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February 19, 2019

To: Pioneer-Sarah Creek Commissioners
Fr: Judie Anderson
Re: 2018 Work Plan in Review

Minnesota Rule 8410.0150 requires the Commission to submit to the Board of Water and Soil Resources a financial report, activity report and audit report for the preceding fiscal year. 8410.0150 Subp. 3 outlines the required content of the annual activity report. It includes an assessment of the previous year's annual work plan and development of a projected work plan for the following year. The 2018 Work Plan accomplishments were accepted at the [REDACTED] meeting.

The Commission's Third Generation Watershed Management Plan identifies issues, priorities and goals for the six-year period 2015-2020. As a reminder, they are enumerated on pages 6-8 of this memo. **Those goals that have not been pursued are shown in red.**

Following is a summary of the work undertaken by the Pioneer-Sarah Creek Watershed Management Commission in 2018 to meet the goals, objectives and projected work plan outlined in its 2017 *Annual Report*. The Work Plan was approved at the Commission's April 19, 2018 meeting..

2018 Work Plan in Review

A. ONGOING TECHNICAL AND ADMINISTRATIVE PROGRAMS

1. Continue to review local development/redevelopment plans for conformance with the standards outlined in the Commission's Third Generation Watershed Management Plan. Those standards include:

- a. Maintain the current flood profile of the creeks and their tributaries.
- b. Maintain the post-development 2-year, 10-year, and 100-year peak rate of runoff at pre-development level for the critical duration precipitation event.
- c. Maintain the post-development annual runoff volume at pre-development volume.
- d. Prevent the loss of floodplain storage below the established 100-year elevation.

The Commission reviewed eighteen plans for conformance with its standards in 2018. Twelve of the projects reviewed were in the city of Greenfield, four in Independence, and one each in Loretto and Medina.

2. Continue to serve as the local government unit (LGU) for administering the Wetland Conservation Act (WCA) for the cities of Greenfield, Loretto and Maple Plain. Preserve the existing functions and values of wetlands within the watershed. Promote enhancement or restoration of wetlands in the watershed. *In 2018 Technical staff assisted approximately 35 landowners/agency/developer contacts with wetland-related questions. On behalf of the Commission they reviewed the following types of wetland applications: eight wetland boundary/type; three no-loss, exemptions, three sequencing, and two wetland replacement plans. Wetland impacts totaled 14,301 SF; wetland replacement totaled 28,602 SF. Two WCA violations were investigated and resolved. The Commission was involved in five Technical Evaluation Panels (TEPs) throughout the watershed. The Pioneer-Sarah Creek Watershed Management Commission does not have a wetland banking program.*

3. Adopt a 2019 operating budget.

- a. Search for grant and other funds to supplement the regular budget.
- b. Operate a capital improvement program and share in the cost of projects.

On June 21, 2018 the Commission approved an operating budget totaling \$134,070, with a total assessment to the membership of \$128,000, a zero increase over 2018. The 2017 audit showed a carry-over of \$74,464 to help fund CIPs.

4. Conduct a Level II Review and Assessment of the Commission's Progress toward its Third Generation Plan Objectives as part of the Board of Water and Soil Resources PRAP (Performance Review and Assistance Program). *In the summer of 2018 the Commission underwent a BWSR Level II Performance Review. The review contained three specific recommendations to enhance the Commission's service and its delivery of effective water and related land resource management. Briefly, they are:*

- a. Develop and implement training plan for each board member. This training will resume in 2019.*
- b. Make water quality data and trends easily accessible to the public. The website will be updated to make information about water quality trends in area lakes available in easy to understand and accessible formats. Future Annual Reports will also contain information on water quality trends.*
- c. Evaluate progress for the implementation of plan actions at a minimum of every two years. BWSR noted that the goals in the Commission's current water management plan are related to resource outcomes. However, efforts to measure the effects of projects on those resources are not apparent. The Commission should evaluate progress at a minimum every two years as required in rule, and make sure to measure outcomes, not just outputs, and report on progress toward achieving resource improvement. Future Work Plans will endeavor to fulfill this recommendation.*

5. Publish a 2017 Annual Activity Report summarizing the Commission's yearly activities and financial reporting. *The 2017 Annual Activity Report was approved by the Commission at their April 19, 2018 meeting and submitted to BWSR by the April 30 statutory deadline.*

6. Draft a 2018 Work Plan. *The Commission's 2018 Work Plan was also approved at the Commission's April 19, 2018 meeting.*

B. WATER QUALITY AND QUANTITY

1. Support the Commission's management goals for water quality. Continue to make progress to improve the lakes and streams in the watershed as well as protect those that are not impaired.

- a. Improve water clarity in the impaired waters by 10% over the average of the previous ten years by 2023.
- b. Maintain or improve water quality in the lakes and streams with no identified impairments. *No waters in the Pioneer-Sarah Creek watershed were added to the impaired waters list in 2018.*

2. Foster implementation of BMPs in the watershed through technical and financial assistance.

3. Operate a monitoring program sufficient to characterize water quantity and quality and biotic integrity in the watershed and evaluate progress toward TMDL goals. Partner with Three Rivers Park District (TRPD) to conduct water quality monitoring in the watershed. Bring stream and lake monitoring efforts into line with monitoring program outlined in the Third Generation Watershed Plan.

- a. Partner with Three Rivers Park District (TRPD) to conduct bi-weekly water quality monitoring of "sentinel lakes" – Independence, Sarah, and Little Long, along with both basins of Whaletail. These five lakes were monitored in 2018. *All of these lakes are classified as "deep" lakes with the exception of Whaletail North, which is classified as a "shallow" lake. The water quality parameters that were collected at the surface for all of the lakes included total phosphorus, soluble reactive phosphorus, total nitrogen, and chlorophyll-a. Samples were also collected at the top of the hypolimnion and 1-m from the bottom for analysis of total phosphorus and soluble reactive phosphorus for those lakes classified as "deep" lakes.*

b. Partner with Three Rivers Park District (TRPD) to conduct flow and water quality monitoring on Pioneer Creek at Copeland Road and Sarah Creek at County Road 92, along with possible water quality and flow monitoring at up to two additional sites. *The stream sites that were monitored for continuous flow in 2018 included Sarah Creek at Highway 92, Pioneer Creek at Pagenkopf, and Pioneer Creek at Copeland. No water quality data was collected at these stream monitoring sites. However, two sites were monitored for continuous flow and water quality on a stream that flows into Lake Rebecca. These sites were located on a stream (designated as Rebecca North) that outlets on the east side of Lake Rebecca. There was a sample site located at the channel inlet as water enters Lake Rebecca Park Reserve, and a sampling site as water flows through an outlet prior to entering Lake Rebecca. These sites were intended to determine the amount of nutrient loading attributed to the watershed outside of Lake Rebecca Park Reserve and determine the amount of total nutrient loading entering Lake Rebecca through the channel. It was assumed that the difference between the two monitoring sites were representative of the nutrient loading attributed to the Lake Rebecca Park Reserve.*

c. Participate in Metropolitan Council's Citizen Assisted Monitoring Program (CAMP). The Commission has budgeted funds to monitor one lake in 2018. *Hafften Lake was monitored through the CAMP program in 2018. The 2018 CAMP report will be available in spring 2019 at <https://metro council.org/Wastewater-Water/Services/Water-Quality-Management/Lake-Monitoring-Analysis.aspx>*

C. EDUCATION

1. Annually evaluate the proposed Education and Outreach program and establish education and outreach activities for the coming year, including goals and strategies identified in the WRAPS study. These later activities could be identified through a collaboration of the Technical Advisory Committee (TAC) and the Citizen Advisory Committee (CAC). *The Commission should consider establishing a Facebook page to foster e-information sharing.*

2. Educate Commissioners, member City Councils and Planning Commissions about watershed and water resources management. Sponsor watershed and water resources training opportunities such as NEMO (Nonpoint Education for Municipal Officials). *NEMO activities were not scheduled in 2018. The Commission will continue to be involved in NEMO whenever programs and activities become available.*

3. Become a member of WaterShed Partners, a coalition of more than 70 public, private and nonprofit organizations in the Twin Cities Metro area promoting public understanding that inspires people to act to protect water in their watershed through educational projects, networking, and resource sharing. *The Commission became a member of WaterShed Partners in 2018. Administrative Staff regularly attended their meetings and brought forward information to the Commission regarding their activities and educational projects. Resources were shared on the Commission's website and on their Facebook page.*

4. Convene Citizen Advisory Committee (CAC) as necessary to make recommendations on education and outreach actions and assist the Commission with implementation. *The CAC was not convened in 2018.*

5. Participate with collaborative groups to pool resources to undertake activities in a cost-effective manner, promote interagency cooperation and collaboration, and promote consistency of messages. Use the Commission's, member cities', and educational partners' websites and newsletters, social media, co-ops, local newspapers and cable TV to disseminate education materials to all stakeholders about actions they can take to protect and improve water quality. *The WaterShed Partner website, <http://cleanwatermn.org/about-us/>, describes opportunities to protect the environment - Clean up dog poop, Adopt-a-Drain, Autumn raingarden maintenance tips, Tips to protect local waterways from runoff pollution, Organic lawn care, Salt tip card, Green up your lawn not lakes and rivers, and many more.*

6. Continue to maintain the Commission's website to provide news to residents of the watershed. Maintain the Commission Facebook page. *In 2018 PioneerSarahCreek.org had 1200 users for 1600 sessions. In the first month of 2019 those numbers were 130 and 151, respectively. In the final month of 2018 the Facebook page posted 18 likes, 68 reaches and 16 engagements.*

7. Provide opportunities for the public to learn about and participate in water quality activities. Enhance education opportunities for youth. Provide opportunities for bridge-building between stakeholders.

a. Promote river stewardship through the River Watch program. Encourage participation by local school students and their teachers. Funding for monitoring one site was included in the 2018 budget. *No sites were monitored as part of the River Watch program in 2018. However, three sites were included in WHEP (the Wetland Health Evaluation Program). They were PS-1, the Loretto Treatment Pond downstream from the new Loretto wastewater treatment facility; PS-2. The Selstad wetland that feeds into Lake Independence; and PS-8, the Dance Hall Creek wetland located at the end of the creek just before it flows into Lake Sarah.*

b. Work with Boy Scouts for conservation hours, dependent on appropriate environmental projects being identified. *This task was not pursued in 2018.*

c. Work in partnership with the University of Minnesota's agriculture specialist to help build relationships with the agricultural community in the watershed in order to encourage TMDL implementation. *As an example, one project provided assistance to a landowner in creating a horse manure composting system that makes manure handling more convenient and less time consuming. This manure storage and composting facility conserves valuable fertility for their pasture and hay fields and prevents those nutrients from leaching to groundwater and running off to the adjacent creek.*

d. Working in partnership with the Hennepin County Rural Conservationist, continue to work with landowners, writing county cost-share grants to help owners become compliant with the MN Buffer Law. *The deadline for compliance passed in late 2017 and anyone who did not respond to the County or did not get their property into compliance was referred to BWSR for enforcement. The MN Buffer Law requires Staff to check each parcel in the County at least once every three years and spot check up to 15% of parcels. Hennepin County has opted to section the County into thirds and check 1/3 each year. Those residents chosen for a spot check will be notified by letter. In 2019, review and inspections will take place in the Pioneer-Sarah Creek watershed in the cities of Independence, Greenfield, Loretto, Maple Plain, Medina, and parts of Minnetrista.*

D. STUDIES, PROJECTS AND CIPS.

1. Continue to support member cities as they identify studies and projects which benefit both the cities and the watershed. *Submitted FY20-21 Biennial Budget Request (BBR) to the Board of Water and Soil Resources Among projects identified on the BBR are carp population control in chain of lakes; feedlot BMPs; Dancehall Creek SWA-identified implementation projects; SWAs for Hafften, Schendel, Schwappauff Lakes drainage basin; Tomahawk Trail wetland external load reduction; Ardmore neighborhood projects; and Lake Independence alum treatment.*

2. Continue to identify Watershed-wide TMDL implementation projects. Seek grant funding to assist with the costs associated with those projects. *Sought grant funding assistance for the Baker Park Reserve Campground Ravine Stabilization project. Received funding in the amount of \$416,000 through a BWSR Clean Water Fund grant and \$59,500 through the Hennepin County Natural Resources Opportunity Grant program. Local partners (the cities of Independence and Medina, Three Rivers Park District, and the Lake Independence Citizens Association [LICA]) are providing \$34,000. The Commission's share of this \$520,000 project is \$10,500.*

3. Prioritize BMPs identified in the Dance Hall Creek Subwatershed Retrofit Assessment for implementation or further study. *In 2016 the City of Greenfield sent letters to the Dance Hall Creek landowners requesting their cooperation in beginning the implementation phase of the SWA. While no responses were forthcoming, the City and the Commission will continue to make personal contacts to further this process.*

4. Cost-share with the Lake Sarah Improvement Association (LSIA) to complete a round of curly-leaf pondweed (CLPW) treatment in 2018. *In 2018 the Commission entered into a joint powers agreement with the Three Rivers Park District to complete curly-leaf pondweed turion surveys, annual aquatic plant surveys and annual water quality monitoring to determine the effectiveness of the CLPW control program to reduce phosphorus loading to the lake. The parties will coordinate with the Lake Sarah Improvement Association to develop and implement a*

CLPW control strategy per the Lake Sarah TMDL Implementation Plan. The Commission's cost-share will be 25%, not to exceed \$8,000 annually.

5. Convene the Technical Advisory Committee (TAC) for the purpose of receiving CIP applications from the member communities, reviewing them for validity, and recommendation to the Commission for incorporation on the Third Generation Plan CIP.

a. Update CIP in anticipation of the PRAP.

b. Seek grant funding to assist with the costs associated with projects identified on the Commission's CIP.

Additions, revisions and deletions were made to the Commission's Capital Improvement Program at the TAC's April and May meetings. The TAC's recommendations were approved by the Commission at their May meeting.

c. Prioritize capital projects in anticipation of funding during the initial round of the Watershed-based Funding Pilot Project. *The Commission identified three projects recommended in the Lake Ardmore Subwatershed Assessment for funding by the BWSR Watershed-based Funding Pilot Project. Those projects were 1) Project SS1, Stream Stabilization - stabilize 70 feet of stream bank erosion in channel between Lakes Ardmore and Independence; 2) Project SR1, Shoreline Restoration - stabilize 160 feet of shoreline at boat launch; and 3) Project PD3, Pond Excavation - enlarge existing stormwater pond to provide additional treatment for urban runoff. Total cost of these projects is \$74,062.00. Grant funding under the pilot project totals \$58,317.*

E. PLANNING

1. When requested, assist member cities to develop their local water plans. Review plans for compliance with the Commission's Third Generation Plan. Revisions to Minnesota Rules 8410 state that all cities and towns in the seven-county metropolitan area must complete and adopt their local water plans between January 1, 2017 and December 31, 2018. *At year-end the local plans from the cities of Loretto, Medina and Minnetrista had been approved and the plans from Greenfield, Independence and Maple Plain were under review by Commission Staff.*

2. Budget for the expense of writing the Fourth Generation Plan, due in 2020. Development should begin in late 2018. *The 2017 Audit includes \$25,000 set aside for next generation plan expense.*

PRIORITIES

1. Educate the Commissioners and member City Councils and Planning Commissions about watershed and water resources management.
2. Undertake a monitoring program to monitor water quality trends and to track progress toward meeting TMDLs.
3. Partner with member cities and other parties to conduct subwatershed assessments and other studies to identify feasible and cost-effective Best Management Practices to protect and improve water quality.

GOALS**A. Water Quantity.**

1. Maintain the post-development 2-year, 10-year, and 100-year peak rate of runoff at pre-development level for the critical duration precipitation event.
2. Maintain the post-development annual runoff volume at pre-development volume.
3. Prevent the loss of floodplain storage below the established 100-year elevation.

Actions:

- a. The Commission shall maintain Rules and Standards requiring development and redevelopment meeting certain criteria to meet runoff rate control and runoff volume and infiltration requirements.
- b. Landlocked depressions that presently do not have a defined outlet and do not typically overflow may only be allowed a positive outlet provided the downstream impacts are addressed and the plan is approved by the Commission.
- c. The Commission encourages the use of Low Impact Design techniques to reduce runoff rates and volumes, erosion and sedimentation, and pollutant loading.
- d. Member cities shall adopt local controls and local stormwater management plans that are at least as stringent as the Commission Water Quantity goals and policies and the Commission Rules and Standards.
- e. The Commission requires a plan review by the local permitting authority for development or redevelopment if any part of the development is within or affects a 100-year floodplain
- f. The Commission shall maintain Rules and Standards requiring development and redevelopment affecting the 100-year floodplain to meet Commission compensatory storage, low flow elevation, and timing requirements.
- g. Member cities shall adopt a floodplain ordinance and any other required local controls, and local stormwater management plans that are at least as stringent as the Commission Floodplain goals and policies and the Commission Rules and Standards.

B. Water Quality

The TMDLs completed for Lake Independence and Lake Sarah established nutrient load reductions necessary to improve water quality in those lakes. The WRAPS study currently underway will establish additional water quality improvement and protection goals for the other lakes and streams in the watershed. The Third Generation goals for water quality are focused on making progress to improve the lakes and streams in the watershed as well as protect unimpaired waters. The goals are aggressive; some of them will require much dedication and effort and public and private resources to achieve. However, public input received for this Plan, the TMDLs, and other sources show that achieving a high standard of water quality is a priority for the public as well as required by state statute, and the Implementation Plan includes a number of actions to help meet these goals.

Actions.

- a. The Commission adopts as water quality goals the standards for Class 2b waters in the North Central Hardwood Forest ecoregion as set forth in MN rules 7050.0222.
- b. The Commission will undertake a routine lake and stream monitoring program to assess progress toward meeting these goals.
- c. The Commission shall maintain Rules and Standards requiring development and redevelopment meeting certain criteria to meet water quality requirements.
- d. The Commission shall maintain Rules and Standards requiring development and redevelopment meeting certain criteria to meet erosion control requirements.
- e. **The Commission will develop and implement a program to provide technical and financial assistance to the member cities in identifying appropriate and cost-effective Best Management Practices to reduce nutrient and sediment load to lakes and streams.**
- f. The Commission will work in partnership with other organizations and agencies to pursue grant and other funding to implement improvement projects and feasibility studies.
- g. The Commission shall update implementation plans and this Plan as necessary following TMDL/WRAPS completion and progress reviews.
- h. Member cities shall adopt local controls and local stormwater management plans that are at least as stringent as Commission Water Quality goals and policies and the Commission Rules and Standards.
- i. The Commission will develop and publish a model manure management ordinance within six months of this Plan's adoption. Member cities shall then have one year to adopt a manure management ordinance using the model

ordinance for guidance, or to adopt other standards and practices that will accomplish the objective of reducing phosphorus loading from new livestock operations.

C. Groundwater

The Commission has undertaken limited groundwater management activities in the past, primarily by encouraging projects requiring project review to infiltrate a portion of runoff. Over the past decade cities that rely on groundwater for drinking water have worked with the Minnesota Department of Health to adopt wellhead protection plans and to implement policies and official controls to protect drinking water sources. In the Third Generation Plan, the Commission has adopted a new infiltration requirement for new development and redevelopment to promote groundwater recharge and reduce runoff.

1. Promote groundwater recharge by requiring abstraction/infiltration of runoff from new development and redevelopment.
2. Protect groundwater quality by incorporating wellhead protection study results into development and redevelopment Rules and Standards.

Actions

- a. The Commission shall maintain Rules and Standards requiring development and redevelopment meeting certain criteria to meet infiltration requirements.
- b. Member cities shall adopt local controls and local stormwater management plans that are at least as stringent as Commission Groundwater goals and policies and the Commission Rules and Standards.
- c. **The Commission will partner with the DNR, USGS, MDH, and other agencies to educate the member cities and watershed community officials about groundwater issues and their relation to stormwater management and surface water quality.**
- d. The Commission shall develop and maintain a map showing the wellhead protection zones within its boundaries upon completion of a local wellhead protection plan for use in determining vulnerable areas that should be exempted from infiltration.
- e. **The Commission will develop and implement a program to provide technical and financial assistance to the member cities in identifying appropriate and cost-effective Best Management Practices to increase infiltration and groundwater recharge and reduce stormwater runoff.**

D. Wetlands

The Commission's primary tool for managing wetlands is the Wetland Conservation Act (WCA). The Commission serves as the Local Government Unit (LGU) for WCA administration in Greenfield, Loretto and Maple Plain and the other three member cities administer WCA themselves. The Commission requires submittal of a functions and values assessment using the latest version of MnRAM whenever an applicant proposes wetland impacts.

1. Preserve the existing functions and values of wetlands within the watershed.
2. Promote wetland the enhancement or restoration of wetlands in the watershed.

Actions

- a. The Commission shall maintain Rules and Standards requiring development and redevelopment meeting certain criteria to provide buffers adjacent to wetlands, lakes, and streams.
- b. Member cities shall adopt local controls and local stormwater management plans that are at least as stringent as Commission Wetland goals and policies and the Commission Rules and Standards.
- c. **The Commission shall act as the Local Government Unit (LGU) for the Wetland Conservation act for those communities that choose to so designate.**
- d. Developers must complete a wetland delineation by a wetland professional to identify the location and extent of any wetlands present within the development site.
- e. For any development or redevelopment proposing impacts to any wetlands in the watershed, a functions and values assessment using the most recent version of the MnRAM protocol must be completed and submitted to the Commission and to the respective LGU.
- f. Before consideration or approval of a wetland replacement plan or use of wetland banking credits, the Commission shall ensure that the applicant has exhausted all possibilities to avoid and minimize adverse wetland impacts according to the sequencing requirements of the Wetland Conservation Act. The order of descending priority for the location of replacement wetland, including the use of wetland banking credits, is as follows: 1) On-site; 2) Within the same subwatershed; 3) Within the Pioneer-Sarah Creek watershed; 4) Within Hennepin County; and 5) Outside the Pioneer-Sarah Creek watershed within Major Watershed Number 18 or Major Watershed Number 19

E. Drainage Systems

Pioneer Creek between Highway 12 and Watertown Road and several lateral ditches, including parts of Robina Creek, are under the ditch authority of Hennepin County as County Ditch #19. The County also is ditch authority for County Ditch #9 connecting and outletting Lake Schwauppauff, Schendel Lake, and Hafften Lake in the northern watershed; and Judicial Ditch #20, which includes part of Deer Creek and several laterals, and Pioneer Creek downstream of Ox Yoke Lake. The primary Third Generation activity related to drainage systems is to periodically review the advantages and disadvantages of ditch authority and to reconsider jurisdiction

1. Continue current Hennepin County jurisdiction over county ditches in the watershed.

Actions

- a. Periodically reconsider the appropriate jurisdiction over the county ditches in the watershed

F. Operations and Programming

These goals guide the routine programs and operations of the Commission, and include the education and outreach program; maintenance of rules and standards; the annual monitoring program; and programs and activities to stay abreast of changing standards and requirements, search for grant and other funds to supplement the regular budget, and operate a capital improvement program and share in the cost of projects.

1. Identify and operate within a sustainable funding level that is affordable to member cities.
2. Foster implementation of TMDL and other implementation projects by sharing in their cost and proactively seeking grant funds.
3. Operate a public education and outreach program prioritizing elected and appointed officials education and building better understanding between all stakeholders.
4. Operate a monitoring program sufficient to characterize water quantity and quality and biotic integrity in the watershed and to evaluate progress toward TMDL goals.
5. Maintain rules and standards for development and redevelopment that are consistent with local and regional TMDLs, federal guidelines, source water and wellhead protection requirements, nondegradation, and ecosystem management goals.
6. Serve as a technical resource for member cities.

Actions

- a. Annually review the budget and Capital Improvement Program and convene a professional Technical Advisory Committee to identify and prioritize projects.
- b. Convene Citizen Advisory Committees as necessary to advise the Commission and to assist in program development and implementation.
- c. Prepare and implement an annual monitoring plan and provide annual reporting.
- d. According to the schedules set forth in TMDL Implementation Plans and WRAPS studies, every five years evaluate progress toward meeting those water quality goals, and adjust the Implementation Plans as necessary to achieve progress.
- e. Periodically review the development rules and standards for adequacy and make revisions as necessary.
- f. Coordinate water resources management between the Commission, Three Rivers Park District, and the member cities.

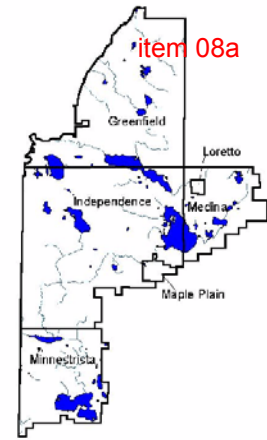
pioneer-sarah creek

Watershed Management

Commission

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DATE: FEBRUARY 19, 2019
TO: PIONEER-SARAH CREEK WATERSHED COMMISSION
FROM: JIM KUJAWA
RE: CITY OF GREENFIELD DRAFT 2040 COMPREHENSIVE PLAN DATED DECEMBER 2018.

Commission staff reviews member Community Storm Water Management Plans for conformance with the Commission's third Generation Stormwater Management Plan. The review focuses on the requirements of the communities as outlined in MS 103B.231 and .235.

Updates to the local stormwater management plans are expected to include:

- Updated land use, hydrologic, and hydraulic data, and existing or potential water resource related problems that may have changed since the last LWMP.
- An explanation of how the member city will help to implement the actions set forth in the Commission's Plan, including specifically addressing adoption and enforcement of a manure management ordinance.
- Show how the member city will take action to achieve the load reductions and other actions identified in and agreed to in TMDL Implementation Plans.
- Updated Implementation Plan identifying the specific structural, nonstructural, and programmatic solutions to the problems and issues identified in the LWMP.
- Set forth an implementation program including a description of adoption or amendment of official controls and local policies necessary to implement the Rules and Standards; programs; policies; a capital improvement plan; and estimates of cost and funding mechanisms.

Information

Staff received the first Greenfield Draft 2040 Comprehensive Plan update on June 25, 2018. At that time, they offered the following comments:

- 1) Page 7-86 refers to the Commission's second-generation watershed management plan in the first and last paragraphs. This should reference the Commission's third-generation watershed management plan.
- 2) Page 7-96, Table 7-1 lists Lake Rebecca as impaired for Nutrient/Eutrophication and Biological Indicators. Lake Rebecca has been removed from the MPCA 303(d) list of impaired waters..

- 3) Page 7-97 *Key Strategies* section 1. Buffers refers to the PSCWMC wetland buffer requirement of an average of 20 feet. The PSCWMC wetland buffer requirement is an average of 25 feet for all wetlands, watercourses and lakes. Please reference Table 3.6 in the PSCWMC WRAPS Strategy Report for South and North Whaletail Lakes and Deer and Unnamed Creeks in Minnetrista for strategies and action in the areas of Minnetrista. Incorporating some of these problems/strategies/actions into Section 3 A. and Table 7.1 was anticipated from our original comments.
- 4) Page 7-98, *City plans and related ordinances, Capital Improvement Plan*. This section states the City does not maintain a formal CIP, but it does maintain a project list for budgeting and expenditures. This section goes on to state, *'it is recommended the City inventory existing stormwater infrastructure, outline an ongoing maintenance and management strategy in collaboration with PSCW, and identify needed public improvements to establish a long range capital improvement plan for stormwater and surface water improvement needs;*

This should be more than just a recommendation and that there be a timeline commitment to establish a CIP for stormwater and surface water improvement needs. For potential Clean Water Grant funding from in the future, having an adopted CIP is essential. Also see Met Councils comments
- 5) The Commission requests the modifications or clarifications of the comments and recommendations provided by the Metropolitan Council in their August 7, 2018 correspondence (attached)

The updated plan addresses all the comments listed above to the satisfaction of staff. Items of note in the updated plan are;

- 1) The City plan adopts all the PSCWMC goals, standards and rules including the PSCWMC wetland buffer requirements.
- 2) Greenfield encourages the use of Minimal Impact Design Standards (MIDS) where appropriate to minimize stormwater runoff and pollution and preserve natural resources in a cost effective and environmentally responsible manner.
- 3) The plan commits the City to work toward establishing a CIP for stormwater related improvements by end of 2019.

Action

Staff recommends the Commission approve the Greenfield Draft 2040 Comprehensive Plan dated December 2018.

JCK

Pioneer-Sarah Creek Watershed Management Commission



Baker Campground Ravine Stabilization

Annual Progress Report

2018



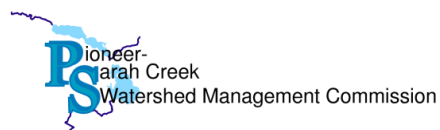
Submitted

To



Submitted

By



Baker Campground Ravine Stabilization Project
Annual Progress Report
2018

Background

Lake Independence is among one of the most visible and highly valued recreational water bodies in Hennepin County. The Three Rivers Park District owns and operates the Baker Park Reserve that provides 4,500 feet of public accessible shoreline on Lake Independence. The Baker Park Reserve has two swimming beaches, a public watercraft access, fishing piers, picnic and playground areas, trails, and a campground area. The lake was listed as impaired for excessive nutrients by the MPCA in 2002. The Lake Independence Total Maximum Daily Load and Implementation Plan was completed by Three Rivers Park District in partnership with the Pioneer-Sarah Creek Watershed Management Commission in 2007. The TMDL study identified phosphorus loading from the watershed as the main cause of the impairment, and emphasized phosphorus load reductions from the watershed as the primary means to improve water quality in the lake to meet state water quality standards.

A sub-watershed assessment was completed in 2014 by the City of Independence in partnership with Hennepin County Environmental Services and the Anoka County Conservation District to identify areas within the Lake Sarah and Lake Independence watersheds that were considered significant sources of nutrient loading (Lake Sarah and Lake Independence Stormwater Retrofit Analysis 2014). The sub-watershed assessment identified an eroding ravine within the City of Medina and the Baker Park Reserve as a potentially significant source of phosphorus and sediment loading to Lake Independence. A subsequent joint effort between the Pioneer-Sarah Creek Watershed Commission (PSCWMC), the cities of Medina and Independence, and Three Rivers Park District completed a more detailed feasibility study in 2016 that evaluated the ravine as a source of pollutant loading to Lake Independence, assessed the cost-effectiveness of multiple watershed and in-ravine management options to decrease those loads, and generated recommendations on how to proceed to address the issue (Baker Park Reserve Campground Ravine and Sub-watershed Assessment 2016). The sub-watershed assessment estimated the eroding channel contributes approximately 277 pounds of total phosphorus and 300 tons of sediment loading annually to Lake Independence.

The most cost-effective approach to decrease phosphorus and sediment loading to Lake Independence from the project area is to stabilize 1,800 linear feet of the main channel and an additional 400 feet in two tributary ravines adjacent to the Baker Park Reserve Campground. A series of rock grade control structures would be installed throughout the main ravine and two tributary ravines to control the channel grade. In addition, the channel reaches would be lined with combination of rounded field stone and angular rip-rap up to the expected 10-year flood elevation. It is anticipated that average annual phosphorus loads to Lake Independence would be reduced by an estimated 134 pounds, at a cost per pound of phosphorus load reduction of less than \$130/pound based on an estimated project life of 30 years. This reduction in annual phosphorus load would accomplish 15% of the total watershed phosphorus load reduction that was required in the TMDL to meet state water quality standards.

Three Rivers Park District and the Pioneer-Sarah Creek Watershed Management Commission have taken the initiative to implement the Baker Campground Ravine Stabilization Project. It is estimated that the total costs to complete the project is \$520,000. The TMDL study and the two sub-watershed assessments/feasibility studies were valuable for acquiring grant funding that was necessary to proceed with the project. The Pioneer-Sarah Creek Watershed Management Commission received \$416,000 in Clean Water Legacy Funds from the Board of Water and Soil Resources, and received an additional \$59,500 in grant funding from the Hennepin County Opportunity Grant. The remaining portion of the funding will be cost-shared (\$44,500) between the Pioneer-Sarah Creek Watershed Management Commission, City of Independence, City of Medina, Three Rivers Park District, and Lake Independence Citizens Association. The specific details of the annual progress on the project is provided in the following section.

Project Status

- May 25, 2018 – Obtained signed contract between Wenck and Pioneer-Sarah Creek Watershed Management Commission (PSCWMC) outlining the scope and projected budget of the project. Wenck Associates will be administering the project by conducting necessary surveys for the development of design plans, permitting, coordination of meetings with stakeholders, developing bid proposal, construction meetings with contractor, and monitoring construction/post construction progress.
- June 2018 - The preliminary design of the ravine stabilization started by assessing the area and inventorying what was known about the project area. Field surveys were completed to determine the topography and boundary of the project and to create the base of the design plans. The records of existing utilities, possible access routes, paved areas, buildings and electric service areas were added to the design plans. Part of the project objective for Three Rivers Park District (TRPD) is to minimize the impact to the current vegetation community so tree removal will be kept to a minimum. Trees that should be removed to provide access to the site were identified as well as trees that require additional protection. It was determined that there was one wetland within the construction boundaries that required delineation of the wetland boundary (Appendix A). There will be erosion control measures taken to ensure protection of the wetland boundary.
 - June 11, 2018 – Survey was completed for tree identification, tagging, and measurements
 - June 12, 2018 - Wetland delineation was completed
 - June 15, 2018 – Topography survey was completed for the channel profile
 - June 22, 2018 – Base Plan set was developed to define existing conditions
 - June 27, 2018 – Updated base plan set with existing conditions linework from Three Rivers Park District
 - June 28, 2018 – Preliminary design field work was completed

- July 2018 – The survey information was used to develop the design plans for the project. The survey data was compiled into an existing condition base map for the construction plan set. Other data sets that were used for the development of the design plans included aerial imagery, property boundaries, utilities, pavement and building outlines, campground pad outlines, electrical service locations, turf and paved trails, easements, storm sewer infrastructure, and potential access routes. The 90% plans were completed and distributed to various stakeholders for review. There was an on-site meeting scheduled to discuss the 90% completed design plans and to further discuss logistics with access routes to the channel as well as project construction. Property owners adjacent to the channel were invited and attended the site meeting to discuss project logistics.
 - July 6, 2018 – Preliminary 90% design plans were developed
 - July 20, 2018 – Completed the 90% design plans and distributed to stakeholders for review. Also prepared a 90% construction cost estimate for review and discussion at the design review meeting.
 - July 22, 2018 - Scheduled the design review meeting for August 3, 2018 from 10:00 A.M. – 12:00 P.M.

- August 2018 – The 90% design plans were completed and distributed to stakeholders for review in July of 2018. This was in preparation for the on-site meeting scheduled for early August to discuss project logistics with stakeholders. The on-site meeting included the discussion of the design plans, access routes to the channel, wetland delineation boundaries, scope of work, logistics of construction, and cost estimates for the project. The meeting discussion items were used to make the necessary revisions to address issues/concerns for the final design plans to be submitted for permitting. After the design plans were updated, permit applications were submitted to Pioneer-Sarah Creek Watershed Management Commission, City of Medina, Minnesota Department of Natural Resources, and Army Corp of Engineers. It appears through conversations with the Army Corp of Engineers that they want to have jurisdiction as the permitting agency. The measurable ordinary high water level and length of the project will define whether Arm Corp of Engineers will have permitting jurisdiction. It was recommended that an on-site meeting be scheduled to discuss permitting jurisdiction. An Army Corp of Engineer permit will extend the timing of the review process of the project, which potentially could delay project construction to the winter of 2019/2020.
 - August 3, 2018 – On-site meeting to discuss 90% design plans
 - August 17, 2018 – Updated the design plans with the recommended design changes and access routes that were discussed from the on-site meeting.
 - August 20, 2018 – Revised cost estimates for the project
 - August 22, 2018 – Drafted Storm Water Pollution Prevention Plan (SWPP)
 - August 23, 2018 – Drafted the impact figure based on the revised plans that will be submitted to the various permitting agencies.
 - August 23, 2018 – Conversation with Army Corp of Engineers about permitting jurisdiction

- August 24, 2018 – Submitted permit applications for wetland delineation to City of Medina
 - August 31, 2018 – Draft final plans and SWPP completed and submitted for review
 - August 31, 2018 – Draft of technical specifications completed and submitted for review
- September 2018 – The various permitting applications have been submitted to the various permitting agencies for their review. There was a Wetland Conservation Act Technical Advisory Panel meeting held on-site to review the wetland delineated boundary for the project. There were no changes to the wetland boundary on-site and the wetland delineation was approved. There was also an on-site meeting with the Army Corp of Engineers to discuss permitting agency jurisdiction. The ravine was considered a water of the U.S. and will be within the Army Corp of Engineers jurisdiction. A Minnesota Department of Natural Resources Public Waters Permit is not required. It was recommended by the Army Corp of Engineers to pursue Nationwide Permit 13 requesting a waiver from the normal requirement that the work be less than 500 linear feet. Wenck Associates provided additional survey work to identify the normal water level to incorporate into the design plans for the permit process. The design plans and SWPPP was completed for the permit application process (Appendix B & C). A joint permit application was submitted to the Pioneer-Sarah Creek Watershed Management Commission and Army Corp of Engineers. The revised schedule for construction to begin will occur after the campground closure October 20, 2019.
 - September 5, 2018 – WCA TEP panel meeting to discuss wetland delineation boundary
 - September 12, 2018 – On-site meeting with Army Corp of Engineers to discuss permitting jurisdiction
 - September 13, 2018 – Wenck Associates surveyed the normal water level
 - September 14, 2018 – Discussed the revised schedule for project construction
 - September 21, 2018 – Design plans were updated with normal water level survey
 - September 21, 2018 – U.S. Army Corp of Engineers permit application submitted
 - September 22, 2018 – Received Notice of Decision from City of Medina approving the wetland boundary
 - September 28, 2018 – Construction Plans and SWPP completed
 - September 28, 2018 – Pioneer-Sarah Creek Watershed Management Commission and U.S. Army Corp of Engineers joint permit application was submitted
- October 2018 – All of the permit applications were submitted the month of September of 2018. Wenck Associates provided a presentation of the Baker Campground Ravine Stabilization project update at the Pioneer-Sarah Creek Watershed Management Commission October board meeting. The presentation provided the Pioneer-Sarah Creek Watershed Management Commissioners with information about the project design, permitting status, and revised time line of construction. The Pioneer-Sarah Creek Watershed Management Commission indicated that they did not receive a permit application for the project. The permit application was re-sent to the Pioneer-Sarah Creek Watershed Commission for review.

- October 18, 2018 – Presentation to the Pioneer-Sarah Creek Watershed Management Commission
 - October 19, 2018 – Draft of technical specifications completed and submitted for review
 - October 23, 2018 – Permit application for Pioneer-Sarah Creek Watershed Management Commission was resented
- November 2018 – There was no significant work completed for the project due to waiting for the completion of the permit application review process for the U.S. Army Corp of Engineers and Pioneer-Sarah Creek Watershed Management Commission.
- December 2018 - There was no significant work completed for the project due to waiting for the completion of the permit application review process for the U.S. Army Corp of Engineers and Pioneer-Sarah Creek Watershed Management Commission.
- January 2018 – The permit application was approved by the U.S. Army Corp of Engineers and the Pioneer-Sarah Creek Watershed Management Commission (Appendix D).
 - January 17, 2018 – Received the U.S. Army Corp of Engineers permit approval notification letter
 - January 17, 2018 – Pioneer-Sarah Creek Watershed Management Commission approved the project at their monthly Board Meeting.
- Revised Project Schedule
 - May 2019 – Finalize Construction Documents
 - June 2019 – Pioneer-Sarah Creek Watershed Management Commission Board approval to go out for bid
 - July 2019 – Prepare bid documents
 - August 2019 – Advertise request for bids & on-site pre-bid meeting with contractors
 - September 2019 – Receive bids and award contract
 - October 2019 – Pre-construction meeting with contractor
 - November 2019 – Construction begins
 - March 2020 – Substantial completion of the project
 - May 2020 – Final completion of the project



APPENDIX A

Wetland Delineation Report

Wetland Delineation Report: Baker Park Campground



Prepared for:
**Pioneer Sarah Creek Watershed
Management Commission**
3235 Fernbrook Ln N, Plymouth, MN 55447



Prepared by:

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Fax: 763-479-4242

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2. National Wetlands Inventory and National Hydrologic Dataset
3. Hennepin County Soil Survey
4. Minnesota DNR Public Waters Inventory
5. Delineated Features

APPENDICES

- A Field Data Sheets
- B Soil Survey Data
- C Precipitation Data

1.0 Introduction

Wenck Associates, Inc. (Wenck) staff conducted a wetland delineation along a ravine in Baker Park Campground near Medina, Minnesota. The investigation was conducted within a 75-foot wide corridor along the ravine, principally investigating from top of banks to the ravine bottom (see investigation area boundaries, Figure 1). The investigated area terminated at the southern boundary of Lake Independence. Field work was conducted on June 13, 2018.

1.1 SITE DESCRIPTION

The project area consists of an undeveloped, steeply sloped and eroded ravine channel through a forested portion of Baker Park Reserve, located west-northwest of the campground (Figure 1). The area is used recreationally.

Wetlands are defined in the Federal Register (1982) as “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

An area must have 3 elements present in order to be delineated as a wetland:

- 1) Greater than 50% dominance of hydrophytic plant species.
- 2) A hydric soil substrate.
- 3) Wetland hydrology during the growing season.

2.0 Methods

This wetland investigation was conducted by using the on-site methodology set forth in the 1987 U.S. Army Corps of Engineers (COE) Wetlands Delineation Manual (1987 Manual) and the 2010 U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Regional Supplement). Potential wetland areas were examined according to guidelines set forth in these documents and wetland boundaries were determined through analysis of the vegetation, soils, and hydrology.

Plant species at both wetland and upland transect points were identified and assigned a wetland indicator status according to the North American Digital Flora: National Wetland Plant List, version 2.4.0 U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC. (2016). In the text of this report and on the enclosed data forms, the plant indicator status follows the plant's scientific or common name unless a status has not been assigned. According to the 1987 Manual and Regional Supplement, the hydrophytic plant criteria are met when more than 50% of the dominant species within the vegetative strata were assigned an obligate (OBL), facultative wet (FACW), or facultative (FAC) wetland status.

The presence of current wetland hydrology was determined through direct observation of the primary or secondary wetland hydrology indicators as defined in the 1987 Manual and Regional Supplement. The presence of a single primary indicator is sufficient to conclude that wetland hydrology is present. The direct observation of two or more secondary wetland hydrology indicators is required to conclude that wetland hydrology is present.

Hydric soils were determined through use of the Version 8.1, NRCS Field Indicators of Hydric Soils in the United States. Soils were examined and classified by digging soil pits at sample point transects using a Dutch auger. If the soils exhibited indicators of hydric soils as defined by USDA Soil Conservation Service (1994) - a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part - they were determined to be hydric.

Data sheets were completed for each investigation point and are included in Appendix A. Delineated wetland boundaries were marked every 50 to 100 feet with a handheld Trimble GeoXT GPS unit. The GPS data were post-processed using the Minnesota CORS network of GPS reference stations. The corrected GPS data were then used to create the wetland boundary shapefiles in ArcMap as presented in the report figures.

Wetlands are classified in the Results section by their Eggers and Reed, Circular 39, and Cowardin classification systems based on observed field conditions.

3.0 Results

3.1 OFFSITE INVESTIGATION

The National Wetlands Inventory (NWI) (Figure 2) identified the presence of a small Type 1, PFO1A wetland basin outside of the investigation area at the southwestern end. There were no NWI basins identified within the investigation area boundaries. Lake Independence was identified at the northern boundary by both the NWI and the National Hydrography Dataset (NHD). No additional wetlands or waterbodies were identified within the project area.

The Hennepin County soil survey indicates the presence of soil map unit Tadkee-Tadkee, depressional, 0 to 2 percent slopes (92% hydric rating), Angus-Kilkenny complex, 2 to 6 percent slopes (5% hydric rating), Lerdahl loam, 1 to 3 percent slopes (15% hydric rating), and Lester-Kilkenny complex, 6 to 10 and 10 to 16 percent slopes (5% hydric rating) (see Figure 3). Soil survey data is in Appendix B.

The Minnesota Public Waters Inventory identified Lake Independence as a MN DNR public water (ID # 27017600), as described above (Figure 4). There are no additional MNDNR public waters within the project site.

3.2 ONSITE INVESTIGATION

One wetland and one intermittent waterbody (ravine) were identified within the project area (see Figure 5). The ravine ran the length of the investigation area and exhibited steep, sheer slopes throughout much of its reach and significant fall from the south end of the investigation area north to Lake Independence, as shown by LIDAR on Figure 5. The following table includes wetlands classified by type within the project area. Precipitation at the time of the site visit was within the normal range (Appendix C).

Wetland ID	Type	Size
Wetland 1	PFO1A	0.06 ac

3.2.1 Wetland 1

Soils at the upland transect point (IP-4) consisted of loam with a variable matrix color from 10YR 3/2 to 10YR 4/3 over a pale brown (2.5Y 8/2) clay fill along a steep (50%) backslope and was dry to 22 inches in depth. The wetland transect point (IP-3) featured 10YR 2/2 silt loam with 20% redoximorphic features to a depth of 24 inches, which meets the criteria of hydric soil indicator ?? (F6 Redox Dark Surface?).

The wetland vegetation community was dominated by jewelweed (*Impatiens capensis*, FACW), rice cut grass (*Leersia oryzoides*, OBL), and wood nettle (*Laportea canadensis*, FACW). The woody community was dominated by sugar maple (*Acer saccharum*, FACU), green ash (*Fraxinus pennsylvanica*, FACW), cottonwood (*Populus deltoides*, FAC), American elm (*Ulmus Americana*, FACW), and buckthorn (*Rhamnus cathartica*, FAC). The upland community included similar woody species as the wetland community, but additionally included herbaceous green ash seedlings, red oak (*Quercus rubra*, FACU), blue spruce (*Picea pungens*, NI), basswood (*Tilia Americana*, FACU), and blackberry (*Rubus occidentalis*, NI).

Indicators of wetland hydrology observed within the basin included primary indicators saturation and high-water table. Saturation was observed at four inches depth and free water was present 12 inches below the surface at the wetland sample point. Secondary indicators included geomorphic position and FAC-neutral vegetation.



Wetland 1, facing north towards Lake Independence.

3.2.2 Investigation Points

Information was collected at two investigation points upstream from Wetland 1 where topography shifted from steep side slopes to a flat, floodplain bench. Investigation Point 1 (IP-1) had clay soil of mixed 10YR 3/1 and 10YR 3/2 matrix color to 30 inches, below which was 2/5Y 3/1. No redoximorphic features were identified and the water table was encountered at 24 inches. Soils and hydrology at IP-1 did not meet wetland criteria as no primary indicators and only one secondary indicator (FAC-Neutral Vegetation) was present. Vegetation included Virginia creeper (*Parthenocissus quinquefolia*, FACU), garlic mustard (*Alliaria petiolata*, FAC), wood nettle, jewelweed, hispid buttercup (*Ranunculus hispidus*, FAC), and woody species such as green ash, American elm, and alternate-leaf dogwood (*Cornus alternifolia*, FAC). This area did not meet wetland criteria as soils were non-hydric.

Investigation Point 2 (IP-2) had 10YR 3/1 clay loam to 8 inches over 10YR 3/1 soils with 10% redoximorphic features, over 10YR 3/1 sandy lay loam mixed with 10YR 4/3. Below 14 inches the profile shifted to 10YR 3/3 sand over 10YR 2/2 clay loam with mixed 10YR soil starting at 24 inches. No water table or saturation were observed to a depth of 30 inches and only one secondary indicator (FAC-Neutral Vegetation) was present.. Vegetation was dominated by reed canary grass (*Phalaris arundinacea*, FACW), jewelweed, stinging nettle (*Urtica dioica*, FACW), and Canada thistle (*Cirsium arvense*, FACU), but also included garlic mustard, Virginia creeper, daisy fleabane (*Erigeron annuus*, FACU), and burdock (*Arctium minus*, FACU). IP-2 was in a depression at the bottom of a steep, non-forested slope dominated by reed canary grass, which appears to have been a construction access for a culvert outlet and flow diverter built along the ravine. This area did not meet wetland criteria as soils were non-hydric.

Below are photos of the two Investigation Points (IP-1 and IP-2) followed by several photos from the remaining investigation area along the ravine, which are also show on Figure 5.



Photo Point 5, facing north towards IP-1.



Photo Point 6, facing north towards IP-2.



Photo Point 1, facing northwest into ravine.



Photo Point 2, facing northwest into ravine.



Photo Point 3, facing north into ravine.



Photo Point 4, facing north into ravine.



Photo Point 8-1, facing northwest into ravine.



Photo Point 8-2, facing south/upstream into ravine.

4.0 Conclusion

One wetland and one waterbody were identified on the project site. Activities which impact or potentially impact wetlands or other jurisdictional waters may be regulated by the USACE (under Section 404 of the Clean Water Act), the Local Government Unit administering the Wetland Conservation Act and the Minnesota Department of Natural Resources. No grading or filling in wetland basins or other jurisdictional waters should commence until all necessary permits have been obtained or a finding of no jurisdiction has been obtained from applicable regulatory agencies. This wetland delineation meets the standards and criteria described in the 1987 Manual and Regional Supplement and the results represent the conditions present at the time of the field investigation.

Sincerely,

Wenck Associates, Inc.

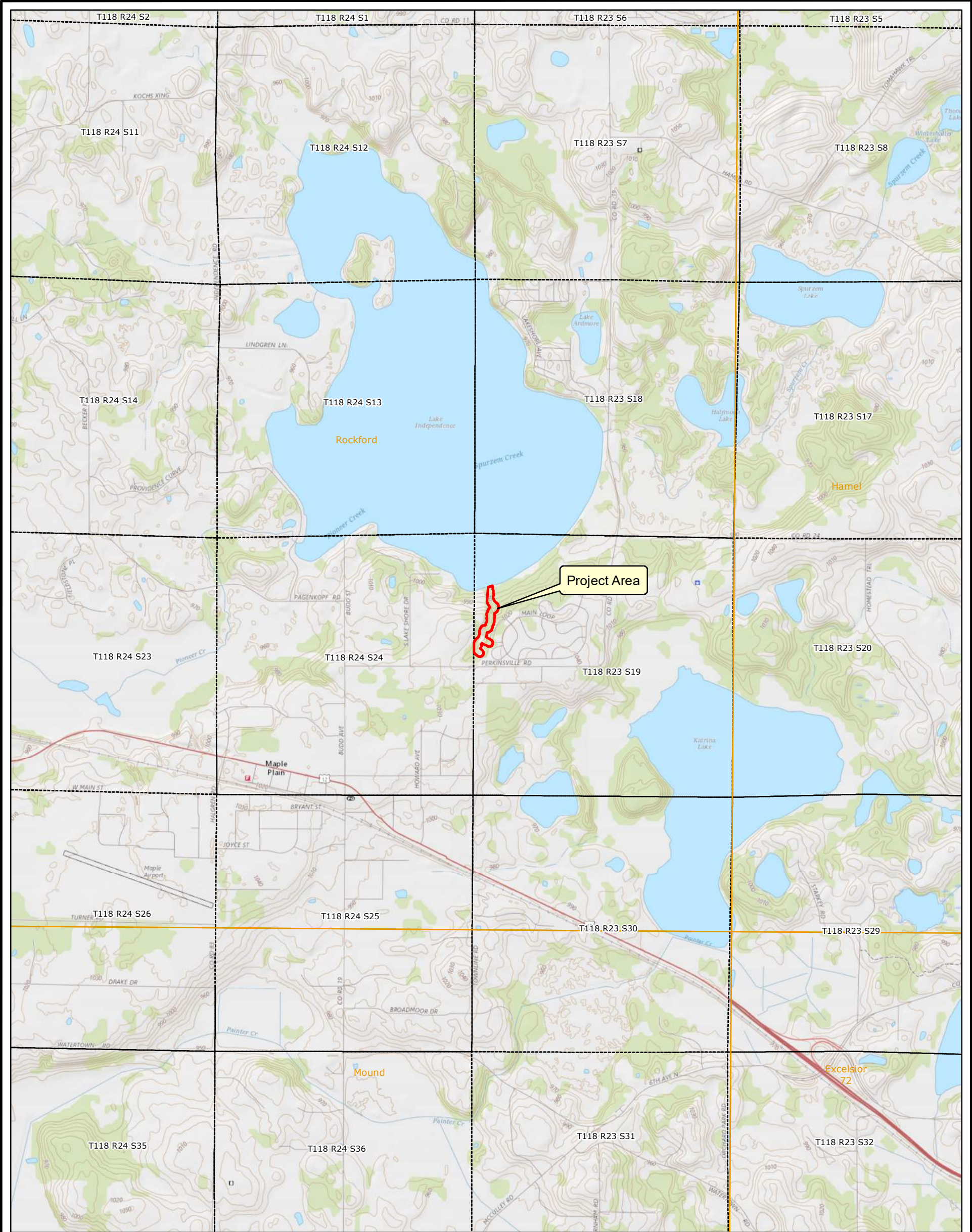


Meaghan Watson
Certified Wetland Delineator In-Training
#5202

August 8, 2018

Date

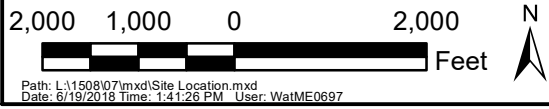
1. Site Location Map
2. National Wetlands Inventory and National Hydrography Dataset
3. Hennepin County Soil Survey
4. Minnesota DNR Public Waters Inventory
5. Delineated Features



Rockford 7.5 Minute Quadrangle (USGS: 1981)
Hamel 7.5 Minute Quadrangle (USGS: 1981)
Mound 7.5 Minute Quadrangle (USGS: 1959)
Excelsior 7.5 Minute Quadrangle (USGS: 1973)

Legend

- Investigation Area
- Quad Sheet Boundary
- Section Boundary





2017 Aerial Photograph (Source: MN GEO)

Legend

- Investigation

NHD

NHDWaterbody

1 - Seasonally Flooded Basin or Flat
- 2 - Wet Meadow

3 - Shallow Marsh

4 - Deep Marsh

5 - Shallow Open Water

6 - Shrub Swamp
- 7 - Wooded Swamp

8 - Bogs

Municipal and Industrial Activities

Riverine Systems



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PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION

National Wetlands Inventory (NWI) & National Hydrography Dataset (NHD)



Responsive partner. Exceptional outcomes.

JUN 2018

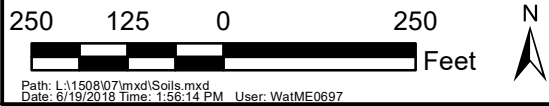
Figure 2



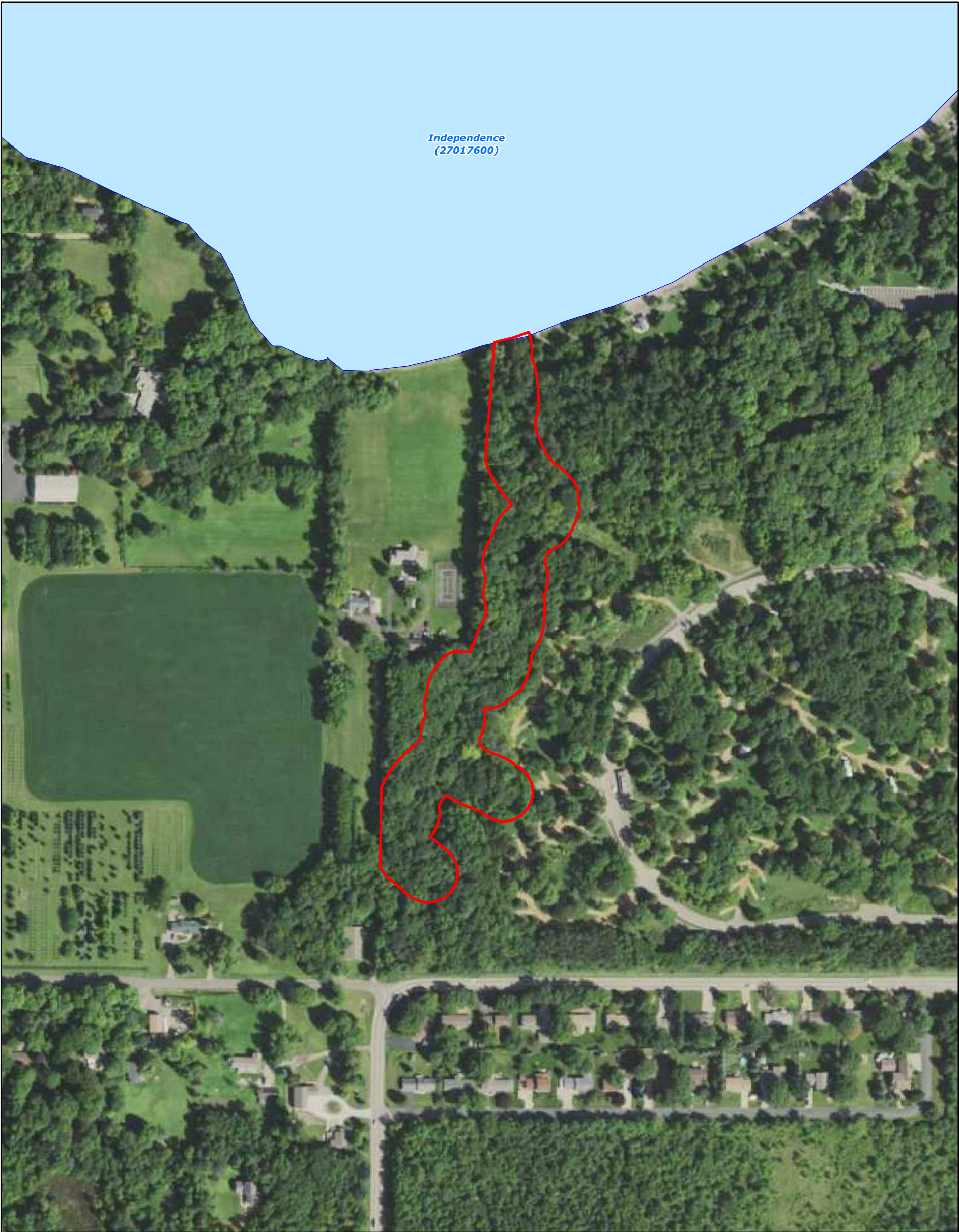
2017 Aerial Photograph (Source: MN GEO)

Legend

- | | | | |
|--|-----------------------------|--|--------------------------|
| | Investigation Area | | 51 - 90% (Mostly Hydric) |
| | 0 - 10% (Nonhydric) | | 91 - 100% (All Hydric) |
| | 11 - 50% (Partially Hydric) | | |







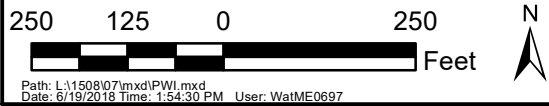
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2017 Aerial Photograph (Source: MN GEO)

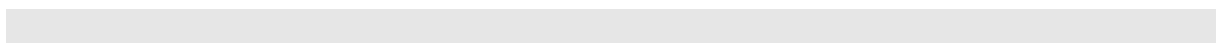
Legend

-  Investigation Area
-  Public Water Watercourse
-  Public Ditch/Altered Natural Watercourse
-  Public Waters Basins



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Field Data Sheets



WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Baker Ravine City/County: Medina/Hennepin Sampling Date: 6/13/2018
 Applicant/Owner: Pioneer-Sarah Creek State: MN Sampling Point: IP-1
 Investigator(s): Meaghan Watson/Tom Langer, Wenck Associates Inc Section, Township, Range: S19, T118, R23
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none
 Slope (%): 0 Lat: 45.01794 Long: -93.64436 Datum: NAD 83 UTM 15
 Soil Map Unit Name Lester-Kilkenny complex, 6-10% slopes, moderately eroded NWI Classification: None
 Subregion (MLRA or LRR): M Are climatic/hydrologic conditions of the site typical for this time of the year? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ significantly disturbed? Are "normal circumstances" present? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u>
Hydric soil present? <u>N</u>	
Indicators of wetland hydrology present? <u>N</u>	
Corps-regulated?: _____	
Wetland Type: _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Fraxinus pennsylvanica</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>
2	<u>Ulmus americana</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>
3				
4				
5				
		<u>10</u>	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>15 ft</u>)			
1	<u>Cornus alternifolia</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
2				
3				
4				
5				
		<u>5</u>	= Total Cover	
Herb stratum	(Plot size: <u>5 ft</u>)			
1	<u>Alliaria petiolata</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>
2	<u>Laportea canadensis</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>
3	<u>Leersia oryzoides</u>	<u>10</u>	<u>N</u>	<u>OBL</u>
4	<u>Impatiens capensis</u>	<u>10</u>	<u>N</u>	<u>FACW</u>
5	<u>Ranunculus hispidus</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
6				
7				
8				
9				
10				
		<u>65</u>	= Total Cover	
Woody vine stratum	(Plot size: <u>30 ft</u>)			
1	<u>Parthenocissus quinquefolia</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>
2				
		<u>20</u>	= 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: 83.33% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>10</u>	x 1 =	<u>10</u>
FACW species	<u>40</u>	x 2 =	<u>80</u>
FAC species	<u>30</u>	x 3 =	<u>90</u>
FACU species	<u>20</u>	x 4 =	<u>80</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>100</u>	(A)	<u>260</u> (B)

Prevalence Index = B/A = 2.60

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0*

Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)

Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: IP-1

Soil Series: _____

Series Drainage Class: _____

Taxonomy (Subgroup): _____

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

Depth (Inches)	Horizon	Matrix			Mottles				Texture	Remarks
		Color (moist)		%	Color (moist)	%	Type*	Loc**		
0-20	1	10YR	3/1	70					clay loam	sandy inclusions
	1	10YR	3/2	30						
20-30	2	10YR	3/1	50					clay loam	
	2	10YR	3/2	50						
30-36	3	2.5Y	3/1	100					clay loam	

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

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <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"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K,L,R) |
| <input type="checkbox"/> Other (explain in remarks) |

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Check here if indicators are not present: ☒**Restrictive Layer (if observed):**

Type: _____ Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:**

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

Secondary Indicators (minimum of two required)

- | | | |
|--|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> True Aquatic Plants (B14) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input type="checkbox"/> Dry Season Water Table (C2) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (not tilled) (C3) | <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) | <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Gauge or Well Data (D9) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <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"/> Water-Stained Leaves (B9) | | |

Check here if indicators are not present: ☒**Field Observations:**

Surface water present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): <u>24</u>
Saturation present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____

(includes capillary fringe)

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Baker Ravine City/County: Medina/Hennepin Sampling Date: 6/13/2018
 Applicant/Owner: Pioneer-Sarah Creek State: MN Sampling Point: IP-2
 Investigator(s): Meaghan Watson/Tom Langer, Wenck Associates Inc Section, Township, Range: S19, T118, R23
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none
 Slope (%): 35 Lat: 45.018 Long: -93.644 Datum: NAD 83 UTM 15
 Soil Map Unit Name Lester-Kilkenny complex, 6-10% slopes, moderately eroded NWI Classification: None
 Subregion (MLRA or LRR): M Are climatic/hydrologic conditions of the site typical for this time of the year? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ significantly disturbed? Are "normal circumstances" present? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	<u>Y</u>	Is the sampled area within a wetland?	<u>N</u>
Hydric soil present?	<u>N</u>	Corps-regulated?:	<u> </u>
Indicators of wetland hydrology present?	<u>N</u>	Wetland Type:	<u> </u>

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

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species	Indicator Status
1				
2				
3				
4				
5				
		<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				
		<u>0</u>	= Total Cover	

Herb stratum	(Plot size: <u>5 ft</u>)	Absolute % Cover	Dominant Species	Indicator Status
1	<i>Phalaris arundinacea</i>	30	Y	FACW
2	<i>Impatiens capensis</i>	20	Y	FACW
3	<i>Urtica dioica</i>	15	N	FACW
4	<i>Cirsium arvense</i>	10	N	FACU
5	<i>Arctium minus</i>	10	N	FACU
6	<i>Erigeron annuus</i>	5	N	FACU
7				
8				
9				
10				
		<u>90</u>	= Total Cover	

Woody vine stratum	(Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species	Indicator Status
1	<i>Parthenocissus quinquefolia</i>	5	Y	FACU
2				
		<u>5</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: 3 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 66.67% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>65</u>	x 2 =	<u>130</u>
FAC species	<u>0</u>	x 3 =	<u>0</u>
FACU species	<u>30</u>	x 4 =	<u>120</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>95</u> (A)		<u>250</u> (B)

Prevalence Index = B/A = 2.63

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0*

Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)

Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present?	<u>Y</u>
---------------------------------	----------

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: IP-2

Soil Series: _____

Series Drainage Class: _____

Taxonomy (Subgroup): _____

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

Depth (Inches)	Horizon	Matrix			Mottles				Texture	Remarks
		Color (moist)		%	Color (moist)	%	Type*	Loc**		
0-8	1	10YR	3/1	100					clay loam	
8-12	2	10YR	3/1	90	10YR	4/6	5	C	M	sandy clay loam
		10YR	3/3	5						
12-14	3	10YR	3/1	70					sand	
	3	10YR	4/3	30						
14-18	4	10YR	3/3	100					sand	
18-24	5	10YR	2/2	100					clay loam	

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

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <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"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K,L,R) |
| <input type="checkbox"/> Other (explain in remarks) |

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Check here if indicators are not present: ☒**Restrictive Layer (if observed):**

Type: _____ Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (not tilled) (C3) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <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"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Drainage Patterns (B10) |
| <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 checked="" type="checkbox"/> FAC-Neutral Test (D5) |

Check here if indicators are not present: ☒**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)

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Baker Ravine City/County: Medina/Hennepin Sampling Date: 6/13/2018
 Applicant/Owner: Pioneer-Sarah Creek State: MN Sampling Point: IP-3
 Investigator(s): Meaghan Watson/Tom Langer, Wenck Associates Inc Section, Township, Range: S19, T118, R23
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none
 Slope (%): 0 Lat: 45.019 Long: -93.644417 Datum: NAD 83 UTM 15
 Soil Map Unit Name Lester-Kilkenny complex, 6-10% slopes, moderately eroded NWI Classification: None
 Subregion (MLRA or LRR): M Are climatic/hydrologic conditions of the site typical for this time of the year? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ significantly disturbed? Are "normal circumstances" present? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u>
Hydric soil present? <u>Y</u>	
Indicators of wetland hydrology present? <u>Y</u>	
Corps-regulated?: _____	
Wetland Type: _____	
Remarks: (Explain alternative procedures here or in a separate report.) Wetland 1 wetland point	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Ulmus americana</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>
2	<u>Fraxinus pennsylvanica</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>
3	<u>Acer saccharum</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
4	<u>Populus deltoides</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
5				
		<u>20</u>	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>15 ft</u>)			
1	<u>Rhamnus cathartica</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
2				
3				
4				
5				
		<u>5</u>	= Total Cover	
Herb stratum	(Plot size: <u>5 ft</u>)			
1	<u>Impatiens capensis</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>
2	<u>Leersia oryzoides</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>
3	<u>Solidago gigantea</u>	<u>5</u>	<u>N</u>	<u>FACW</u>
4				
5				
6				
7				
8				
9				
10				
		<u>45</u>	= Total Cover	
Woody vine stratum	(Plot size: <u>30 ft</u>)			
1	<u>Parthenocissus quinquefolia</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
2				
		<u>10</u>	= 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: 75.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>10</u>	x 1 =	<u>10</u>
FACW species	<u>45</u>	x 2 =	<u>90</u>
FAC species	<u>10</u>	x 3 =	<u>30</u>
FACU species	<u>15</u>	x 4 =	<u>60</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>80</u>	(A)	<u>190</u> (B)

Prevalence Index = B/A = 2.38

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation

☒ Dominance test is >50%

☒ Prevalence index is ≤3.0*

Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)

Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: IP-3

Soil Series: _____

Series Drainage Class: _____

Taxonomy (Subgroup): _____

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

Depth (Inches)	Horizon	Matrix			Mottles					Texture	Remarks
		Color (moist)		%	Color (moist)		%	Type*	Loc**		
0-24	1	10YR	2/2	80	10YR	4/2	5	D	M	silt loam	sandy inclusions
					10YR	4/6	15	C	M		

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

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <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"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K,L,R) |
| <input type="checkbox"/> Other (explain in remarks) |

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Check here if indicators are not present: ☐**Restrictive Layer (if observed):**

Type: _____ Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (not tilled) (C3) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <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"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Drainage Patterns (B10) |
| <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 checked="" type="checkbox"/> FAC-Neutral Test (D5) |

Check here if indicators are not present: ☐**Field Observations:**

Surface water present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): <u>12</u>
Saturation present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches): <u>4</u>

(includes capillary fringe)

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site Baker Ravine City/County: Medina/Hennepin Sampling Date: 6/13/2018
 Applicant/Owner: Pioneer-Sarah Creek State: MN Sampling Point: IP-4
 Investigator(s): Meaghan Watson/Tom Langer, Wenck Associates Inc Section, Township, Range: S19, T118, R23
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none
 Slope (%): 75 Lat: 45.019 Long: -93.64454 Datum: NAD 83 UTM 15
 Soil Map Unit Name Lester-Kilkenny complex, 6-10% slopes, moderately eroded NWI Classification: None
 Subregion (MLRA or LRR): M Are climatic/hydrologic conditions of the site typical for this time of the year? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ significantly disturbed? Are "normal circumstances" present? Y
 Are vegetation ☐ , soil ☐ , or hydrology ☐ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>N</u>
Hydric soil present? <u>N</u>	
Indicators of wetland hydrology present? <u>N</u>	
Corps-regulated?: _____	
Wetland Type: _____	
Remarks: (Explain alternative procedures here or in a separate report.) Wetland 1 upland point	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30 ft</u>)	Absolute % Cover	Dominant Species	Indicator Status
1	<u>Acer saccharum</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
2	<u>Ulmus americana</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>
3	<u>Tilia americana</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
4	<u>Quercus rubra</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>
5	<u>Picea pungens</u>	<u>2</u>	<u>N</u>	<u>NI</u>
		<u>22</u>	= Total Cover	
Sapling/Shrub stratum	(Plot size: <u>15 ft</u>)			
1	<u>Rhamnus cathartica</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>
2				
3				
4				
5				
		<u>30</u>	= Total Cover	
Herb stratum	(Plot size: <u>5 ft</u>)			
1	<u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Y</u>	<u>FACW</u>
2				
3				
4				
5				
6				
7				
8				
9				
10				
		<u>10</u>	= Total Cover	
Woody vine stratum	(Plot size: <u>30 ft</u>)			
1				
2				
		<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: 6 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>15</u>	x 2 =	<u>30</u>
FAC species	<u>30</u>	x 3 =	<u>90</u>
FACU species	<u>15</u>	x 4 =	<u>60</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column totals	<u>60</u>	(A)	<u>180</u> (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance test is >50%

☒ Prevalence index is ≤3.0*

☐ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)

☐ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: IP-4

Soil Series: _____

Series Drainage Class: _____

Taxonomy (Subgroup): _____

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

Depth (Inches)	Horizon	Matrix			Mottles				Texture	Remarks
		Color (moist)		%	Color (moist)	%	Type*	Loc**		
0-12	1	10YR	3/3	60					loam	
	1	10YR	4/3	20						
	1	10YR	4/4	20						
12-16	2	10YR	3/2	50					loam	
	2	10YR	4/4	50						
16-22	3	2.5Y	8/2	90	2.5Y	5/6	10	C	M	very unusual texture

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

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <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"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K,L,R) |
| <input type="checkbox"/> Other (explain in remarks) |

*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Check here if indicators are not present: ☒**Restrictive Layer (if observed):**

Type: _____ Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (not tilled) (C3) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <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"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Drainage Patterns (B10) |
| <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"/> FAC-Neutral Test (D5) |

Check here if indicators are not present: ☒**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): _____

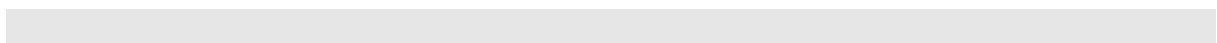
(includes capillary fringe)

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Hennepin County Soil Survey





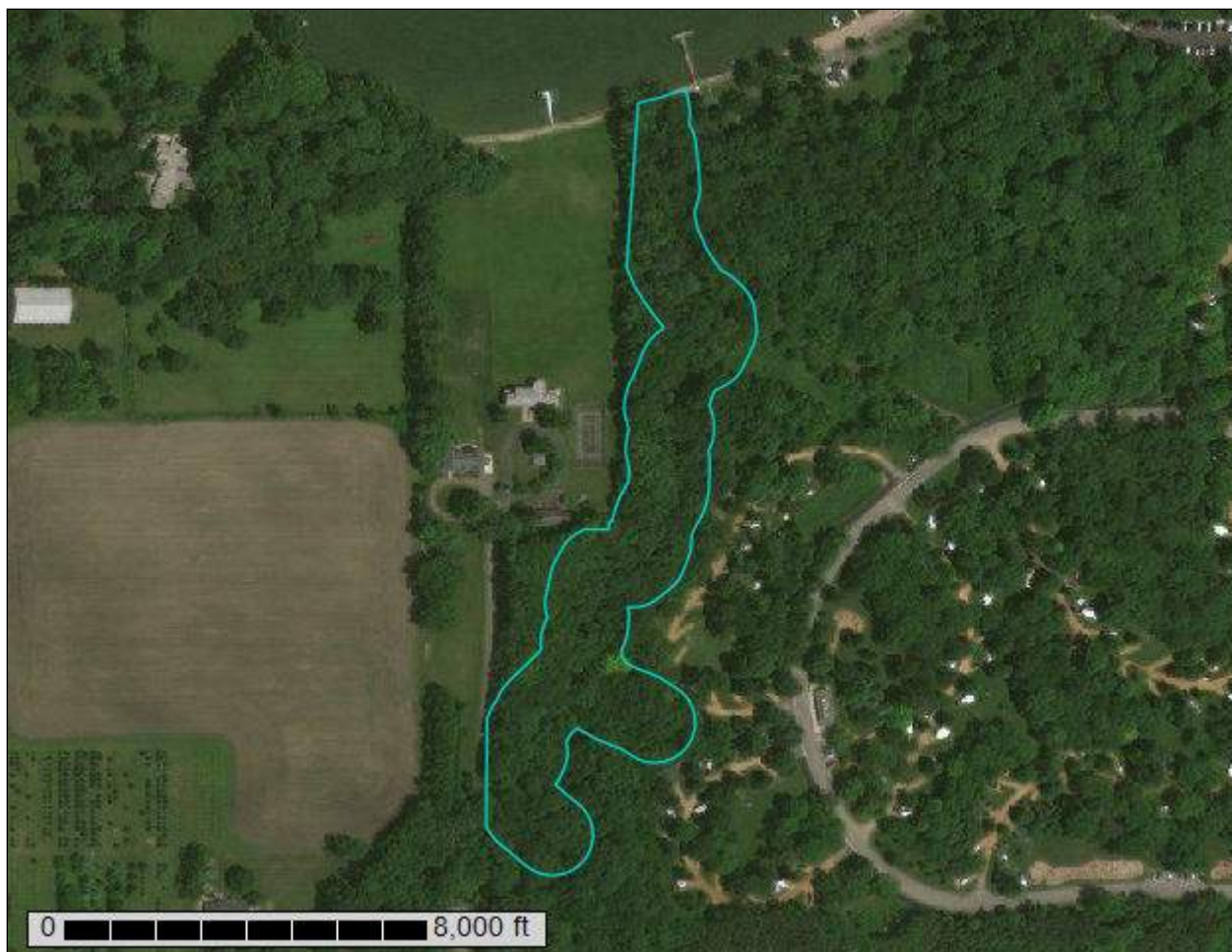
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Hennepin County, Minnesota**



June 19, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

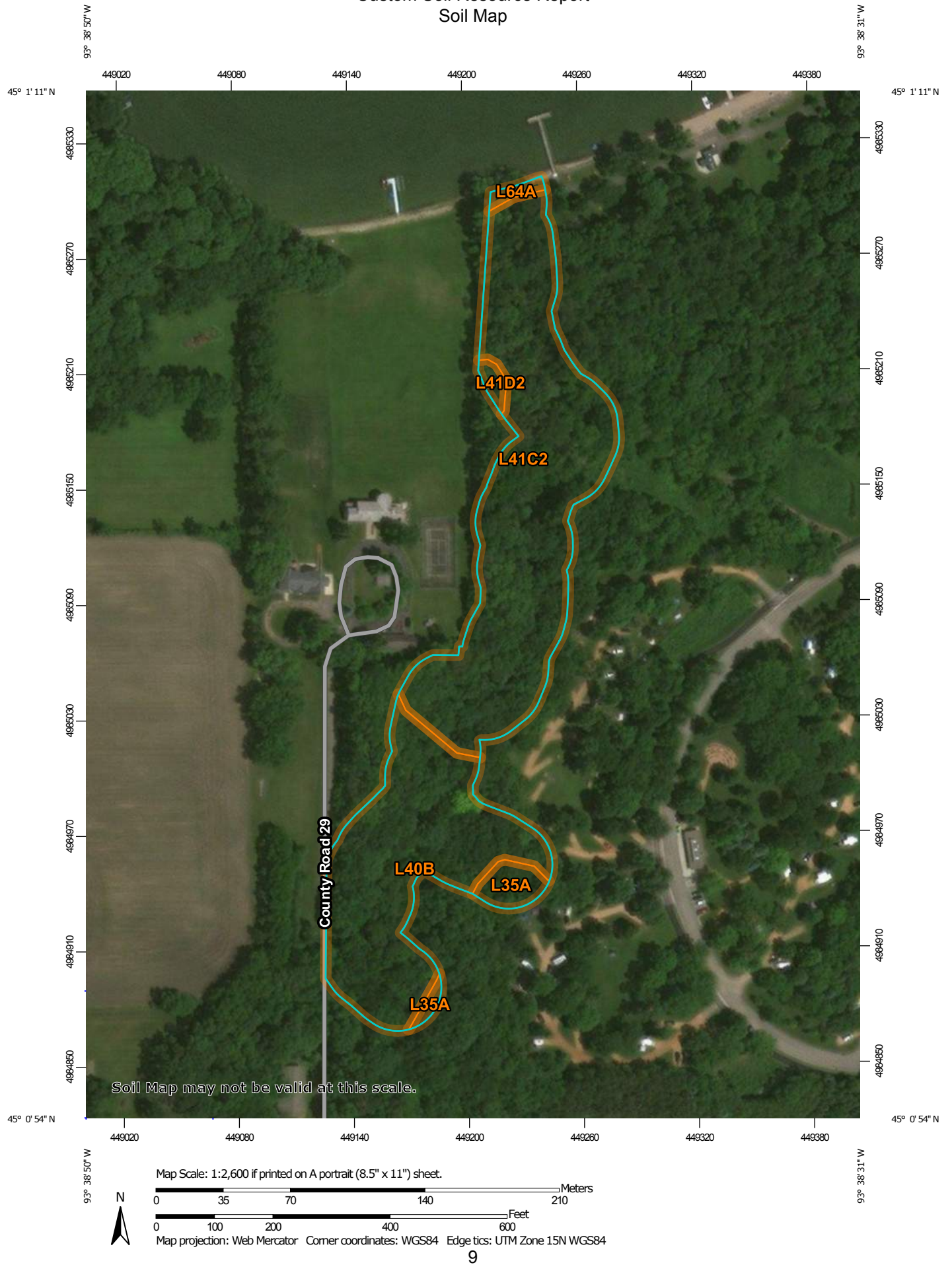
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map






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MAP LEGEND




















Area of Interest (AOI)







Area of Interest (AOI)

Soils


-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


Water Features

-  Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

-  Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Hennepin County, Minnesota
Survey Area Data: Version 13, Oct 4, 2017

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

Date(s) aerial images were photographed: Sep 12, 2010—Aug 2, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
L35A	Lerdal loam, 1 to 3 percent slopes	0.2	3.5%
L40B	Angus-Kilkenny complex, 2 to 6 percent slopes	2.3	37.5%
L41C2	Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded	3.4	57.2%
L41D2	Lester-Kilkenny complex, 10 to 16 percent slopes, moderately eroded	0.1	1.0%
L64A	Tadkee-Tadkee, depressional, complex, 0 to 2 percent slopes	0.0	0.8%
Totals for Area of Interest		6.0	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not

mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Hennepin County, Minnesota

L35A—Lerdal loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: h63c
Mean annual precipitation: 23 to 35 inches
Mean annual air temperature: 43 to 50 degrees F
Frost-free period: 124 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Lerdal and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lerdal

Setting

Landform: Moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Glaciofluvial and reworked till over till

Typical profile

Ap - 0 to 13 inches: loam
Bt,Btg - 13 to 47 inches: clay loam
Bk - 47 to 60 inches: loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 20 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Gypsum, maximum in profile: 1 percent
Available water storage in profile: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: Clayey Upland Forests (F103XY026MN)
Forage suitability group: Level Swale, Acid (G103XS005MN)
Hydric soil rating: No

Minor Components

Mazaska

Percent of map unit: 10 percent
Landform: Swales on moraines
Down-slope shape: Concave

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Across-slope shape: Linear

Hydric soil rating: Yes

Cordova

Percent of map unit: 5 percent

Landform: Swales on moraines, flats on moraines

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: Yes

Le sueur

Percent of map unit: 5 percent

Landform: Moraines

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

L40B—Angus-Kilkenny complex, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: h64l

Mean annual precipitation: 23 to 35 inches

Mean annual air temperature: 43 to 50 degrees F

Frost-free period: 124 to 200 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Angus and similar soils: 45 percent

Kilkenny and similar soils: 40 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Angus

Setting

Landform: Hills on moraines

Landform position (two-dimensional): Backslope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Till

Typical profile

Ap - 0 to 8 inches: loam

Bt - 8 to 35 inches: clay loam

BC - 35 to 40 inches: clay loam

C - 40 to 80 inches: loam

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

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Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: About 43 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Gypsum, maximum in profile: 1 percent

Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: B

Ecological site: Loamy Upland Savannas (R103XY020MN)

Forage suitability group: Sloping Upland, Acid (G103XS006MN)

Hydric soil rating: No

Description of Kilkenny

Setting

Landform: Hills on moraines

Landform position (two-dimensional): Summit

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Glaciofluvial sediments and reworked till over till

Typical profile

Ap - 0 to 11 inches: clay loam

Bt - 11 to 35 inches: clay loam

2Bk, 2C - 35 to 80 inches: loam

Properties and qualities

Slope: 2 to 6 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)

Depth to water table: About 20 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Gypsum, maximum in profile: 1 percent

Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C/D

Ecological site: Clayey Upland Forests (F103XY026MN)

Forage suitability group: Sloping Upland, Acid (G103XS006MN)

Hydric soil rating: No

Minor Components

Lerdal

Percent of map unit: 10 percent

Landform: Moraines

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Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Mazaska

Percent of map unit: 5 percent
Landform: Swales on moraines
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: Yes

L41C2—Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2vvgd
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Lester, moderately eroded, and similar soils: 50 percent
Kilkenny, moderately eroded, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lester, Moderately Eroded

Setting

Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Interfluve, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 38 inches: clay loam
C - 38 to 79 inches: loam

Properties and qualities

Slope: 6 to 10 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)

Custom Soil Resource Report

Depth to water table: About 47 to 63 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Loamy Upland Forests (F103XY025MN)
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Description of Kilkenny, Moderately Eroded

Setting

Landform: Ground moraines, lake plains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over till

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 47 inches: clay loam
2C - 47 to 79 inches: loam

Properties and qualities

Slope: 6 to 10 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: About 20 to 47 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D
Ecological site: Clayey Upland Forests (F103XY026MN)
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Minor Components

Terril

Percent of map unit: 10 percent

Custom Soil Resource Report

Landform: Ground moraines
Landform position (two-dimensional): Foothlope, toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Foothlope/Drainageway Forests (F103XY029MN)
Hydric soil rating: No

Hamel

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Ecological site: Wet Foothlope/Drainageway Forests (F103XY030MN)
Hydric soil rating: Yes

L41D2—Lester-Kilkenny complex, 10 to 16 percent slopes, moderately eroded

Map Unit Setting

National map unit symbol: 2vvgf
Elevation: 690 to 1,840 feet
Mean annual precipitation: 24 to 37 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Lester, moderately eroded, and similar soils: 50 percent
Kilkenny, moderately eroded, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lester, Moderately Eroded

Setting

Landform: Ground moraines, hillslopes
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Nose slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 6 inches: loam
Bt - 6 to 38 inches: clay loam
C - 38 to 79 inches: loam

Custom Soil Resource Report

Properties and qualities

Slope: 10 to 16 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 55 to 71 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Loamy Upland Forests (F103XY025MN)
Forage suitability group: Sloping Upland, Acid (G103XS006MN)
Hydric soil rating: No

Description of Kilkenny, Moderately Eroded

Setting

Landform: Ground moraines, lake plains
Landform position (two-dimensional): Summit, backslope, shoulder
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Glaciolacustrine deposits over till

Typical profile

Ap - 0 to 7 inches: clay loam
Bt - 7 to 47 inches: clay loam
2C - 47 to 79 inches: loam

Properties and qualities

Slope: 10 to 16 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 2.00 in/hr)
Depth to water table: About 55 to 71 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey Upland Forests (F103XY026MN)

Custom Soil Resource Report

Forage suitability group: Sloping; Fine Texture (G103XS023MN)
Hydric soil rating: No

Minor Components

Terril

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Footslope/Drainageway Forests (F103XY029MN)
Hydric soil rating: No

Hamel

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Ecological site: Wet Footslope/Drainageway Forests (F103XY030MN)
Hydric soil rating: Yes

L64A—Tadkee-Tadkee, depressional, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: f8cn
Mean annual precipitation: 25 to 34 inches
Mean annual air temperature: 43 to 46 degrees F
Frost-free period: 124 to 172 days
Farmland classification: Not prime farmland

Map Unit Composition

Tadkee and similar soils: 50 percent
Tadkee, depressional, and similar soils: 36 percent
Minor components: 14 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tadkee

Setting

Landform: Beaches on moraines
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Beach sand over till

Typical profile

A - 0 to 6 inches: loamy fine sand
Bg - 6 to 34 inches: sand

Custom Soil Resource Report

2Cg - 34 to 80 inches: loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: About 6 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Gypsum, maximum in profile: 1 percent

Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B/D

Ecological site: Sandy Wet Prairies (R103XY007MN)

Forage suitability group: Level Swale, Acid (G103XS005MN)

Hydric soil rating: Yes

Description of Tadkee, Depressional

Setting

Landform: Shores on beaches on moraines

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Beach sand over till

Typical profile

A - 0 to 6 inches: mucky loamy fine sand

Bg - 6 to 27 inches: sand

2Cg - 27 to 80 inches: loam

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None

Frequency of ponding: Frequent

Calcium carbonate, maximum in profile: 20 percent

Gypsum, maximum in profile: 1 percent

Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: B/D

Ecological site: Depressional Marsh (R103XY015MN)

Forage suitability group: Not Suited (G103XS024MN)

Hydric soil rating: Yes

Minor Components

Better drained soil

Percent of map unit: 8 percent

Landform: Beaches on moraines

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Granby

Percent of map unit: 4 percent

Landform: Shores on beaches on moraines

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

Less sandy soil

Percent of map unit: 2 percent

Landform: Beaches on moraines

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: Yes

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Custom Soil Resource Report

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United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Precipitation Data



Minnesota State Climatology Office

State Climatology Office - DNR Division of Ecological and Water Resources

University of Minnesota

[home](#) | [current conditions](#) | [journal](#) | [past data](#) | [summaries](#) | [agriculture](#) | [other sites](#) | [about us](#)


Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:

county: **Hennepin** township number: **118N**
 township name: **Medina** range number: **23W**
 nearest community: **Maple Plain** section number: **19**

Aerial photograph or site visit date:

Wednesday, June 13, 2018

Score using 1981-2010 normal period

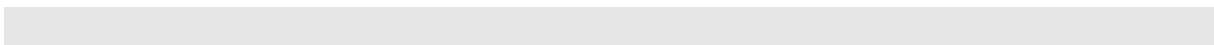
values are in inches A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.	first prior month: May 2018	second prior month: April 2018	third prior month: March 2018
estimated precipitation total for this location:	3.07R	2.41R	1.21R
there is a 30% chance this location will have less than:	2.33	1.80	1.08
there is a 30% chance this location will have more than:	3.99	3.02	1.87
type of month: dry normal wet	normal	normal	normal
monthly score	3 * 2 = 6	2 * 2 = 4	1 * 2 = 2
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	12 (Normal)		

Other Resources:

- [retrieve daily precipitation data](#)
- [view radar-based precipitation estimates](#)
- [view weekly precipitation maps](#)
- [Evaluating Antecedent Precipitation Conditions](#) (BWSR)



Responsive partner.
Exceptional outcomes.

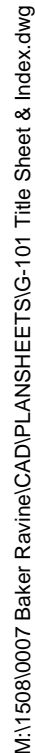




APPENDIX B

Construction Design Plans

9/25/2018 2:15:21 PM



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GRAPHIC SCALE IN FEET

TWIN CITY AREA: 651-454-0002
TOLL FREE 1-800-252-1166



Responsive partner. Exceptional outcomes.

Prepared For: **PIONEER-SARAH CREEK WATERSHED MANAGEMENT**

1

GENERAL NOTES:

- EXISTING CONDITIONS HAVE BEEN PROVIDED BY A COMBINATION OF HISTORIC PLANS FROM THE CITY, SURVEY INFORMATION FROM A SITE VISIT BY WENCK STAFF AND LIDAR. EXISTING FEATURES MAY NOT BE EXACT TO THEIR LOCATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE CONDITIONS OF THE SITE AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR VARIATIONS FROM THE DRAWINGS.
- ALL QUANTITIES ARE APPROXIMATE AND MAY VARY TO ALLOW COMPLETION OF WORK.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF C/ASCE 38-2 ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".
- EXACT LOCATION OF UNDERGROUND UTILITIES SUCH AS GAS, TELEPHONE, FIBER OPTIC, PIPELINES, ELECTRICAL, AND CABLE TV ARE UNKNOWN. CONTRACTOR RESPONSIBLE FOR LOCATING PRIOR TO STARTING WORK.
- CONTRACTOR SHOULD ANTICIPATE PRIVATE UTILITY CONFLICTS THROUGHOUT THE PROJECT SUB CUT AND TRENCH AREAS AND SHALL COORDINATE WITH PRIVATE UTILITY OWNERS.
- THE RELOCATION AND OR PROTECTION OF ALL EXISTING UTILITIES MUST BE COORDINATED BY THE CONTRACTOR AND ANY COSTS FOR SUCH WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR EXTRA TIME AND EFFORT OF PROVISIONS NECESSARY TO WORK AROUND OR UNDER ANY UTILITIES.
- INSTALL AND MAINTAIN EROSION CONTROL DEVICES AS SPECIFIED OR AS DIRECTED BY ENGINEER.
- CONTRACTOR SHALL COMPLY WITH ALL STATE, COUNTY, AND CITY PERMITS.
- MAINTAIN MAIL, GARBAGE, AND RECYCLING SERVICES TO PROPERTIES.
- PROTECT EXISTING PAVEMENT AND SITE FEATURES, EXCEPT AS NOTED.
- CONTRACTOR TO COORDINATE AND MAINTAIN ACCESS TO PROPERTIES.
- MAINTAIN DRAINAGE CONVEYANCE DURING CONSTRUCTION (BOTH PIPED AND OVERLAND).
- THE EXISTING PAVEMENT CONDITIONS HAVE BEEN DOCUMENTED, AND ANY DAMAGE TO THE EXISTING PAVEMENT, CURBING, AND STRIPING SHALL BE REPLACED BY THE CONTRACTOR, TO THE OWNERS SATISFACTION, AT NO ADDITIONAL COST TO THE OWNER.

REMOVAL NOTES:

- FEATURES NOT SPECIFICALLY IDENTIFIED ON PLAN FOR SALVAGE OR REMOVAL THAT CONFLICT WITH CONSTRUCTION ARE TO BE REVIEWED WITH ENGINEER.

DEWATERING NOTES:

- NO BID ITEM HAS BEEN PROVIDED FOR DEWATERING AS ALL DEWATERING WORK NECESSARY FOR CONSTRUCTION WILL BE CONSIDERED INCIDENTAL.
- ENERGY DISSIPATION SHALL BE PROVIDED AT ALL DISCHARGE POINTS TO PREVENT SCOUR.
- PROVIDE SILT BAGS FOR DEWATERING.
- CONTRACTOR RESPONSIBLE TO SUBMIT DEWATERING PLAN TO ENGINEER FOR REVIEW. DEWATERING SHALL MEET ALL PERMIT REQUIREMENTS AND BE APPROVED PRIOR TO STARTING ANY CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR MUST DISCHARGE TURBID OR SEDIMENT-LADEN WATER RELATED TO DEWATERING OR BASIN DRAINING (E.G. PUMPED DISCHARGES, TRENCH/DITCH CUTS FOR DRAINAGE) TO A TEMPORARY OR PERMANENT SEDIMENTATION BASIN ON THE PROJECT SITE UNLESS INFEASIBLE. THE CONTRACTOR MAY DISCHARGE FROM THE TEMPORARY OR PERMANENT SEDIMENTATION BASINS TO THE SURFACE WATERS IF THE BASIN WATER HAS BEEN VISUALLY CHECKED TO ENSURE ADEQUATE TREATMENT HAS BEEN OBTAINED IN THE BASIN AND THAT NUISANCE CONDITIONS (SEE MINN. RULES 7050.0210, SUBPART 2) WILL NOT RESULT FROM THE DISCHARGE. IF THE WATER CANNOT BE DISCHARGED TO A SEDIMENTATION BASIN PRIOR TO ENTERING THE SURFACE WATER, IT MUST BE TREATED WITH THE APPROPRIATE BMPs, SUCH THAT THE DISCHARGE DOES NOT ADVERSELY AFFECT THE RECEIVING WATER OR DOWNSTREAM PROPERTIES. IF THE CONTRACTOR MUST DISCHARGE WATER THAT CONTAINS OIL OR GREASE, THE CONTRACTOR MUST USE AN OIL-WATER SEPARATOR OR SUITABLE FILTRATION DEVICE (E.G. CARTRIDGE FILTERS, ABSORBENTS PADS) PRIOR TO DISCHARGING THE WATER. THE CONTRACTOR MUST ENSURE THAT DISCHARGE POINTS ARE ADEQUATELY PROTECTED FROM EROSION AND SCOUR. THE DISCHARGE MUST BE DISPERSED OVER NATURAL ROCK RIPRAP, SAND BAGS, PLASTIC SHEETING, OR OTHER ACCEPTED ENERGY DISSIPATION MEASURES.
- ALL WATER FROM DEWATERING OR BASIN-DRAINING ACTIVITIES MUST BE DISCHARGED IN A MANNER THAT DOES NOT CAUSE NUISANCE CONDITIONS, EROSION IN RECEIVING CHANNELS OR ON DOWNSLOPE PROPERTIES, OR INUNDATION IN WETLANDS CAUSING SIGNIFICANT ADVERSE IMPACT TO THE WETLAND.
- IF THE CONTRACTOR IS USING FILTERS WITH BACKWASH WATER, THE CONTRACTOR MUST HAUL THE BACKWASH WATER AWAY FOR DISPOSAL, RETURN THE BACKWASH WATER TO THE BEGINNING OF THE TREATMENT PROCESS, OR INCORPORATE THE BACKWASH WATER INTO THE SITE IN A MANNER THAT DOES NOT CAUSE EROSION. THE CONTRACTOR MAY DISCHARGE BACKWASH WATER TO THE SANITARY SEWER IF PERMISSION IS GRANTED BY THE SANITARY SEWER AUTHORITY. THE CONTRACTOR MUST REPLACE AND CLEAN THE FILTER MEDIA USED IN DEWATERING DEVICES WHEN REQUIRED TO RETAIN ADEQUATE FUNCTION.

WARNING:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING FOR LOCATIONS OF ALL EXISTING UTILITIES. THEY SHALL COOPERATE WITH ALL UTILITY COMPANIES IN MAINTAINING THEIR SERVICE AND/OR RELOCATION OF LINES.

THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL AT 651-454-0002 AT LEAST 48 HOURS IN ADVANCE FOR THE LOCATIONS OF ALL UNDERGROUND WIRES, CABLES, CONDUITS, PIPES, MANHOLES, VALVES OR OTHER BURIED STRUCTURES BEFORE DIGGING. THE CONTRACTOR SHALL REPAIR OR REPLACE THE ABOVE WHEN DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.

CALL BEFORE YOU DIG
GOPHER STATE ONE CALL
TWIN CITY AREA: 651-454-0002
TOLL FREE 1-800-252-1166

GOVERNING SPECIFICATIONS:

- THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" 2016 EDITION & LATEST SUPPLEMENTS.
- CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM) STANDARD UTILITIES SPECIFICATIONS (LATEST EDITION)
- CITY OF PLYMOUTH CONSTRUCTION SPECIFICATIONS
- ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND ORDINANCE WILL BE COMPLETED WITH IN THE CONSTRUCTION OF THIS PROJECT.

TRAFFIC CONTROL NOTES:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL CONSTRUCTION STAGING, ON OR OFFSITE, AS NECESSARY TO COMPLETE THE WORK AS SPECIFIED IN THE PROJECT DOCUMENTS. A STAGING PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY CONSTRUCTION RELATED ACTIVITIES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL. ALL TRAFFIC CONTROL SHALL CONFORM TO THE LATEST EDITION OF THE MMUTCD, INCLUDING THE LATEST FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS. A TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE ENGINEER, CITY, AND COUNTY FOR REVIEW AND APPROVAL PRIOR TO ANY CONSTRUCTION RELATED ACTIVITIES. PLANS SHALL COMPLY WITH ALL APPLICABLE PERMIT REQUIREMENTS.
- TRAFFIC CONTROL SHALL ALSO INCLUDE ALL NECESSARY SIGNAGE AND MARKINGS REQUIRED FOR THE BOARDWALK CLOSURE (SIMILAR TO SIDEWALK CLOSURE). THIS SHALL INCLUDE ADVANCED WARNING SIGNS AND NECESSARY FENCING AND SIGNAGE TO PREVENT PEDESTRIANS FROM ACCESSING THE PROPOSED BOARDWALK CONNECTION AREA.

EROSION CONTROL NOTES:

- SEE SHEETS C-201 AND C-202 FOR EROSION AND SEDIMENT CONTROL MEASURES.
- ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED DEPENDING ON SITE CONDITIONS DURING CONSTRUCTION. COORDINATE WITH ENGINEER.
- ALL EROSION CONTROL DEVICES TO BE INSTALLED PRIOR TO COMMENCEMENT OF WORK, MAINTAINED IN ACCORDANCE WITH THE SWPPP, NPDES, AND SPECIFICATIONS THROUGHOUT DURATION OF PROJECT, AND REMOVED UPON ESTABLISHMENT OF FINAL STABILIZATION AS DIRECTED BY ENGINEER. EROSION CONTROL MEASURES USED FOR CONSTRUCTION SHALL NOT BE REMOVED UNTIL AUTHORIZED BY OWNER OR ENGINEER.
- REMOVE TRACKED SEDIMENT FROM ALL PAVED SURFACES BOTH ON AND OFFSITE ON A DAILY BASIS (INCIDENTAL).
- MINIMIZE DUST FROM CONSTRUCTION OPERATIONS BY PROVIDING WATER OR OTHER APPROVED METHOD ON A DAILY BASIS (INCIDENTAL).



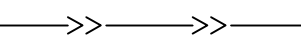

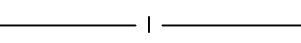


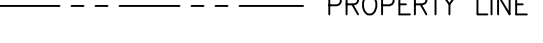
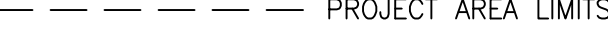

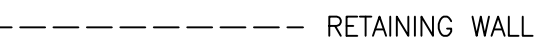
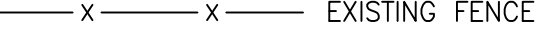
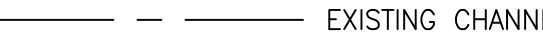

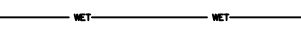
HORIZONTAL AND VERTICAL CONTROL:

- THE HORIZONTAL CONTROL FOR THIS PLAN IS HENNEPIN COUNTY COORDINATE RELATIVE TO SYSTEM NAD83(11).
- THE VERTICAL CONTROL FOR THIS PLAN IS NAVD88.

ABBREVIATIONS




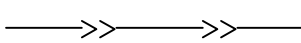
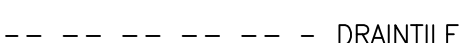


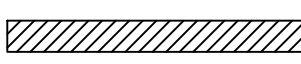
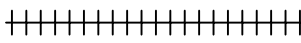




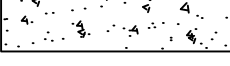

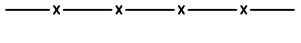
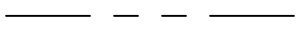
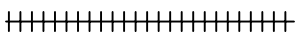
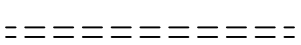


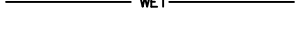
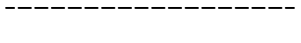
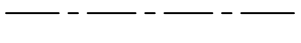
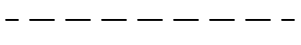
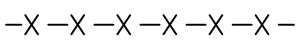



BV	BUTTERFLY VALVE
CL	CENTER LINE
CL	CLASS
CMP	CORRUGATE METAL PIPE
CY	CUBIC YARD
DIP	DUCTILE IRON PIPE
EL./ELEV	ELEVATION
EX	EXISTING
FES	FLARED END SECTION
F/F	FACE TO FACE
FM	FORCEMAIN
GV	GATE VALVE
HDPE	HIGH-DENSITY POLYETHYLENE
HP	HIGH POINT
HWL	HIGH WATER LEVEL
HYD	HYDRANT
INV	INVERT
LF	LINEAL FEET
LP	LOW POINT
MH	MANHOLE
NWL	NORMAL WATER LEVEL
PVC	POLYVINYL CHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
R/W	RIGHT-OF-WAY
SF	SQUARE FEET
STA	STATION
SY	SQUARE YARD
TNH	TOP NUT HYDRANT
TYP	TYPICAL
WM	WATERMAIN

EXISTING SYMBOLS/LINES LEGEND


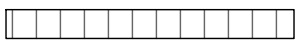
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	STORM SEWER CATCH BASIN/MANHOLE
	STORM SEWER
	HYDRANT
	WATER MAIN
	CONTOUR MINOR
	CONTOUR MAJOR
	PROPERTY LINE
	PROJECT AREA LIMITS
	ACCESS ROUTE BOUNDARY
	RETAINING WALL
	EXISTING FENCE
	EXISTING CHANNEL
	APPROXIMATE TREE LINE
	WETLAND BOUNDARY

	DECIDUOUS TREE
	UTILITY POLE
	LIGHT POLE
	SIGN
	MAILBOX
	GUARD POST
	PROPERTY IRON

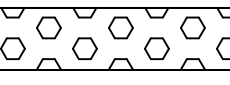

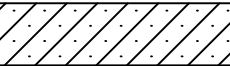
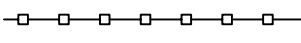
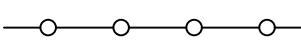


PROPOSED SYMBOLS/LINES LEGEND


	STORM SEWER FLARED END SECTION
	RIP RAP
	STORM SEWER CATCH BASIN/MANHOLE
	STORM SEWER
	DRAINTILE
	VEGETATED RIPRAP
	TWO STAGE CHANNEL
	CHANNEL CLEANOUT
	GRADED BANK
	CONTOUR MINOR
	CONTOUR MAJOR
	SPOT ELEVATION
	BITUMINOUS
	CONCRETE
	DECIDUOUS TREE
	EXISTING FENCE
	PROPERTY LINE
	GRADED BANK
	BARE ROOT SHRUB PLANTING
	BOULDERS
	WATER EDGE
	RETAINING WALL
	PROPOSED CHANNEL CENTERLINE
	PROJECT AREA LIMITS
	ROOTWAD WITH LOG TOE
	VEGETATED RIPRAP TOE
	COIR TOE
	SINGLE LANE ACCESS PLOWED FOR WINTER PEDESTRIAN ACTIVITIES BY THREE RIVER PARK DISTRICT
	CONSTRUCTION AND STAGING ACCESS TO BE PLOWED BY CONTRACTOR (GRAVEL AND WOODCHIP)

REMOVAL SYMBOLS/LINES LEGEND

	TREE REMOVAL
	MISCELLANEOUS REMOVALS

EROSION CONTROL SYMBOLS/LINES LEGEND

	EROSION CONTROL BLANKET AND MN SEED MIX 34-262
	HYDROMULCH AND MN SEED MIX 34-262
	TEMPORARY SEED & EROSION CONTROL BLANKET
	SILT FENCE
	FLOTATION SILT CURTAIN
	INLET PROTECTION
	BIOROLL



Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION

3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared for
PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION

3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Issue #	0	1
Description:	90% DESIGN FOR REVIEW	100% DESIGN FOR REVIEW
Date:	07/19/2018	09/19/2018
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		
PRELIMINARY NOT FOR CONSTRUCTION		
License #:		
Date:		
Project #:	1508-0007	
Drawn By:	SJB	
Issue Date:	XXXX	
Issue #:	1	
Sheet #:	G-102	
Sheet Title:	LEGEND AND NOTES	



- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- SINGLE LANE ACCESS PLOWED FOR WINTER PEDESTRIAN ACTIVITIES BY THREE RIVER PARK DISTRICT
- CONSTRUCTION AND STAGING ACES TO BE PLOWED BY CONTRACTOR (GRAVEL AND WOODCHIP)
- NOTE: TREES MARKED FOR REMOVAL ARE NOT SHOWN FOR CLARITY.

WENCK

ASSOCIATES

Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION

3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared For

PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION

3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Date	Description	Issue #
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Project #:

1508-0007

Drawn By:

SJB

Issue Date:

XXXX

Issue #:

1

Sheet #:

C-100

Sheet Title:

SITE ACCESS PLAN



WENCK

ASSOCIATES

Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION

3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared For

PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION

3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Date	Description	Issue #
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Date: _____

Project #: 1508-0007

Drawn By: SJB

Issue Date: XXXX

Issue #: 1

Sheet #: **C-101**

Sheet Title: EXISTING CONDITIONS & REMOVALS



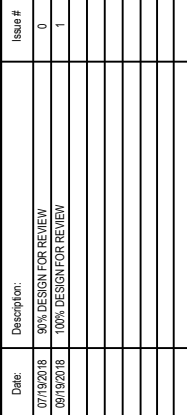
Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION

3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared For: **PIONEER-SARAH CREEK WATERSHED MANAGEMENT**

COMMISSION
3235 FERNBROOK LANE N PLYMOUTH, MN 55447



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Date: _____

Project #:	1508-0007
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Drawn By: SJB

Issue Date: XXXX

Issue #: 1

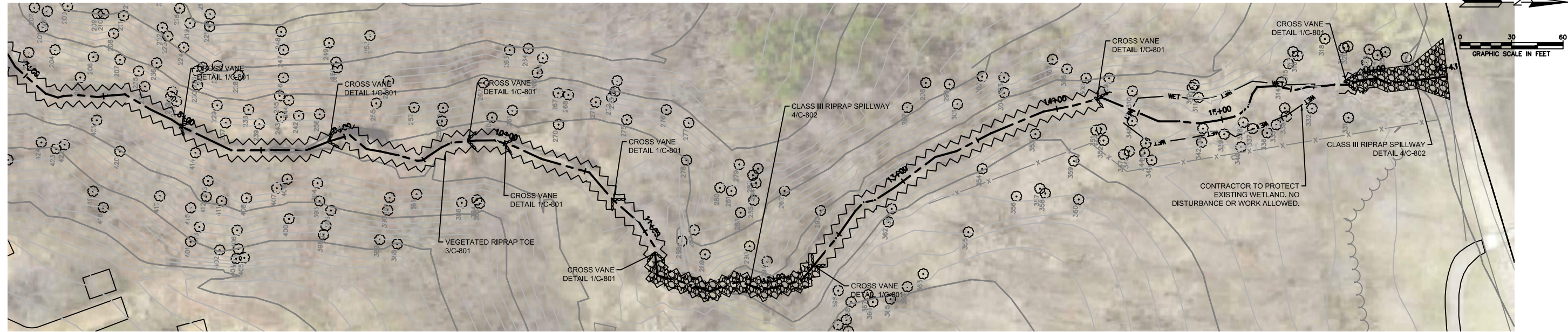
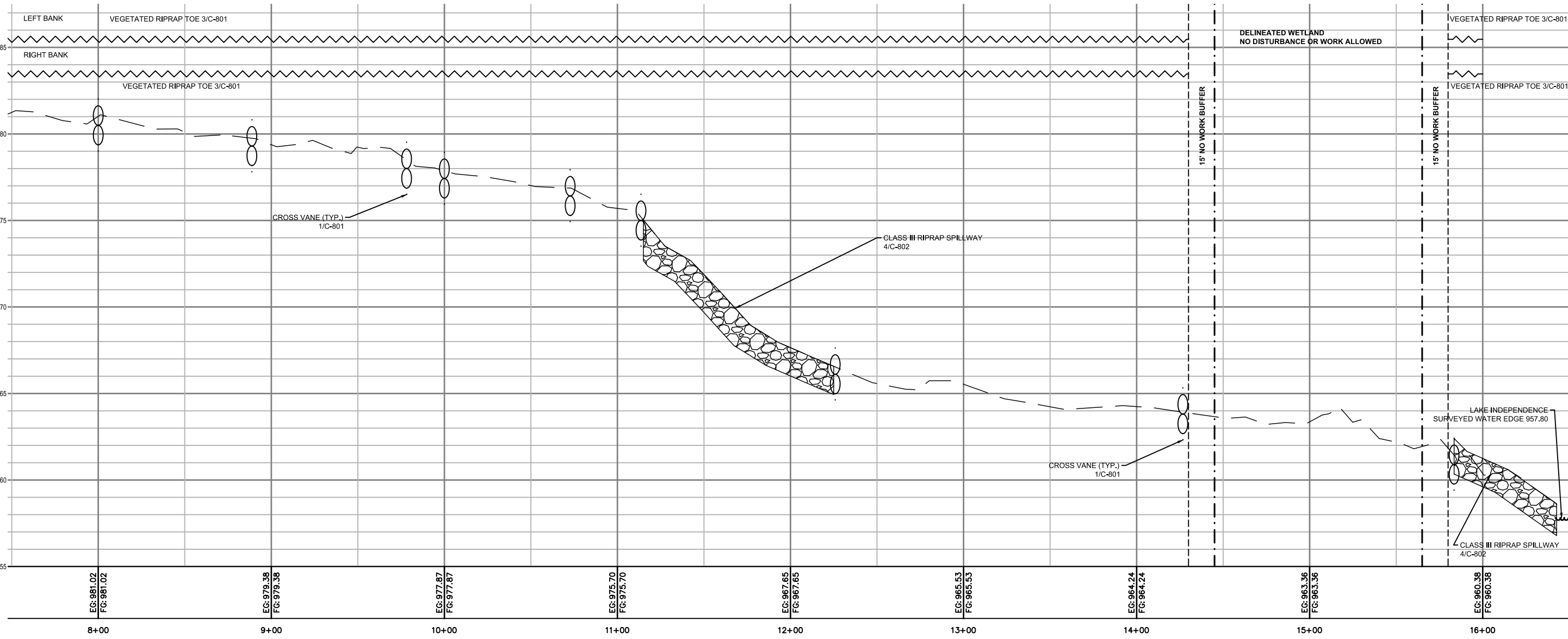
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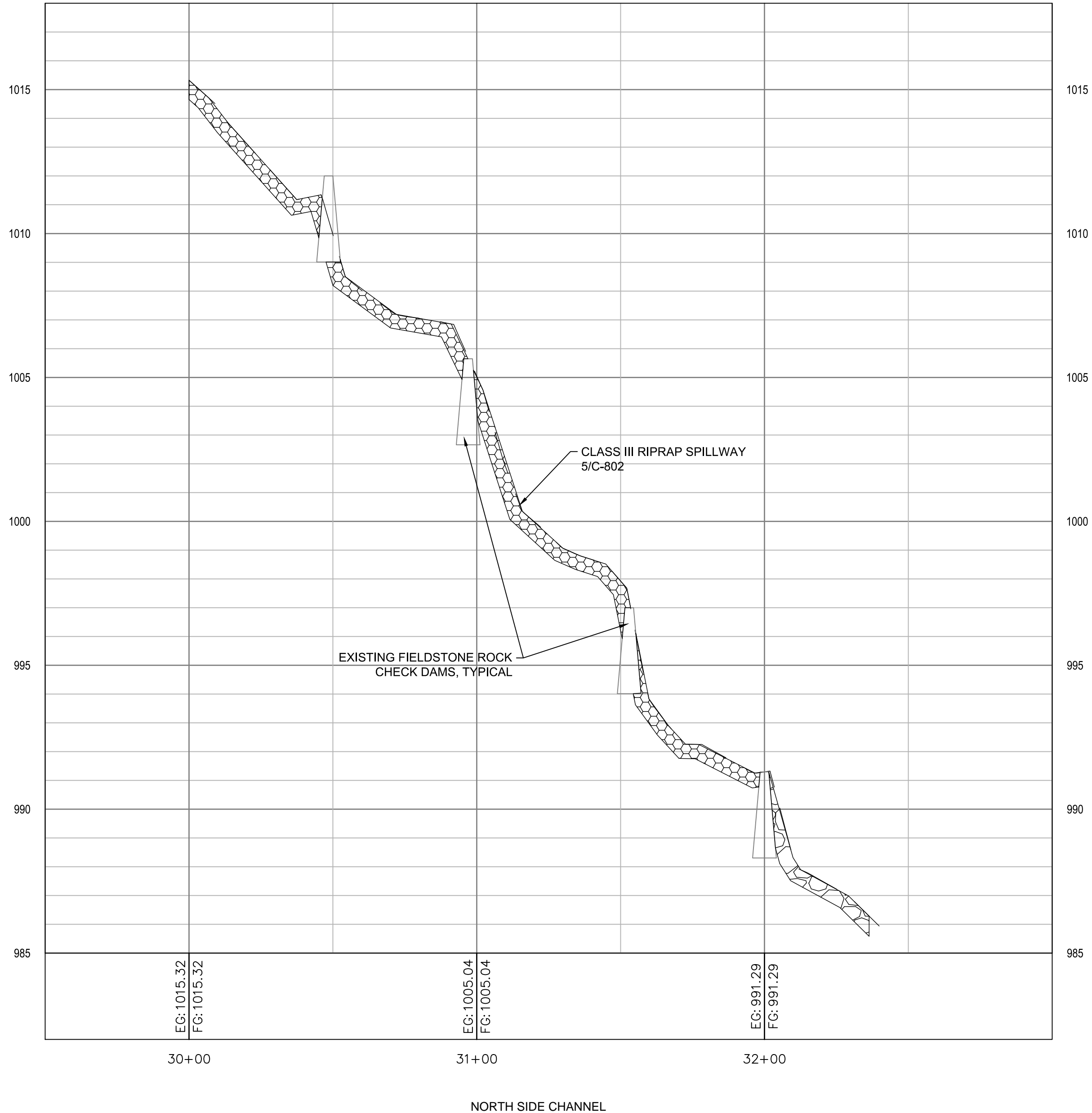
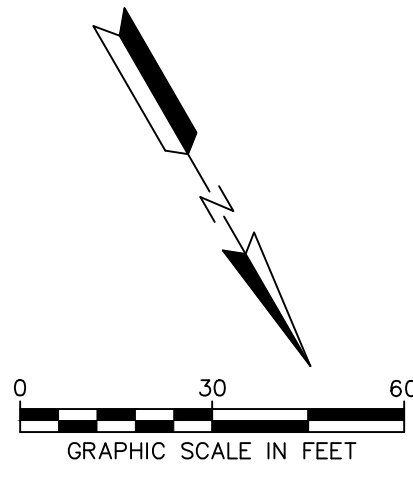
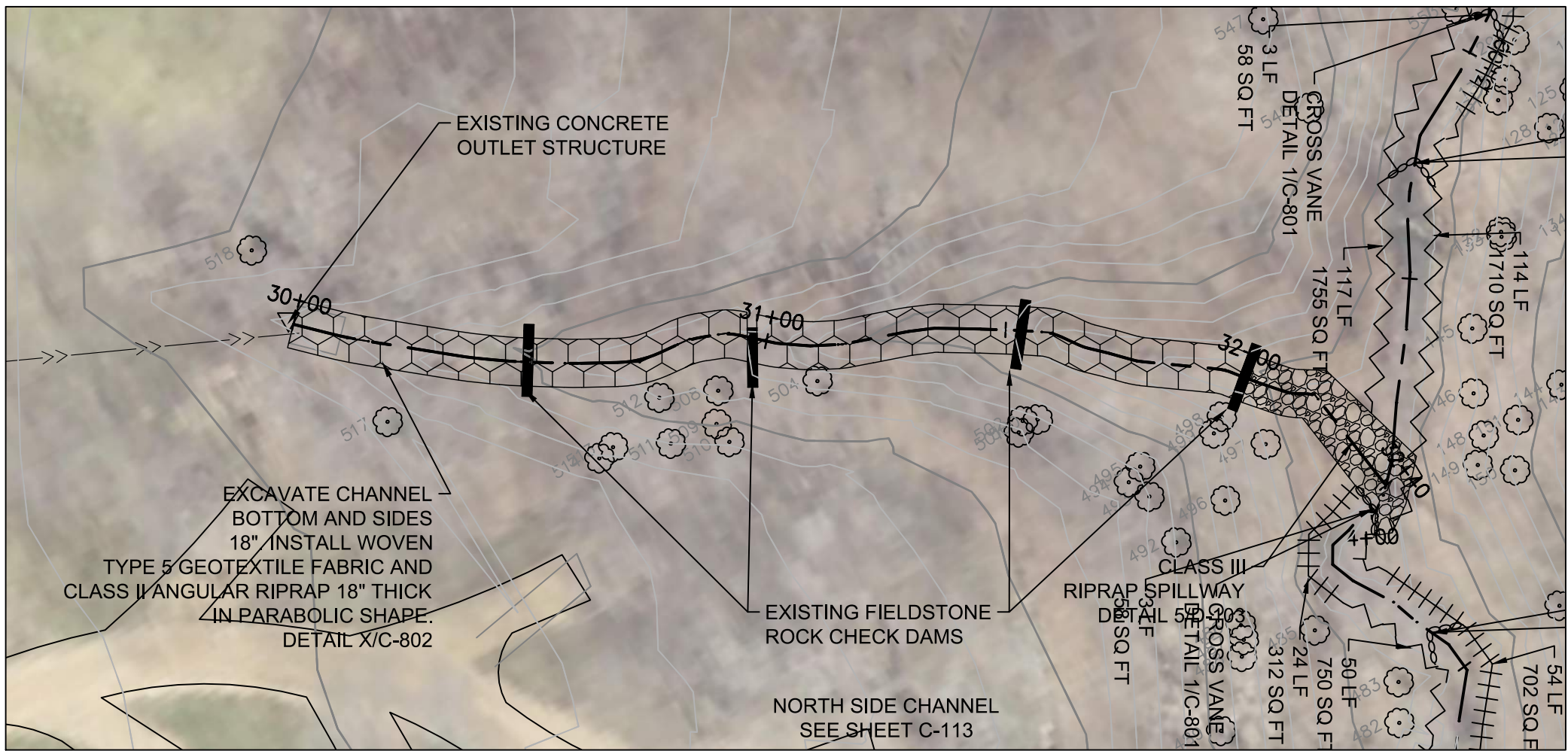
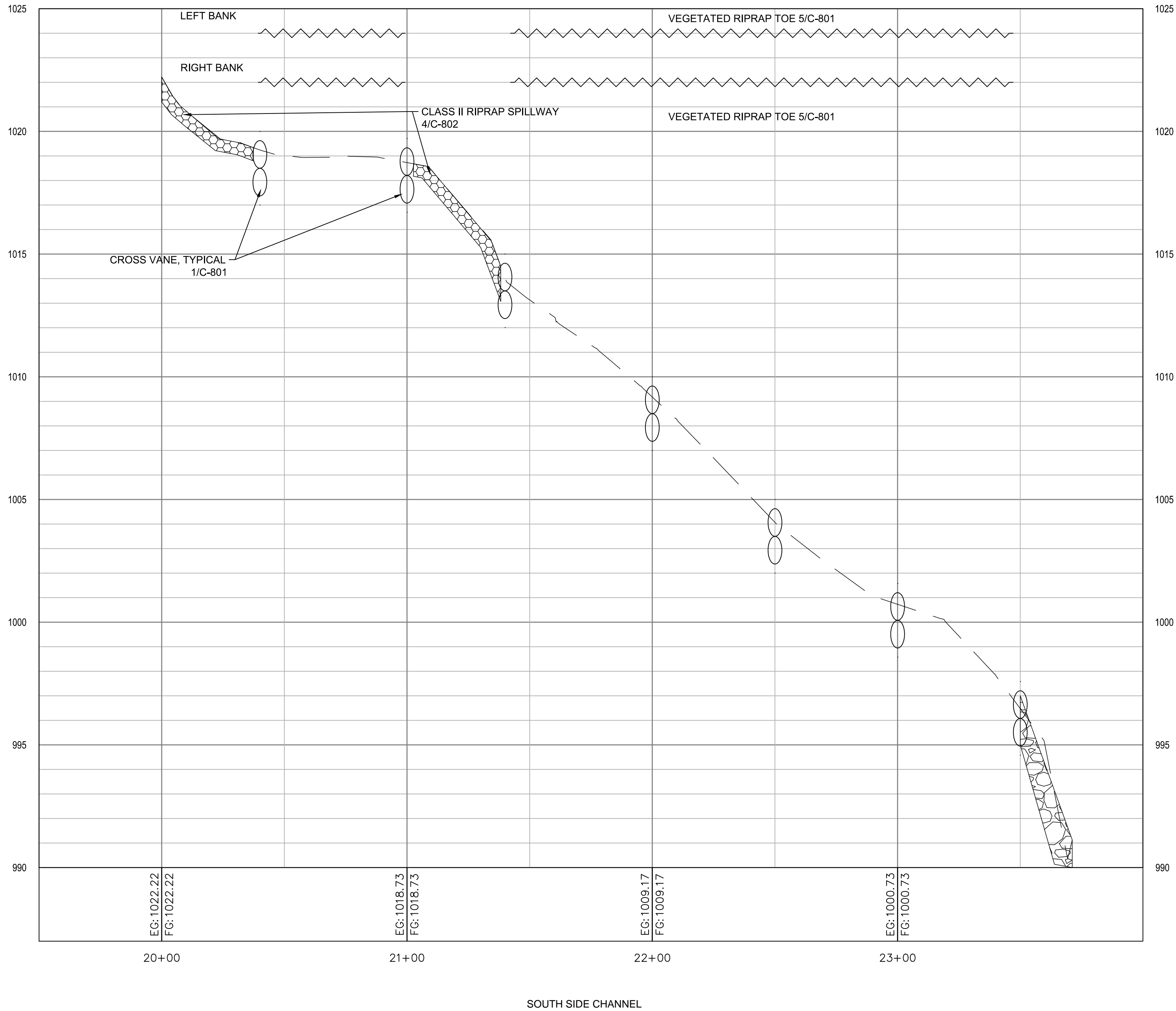
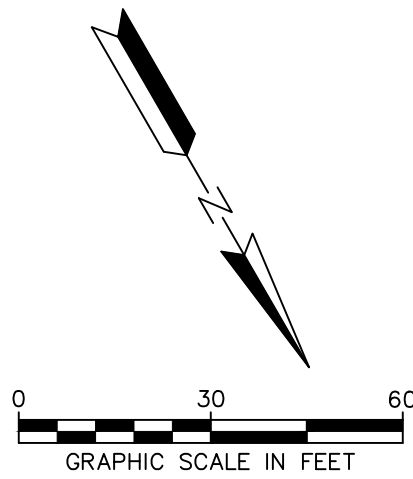
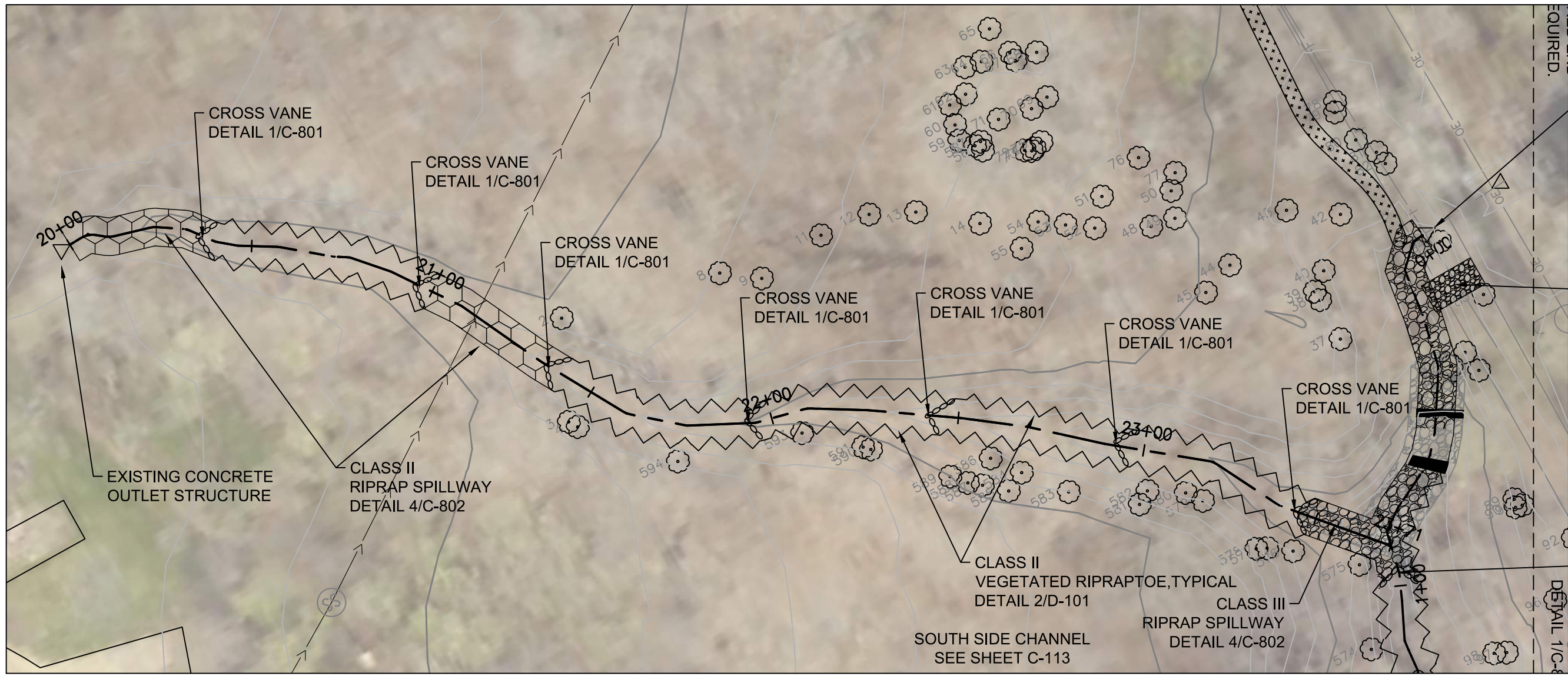
C-111

Sheet Title:

PLAN AND PROFILE

0400 TO 0730





Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION

3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared For:
PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION
3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Date	Description	Issue #
07/19/2018	90% DESIGN FOR REVIEW	0
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Date: _____
Project #: 1508-0007
Drawn By: SJB
Issue Date: XXXX
Issue #: 1
Sheet #: **C-113**
Sheet Title:
PLAN AND PROFILE
20+00 TO 23+71
30+00 TO 32+40

Issue	Date	Description
0	07/19/2018	90% DESIGN FOR REVIEW
1	09/19/2018	100% DESIGN FOR REVIEW

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Date: _____

Project #: 1508-0007

Drawn By: SJB

Issue Date: XXXX

Issue #: 1

Sheet #: **C-201**

Sheet Title: SWPPP



BITUMINOUS PAVEMENT

CONCRETE PAVEMENT

SINGLE LANE ACCESS PLOWED FOR WINTER PEDESTRIAN ACTIVITIES BY THREE RIVER PARK DISTRICT

CONSTRUCTION AND STAGING ACCESS TO BE PLOWED BY CONTRACTOR (GRAVEL AND WOODCHIP)

BIOLOGS

FLOATING SILT CURTAIN

ORANGE SAFETY FENCE

INLET PROTECTION

CULVERT PROTECTION

NOTE: TREES MARKED FOR REMOVAL ARE NOT SHOWN FOR CLARITY.

1508-0007

SJB

XXXX

1

C-202

EROSION CONTROL PLAN

WENCK

ASSOCIATES

Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION

3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared For

PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION

3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Date	Description	Issue #
07/19/2018	90% DESIGN FOR REVIEW	0
09/19/2018	100% DESIGN FOR REVIEW	1

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Date: _____

Project #: 1508-0007

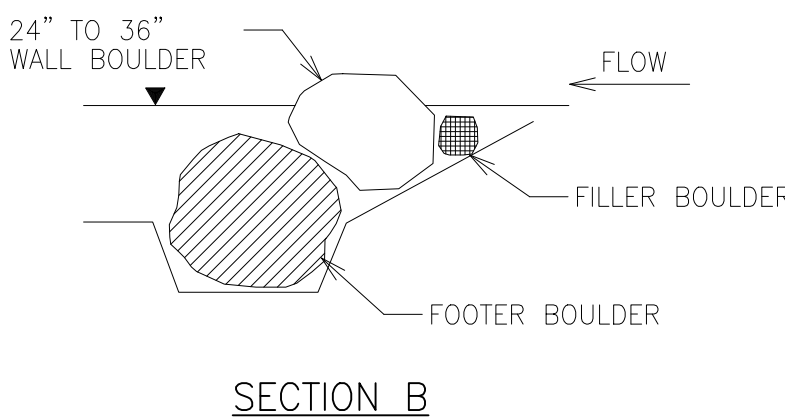
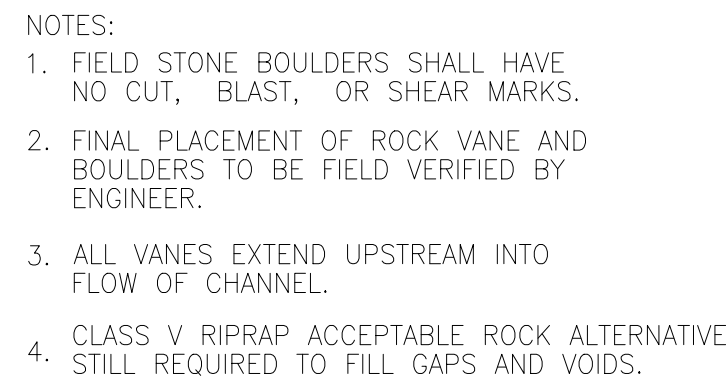
Drawn By: SJB

Issue Date: XXXX

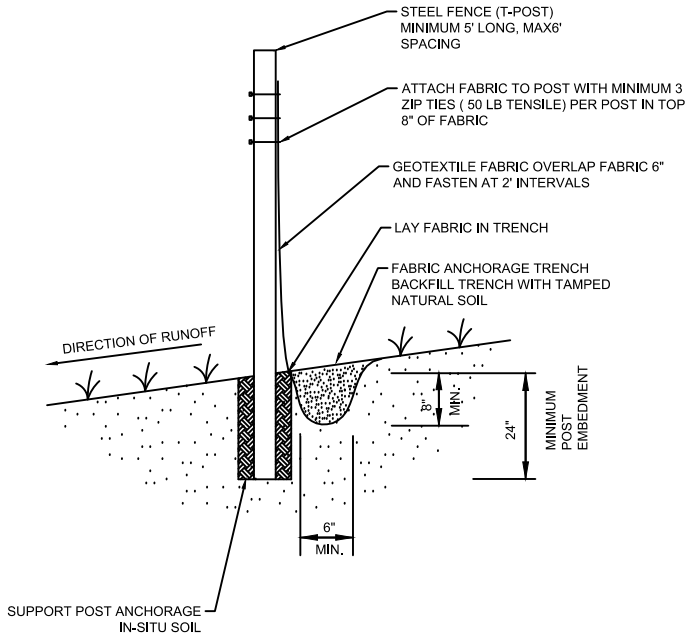
Issue #: 1

Sheet #: C-202

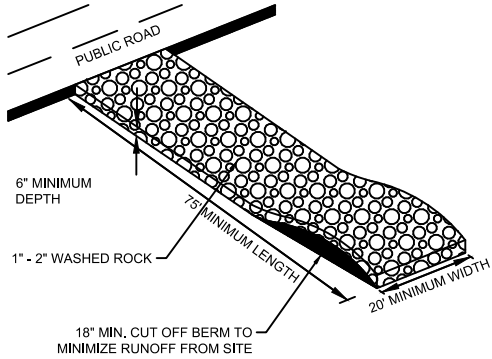
Sheet Title: EROSION CONTROL PLAN



FALLEN, LEANING, AND SWEEPING TREES/LIMBS (2)
NOT TO SCALE C-80

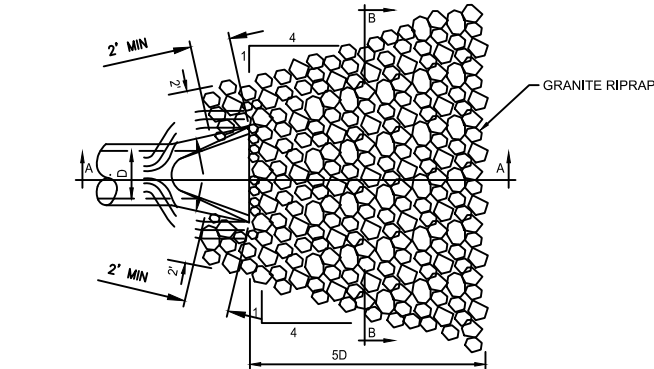


SILT FENCE — MACHINE SLICED
NOT TO SCALE

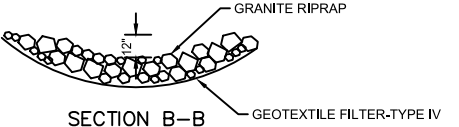
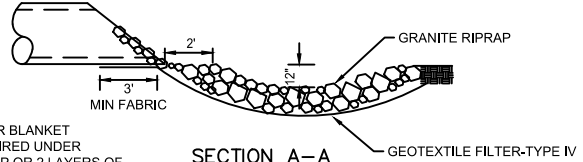


NOTE:
FILTER FABRIC SHALL BE PLACED UNDER ROCK TO STOP MUD MIGRATION THROUGH ROCK.
ENTRANCE MUST BE MAINTAINED TO PREVENT SEDIMENTATION ON PUBLIC ROADWAYS. FUGITIVE ROCKS WILL BE REMOVED FROM ADJACENT ROADWAYS DAILY OR MORE FREQUENTLY AS NECESSARY.

CONSTRUCTION ENTRANCE
NOT TO SCALE

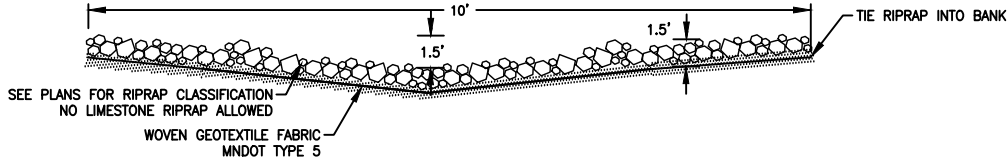


RIPRAP REQUIREMENTS
12" TO 18" 8-10 CUBIC YARDS CL.3
21" TO 27" 12-14 CUBIC YARDS CL.3
30" TO 36" 16-24 CUBIC YARDS CL.3
42" TO 48" 30-38 CUBIC YARDS CL.3
54" AND UP 62-UP CUBIC YARDS CL.4
(ONE CUBIC YARD IS APPROXIMATELY 2,800 LBS.)

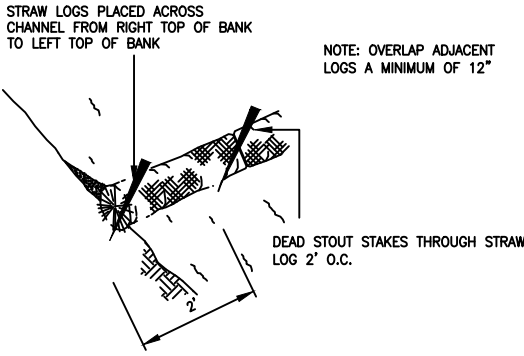


NOTES:
1. FILTER BLANKET REQUIRED UNDER RIPRAP OR 2 LAYERS OF 500X MIRAFI FABRIC OR EQUAL.
2. ONLY GRANITE RIPRAP TO BE USED AT OUTLETS.
3. GRADE A SWALE ADJACENT TO BOTH SIDES OF PIPE TO DIRECT WATER AWAY FROM FES.

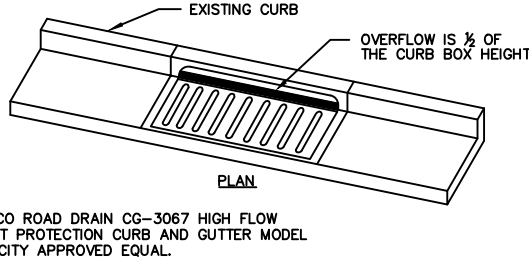
RIPRAP AT OUTLETS
NOT TO SCALE



RIPRAP SPILLWAY
NOT TO SCALE

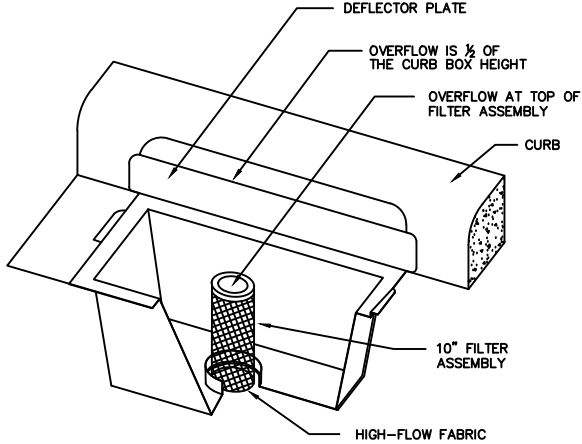


BIOROLL DETAIL
NOT TO SCALE



WIMCO ROAD DRAIN CG-3067 HIGH FLOW INLET PROTECTION CURB AND GUTTER MODEL OR CITY APPROVED EQUAL.

INLET PROTECTION DETAIL
NOT TO SCALE



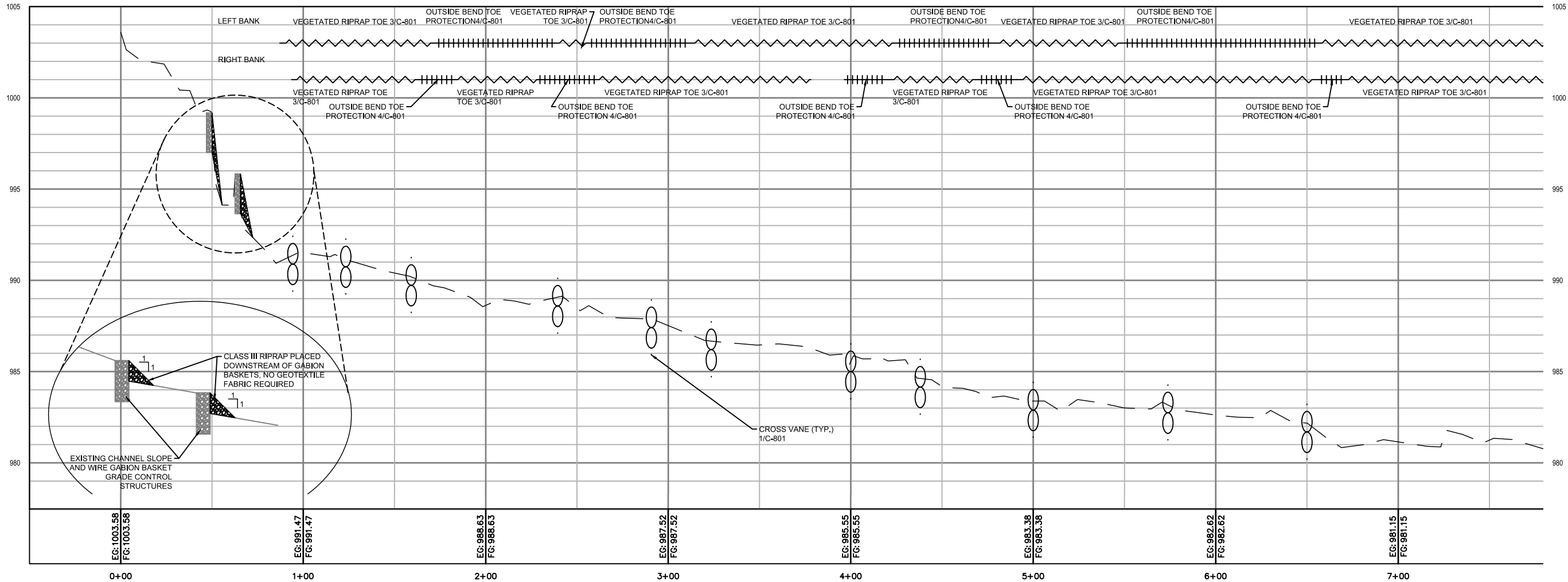
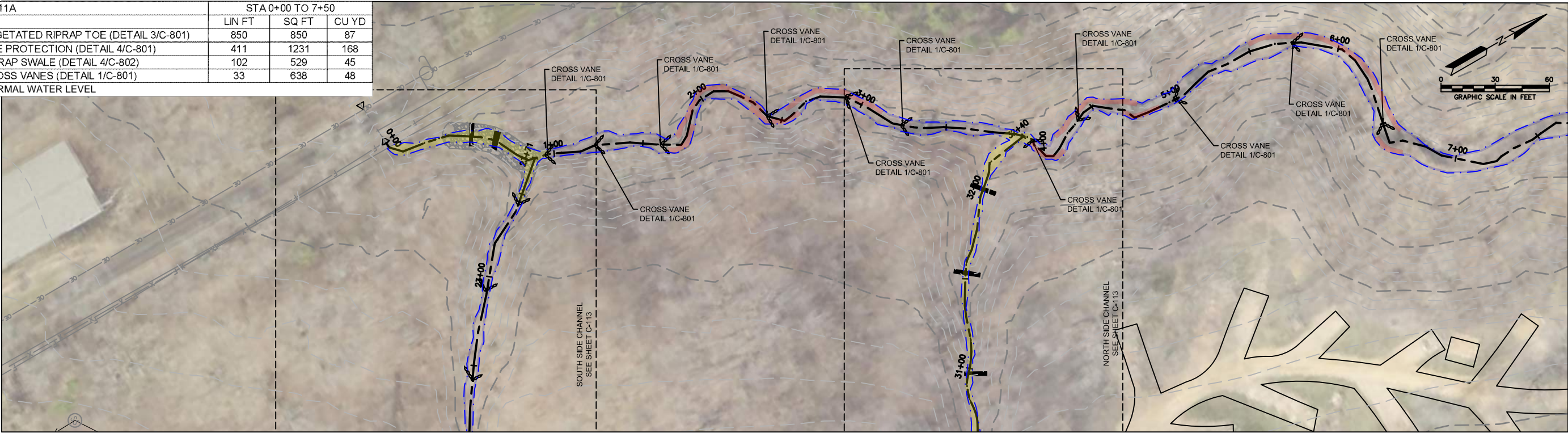
Issue #	Description	Date
0	90% DESIGN FOR REVIEW	07/19/2018
1	100% DESIGN FOR REVIEW	09/19/2018

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License #: _____
Date: _____
Project #: 1508-0007
Drawn By: SJB
Issue Date: XXXX
Issue #: 1
Sheet #: **C-802**
Sheet Title: DETAILS

C-111A	STA 0+00 TO 7+50			
	LIN FT	SQ FT	CU YD	
	VEGETATED RIPRAP TOE (DETAIL 3/C-801)	850	850	87
	TOE PROTECTION (DETAIL 4/C-801)	411	1231	168
	RIPRAP SWALE (DETAIL 4/C-802)	102	529	45
CROSS VANES (DETAIL 1/C-801)	33	638	48	
NORMAL WATER LEVEL				



Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION
3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared for:
PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION
3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Issue #	0
Date	07/19/2018
Description	90% DESIGN FOR REVIEW
Date	09/19/2018
Description	100% DESIGN FOR REVIEW

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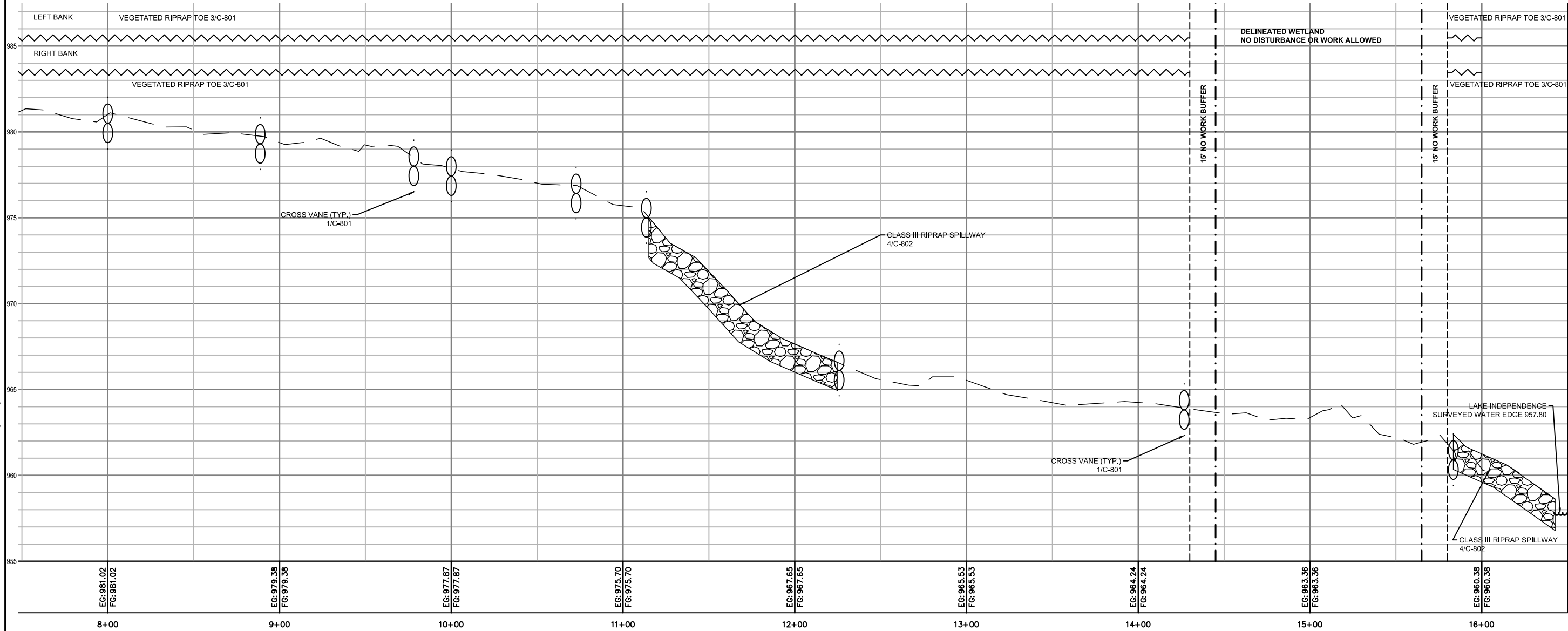
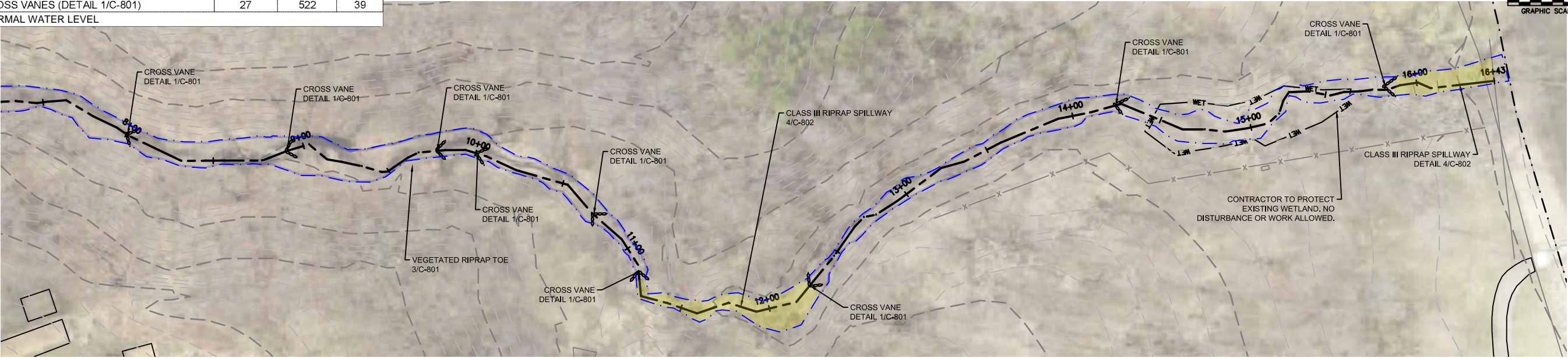
License #: _____
Date: _____

Project #: 1508-0007
Drawn By: SJB
Issue Date: XXXX
Issue #: 1
Sheet #: **C-111A**
Sheet Title: **IMPACT FIGURE 0+00 TO 7+50**

9/25/2018 2:17:46 PM

M:\1508\0007 Baker Ravine\CAD\PLANS\SHEETS\C-111a Plan And Profile_COE Figures.dwg

C-112A	STA 7+50 TO 16+43		
	LIN FT	SQ FT	CU YD
VEGETATED RIPRAP TOE (DETAIL 3/C-801)	1168	1168	119
RIPRAP SWALE (DETAIL 4/C-802)	165	1788	149
CROSS VANES (DETAIL 1/C-801)	27	522	39
NORMAL WATER LEVEL			



Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION
3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

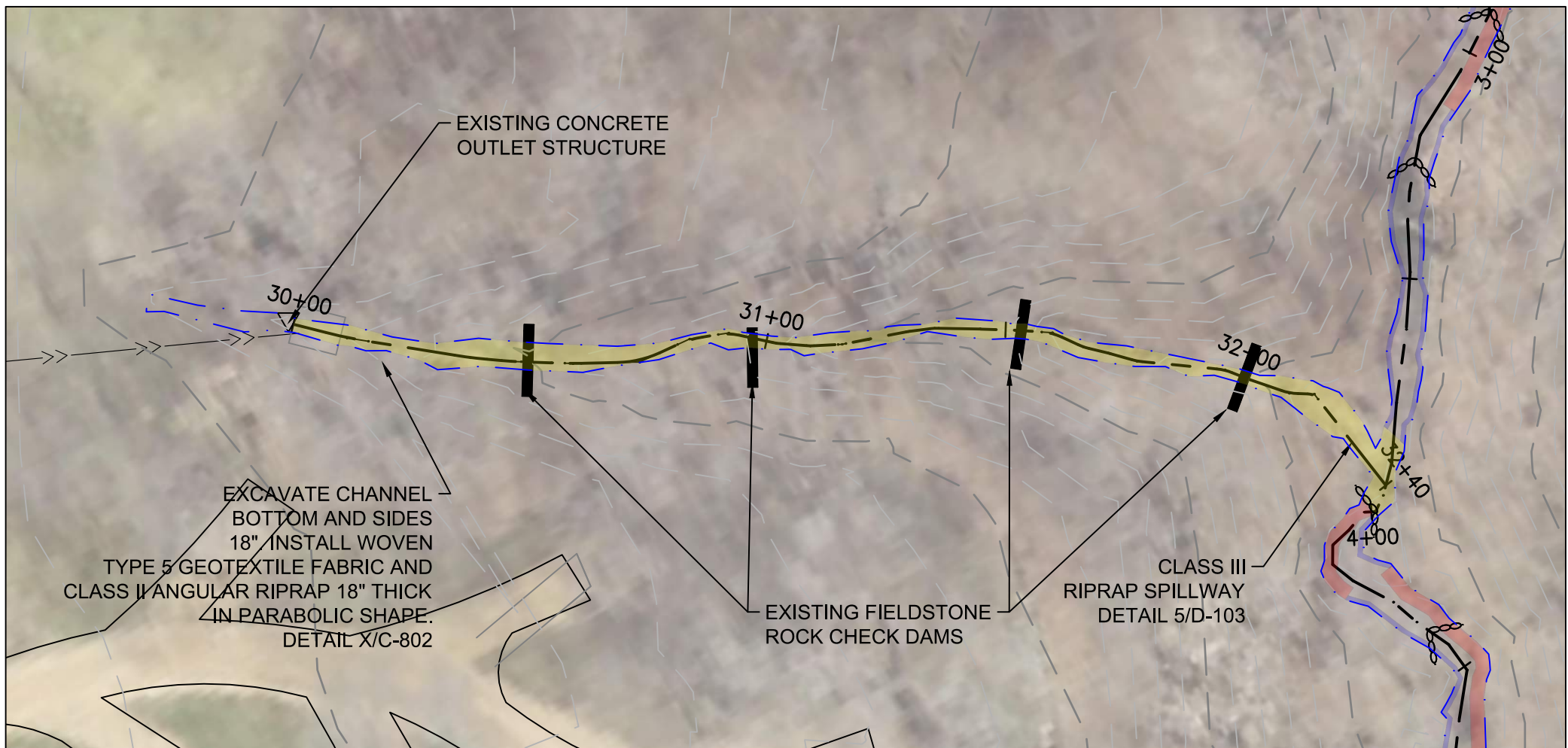
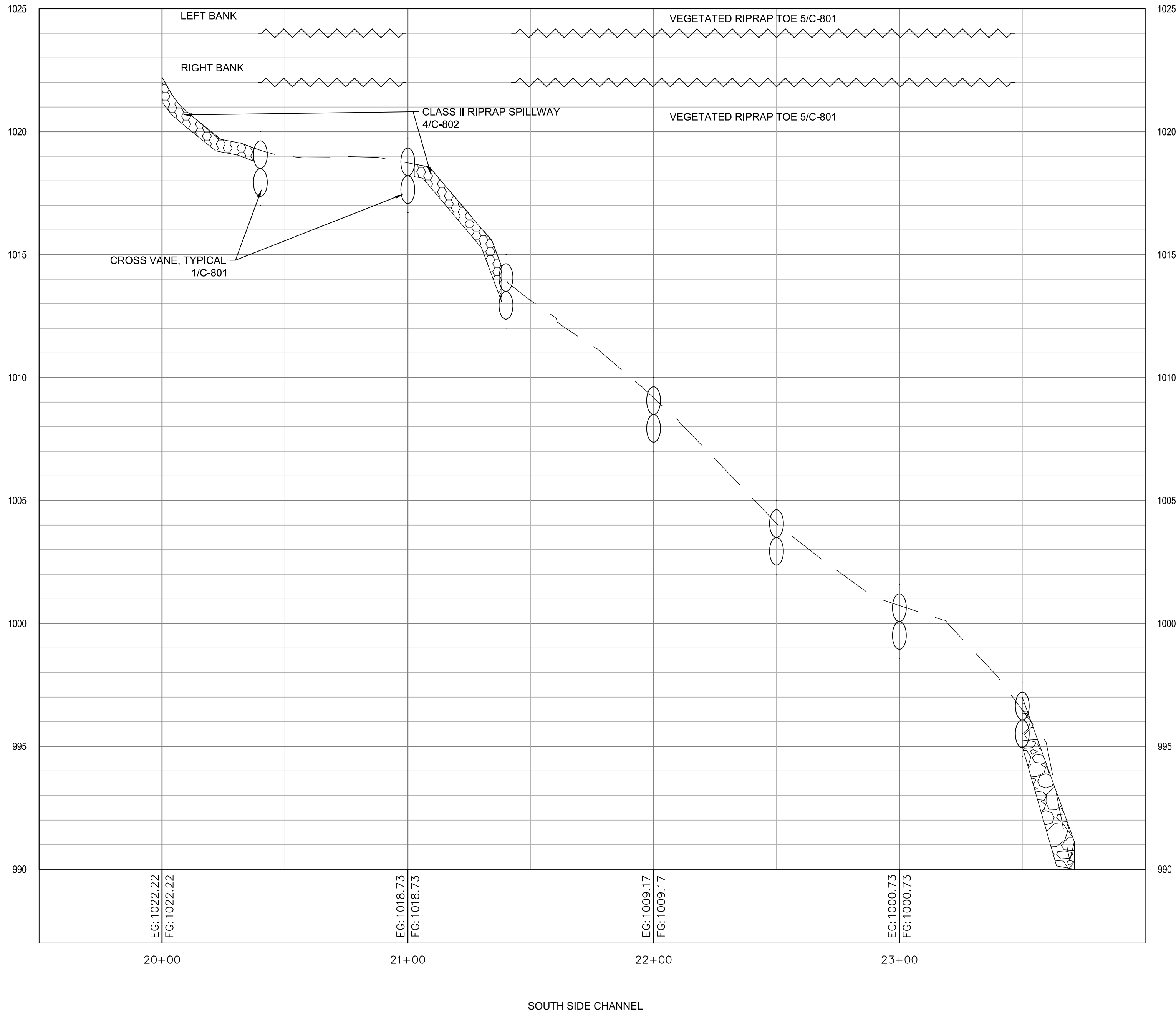
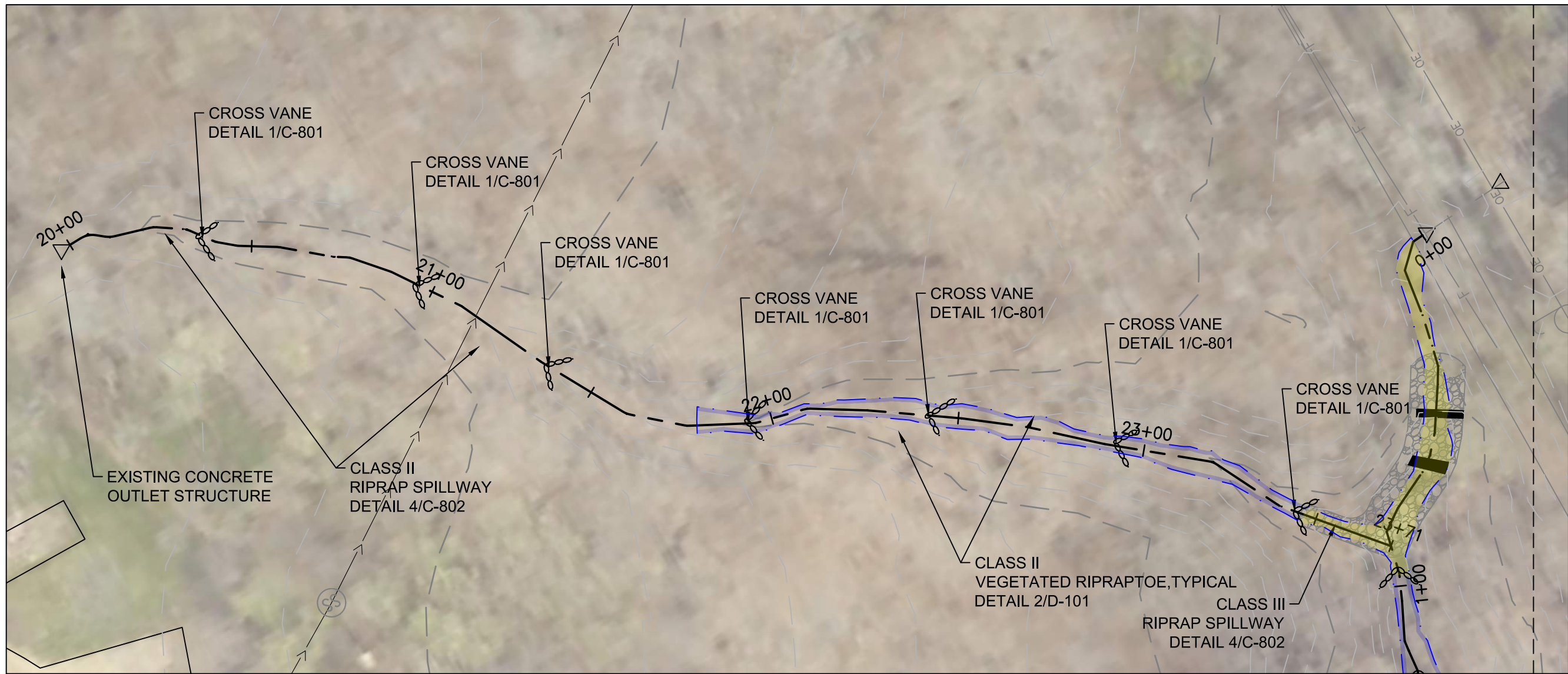
Prepared for:
PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION
3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Issue #	0
Date	07/19/2018
Description	90% DESIGN FOR REVIEW
Date	09/19/2018
Description	100% DESIGN FOR REVIEW

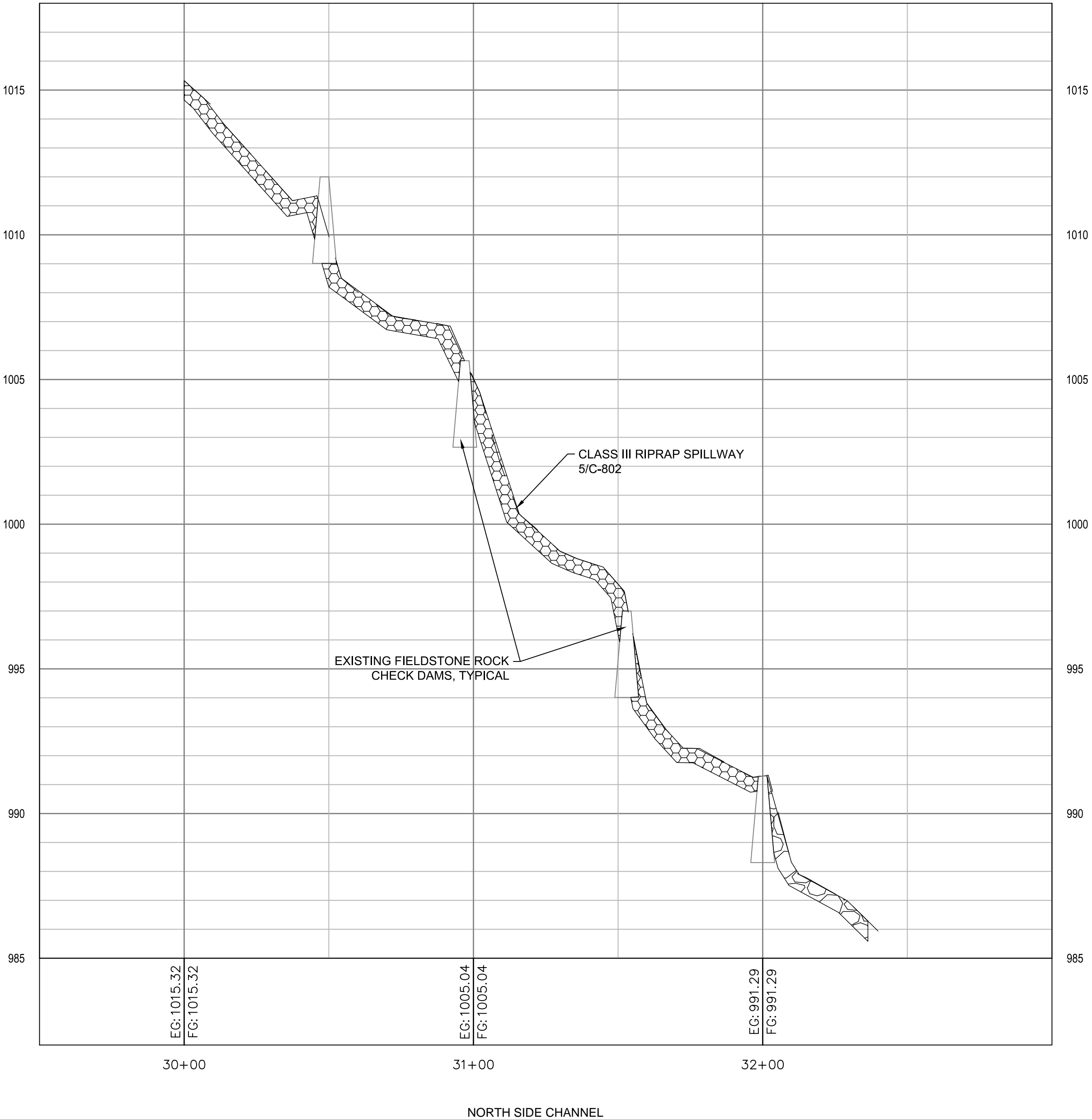
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRELIMINARY
NOT FOR CONSTRUCTION

License #: _____
Date: _____
Project #: 1508-0007
Drawn By: SJB
Issue Date: XXXX
Issue #: 1
Sheet #: **C-112A**
Sheet Title: **IMPACT FIGURE 7+50 TO 16+43**



C-113A	STA 20+00 TO 23+71, STA 30+00 TO 32+40		
	LIN FT	SQ FT	CU YD
VEGETATED RIPRAP TOE (DETAIL 5/C-801)	336	336	35
RIPRAP SWALE (DETAIL 4/C-802)	267	1160	97
CROSS VANES (DETAIL 1/C-801)	12	232	18
NORMAL WATER LEVEL			



Responsive partner. Exceptional outcomes.

BAKER RAVINE STABILIZATION

3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

Prepared For
PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION
3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Date	Description	Issue #
07/19/2018	90% DESIGN FOR REVIEW	0
09/19/2018	100% DESIGN FOR REVIEW	1

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License #: _____
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Project #: 1508-0007
Drawn By: SJB
Issue Date: XXXX
Issue #: 1
Sheet #: **C-113A**
Sheet Title: **IMPACT FIGURE**
20+00 TO 23+71
30+00 TO 32+40



APPENDIX C

SWPPP

Stormwater Pollution Prevention Plan

Sheet Title:



APPENDIX D

Permits



REPLY TO ATTENTION OF
REGULATORY BRANCH

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678
January 17, 2019

Regulatory File No. MVP-2018-02362-JTB

Three Rivers Park District
c/o Brian Vlach
3000 Xenium Lane North
Plymouth, Minnesota 55441

Dear Mr. Vlach:

This correspondence is in regard to your pre-construction notification (PCN) requesting Department of the Army authorization to discharge fill material below the ordinary high water mark (OHWM) along 2,354 linear feet (0.18 acre) on an unnamed tributary to Lake Independence for the purpose of bank stabilization. Work will include the placement of vegetated rip rap, rip rap swales and boulder cross vanes. The project site is in Section 18, Township 118 North, Range 23 West, Hennepin County, Minnesota.

Certain minor activities are eligible for authorization by general permits, which include Nationwide (NWP) and Regional General (RGP) permits. Your project as shown on the enclosed figures labeled MVP-2018-03377-JTB Pages 1 of 13 through 13 of 13 is authorized by NWP 13, Bank Stabilization. A waiver for exceeding 500 linear feet has been granted by the District Engineer.

In order for this verification to be valid, you must ensure the work is performed in accordance with the enclosed general permit terms, General Conditions, St. Paul District Regional Conditions, and the Minnesota Pollution Control Agency's 401 Water Quality Certification Conditions.

You are also required to complete and return the enclosed Compliance Certification form within 30 days upon completion of your project in accordance with your permit conditions. Please mail the completed form to the Corps contact identified in the last paragraph.

This verification is valid until March 18, 2022, unless the general permit is modified, suspended, or revoked. If the work has not been completed by that time, you should contact this office to verify that the permit is still valid. Furthermore, if you commence or are under contract to commence this activity before the date of general permit expiration, modification, or revocation, you will have 12 months from the date of expiration, modification or revocation to complete the activity under the present terms and conditions of the general permit.

Our verification of this permit is based on the project description and construction methods provided in your PCN. You are cautioned that a change in the location or plans may invalidate this verification. Proposed changes should be coordinated with this office prior to construction. Failure to comply with all terms and conditions of this permit verification invalidates this verification and could result in a violation of Section 301 of the Clean Water Act or Section 10 of the Rivers and Harbors Act. You must also obtain all local, State, and other Federal permits that apply to this project.

Regulatory Branch (File No. MVP-2018-02362-JTB)

No jurisdictional determination was requested or prepared for this project. While not required, you may request a jurisdictional determination from the Corps contact indicated below.

If you have any questions, please contact me in our St. Paul office at (651) 290-5446 or Justin.T.Berndt@usace.army.mil. In any correspondence or inquiries, please refer to the Regulatory file number shown above.

Sincerely,

A handwritten signature in black ink, appearing to be 'JB' with a stylized flourish.

Justin Berndt
Project Manager

Enclosures

cc:

Meaghan Watson, Wenck
Jennie Skancke, MNDNR
Alison Harwood, LGU
Ben Carlson, BWSR