NWI classification: None

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 <input type="checkbox"/> No <input checked="" type="checkbox"/>	Hydic Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is not met. Antecedent precipitation is above average for the time of year			

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 25B

<table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Tree Stratum</th> <th style="text-align: left;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Sapling/Shrub Stratum</th> <th style="text-align: left;">(Plot size: <u>15-ft</u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Herb Stratum</th> <th style="text-align: left;">(Plot size: <u>5-ft</u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr> <td>1.</td> <td><i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian</td> <td style="text-align: center;">20</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">UPL</td> </tr> <tr> <td>2.</td> <td><i>Poa pratensis</i> / Kentucky blue grass</td> <td style="text-align: center;">15</td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">FACU</td> </tr> <tr> <td>3.</td> <td><i>Phalaris arundinacea</i> / Reed canary grass</td> <td style="text-align: center;">10</td> <td style="text-align: center;">No</td> <td style="text-align: center;">FACW</td> </tr> <tr> <td>4.</td> <td><i>Solidago altissima</i> / Canada goldenrod</td> <td style="text-align: center;">10</td> <td style="text-align: center;">No</td> <td style="text-align: center;">FACU</td> </tr> <tr> <td>5.</td> <td><i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion</td> <td style="text-align: center;">5</td> <td style="text-align: center;">No</td> <td style="text-align: center;">FACU</td> </tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr><td>8.</td><td></td><td></td><td></td><td></td></tr> <tr><td>9.</td><td></td><td></td><td></td><td></td></tr> <tr><td>10.</td><td></td><td></td><td></td><td></td></tr> <tr><td>11.</td><td></td><td></td><td></td><td></td></tr> <tr><td>12.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>65</u></td> <td colspan="2">= Total Cover</td> </tr> </table> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Woody Vine Stratum</th> <th style="text-align: left;">(Plot size: <u>30-ft</u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr> <td colspan="2"></td> <td style="text-align: center;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </table>	Tree Stratum	(Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.					5.					6.					7.							<u>0</u>	= Total Cover		Sapling/Shrub Stratum	(Plot size: <u>15-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.					5.					6.					7.							<u>0</u>	= Total Cover		Herb Stratum	(Plot size: <u>5-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	1.	<i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	20	Yes	UPL	2.	<i>Poa pratensis</i> / Kentucky blue grass	15	Yes	FACU	3.	<i>Phalaris arundinacea</i> / Reed canary grass	10	No	FACW	4.	<i>Solidago altissima</i> / Canada goldenrod	10	No	FACU	5.	<i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion	5	No	FACU	6.					7.					8.					9.					10.					11.					12.							<u>65</u>	= Total Cover		Woody Vine Stratum	(Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.							<u>0</u>	= Total Cover		<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>2</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0</u> (A/B)</p> <hr/> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>10</u></td> <td>x 2 = <u>20</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>35</u></td> <td>x 4 = <u>140</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>65</u> (A)</td> <td><u>260</u> (B)</td> </tr> </table> <p style="text-align: center;">Prevalence Index = B/A = <u>4.0</u></p> <hr/> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><u>    </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u>    </u> 2 - Dominance Test is &gt;50%</p> <p><u>    </u> 3 - Prevalence Index ≤3.0<sup>1</sup></p> <p><u>    </u> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <hr/> <p><b>Definitions of Vegetation Strata</b></p> <p><b>Tree</b> - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p><b>Sapling/shrub</b> - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p><b>Herb</b> - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p><b>Woody vines</b> - All woody vines greater than 3.28 ft in height.</p> <hr/> <p><b>Hydrophytic Vegetation Present?</b>      Yes <u>    </u>      No <u>  X  </u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>10</u>	x 2 = <u>20</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>35</u>	x 4 = <u>140</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>65</u> (A)	<u>260</u> (B)
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Herb Stratum	(Plot size: <u>5-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status																																																																																																																																																																																																									
1.	<i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	20	Yes	UPL																																																																																																																																																																																																									
2.	<i>Poa pratensis</i> / Kentucky blue grass	15	Yes	FACU																																																																																																																																																																																																									
3.	<i>Phalaris arundinacea</i> / Reed canary grass	10	No	FACW																																																																																																																																																																																																									
4.	<i>Solidago altissima</i> / Canada goldenrod	10	No	FACU																																																																																																																																																																																																									
5.	<i>Taraxacum officinale</i> / Red seeded dandelion, Common dandelion	5	No	FACU																																																																																																																																																																																																									
6.																																																																																																																																																																																																													
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Woody Vine Stratum	(Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status																																																																																																																																																																																																									
1.																																																																																																																																																																																																													
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Total % Cover of:	Multiply by:																																																																																																																																																																																																												
OBL species <u>0</u>	x 1 = <u>0</u>																																																																																																																																																																																																												
FACW species <u>10</u>	x 2 = <u>20</u>																																																																																																																																																																																																												
FAC species <u>0</u>	x 3 = <u>0</u>																																																																																																																																																																																																												
FACU species <u>35</u>	x 4 = <u>140</u>																																																																																																																																																																																																												
UPL species <u>20</u>	x 5 = <u>100</u>																																																																																																																																																																																																												
Column Totals: <u>65</u> (A)	<u>260</u> (B)																																																																																																																																																																																																												
Remarks: (Explain alternative procedures here or in a separate report.)																																																																																																																																																																																																													

## SOIL

Sampling Point: 25B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 26A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 1  
 Subregion (LRR or MLRA): LRR K Lat: 45.23925928 Long: -92.99374982 Datum: WGS 84  
 Soil Map Unit Name: 113 - Webster loam, Hydric soil unit NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent precipitation is above average for the time of year	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 26A

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	<u>0</u>	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	<u>0</u>	= Total Cover		
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )				
1. <i>Phalaris arundinacea</i> / Reed canary grass	25	Yes		FACW
2. <i>Solidago gigantea</i> / Smooth goldenrod	10	Yes		FACW
3. <i>Typha angustifolia</i> / Narrow leaf cattail, Narrow-leaved cattai	10	Yes		OBL
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>45</u>	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
	<u>0</u>	= 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: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>10</u>	x 1 = <u>10</u>
FACW species <u>35</u>	x 2 = <u>70</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>45</u>	(A) <u>80</u> (B)

Prevalence Index = B/A = 1.78

**Hydrophytic Vegetation Indicators:**

☒ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 26A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) <b>(LRR R,MLRA 149B)</b>
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) <b>(LRR R, MLRA 149B)</b>
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) <b>(LRR K, L)</b>
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7) <b>(LRR R, MLRA 149B)</b>	

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023		
Applicant/Owner:	TKDA			State:	MN		Sampling Point:	26B	
Investigator(s):	Dylan Kruzel, Garrett Wee			Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	convex		Slope (%):	3		
Subregion (LRR or MLRA):	LRR K		Lat:	45.2392602		Long:	-92.99375731		
Soil Map Unit Name:	113 - Webster Loam, Hydric soil unit			NWI classification:	None				
Datum:	WGS 84								

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is not met. Antecedent precipitation is above average for the time of year.

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |   |  |   |
|---|--|---|
| ___ Surface Water (A1)                        | ___ Water-Stained Leaves (B9)                  | ___ Surface Soil Cracks (B6)                  |
| ___ High Water Table (A2)                     | ___ Aquatic Fauna (B13)                        | ___ Drainage Patterns (B10)                   |
| ___ Saturation (A3)                           | ___ Marl Deposits (B15)                        | ___ Moss Trim Lines (B16)                     |
| ___ Water Marks (B1)                          | ___ Hydrogen Sulfide Odor (C1)                 | ___ Dry-Season Water Table (C2)               |
| ___ Sediment Deposits (B2)                    | ___ Oxidized Rhizospheres on Living Roots (C3) | ___ Crayfish Burrows (C8)                     |
| ___ Drift Deposits (B3)                       | ___ Presence of Reduced Iron (C4)              | ___ Saturation Visible on Aerial Imagery (C9) |
| ___ Algal Mat or Crust (B4)                   | ___ Recent Iron Reduction in Tilled Soils (C6) | ___ Stunted or Stressed Plants (D1)           |
| ___ Iron Deposits (B5)                        | ___ Thin Muck Surface (C7)                     | ___ Geomorphic Position (D2)                  |
| ___ Inundation Visible on Aerial Imagery (B7) | ___ Other (Explain in Remarks)                 | ___ Shallow Aquitard (D3)                     |
| ___ Sparsely Vegetated Concave Surface (B8)   |  | ___ Microtopographic Relief (D4)              |
|   |  | ___ FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present?      Yes \_\_\_\_\_ No X      Depth (inches): \_\_\_\_\_

Water Table Present?      Yes \_\_\_\_\_ No X      Depth (inches): \_\_\_\_\_

Saturation Present?      Yes \_\_\_\_\_ No X      Depth (inches): \_\_\_\_\_

(includes capillary fringe)

Wetland Hydrology Present?      Yes      No      ☒ X

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 26B

Tree Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
Herb Stratum (Plot size: <u>5-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	40	Yes	UPL	
2. <i>Solidago altissima</i> / Canada goldenrod	10	Yes	FACU	
3. <i>Poa pratensis</i> / Kentucky blue grass	10	Yes	FACU	
4. <i>Solidago gigantea</i> / Smooth goldenrod	10	Yes	FACW	
5. <i>Phalaris arundinacea</i> / Reed canary grass	10	Yes	FACW	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>80</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= 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: 40.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:		
OBL species	0	x 1 =	0	
FACW species	20	x 2 =	40	
FAC species	0	x 3 =	0	
FACU species	20	x 4 =	80	
UPL species	40	x 5 =	200	
Column Totals:	80	(A)	320	(B)

Prevalence Index = B/A = 4.0

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
 \_\_\_ 2 - Dominance Test is >50%  
 \_\_\_ 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No X

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 26B

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

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

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) (**LRR R, MLRA 149B**)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- \_\_\_ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- \_\_\_ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- \_\_\_ Loamy Mucky Mineral (F1) **(LRR K, L)**
- \_\_\_ Loamy Gleyed Matrix (F2)
- \_\_\_ Depleted Matrix (F3)
- \_\_\_ Redox Dark Surface (F6)
- \_\_\_ Depleted Dark Surface (F7)
- \_\_\_ Redox Depressions (F8)

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

<b>Hydric Soil Present?</b>	Yes	No	X
-----------------------------	-----	----	---

Remarks:

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: 27A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): Toe Slope Local relief (concave, convex, none): concave Slope (%): 0  
 Subregion (LRR or MLRA): LRR K Lat: 45.24000421 Long: -92.99319574 Datum: WGS 84  
 Soil Map Unit Name: 113 - Webster Loam, Hydric soil unit NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes        No X (If no, explain in Remarks.)  
 Are Vegetation       , Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No <u>      </u> Hydric Soil Present? Yes <u>X</u> No <u>      </u> Wetland Hydrology Present? Yes <u>X</u> No <u>      </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>      </u> If yes, optional Wetland Site ID: <u>      </u>
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is met. Antecedent precipitation is above average	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Water Table Present? Yes <u>      </u> No <u>X</u> Depth (inches): <u>      </u> Saturation Present? Yes <u>X</u> No <u>      </u> Depth (inches): <u>8</u> (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>      </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 27A

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )			
1. <i>Salix amygdaloides</i> / Peachleaf willow	10	Yes	FACW
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>10</u>	= Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )			
1. <i>Typha angustifolia</i> / Narrow leaf cattail, Narrow-leaved cattail	75	Yes	OBL
2. <i>Equisetum arvense</i> / Common horsetail	15	No	FAC
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	<u>90</u>	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
	<u>0</u>	= 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: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	75	x 1 =	75	
FACW species	10	x 2 =	20	
FAC species	15	x 3 =	45	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	100	(A)	140	(B)

Prevalence Index = B/A = 1.4

**Hydrophytic Vegetation Indicators:**  
☒ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 27A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

☐ Histosol (A1)  
☐ Histic Epipedon (A2)  
☐ Black Histic (A3)  
☐ Hydrogen Sulfide (A4)  
☐ Stratified Layers (A5)  
☒ Depleted Below Dark Surface (A11)  
☐ Thick Dark Surface (A12)  
☐ Sandy Mucky Mineral (S1)  
☐ Sandy Gleyed Matrix (S4)  
☐ Sandy Redox (S5)  
☐ Stripped Matrix (S6)  
☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☒ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	27B	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Hillslope		Local relief (concave, convex, none):	convex			Slope (%):	3
Subregion (LRR or MLRA):	LRR K		Lat:	45.23995136		Long:	-92.99324016	
Soil Map Unit Name:	123 - Dundas fine sandy loam			NW1 classification:		None		

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

Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_

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

Hydrophytic Vegetation Present?      Yes _____ No <u>  X  </u> Hydric Soil Present?                      Yes _____ No <u>  X  </u> Wetland Hydrology Present?            Yes _____ No <u>  X  </u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>  X  </u> If yes, optional Wetland Site ID: _____
--	---

Wetland criteria is not met. Antecedent precipitation is above average for the time of year.

**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input type="checkbox"/> FAC-Neutral Test (D5)                     |

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

(includes capillary fringe)

**Wetland Hydrology Present?**      Yes      No      ☒ X

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 27B

Tree Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
Herb Stratum (Plot size: <u>5-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Phalaris arundinacea</i> / Reed canary grass	25	Yes	FACW	
2. <i>Cirsium arvense</i> / Canada thistle	20	Yes	FACU	
3. <i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	10	No	UPL	
4. <i>Andropogon gerardii</i> / Big bluestem	10	No	FACU	
5. <i>Asclepias syriaca</i> / Common milkweed	5	No	UPL	
6. <i>Rudbeckia subtomentosa</i> / Sweet coneflower	5	No	FACU	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>75</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>30-ft</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
  
 Total Number of Dominant Species Across All Strata: 2 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:		
OBL species	<u>0</u>	x 1 =	<u>0</u>	
FACW species	<u>25</u>	x 2 =	<u>50</u>	
FAC species	<u>0</u>	x 3 =	<u>0</u>	
FACU species	<u>35</u>	x 4 =	<u>140</u>	
UPL species	<u>15</u>	x 5 =	<u>75</u>	
Column Totals:	<u>75</u>	(A)	<u>265</u>	(B)

Prevalence Index = B/A = 3.53

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
 \_\_\_ 2 - Dominance Test is >50%  
 \_\_\_ 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No X

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 27B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |   |  |
|---|--|
| ___ Histosol (A1)                                 | ___ Polyvalue Below Surface (S8) ( <b>LRR R, MLRA 149B</b> ) |
| ___ Histic Epipedon (A2)                          | ___ Thin Dark Surface (S9) ( <b>LRR R, MLRA 149B</b> )       |
| ___ Black Histic (A3)                             | ___ Loamy Mucky Mineral (F1) ( <b>LRR K, L</b> )             |
| ___ Hydrogen Sulfide (A4)                         | ___ Loamy Gleyed Matrix (F2)                                 |
| ___ Stratified Layers (A5)                        | ___ Depleted Matrix (F3)                                     |
| ___ Depleted Below Dark Surface (A11)             | ___ Redox Dark Surface (F6)                                  |
| ___ Thick Dark Surface (A12)                      | ___ Depleted Dark Surface (F7)                               |
| ___ Sandy Mucky Mineral (S1)                      | ___ Redox Depressions (F8)                                   |
| ___ Sandy Gleyed Matrix (S4)                      |  |
| ___ Sandy Redox (S5)                              |  |
| ___ Stripped Matrix (S6)                          |  |
| ___ Dark Surface (S7) ( <b>LRR R, MLRA 149B</b> ) |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

Project/Site:	MCES Sanitary Sewer - Forest Lake		City/Country:	Forest Lake/Washington		Sampling Date:	10/19/2023	
Applicant/Owner:	TKDA		State:	MN		Sampling Point:	28A	
Investigator(s):	Dylan Kruzel, Garrett Wee		Section, Township, Range:	S28, T163, R36W				
Landform (hillslope, terrace, etc):	Toe Slope		Local relief (concave, convex, none):	concave			Slope (%):	0
Subregion (LRR or MLRA):	LRR K		Lat:	45.24263129		Long:	-92.99354862	
Soil Map Unit Name:	113 - Webster Loam, Hydric soil unit			NW1 classification:			PUBHx	

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

Remarks: (Explain alternative procedures here or in a separate report.)  
Wetland criteria is met. Antecedent precipitation is above average for the time of year.

**Wetland Hydrology Indicators:**

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

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> Marl Deposits (B15)                        | <input type="checkbox"/> Moss Trim Lines (B16)                     |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input checked="" type="checkbox"/> Geomorphic Position (D2)       |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks)                 | <input type="checkbox"/> Shallow Aquitard (D3)                     |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   |   | <input type="checkbox"/> Microtopographic Relief (D4)              |
|  |   | <input checked="" type="checkbox"/> FAC-Neutral Test (D5)          |

**Field Observations:**

Surface Water Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Water Table Present?	Yes	<u>      </u>	No	<u>  X  </u>	Depth (inches):	<u>                    </u>
Saturation Present? (includes capillary fringe)	Yes	<u>  X  </u>	No	<u>      </u>	Depth (inches):	<u>          16          </u>

**Wetland Hydrology Present?**      Yes      ☒      No      ☐

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 28A

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>30-ft</u> )			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>0</u>	= Total Cover	

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>15-ft</u> )			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>0</u>	= Total Cover	

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>5-ft</u> )			
1. <u><i>Typha x glauca</i></u>	<u>100</u>	<u>Yes</u>	<u>OBL</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	<u>100</u>	= Total Cover	

Woody Vine Stratum	Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: <u>30-ft</u> )			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	<u>0</u>	= Total Cover	

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>100</u>	x 1 = <u>100</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>100</u>	(A) <u>100</u> (B)

Prevalence Index = B/A = 1.0

**Hydrophytic Vegetation Indicators:**

☒ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☒ 3 - Prevalence Index ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 28A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☒ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

## WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
Applicant/Owner: TKDA State: MN Sampling Point: 28B  
Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): convex Slope (%): 7  
Subregion (LRR or MLRA): LRR K Lat: 45.24261669 Long: -92.99353324 Datum: WGS 84  
Soil Map Unit Name: 123 - Dundas fine sandy loam NWI classification: None

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 <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

#### Is the Sampled Area

**within a Wetland?** Yes ☐ No ☒

If yes, optional Wetland Site ID: \_\_\_\_\_

Remarks: (Explain alternative procedures here or in a separate report.)

Wetland criteria is not met. Antecedent precipitation is above average for the time of year

### HYDROLOGY

#### Wetland Hydrology Indicators:

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

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> FAC-Neutral Test (D5)

#### Field Observations:

Surface Water Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____
Water Table Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____
Saturation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____
(includes capillary fringe)			

**Wetland Hydrology Present?** Yes ☐ No ☒

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: 28B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )			
1. <i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian	50	Yes	UPL
2. <i>Trifolium repens</i> / White clover	20	Yes	FACU
3. <i>Cirsium arvense</i> / Canada thistle	15	No	FACU
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	<u>85</u>	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
	<u>0</u>	= Total Cover	

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>35</u>	x 4 = <u>140</u>
UPL species <u>50</u>	x 5 = <u>250</u>
Column Totals: <u>85</u>	(A) <u>390</u> (B)

Prevalence Index = B/A = 4.59

**Hydrophytic Vegetation Indicators:**

     1 - Rapid Test for Hydrophytic Vegetation

     2 - Dominance Test is >50%

     3 - Prevalence Index ≤3.0<sup>1</sup>

     4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes      No   X

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: 28B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- \_\_\_ Histosol (A1)
- \_\_\_ Histic Epipedon (A2)
- \_\_\_ Black Histic (A3)
- \_\_\_ Hydrogen Sulfide (A4)
- \_\_\_ Stratified Layers (A5)
- \_\_\_ Depleted Below Dark Surface (A11)
- \_\_\_ Thick Dark Surface (A12)
- \_\_\_ Sandy Mucky Mineral (S1)
- \_\_\_ Sandy Gleyed Matrix (S4)
- \_\_\_ Sandy Redox (S5)
- \_\_\_ Stripped Matrix (S6)
- \_\_\_ Dark Surface (S7) **(LRR R, MLRA 149B)**

- \_\_\_ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- \_\_\_ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- \_\_\_ Loamy Mucky Mineral (F1) **(LRR K, L)**
- \_\_\_ Loamy Gleyed Matrix (F2)
- \_\_\_ Depleted Matrix (F3)
- \_\_\_ Redox Dark Surface (F6)
- \_\_\_ Depleted Dark Surface (F7)
- \_\_\_ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X

Remarks:

Sample area located in upland spoil pile adjacent to resource 24.

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: IA-A  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 2  
 Subregion (LRR or MLRA): LRR K Lat: 45.22678377 Long: -92.99276261 Datum: WGS 84  
 Soil Map Unit Name: 75 NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes _____ No <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is absent. Antecedent precipitation is above average for time of year.	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		



**VEGETATION - Use scientific names of plants.**

 Sampling Point: IA-A

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )				
1. <u><i>Picea glauca</i> / White spruce</u>	30	Yes	FACU	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	30	= Total Cover		
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
	0	= Total Cover		
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )				
1. <u><i>Phalaris arundinacea</i> / Reed canary grass</u>	65	Yes	FACW	
2. <u><i>Cirsium arvense</i> / Canada thistle</u>	25	Yes	FACU	
3. <u><i>Solidago gigantea</i> / Smooth goldenrod</u>	10	No	FACW	
4. <u><i>Solidago altissima</i> / Canada goldenrod</u>	10	No	FACU	
5. <u><i>Persicaria hydropiper</i> / Common smartweed, Waterpepper</u>	5	No	OBL	
6. <u><i>Bromus inermis</i> / Smooth brome, Smooth brome, Hungarian</u>	5	No	UPL	
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	120	= Total Cover		
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
	0	= Total Cover		

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
  
 Total Number of Dominant Species Across All Strata: 3 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:		Multiply by:		
OBL species	5	x 1 =	5	
FACW species	75	x 2 =	150	
FAC species	0	x 3 =	0	
FACU species	65	x 4 =	260	
UPL species	5	x 5 =	25	
Column Totals:	150	(A)	440	(B)

Prevalence Index = B/A = 2.93

**Hydrophytic Vegetation Indicators:**  
   1 - Rapid Test for Hydrophytic Vegetation  
   2 - Dominance Test is >50%  
  X 3 - Prevalence Index ≤3.0<sup>1</sup>  
   4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes   X   No

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: IA-A

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR R, MLRA 149B)**

☐ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**  
☐ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**  
☐ Loamy Mucky Mineral (F1) **(LRR K, L)**  
☐ Loamy Gleyed Matrix (F2)  
☒ Depleted Matrix (F3)  
☐ Redox Dark Surface (F6)  
☐ Depleted Dark Surface (F7)  
☐ Redox Depressions (F8)

### Indicators for Problematic Hydric Soils<sup>3</sup>:

☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      X      No

Remarks:

soils appear to be manipulated due to the proximity to golf course and sewer line.

# WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: MCES Sanitary Sewer - Forest Lake City/County: Forest Lake/Washington Sampling Date: 10/19/2023  
 Applicant/Owner: TKDA State: MN Sampling Point: IA-B  
 Investigator(s): Dylan Kruzel, Garrett Wee Section, Township, Range: S28, T163, R36W  
 Landform (hillslope, terrace, etc): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 2  
 Subregion (LRR or MLRA): LRR K Lat: 45.22739008 Long: -92.99284323 Datum: WGS 84  
 Soil Map Unit Name: 123 NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No X  
 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 <u>X</u>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.) Wetland criteria is absent. Antecedent precipitation is above average for time of year. Sample area is located in a turf-sod golf course. Sampled area is partially sloped. Sample area occurs directly on top of sewer line, of which may be leaking hydrology.	

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)		<b>Wetland Hydrology Present?</b> Yes _____ No <u>X</u>

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

Remarks:



**VEGETATION - Use scientific names of plants.**

 Sampling Point: IA-B

	Absolute % Cover	Dominant Species?	Indicator Status
<b>Tree Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
	<u>0</u>	= Total Cover	
<b>Herb Stratum</b> (Plot size: <u>5-ft</u> )			
1. <i>Poa pratensis</i> / Kentucky blue grass	75	Yes	FACU
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
	<u>75</u>	= Total Cover	
<b>Woody Vine Stratum</b> (Plot size: <u>30-ft</u> )			
1. _____			
2. _____			
3. _____			
4. _____			
	<u>0</u>	= Total Cover	

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
  
 Total Number of Dominant Species Across All Strata: 1 (B)  
  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:		Multiply by:		
OBL species	<u>0</u>	x 1 =	<u>0</u>	
FACW species	<u>0</u>	x 2 =	<u>0</u>	
FAC species	<u>0</u>	x 3 =	<u>0</u>	
FACU species	<u>75</u>	x 4 =	<u>300</u>	
UPL species	<u>0</u>	x 5 =	<u>0</u>	
Column Totals:	<u>75</u>	(A)	<u>300</u>	(B)

Prevalence Index = B/A = 4.0

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
 \_\_\_ 2 - Dominance Test is >50%  
 \_\_\_ 3 - Prevalence Index ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting Problematic Hydrophytic Vegetation<sup>1</sup> (Explain )

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Vegetation Strata**

**Tree** - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

**Sapling/shrub** - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

**Woody vines** - All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes        No   X

Remarks: (Explain alternative procedures here or in a separate report.)

## SOIL

Sampling Point: IA-B

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

[illegible]

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

### Hydric Soil Indicators:

- |   |  |
|---|--|
| ___ Histosol (A1)                                 | ___ Polyvalue Below Surface (S8) ( <b>LRR R, MLRA 149B</b> ) |
| ___ Histic Epipedon (A2)                          | ___ Thin Dark Surface (S9) ( <b>LRR R, MLRA 149B</b> )       |
| ___ Black Histic (A3)                             | ___ Loamy Mucky Mineral (F1) ( <b>LRR K, L</b> )             |
| ___ Hydrogen Sulfide (A4)                         | ___ Loamy Gleyed Matrix (F2)                                 |
| ___ Stratified Layers (A5)                        | ___ Depleted Matrix (F3)                                     |
| ___ Depleted Below Dark Surface (A11)             | ___ Redox Dark Surface (F6)                                  |
| ___ Thick Dark Surface (A12)                      | ___ Depleted Dark Surface (F7)                               |
| ___ Sandy Mucky Mineral (S1)                      | ___ Redox Depressions (F8)                                   |
| ___ Sandy Gleyed Matrix (S4)                      |  |
| ___ Sandy Redox (S5)                              |  |
| ___ Stripped Matrix (S6)                          |  |
| ___ Dark Surface (S7) ( <b>LRR R, MLRA 149B</b> ) |  |

### Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)  
☐ Coast Prairie Redox (A16) (**LRR K, L, R**)  
☐ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)  
☐ Dark Surface (S7) (**LRR K, L**)  
☐ Polyvalue Below Surface (S8) (**LRR K, L**)  
☐ Thin Dark Surface (S9) (**LRR K, L**)  
☐ Iron-Manganese Masses (F12) (**LRR K, L, R**)  
☐ Piedmont Floodplain Soils (F19) (**MLRA 149B**)  
☐ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)  
☐ Red Parent Material (F21)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>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      **X**

Remarks:

Assumed non-hydric based on best professional judgement. Sampled area is located in a mapped non-hydric soil unit with no hydrophytic vegetation.

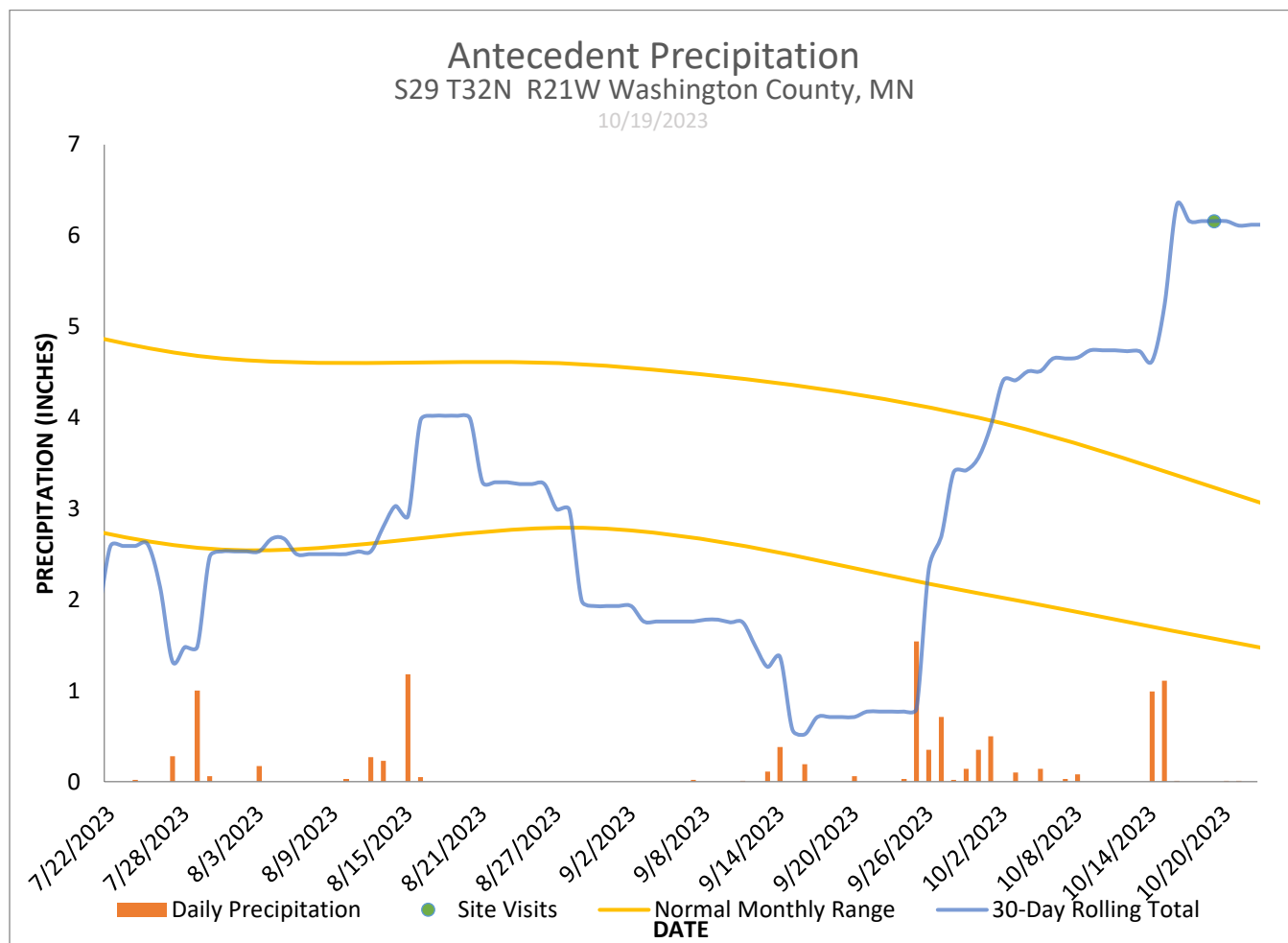
## Appendix C

### ANTECEDENT PRECIPITATION RECORD

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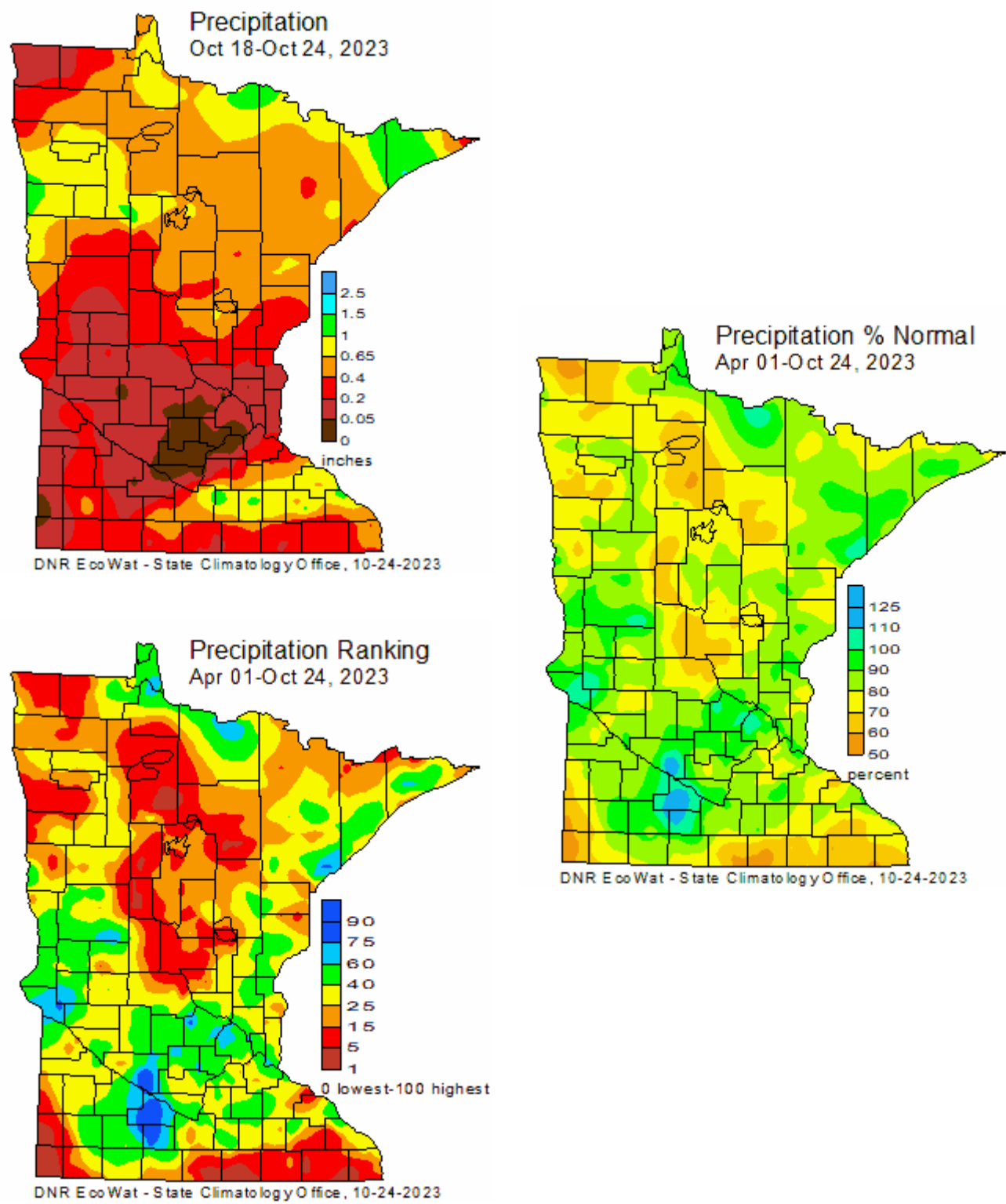


**Appendix C, Figure 1.** Graph of recent precipitation in comparison with the normal range of precipitation in the general site location. Daily precipitation data is plotted independently and as a 30-day rolling total up to the date of the site visit. The normal range is plotted from precipitation data recorded from 1981 to 2010. The normal range is represented in this graph with two lines, the 30<sup>th</sup> percentile and the 70<sup>th</sup> percentile of the period-of-record data distribution.



Source: <http://climate.umn.edu/>

**Appendix C, Figure 2.** Minnesota State Climatology Office map depicting total precipitation for the week of the site visit



Source: <https://www.dnr.state.mn.us/climate/weekmap/maps-produced-october-24-2023.html>

**Appendix D**  
CREDENTIALS

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#### CERTIFICATIONS

Professional Wetland Scientist #1832  
MN Certified Wetland Delineator #1016

#### EDUCATION

MS Water Resources Management  
University of Wisconsin-Madison

BS Biology; Ecology  
Minnesota State University- Mankato

#### SPECIALIZED TRAINING

Wetland Delineation & Management Training  
Richard Chinn Environmental Training, Inc.

Wetland Plant Identification  
Biotic Consultants Inc.

Plant Identification for Wetland Delineation  
University of Wisconsin-La Crosse

Watershed Academy Web Certificate  
United States Environmental Protection Agency

#### PROFESSIONAL ASSOCIATIONS

Society of Wetland Scientists  
MN Wetland Professionals Association (WPA)  
MN WPA President 2010  
Wisconsin Wetlands Association  
Association of State Wetland Managers  
Minnesota Native Plant Society  
Ecological Society of America

#### TOTAL EXPERIENCE

19 years

#### YEARS WITH CURRENT FIRM

2004 to Present

#### PUBLICATIONS & PRESENTATIONS

*The Future of Rowan Creek Watershed: Connecting Land Use and Management with Water Quality.* 2003. Water Resources Management Workshop 2002, Gaylord Nelson Institute for Environmental Studies, University of Wisconsin, Madison.

*The Tumultuous World of Drainage Districts: An Analysis of Existing Management Arrangements, with Recommendations.* Working Paper Series 2002-1. Water Resources Institutions and Policies, Department of Urban and Regional Planning, University of Wisconsin, Madison.

*South Shore Lake Bemidji Remediation & Restoration,* Society of American Military Engineers meeting June 22, 2016, St Paul, MN.

#### SUMMARY OF EXPERIENCE

Benjamin Hodapp, an Environmental Specialist and Senior Project Manager, brings a broad background of knowledge and experience in the environmental field to the Anderson Engineering team. Benjamin has a unique combination of multi-disciplinary academic training and work experience at various levels of federal, state and local government and private consulting.

Benjamin's project experience includes natural resource inventory and assessment; wetland delineation, mitigation design and monitoring; regulatory permitting; agency and stakeholder coordination; environmental impact assessment, environmental document preparation and public outreach.

#### REPRESENTATIVE PROJECTS

**Southwest Light Rail Transit- Metropolitan Council – Minneapolis, MN:** Project manager for wetland delineation and permitting efforts in support of multi-disciplinary consultant team for preparation of Final Environmental Impact Statement for proposed 16 mile light rail alignment. Project tasks included completion of wetland delineations, preparation of all federal, state and local wetland permits and wetland mitigation plans, quality assurance and quality control of all deliverable products.

**Harriet Island to South St. Paul Regional Trail – City of St Paul, City of South St. Paul and Dakota County – St Paul, MN:** Project manager for wetland delineation, mapping and assessment efforts in support of multi-disciplinary consultant team responsible for preliminary engineering and final design. Project tasks included project management oversight and coordination, supervising field staff in completion of both off-site and on-site wetland determinations, boundary delineations, GPS mapping and functional assessments. Oversaw preparation of and responsible for quality assurance and quality control of all deliverable products.

**Crosstown Blvd. Pedestrian Trail – City of Andover – Andover, MN:** Project Manager for wetland delineation associated with proposed City trail improvements. Services included a wetland delineation, GPS mapping and functional assessment document findings and coordination and approval of findings with federal, state and local regulatory agencies.

**Bennett Family Park Improvements – Minnetonka, MN:** Project Manager for wetland delineation associated with proposed baseball complex improvements. Services included a wetland delineation, GPS mapping and functional assessment document findings and coordination and approval of findings with federal, state and local regulatory agencies.

**Section 401/404 Wetland Permitting – Fort McCoy Commemorative Park Expansion – Fort McCoy, WI:** Provided project management services for Section 401/404 permitting associated with proposed wetland impacts resulting from the Commemorative Park Expansion Project at the Fort McCoy U.S. Army installation. Project tasks included project management, developing a wetland mitigation strategy in compliance with Section 401/404 and state wetland permitting requirements and oversight and quality control in preparing Section 401/404 permit application.

### EDUCATION

Bachelor of Science: Wildlife Biology  
Minor: Wetlands Ecology and Biology

Bemidji State University – Bemidji

### SPECIALIZED TRAINING

Certified Minnesota Wetland  
Professional #1406

Erosion and Stormwater  
Construction Site Management  
Certification

S-130 Basic Wildland Firefighter

S-190 Introduction to Fire Behavior

L-180 Human Factors in the Wildland  
Fire Service

Certified Open Water Diver

OSHA 10 Hour Training

### PROFESSIONAL ASSOCIATIONS

MN Wetland Professionals  
Association

Wisconsin Wetlands Association

The Wildlife Society

### TOTAL EXPERIENCE

4.5 years

### YEARS WITH CURRENT FIRM

2020 to present

### SUMMARY OF EXPERIENCE

Dylan Kruzel, an Environmental Scientist, brings a broad background of knowledge and experience in the environmental field to the Anderson Engineering team. Prior to his employment with Anderson Engineering of MN, LLC, Dylan worked for the Soil and Water Conservation District (SWCD) of Becker County as a Conservation Technician. He conducted field evaluations for conservation plans, monitored conservation easements, and provided available natural resource program information to landowners with conservation concerns. He has also assisted in the design and installation of various native habitat, shoreline restoration, rain garden, and storm water mitigation projects. The skills that Dylan has developed through his educational background and experience make him proficient in assessing and addressing a range of ecological indications and environmental issues.

Dylan's project and educational experience includes conservation management practices, habitat management evaluations, ecosystem restoration, species identification, regulatory permitting, environmental document preparation and compliance oversight, wetland delineation and classifications, wetland mitigation, and project coordination. Dylan has experience with Collector for ArcGIS, Wildnote, Geographic Information Systems, Global Positioning Systems, and Realtime Landscape Architect.

### REPRESENTATIVE PROJECTS

**Wetland Delineation/Reporting – Various Locations:** Services included wetland delineation and reporting in support of linear construction projects and real-estate transactions for federal, state, and local agencies, as well as private companies. Project tasks included completion of wetland field delineations following the 1987 Corps of Engineers Wetland Delineation Manual and Regional Supplement: Midwest Region, and Northcentral and Northeast Region, GPS mapping, and preparation of reports to document findings and assess wetland impacts.

**Permitting Specialist – MN:** Services include preparation of permit applications in accordance with the Minnesota Wetland Conservation Act to support the planning, design, and mitigation for residential, commercial, and state land development projects.

**NEPA Documentation – MN:** Services include preparation of Categorical Exclusion Determination documents in accordance with the Minnesota Department of Transportation Highway Project Development Process and the Department of Veteran Affairs (VA) NEPA Interim Guidance for Projects. Tasks include evaluation, coordination, and responding to assist project managers in environmental documentation for Minnesota highways and VA health care facilities.

**Project Book – US Department of Veteran Affairs (VA) – Dallas VA Medical Center, TX:** Project Coordinator to guide a multidisciplinary team in development of a project book for expansion of and upgrades to the Dallas VA Medical Center. The project consists of organizing and collection of pre-design information that will serve as the foundation of all future design work by defining project requirements and refining cost elements. Efforts involve close coordination with members of the design team.

**Land Alterations and Field Monitoring – Becker County SWCD – MN:** Services include performing the following general activities in compliance with federal, state, and local regulations: assisting in site evaluations and installing for various cost share projects like conservation easements, management practices, and shoreland alterations.



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	8:55		500ft south of Fenway park trail
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
101	48"  24" Clear	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	8.15	_____ through  _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 8.8'	Clock Pos: 12	Depth (Rim to Inv.) 8.8'
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry - Cold <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated MH Buried 3-4" At Edge of Wetland	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Estimate 6" Sediment could not recover with sludge Judge





Photo 1: MH 101 Casting



Photo 2: MH 101 Surroundings



Photo 3: MH 101 Pipe



Photo 4: MH 101 Steps



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	9:10	202 <sup>nd</sup> st / Fenway Pk Trail	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
102	27" Riser Section 48" Barrel Section w/ flat top 72" Bottom Section w/ flat top	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other		_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6	Depth (Rim to Inv.) 13.5	Clock Pos: 12	Depth (Rim to Inv.) 12.2
Pipe ID#: 7029 Interceptor		Pipe ID# Municipal Sewer	
Material/Size: 36" RCP		Material/Size: 22" OD HDPE	
Comments:		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% <b>25%</b> 50% 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos: 3	Depth (Rim to Inv.) 12.7 approx.	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#: 7029 Interceptor		Pipe ID#	
Material/Size: 36" RCP		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry – 16 Deg <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input checked="" type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input type="checkbox"/> Eccentric <input checked="" type="checkbox"/> Flat Top <input type="checkbox"/> Other  3 sections 2 flat tops	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>West side splash on bench</u> Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	3 tiers each with its own flat top  No sediment

<b>MH Entry Notes</b>
Invert/Channel, Riser in good condition 6' MH bottom flat top ~ 4' Tall 4' MH mid flat top ~ 4' Tall, layer of brick supporting lid on 4 foot barrel section is more brittle than the concrete





Photo 1: MH 102 Top



Photo 2: MH 102 Casting



Photo 3: MH 102 Pipes



Photo 4: MH 102 Stairs Brick layer on top section of barrel are less competent than barrel section, but in fair condition.





Photo 5: Compitent Concrete MH wall after film scraped away



Photo 6: Compitent concrete flat top sitting on 6' bottom section



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	9:45	202 <sup>nd</sup> Street, gravel road	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
104	4'  24" clear opening	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	17'	_____ through  _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 9	Depth (Rim to Inv.) 18.75'	Clock Pos: 3	Depth (Rim to Inv.) 18.65'
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% <b>25%</b> 50% 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry – 16 Deg <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input checked="" type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	4" of sediment recovered, more likely (6-7" Est)





Photo 1: MH 104 Lid



Photo 2: MH 104 Surroundings



Photo 3: MH 104 Ladder and Pipe



Photo 4: MH 104 Sludge Judge Sample





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	12:52	202 <sup>nd</sup> street, gravel road	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
105	4' 24" Clear Opening	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	21.50	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 9	Depth (Rim to Inv.) 22.35	Clock Pos: 3	Depth (Rim to Inv.) 22.35
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% <b>25%</b> 50% 75% 100%	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain – Possible slow infiltration, see growth <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

<b>MH Type</b>	<b>Evidence of Surchage</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Dirt buildup on steps</u> Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Lots of dirt build up on steps, casting might not be 100% sealed.  No sediment  Buried MH recently uncovered and raised to gravel road surface



Photo 1: MH 105 Lid



Photo 2: MH 105 Surroundings



Photo 3: MH 105 Ladder

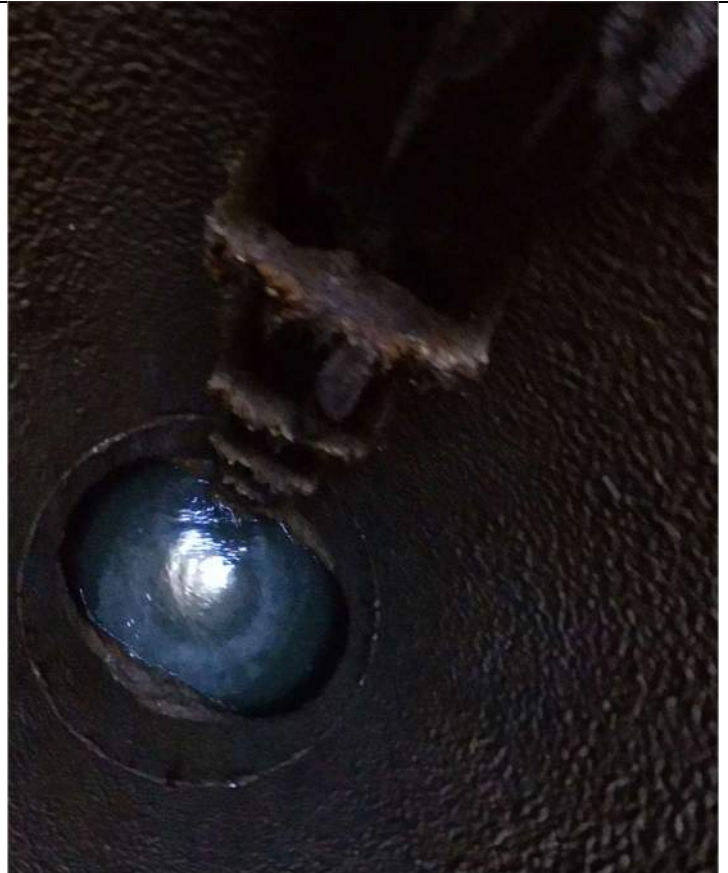


Photo 4: MH 105 Ladder and Pipe





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	1:17	202 <sup>nd</sup> Street, gravel road	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
106	4' 24" Clear Opening	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	18.2	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 9	Depth (Rim to Inv.) 19.1	Clock Pos: 3	Depth (Rim to Inv.) 19.75
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments: Sediment prevents full depth measurement		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% <b>25%</b> 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos: 12	Depth (Rim to Inv.) 18.5	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#: Lateral from airport?		Pipe ID#	
Material/Size: 12" PVC		Material/Size:	
Comments: Limited visibility from surface, tucked under steps		Comments:	
Flow (% full): <b>0%</b> 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheetting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input checked="" type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	10" of sediment from MH entry  Sludge Judge gives 5"

MH Entry Notes
10" PVC lateral under steps (might be from airport) Concrete still good, no hammer penetration, little to no scratch depth Weeping on joints Barnacle mid-way up manhole, is solid





Photo 1: MH 106 Surroundings and Lid



Photo 2: MH 106 Sludge Judge



Photo 3: MH 106 Ladder

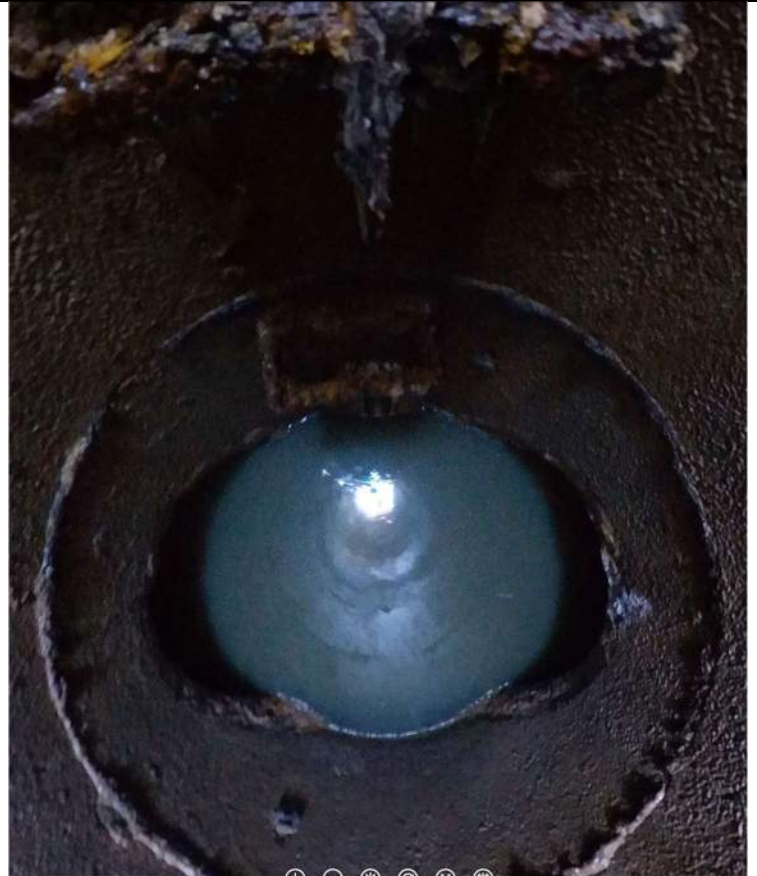


Photo 4: MH 106 Pipes





Photo 5: 10" PVC Lateral – North Side, below steps



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<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	1:44	202 <sup>nd</sup> street	Frontage road
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
107	24" Clear Open 27" riser section 48" barrel section w/ flat top 72" bottom section w/ flat top	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	21.3	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 9	Depth (Rim to Inv.) 23.15'	Clock Pos: 3	Depth (Rim to Inv.) 22.8'
Pipe ID#: 7029 Interceptor		Pipe ID# 7029 Interceptor	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos: 5	Depth (Rim to Inv.) 22.20'	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#: Municipal Connection		Pipe ID#	
Material/Size: 24" PVC?		Material/Size:	
Comments: ~4" of Sediment		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheetting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input checked="" type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input checked="" type="checkbox"/> Flat Top <input type="checkbox"/> Other  6' bottom section has flat top 4' barrel section is eccentric cone	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Stairs</u>  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Bench has debris buildup 27" Riser





Photo 1: MH 106 Ladder



Photo 2: MH 106 Pipes, Inlet 1 (right), Inlet 2 (left), Outlet (top)



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	11:15	Forest Road North	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
108	4'  24" Clear Open	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	18.6"	_____ through  _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 20.15	Clock Pos: 12	Depth (Rim to Inv.) 19.90
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments:	
Flow (% full): 0% <b>25%</b> 50% 75% 100%		Flow (% full): 0% <b>25%</b> 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input type="checkbox"/> Stain <input checked="" type="checkbox"/> Weeping – AT JOINTS <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	New 27" Rings 8" Sediment from MH entry 5" Sediment measured on sludge Judge

MH Entry Notes
Soft sediment felt under water surface, large object also felt, possibly brick under surface? ~1/4" Thick slime on walls Weeping seen Concrete has black coating Concrete is solid overall





Photo 1: MH 108 Ladder

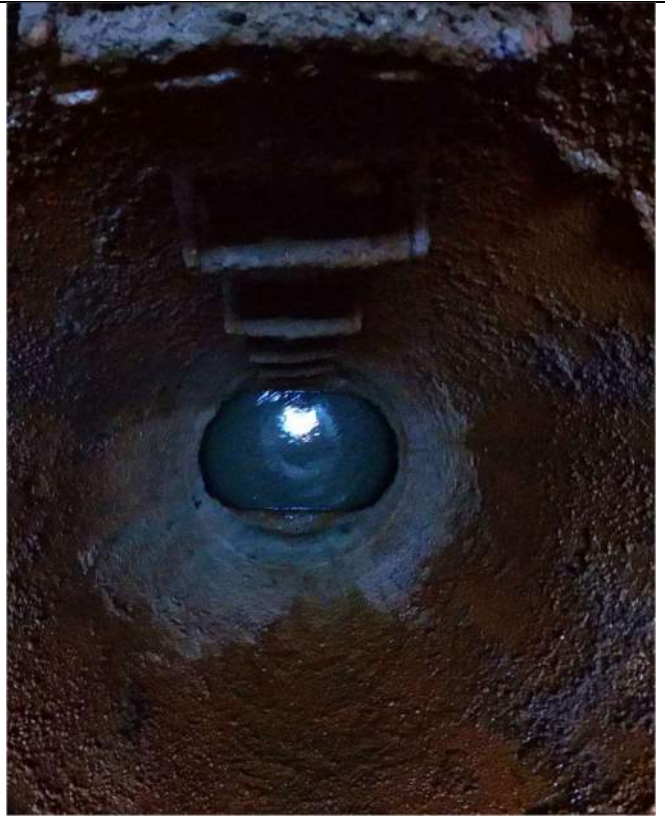


Photo 2: MH 108 Pipes



Photo 3: Slime and black coating on MH walls



Photo 4: Slime and black coating on MH walls





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	2:32	Forest Road North	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
109	4'  24" Clear Open	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	17.80	_____ through  _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 19.80	Clock Pos: 12	Depth (Rim to Inv.) 19.80
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry – 16 deg <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	New 27' Riser Rings ~12" Sediment (3" in sludge judge)



Photo 1: MH 109 Surroundings



Photo 2: MH 109 Sludge Judge



Photo 3: MH 109 Ladder

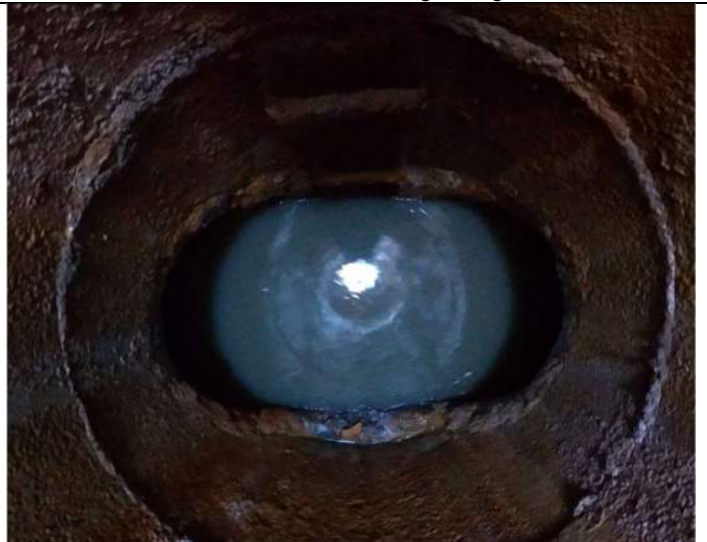


Photo 4: MH 109 Pipes



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<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	2:53 PM	Forest Road North	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
110	4'  24" Clear Open	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	Bench Not seen	_____ through _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 18.45'	Clock Pos: 12	Depth (Rim to Inv.) 18.45'
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments:	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% 25% <b>50%</b> 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry – 16 deg <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input type="checkbox"/> None <input checked="" type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surcharge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Potential erosion of bench, west side</u> Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	New rings & casting ~8" Sediment





Photo 1: MH 110 Surroundings



Photo 2: 110 Ladder



Photo 3: MH 110 Pipes



Picture 4: Eroded Remains of Bench



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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	3:15 pm	Forest BLVD N	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
111	4'  24" clear	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	14.80'	_____ through  _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 16.55'	Clock Pos: 12	Depth (Rim to Inv.) 16.35'
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments: 6" Sediment		Comments: 12" Sediment	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input checked="" type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surge	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Debris caught on edge of outlet</u> Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Noticeable water waves when lift station turned on  ~12" total sediment measured during MH entry

MH Entry Notes
Wet at 1 <sup>st</sup> barrel section from top Debris ball in invert Worm holes in wall near bottom Concrete walls in good shape





Photo 1: MH 111 Surroundings



Photo 2: MH 111 Ladder



Photo 3: MH 111 Debris caught on edge of pipe



Photo 4: MH 111 Worm holes in concrete wall, but competent concrete



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<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	3:20 pm	Forest BLVD N	
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
112	4'  24" Clear	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	11.7'	_____ through  _____

Outlet Pipe		Influent Pipe 1	
Clock Pos: 6	Depth (Rim to Inv.) 12.45'	Clock Pos: 12	Depth (Rim to Inv.) 12.35'
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments: 6" Sediment		Comments: 6" Sediment	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	
Influent Pipe 2		Influent Pipe 3	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos:	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments:	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

Weather	Runoff / Inflow	Infiltration
<input checked="" type="checkbox"/> Dry – 16 Deg <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input checked="" type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

MH Type	Evidence of Surchage	Debris Deposits	Structural Defects	Comments
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____  Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	New ring and casting  Sludge Judge unable to get good sample  6" sediment by feel





Photo 1: MH 112 Surroundings



Photo 2: MH 112 Sludge Judge Sample



Photo 3: MH 112 Ladder



Photo 4: MH 112 Pipe





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# MH ASSESSMENT FORM

<b>Inspector(s):</b>	<b>Date:</b>	<b>Time:</b>	<b>Street:</b>	<b>Cross Street/House #</b>
BJM, WSF	12/18/23	3:50 pm	Forest BLVD N	Interstate Companies LLC Driveway
<b>MH ID#</b>	<b>MH Dia. (ft)</b>	<b>Material</b>	<b>Rim to Bench (ft):</b>	<b>Photo's</b>
113	4'  24" clear opening	<input type="checkbox"/> Brick <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Polymer <input type="checkbox"/> Combination <input type="checkbox"/> Other	N/A	_____ through _____

<b>Outlet Pipe</b>		<b>Influent Pipe 1</b>	
Clock Pos: 6	Depth (Rim to Inv.) 9.7'	Clock Pos: 12	Depth (Rim to Inv.) 9.7'
Pipe ID#:		Pipe ID#	
Material/Size: 36" RCP		Material/Size: 36" RCP	
Comments:		Comments: Forcemain	
Flow (% full): 0% 25% <b>50%</b> 75% 100%		Flow (% full): 0% <del>25%</del> <del>50%</del> <del>75%</del> <del>100%</del>	
<b>Influent Pipe 2</b>		<b>Influent Pipe 3</b>	
Clock Pos:	Depth (Rim to Inv.)	Clock Pos: 3	Depth (Rim to Inv.)
Pipe ID#:		Pipe ID#	
Material/Size:		Material/Size:	
Comments:		Comments: Abandoned former connection to dump station and Bulkheaded	
Flow (% full): 0% 25% 50% 75% 100%		Flow (% full): 0% 25% 50% 75% 100%	

<b>Weather</b>	<b>Runoff / Inflow</b>	<b>Infiltration</b>
<input checked="" type="checkbox"/> Dry <input type="checkbox"/> Heavy Rain <input type="checkbox"/> Light Rain <input type="checkbox"/> Snow <input type="checkbox"/> Saturated <input type="checkbox"/> Damp <input type="checkbox"/> Very Dry	<input checked="" type="checkbox"/> None <input type="checkbox"/> Sheeting <input type="checkbox"/> Ponding <input type="checkbox"/> Inundated	<input checked="" type="checkbox"/> None <input type="checkbox"/> Stain <input type="checkbox"/> Weeping <input type="checkbox"/> Dripping <input type="checkbox"/> Gushing <input type="checkbox"/> Roots

<b>MH Type</b>	<b>Evidence of Surge</b>	<b>Debris Deposits</b>	<b>Structural Defects</b>	<b>Comments</b>
<input type="checkbox"/> Concentric <input checked="" type="checkbox"/> Eccentric <input type="checkbox"/> Flat Top <input type="checkbox"/> Other	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes Describe: _____ Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes Describe: <u>Erosion around bulkhead &amp; force main</u> Component: Chimney Cone Wall Bench Channel Pipe Inlet / Outlet	Bulkhead and force main  No sediment

<b>MH Entry Notes</b>
FM Discharge ~9" gap from MH to concrete bulkhead, behind force main, concrete bulkhead feels solid Top slab rests on brick, motor on top of brick is starting to fail



Photo 1: MH 113 Surroundings



Photo 2: MH 113 Ladder and pipes



Photo 3: MH 113 Force main (Left) Bulkhead (Right) top view.



Photo 4: MH 113 Force main (Left) and Bulkhead (Right)

# Appendix B

## MCES Capacity Analysis





## INTERNAL MEMORANDUM

**DATE:** February 14, 2023  
**TO:** Amanda Mondor  
**FROM:** Emily Steinweg, Principal Engineer, Wastewater Planning & Community Programs  
**SUBJECT:** Forest Lake Interceptor 7029 Evaluation

### Project Background

The Metropolitan Council Environmental Services (ES) owns and operates the Forest Lake Interceptor from Lift Station L01 to L78 in White Bear Lake. A 2018 condition assessment revealed approximately 1,000 linear feet (LF) upstream of L02 to be condition 4.5 and the remaining 7,000 LF between Manhole 94 and L02 to be condition rating 4.

The 36-inch, single barrel, reinforced concrete pipe (RCP) was installed in 1970. A 35 LF permanent easement exists over the corridor; however, Tanner's Brook golf course was constructed over the interceptor and the City of Forest Lake (City) has approached ES about developing the parcel to the north of the golf course. The City has suggested rerouting the pipe down Fenway Ave and 180th Street North between MH 99 and L02.

Meter Station 043 is located just downstream from L02. Flows at this station were consistent with those recorded at L01. The 10-year average dry weather flow (ADWF) was 1.5 million gallons per day (MGD) and 10-year peak wet weather flow (PWWF) was 2.9 MGD.

A capacity analysis for this stretch of 7029 has been requested for project 802xxx to fulfill the Consultant's request for future capacity evaluation to inform alternatives for future rehabilitation and/or relocation of the existing interceptor.

### Comprehensive Plan Growth Forecasts and Flow Projections

2020, 2030, and 2040 flows from Forest Lake and Columbus were determined using each community's 2040 Comprehensive Plan growth forecasts and average flow rates for households and employees, for the sewershed that contributes to 7029 at the south border of Forest Lake (Figure 1).

From those calculations (see associated spreadsheet), flows are summarized in Table 1:

Table 1: Comprehensive Plan Flow Projections

	<b>ADF MGD</b>	<b>ES Std PF</b>	<b>Peak Flow MGD</b>
2020 Flow Projection	1.3	3.0	4.0
2030 Flow Projection	1.6	2.9	4.8
2040 Flow Projection	1.9	2.8	5.4

Assumptions for these flow projections:

- 150 gpd/household; 20 gpd/employee
- Flow amounts include entire contributing sewersheds to the 7029 interceptor at the south border of Forest Lake. No incremental flows along the interceptor were calculated.

Calculations and supporting documents are saved here: N:\TechServ\Engr\_Services\_Info\25 Programs\System Planning\Service Area Analyses\Metro SA Analyses\7029 - Forest Lake

## Ultimate Flow Projections

To estimate the Ultimate Flow, a previous study of the capacity of the NEI (Northeast Interceptor) was used as a starting point. That study was last updated in 2019 and files are saved here: N:\TechServ\Engr\_Services\_Info\25 Programs\System Planning\Service Area Analyses\Metro SA Analyses\NEI\Flow vs Cap Analysis\Aug 2019 Update

Flow areas to the same input locations as in the 2019 study were updated per the Long-Term Service Area (LTSA) shapefile (as of July 2022) and the Comprehensive Plans of the served communities. Three flow areas pertain to this analysis: MH 125, MH 114 near L01, and MH 77A near L02.

The Very Long-Term developable land area from February 2023 was used in this analysis (N:\ESGM\ESGIS\Public\_PublicProjects\Developable Land Analysis Resources). That layer shows developable land for 25+ years into the future. Areas removed from development in this layer include some golf courses (depending on how counties report golf course land), Metro Collaborative Parks, wetlands (NWI), wildlife management zones, and cemeteries.

The Erase tool was used to subtract the nondevelopable land, for the very long-term scenario, from the contributing areas to the study area. Those acres are used in the calculation for ultimate flow projections (GIS output saved here: N:\TechServ\Engr\_Services\_Info\25 Programs\System Planning\Service Area Analyses\Metro SA Analyses\7029 - Forest Lake\GIS\ForestLakeCapacity.gdb).

- VeryLongTerm\_Erase1

Ultimate flow projections for each location were calculated with areal generation rates of both 600 gallon/acre/day and 800 gallon/acre/day (gpad) for the ultimate service area delineated using the Very Long-Term developable acres (Table 2). Peak flows were calculated using the ES standard peaking factor. Note – this calculation assumes that all areas are fully developed at 600 and 800 gpad.

Table 2: Ultimate Flow Scenario (MGD)

Location	Areal Rate – 600 gpad		Areal Rate – 800 gpad	
	Cumulative Flow	Peak Flow	Cumulative Flow	Peak Flow
MH 125	0.7	2.4	1.0	3.1
MH 114 near L01	2.3	6.3	3.1	8.0
MH 77A near L02	5.3	12.3	7.1	15.7

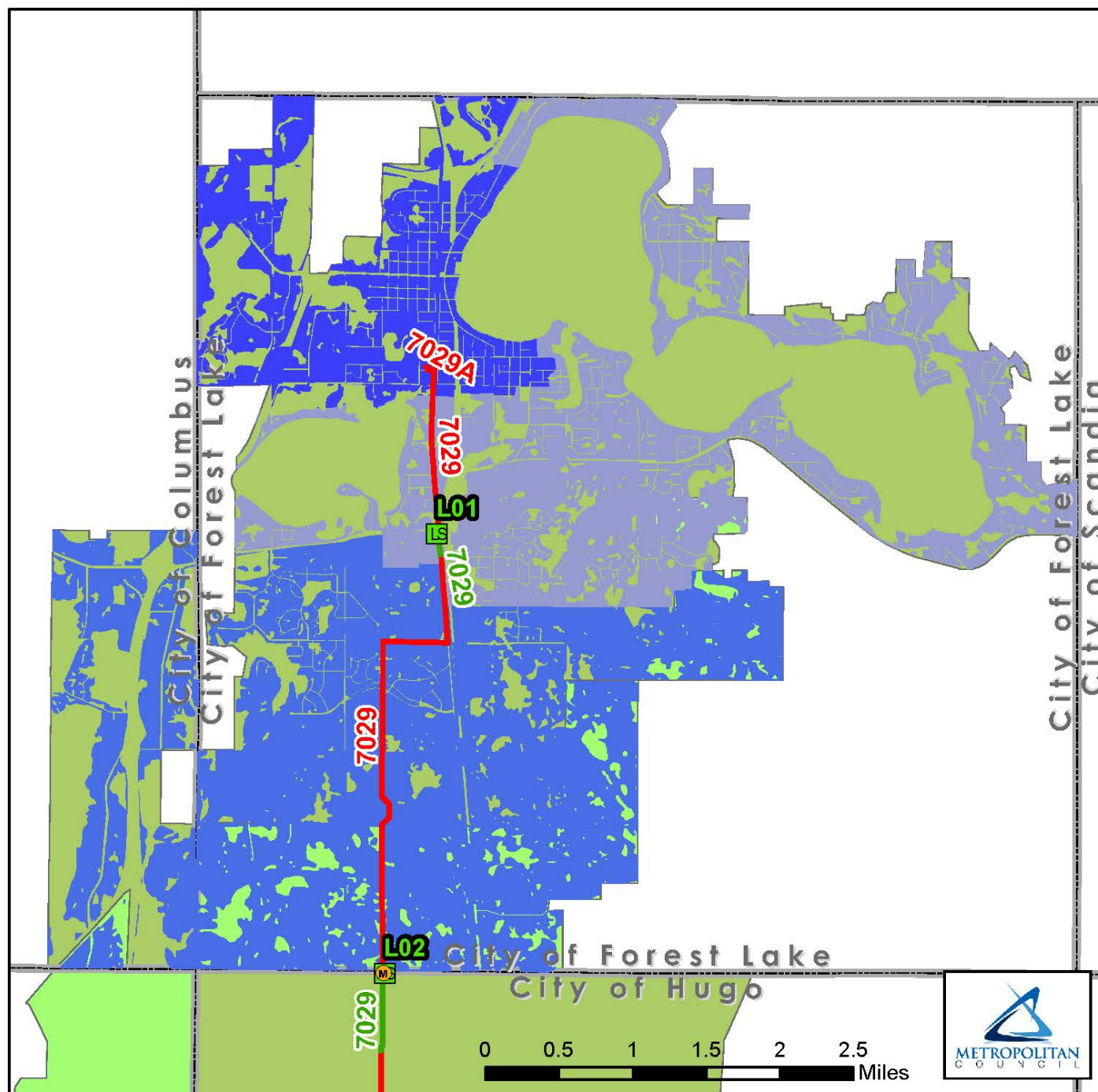
Step graphs for that section of 7029 and comparison of step graph capacity and projected peak flows are shown in Table 3. Note the large difference in projected capacity between the 2040 Comprehensive Plan estimate and the fully developed with areal rates for the long-term service area. The large difference is reflective of the different calculation methods.

Table 3: Step Graph Capacity Comparison Flow (MGD)

	MH 125	MH 114 near L01	MH 77A near L02
Step Graph Est. Capacity	5	5	12
2040 Comp Plan Est. Flow	--	--	5.4
% Capacity Utilized	--	--	45%
Peak Flow, cumulative 600 gpad	2.4	6.3	12.3
% Capacity Utilized	47%	125%	102%
Peak Flow, cumulative 800 gpad	3.1	8.0	15.7
% Capacity Utilized	61%	161%	131%





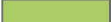


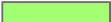



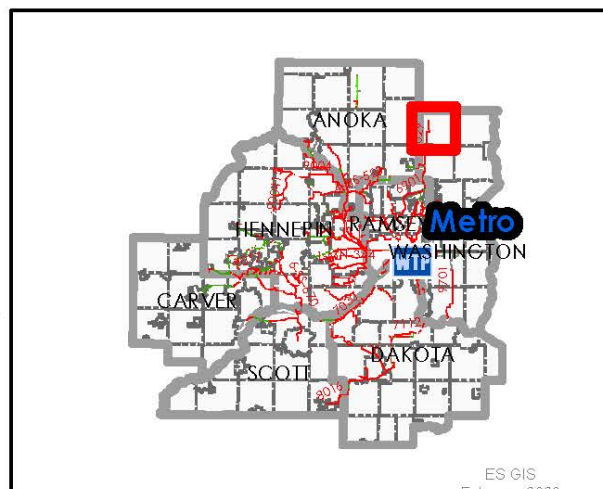
Figure 1



## Ultimate Flow Scenario - 7029

### Legend

	Meters	<b>Long Term Service Area</b>	<b>Contribution Area</b>		
	Lift Stations			MH 114 near L01	
	Gravity		Metro		MH 125
	Forcemain		Potential Metro		MH 77A near L02



# Appendix C

## Location Drawing



