Pioneer-Sarah Creek Watershed Management Commission

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Windsong Farm Golf Club
Parking Lot and Practice Facility Improvements
Independence, Project #2018-13

Project Overview: This project will take place on the golf course property on both sides of CR 6. They propose to reconstruct their existing practice facility and clubhouse service access road, reconstruct their existing main parking lot and construct a new event overflow parking lot. Commission Rules that apply to this work will include Rule D (stormwater management) and Rule E (Erosion and Sediment Control).

Applicant: Windsong Farm Golf Club, Attn. Jon Dailing, 18 Golf Walk, Independence, MN 55359. Phone: 952-797-3727. Email; jdailing@wsfarm.com

Agent/Engineer: EOR Inc., Attn. Derek Lash, 7030 6th St. N., Oakdale, MN 55128. Phone; 651-203-6031. Email; dlash@eorinc.com

Exhibits:

1) PSCWMC Request for Plan Review, received September 11, 2018.
2) Fees for $1,675 for 15.48 acres of disturbance for grading and erosion control and 1.237 acres of new impervious areas water quality/quantity.
3) Windsong Farm Golf Club construction Plans for 2018 Parking Lot and Golf Course Practice Facility Improvements by Duininck Inc. dated September 6, 2018
    a. Sheet 1 of 11, Title Page
    b. Sheet 2 and 3 of 11, Demo Plan,
    c. Sheet 4 of 11, Site and Surfacing Plan, Main Parking Lot
    d. Sheet 5 of 11, Site and Surfacing Plan, Overflow Parking Lot updated October 3, 2018.
    e. Sheet 6 of 11, Grading and Drainage Plan Main Parking Lot.
    f. Sheet 7 of 11, Grading and Drainage Plan Overflow Parking Lot, updated October 3, 2018.
    g. Sheets 8 to 10 of 11 Windsong Golf Club Stormwater Pollution Prevention Plan. (sheet 10 of 11, Entire Site Erosion Control Plan by Duininck Inc. dated October 3, 2018)
    h. Sheet 11 of 11 Phasing Plan
4) Windsong Golf Club, Practice Facility Plans by John Faught Design, dated August 27, 2018.
    a. Sheet 1 of 6, Site Plan
    b. Sheet 2 of 6, Area of Disturbance Plan
    c. Sheet 3 of 6, Grading and Drainage Plan
    d. Sheet 4 of 6 Earthwork Plan

e. Sheet 5 of 6, Grassing Plan
f. Sheet 6 of 6, Construction Details.

5) Windsong Practice Facility Expansion Stormwater Management Plan Narrative and HydroCAD model by EOR Inc., Narrative dated September 6, 2018, revised October 3, 2018. HydroCAD model dated October 3, 2018.

Findings;

1) A complete application was received September 11, 2018. Updated overflow parking location change details received October 3, 2018. The initial 60-day period for a PSCWMS decision, per MN Statute 15.99 expires November 10, 2018.
2) Actual project review fee should be $1,550 (15.48 acres of disturbance for grading fee and 1.237 ac. of new impervious area for water quality fee). $125 refund is due.
3) A breakdown of the work proposed is as follow;
    a. The practice facility work will disturb 12.3 acres for reconstruction of practice tees, greens, bunkers, and drainage infrastructure. 9,500 sq. ft. of existing cart path will be removed and replaced with 36,700 sq. ft. of new path and 2,250 sq. ft. of new impervious artificial tee areas. For site analysis, new imperious areas from this portion of the work will amount to 18,850 sq. ft.
        i. This water will be routed over a filter swale and then into an existing detention basin for rate and quality controls.
    b. The main parking area work will disturb 1.15 acres. The asphalt surface will be milled and overlaid with some additional parking spaces and islands constructed. New impervious areas from this portion of the work will be 7,925 sq. ft.
        i. This water will be routed over a filter swale and then into an existing detention basin for rate and quality controls.
    c. The work on the clubhouse service access road will disturb 0.51 acres. It will actually reduce its current impervious footprint by 512 sq. ft.
        i. Stormwater management improvements for this portion of the work will consist of routing the water over a filter swale area before it runs into an existing irrigation pond.
    d. Construction on the event parking lot will disturb 1.4 acres. 2,536 sq. ft. of existing gravel road will be removed and replaces with 19,009 sq. ft. of new gravel and paved parking areas. An additional 25,600 sq. ft. of new turf (pervious) parking area will also be constructed as part of this work. The net amount of new impervious areas from this work will be 16,473 sq. ft.
        i. Stormwater management proposed for this area by directing the impervious area over the new turf parking lot. The turf parking lot will have engineered soils, that in effect treat the impervious areas by filtration and increasing distance the impervious area flows over grass/amended soil areas. This combination of distance of travel and amended soils will treat the water before it leaves the site.

Stormwater Management

1) The area on the north side of CR 6 will drain into Fox Lake. The area south of CR 6 drains into the Pioneer Creek.
2) Land use will remain the same on the south side of the project. The event overflow parking on the north side is currently cropland.
3) The project proposes to direct the water from the impervious areas over filtration swales, engineered overflow parking areas with turf /filtration and into an existing irrigation pond and detention pond.
4) Based on the site design, the project will meet the Commission's flow rate requirements. They will be as follows;

	2-yr (cfs)		10-yr (cfs)		100-yr (cfs)	
	Existing	**Proposed**	**Existing**	**Proposed**	**Existing**	**Proposed**
Practice Facility	2.2	2.2	6.8	6.3	11.5	11.1
Clubhouse Area	1.2	0.8	2.1	1.4	4.2	2.5
Event Parking Lot	2.8	0.3	5.6	0.7	12.1	7.3

4) Total phosphorus and suspended solids will be reduced after development without the need for ponding or basins based on; a) the change in the land use from agriculture/open areas to golf course/open areas, b) the new impervious areas are linear (cart path) that do not concentrate runoff and c) designed water flows over vegetation areas.
    a. This design will essentially route the water over vegetation areas and through engineered filter swales/turf parking areas for a minimum of 300 feet. The water from the club house and practice areas will have additional treatment in an existing irrigation pond and detention basin.
5) TP and TSS loads will meet the Commissions Standards. These loads are as follows;

	Total Phosphorus (lbs/year)		TSS (lbs/year)	
	Existing	**Proposed**	**Existing**	**Proposed**
Practice Facility	8.9	7.0	1195	365
Clubhouse Area	0.8	0.7	81	16
Event Parking Lot	11.1	8.9	105	56

6) Abstraction/volume controls necessary for the increase in impervious areas. Total increase in impervious areas will be 43,248 sq. ft. With the disconnection credits (75 feet for sheet flows or 300 feet for channel flows) the actual impervious area that needs abstraction is 7,925 sq. ft. All the other areas are routed over turf, filter swales or overland at least 300 feet before entering any water body or wetland. This allows these impervious areas to be considered disconnected and subtracted from our abstraction

requirements. Actual filtration volumes created by permeable turf, filter swales and other engineered soil areas will be 6,972 cubic feet. 725 cubic feet of storage is required.

7) No floodplains or wetlands will be impacted by this site plan.

8) Grading and Erosion Controls; Silt fence, natural buffer areas and other construction BMP's are specified for the erosion and sediment controls during construction. These practices meet the Commission's erosion control requirements.

Recommendation: **Approval.**

Note: Staff recommends the applicant consider installing 2 grassed waterways in the cropland area north of the overflow parking (locations and typical cross section attached). If desired, agriculture BMP cost share is available for these waterways.

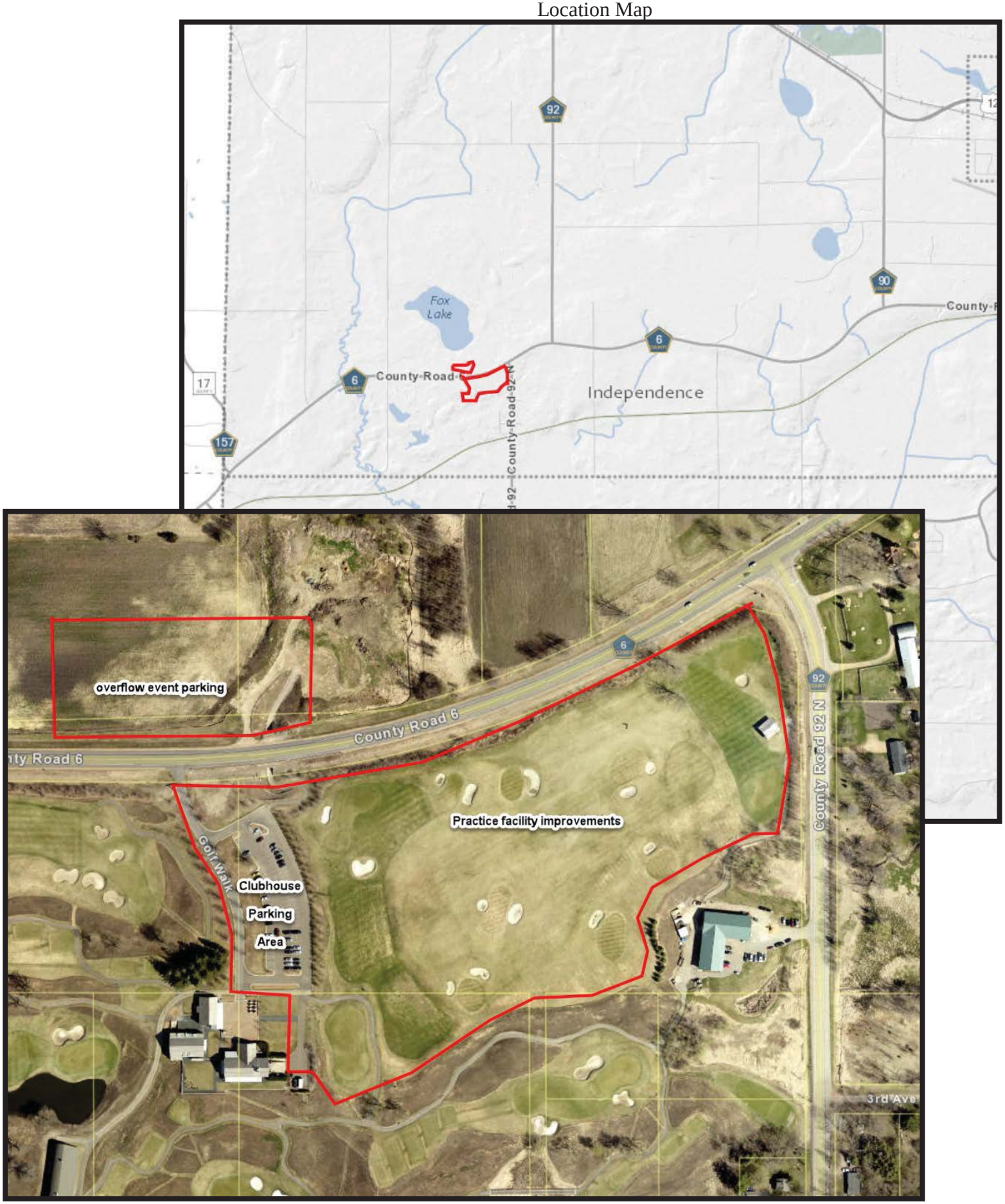
Hennepin County Department of Environmental Services
Advisor to the Commission

October 15, 2018
Date

James C. Kujawa,
Water Quality Specialist

Windsong Farm Golf Club Parking Lot and Practice Facility Improvements
2018-13, Independence
October 5, 2018

Location Map



Windsong Farm Golf Club Parking Lot and Practice Facility Improvements
2018-13, Independence
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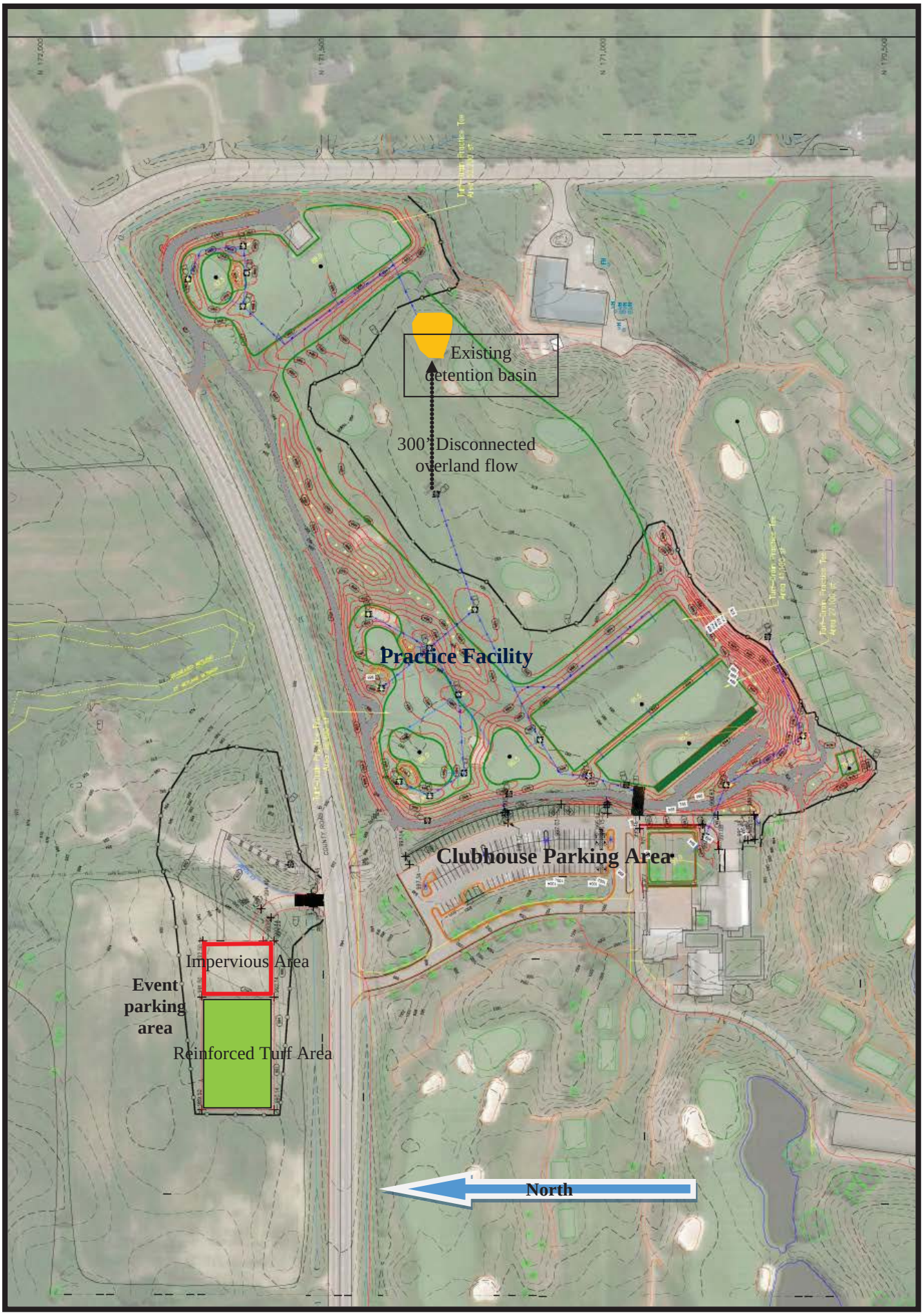

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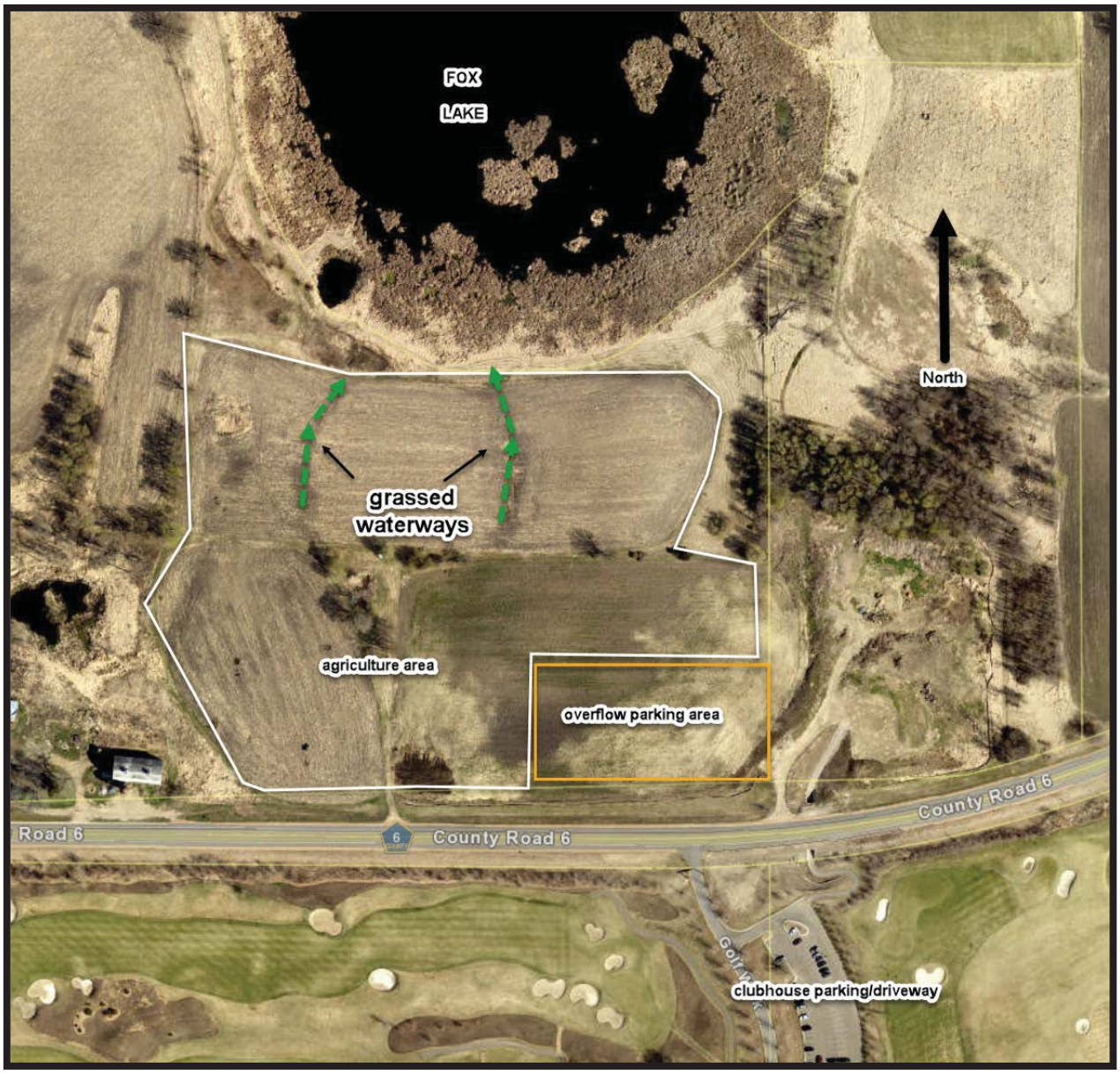
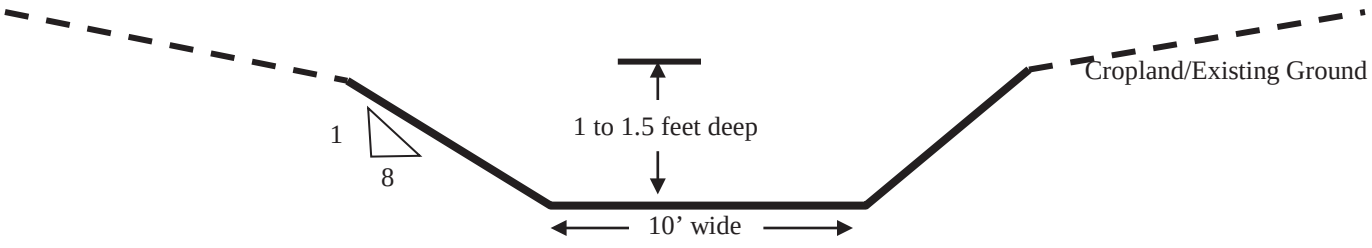




Typical Grassed Waterway Cross Section

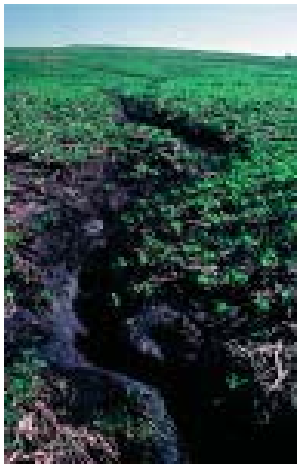
Windsong Farm Golf Club Parking Lot and Practice Facility Improvements
2018-13, Independence
October 5, 2018

Grassed Waterway

Grassed waterways are constructed graded channels that are seeded to grass or other suitable vegetation. The vegetation slows the water and the grassed waterway conveys the water to a stable outlet at a non-erosive velocity.

Grass or permanent vegetation established in waterways protects the soil from concentrated flows. Grassed waterways significantly reduce gully erosion.

A natural drainage way is graded and shaped to form a smooth, bowl-shaped channel. This area is seeded to sod-forming grasses. Runoff water that flows down the drainage way flows across the grass rather than tearing away soil and forming a larger gully. An outlet is often installed at the base of the drainage way to stabilize the waterway and prevent a new gully from forming.



Grass cover protects the drainage way from gully erosion.
Vegetation may act as a filter, absorbing some of the chemicals and nutrients in runoff water.
Vegetation provides cover for small birds and animals.

The expected life span of a waterway is 10 to 20 years. It is Highly determined by the amount of sediment that the grass in The waterway traps. Eventually the cropland at the edge of the grass And the waterway itself will need to be re-excavated to allow for the water to flow into and down the waterway. If upland erosion is not controlled, the lifespan of the waterway is greatly reduced.

MEMORANDUM

TO: **Pioneer-Sarah Creek Watershed Management Commission**
FROM: **James Kujawa and Kirsten Barta, Hennepin County Dept. of Environment and Energy**
DATE: **October 11, 2018**
SUBJECT: **Staff Report**

1. 2016-05 Proto Labs Parking Lot Expansion, Maple Plain. The Commission approved this project contingent upon three conditions. One condition remains open - receipt of an Operation and Maintenance agreement on the biofiltration basin per Staff findings dated September 6, 2016. The agreement has been signed but remains to be recorded on the property title.

2. 2017-03 Equestrian Facility (Bel Farms) Independence. This is a 16.5 acre rural residential parcel located approximately 500 feet north of the intersection of CR6 and Nelson Road. The owner is proposing to construct a new garage/apartment, horse stall barn, indoor arena, outdoor arena, six grass and four sand paddocks for horses. Because this project disturbs greater than 1.0 acre and creates 3.1 acres of additional impervious area, it triggers the Commission's review for Rules D and E. Staff provided grading and erosion control approval contingent upon (1) The applicant assuming the risk and responsibility for any changes to the site plans necessary for final Commission approval and (2) The City of Independence approving a grading permit. In September 2017 the Commission approved the Stormwater Management Plan contingent upon receipt of an approved long-term pond/basin operation and maintenance plan between the landowner and City, to be recorded on the land title. No new information has been received since that time.

3. 2017-04 Windsong Farm Golf Club Practice Facility, Independence. This site is north of CR6 and the entrance to the current Windsong Golf Course. The total area owned by Windsong Farm Golf Club north of CR6 is 126 acres. This project will impact the three easterly parcels (36 acres) of their property. The applicant proposes to construct a new practice facility on a portion of these three parcels. Actual grading/disturbance will be 13.4 acres. New impervious areas will be 0.7 acres. The east shore of Fox Lake (DNR 925W) is the west border of the parcels being impacted. The Commission Rules that apply to this work include Rules D, E, F, and I. Staff recommended approval contingent upon: (1) Specific turf establishment timing requirements being outlined in the SWPPP or Site Plan, (2) Floodplain and Wetland/buffer easements being established over said features on the three parcels where this project is located, and (3) The locations and signage standards for the wetland buffer monumentation being provided to the Commission for review and approval. The Commission approved this project per Staff's recommendations. Item 1 has been addressed adequately, but Staff are still awaiting word on items 2 and 3. This project never proceeded. A new project was submitted revising the original plan and enlarging its scope. Based on the revised plan submittal, project 2017-04 will be removed from the report and project 2018-13 will be started in its place.

4. 2017-05 Ostberg Equestrian Facility, Independence. This is a 40-acre agriculture parcel located just southwest of the intersections of CSAH 6 and Game Farm Road. The owner is proposing to construct a new home, two garages, a horse stall barn, indoor arena, outdoor ring, eight horse paddocks and an access drive off of CSAH 6. The project will disturb 7 acres during construction and create 1.69 acres of new impervious areas. Because this project disturbs more than 1.0 acre and creates 1.7 acres of additional impervious area, this triggers the Commission's review for Rules D and E. There are also two wetlands that have been delineated on this site, so the Commission wetland buffer requirements (Rule I) are triggered. The project received grading and erosion control approval by Staff in October 2017 pending final Commission approvals. The project was approved by the Commission at their November 2017 meeting contingent upon receipt of an approved long-term pond/basin operation and maintenance plan between the landowner and the City, said plan to be recorded on the land title. This information has not been received as of this report.

5. 2018-01 Salem Lane Reconstruction Project, Greenfield. Salem Lane work must be reviewed for compliance with Rules E and F. A stormwater quality review is not necessary because the site disturbance is less than 1.0 acre and less than 0.5 acres of new impervious area. At the January 2018 meeting, this item was approved per Staff's recommendations. The only remaining item is Staff approval of the erosion and sediment control plans. These have not been submitted as of this report.

6. 2018-02W Warren DaLuge Wetland Violation, Greenfield. Staff met with DaLuge and came to an agreement for him to voluntarily remove any fill placed in the wetland on his farmstead by December 1, 2017.As of February 8 the work had not started. Staff requested a restoration order be issued for compliance by June 15. The order was sent by certified mail. Staff has stopped in on the site four or five times since the June 15th deadline. They have been actively moving dirt out of the wetland, but are only about 3/4 of the way done to date. As long as they continue to work on it, Staff will continue to monitor their progress and update the Commission.

7. 2018-07W 810 Copeland Road, Independence. The City of Independence issued a notice last fall for this landowner to remove manure fill from Fox Lake. It has not been accomplished to date. The DNR and MPCA were contacted by PSC staff about this violation on May 30, 2018. The MN DNR issued a Resource Protection Order to the landowner on May 31, 2018. DNR Hydrologist Jason Spiegel and MPCA Feedlot Inspections Officer Walter Jordan were also contacted by PSC staff and visited the site. They are coordinating their efforts to have this material removed. The DNR surveyed the site and issued a restoration order giving them until September 30, 2018 to remove the material. This site has been restored and certified as complete by the DNR. This item will be removed from the report.

8. 2018-010 Chippewa Estates, Loretto. This is a 1.54-acre parcel located in the far northeast corner of Loretto on Chippewa Road. The project is proposing to subdivide the lot into four single family residential lots and triggers the Commission's review for Rules D and E. The applicant has requested administrative approval from Staff to begin grading the site. Staff provided this approval contingent upon the City of Loretto issuing a grading permit and that the applicant understands they assume all risks associated with changes that may be necessary for final Commission approvals. At their August 16, 2018 meeting, the Commission approved Staff findings with three conditions regarding the operations and maintenance plan, sequencing, and retrofitting of the pond.

It is Staff's understanding that the City chose not to expand their existing regional pond to accommodate this site's stormwater, so the back and side yard filter system will be installed per the site plans. With this being the case, the only remaining item necessary for final approval is the Operation and Maintenance agreement on the stormwater system. If the City chooses not to maintain the filter system, the applicant must provide an operation and maintenance plan that is acceptable to the City and the Commission and must be recorded on the title to the property.

9. 2018-011W Hilary Driveway Access Wetland Replacement Plan, Greenfield.* This replacement plan corresponds to the Town Hall Drive Wetland Delineation (2018-09W) Two wetlands were identified, delineated and surveyed on the property with that delineation. This plan is for impacting and replacing 3,968 SF of wetland to install an access driveway into this lot. 2:1 replacement ratio mitigation is proposed. 1:1 credits from the Ball Wetland Bank (account 1546) in Greenfield and 1:1 credits from the Stamer Wetland Bank (account 1542) in Stearns County. The project application has been noticed per WCA requirements. A Technical Evaluation Panel (TEP) meeting on the sequencing analysis was held August 23, 2018. The TEP requested more information on the sequencing analysis before they could make their final recommendations. Based on additional information received on October 5, the TEP recommends that the sequencing analysis is adequate and that the Commission approve the wetland replacement plan Staff recommends approval of this wetland replacement plan.

10. 2018-012W 7770 Woodland Trail, Greenfield. This is a 41.5-acre parcel inspected on June 21, 2018 for the presence and extent of wetlands by Kjolhaug Environmental Services. It is located in Section 16, Township 119 North, Range 24 West, Hennepin County PID#: 1611924340002. Three wetlands were identified, delineated and surveyed on the property. Staff has visited the site and reviewed the report. The delineation was found to be accurate and has been approved per WCA requirements. This item will be removed from the report.

11. 2018-013 Windsong Farm Golf Club Parking Lot and Practice Facility Improvements, Independence. This project will take place on the golf course property on both sides of CR 6. They propose to reconstruct their existing practice facility and clubhouse service access road, reconstruct their existing main parking lot and construct a new event overflow parking lot. Commission Rules that apply to this work will include Rules D and E. A recommendation will be provided to the Commission at their meeting.

12. 2018-014 Verizon Tower, Independence. Verizon Wireless is proposing to build a 120-foot cell tower and a 12x30 foot equipment building on the south side of Highway 12, just west of Mobile Marine (PID

2211824440001). There is floodplain located on this property and the project is considered commercial. The Commission rules require review and approval of the grading and erosion control site plans. Disturbance and grading on this project will be less than 1 acre. Approximately 6,500 SF (0.15 acre) of new impervious area will be created. The disturbance and new impervious area do not trigger the thresholds for the Commission's review of stormwater management for this site. Staff will administratively approve this project.

13. 2018-015W Kettering Creek Wetland Delineation, Greenfield. This is two parcels with approximately 21 total acres (parcel numbers: 2811924320037 and 2811924320038). The western portion of the site is deciduous forest and the eastern side is a fallow field with wetlands. The eastern side was mass graded sometime between 2003 and 2006 as part of the Greenfield Business and Industrial Park. Westwood delineated two wetlands (W1 and W2) and one watercourse (WC1) on these parcels. Staff has visited the site and reviewed the delineation report and finds the delineation to be accurate. The public comment period on this delineation report expires on October 15, 2018. If no comments are received, it will be approved and noticed per WCA requirements.

LOCAL WATER PLANS

Per the amended MN Rule 8410.0105, subp. 9, and 8410.0160, subp. 6, Local Water Plans must be prepared by metropolitan cities and towns and must become part of their local comprehensive plans. They must be revised essentially once every ten years in alignment with the local comprehensive plan schedule. A municipality has two years prior to its local comprehensive plan being due to adopt its local water plan. The next local comprehensive plans are due December 31, 2018; thus all cities and towns in the seven-country metropolitan area must complete and adopt their local plans between January 1, 2017 and December 31, 2018.

Local plans from the cities of **Loretto** and **Medina** were approved in 2017.

Minnetrista's Local Plan was reviewed and comments were provided to the city in July. Updated stormwater management plans were received in September. Staff reviewed the updates and recommends the Commission approve the City of Minnetrista's Final Comprehensive Surface Water Management Plan dated September 2018. See memo in this month's packet.

Greenfield's Local Plan comments were forwarded to the City in August 2018 for their consideration in their final plan. No updates to the plan have been received to date.

GRANT OPPORTUNITIES

MPCA put out an RFP for section 319 funding (pass through from US EPA) to implement watershed wide impairment reductions. Hennepin Staff put in an application on behalf of the watershed, but Pioneer Sarah Creek was not selected for the final round of consideration this year. MPCA feedback indicates there were two reasons for this: 1. Lack of general idea how much it would cost to clean up the entire watershed (staff will work on producing this for the next round of applications), and 2. Because the state is not confident the watershed itself would be willing to invest in this project. Pioneer Sarah Creek does not have a strong track record of spending or allocating funds for larger projects so MPCA was not comfortable entering into a 16 year pilot program that involves spending a significant amount of money at this time.

Hennepin will work together with TRPD staff to come up with some kind of ballpark monetary amount for the next round of applications – there will be three more years to apply.

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Pioneer-
Sarah Creek
Watershed Management Commission
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DATE: **OCTOBER 15, 2018**

TO **KIRSTEN BARTA, RURAL CONSERVATIONIST, HENNEPIN COUNTY DEPARTMENT OF ENVIRONMENT AND ENERGY,**

FROM: **JIM KUJAWA**

RE: **PIONEER-SARAH CREEK WATERSHED METRICS DATA REQUEST**

Below is the information you requested. If you would like more detailed information, please visit our web site at the following link; http://www.pioneersarahcreek.org/annual-reports.html. This link has the PSCWMC annual reports between 2003 and 2017.

The following information is from our 2017 annual report. We reviewed 7 site plans for our member communities of Greenfield, Independence, Minnetrista, Medina, Maple Plain and Loretto. Please let me know if you have any questions.

1. Numbers on TSS reductions (in tons) and any Phosphorus or nutrient reductions you have (in pounds)

2. How many projects you have completed (both capital and cost share)

Baker Regional Park, gully control project was approved for design with construction expected in 2018-2019. The most cost-effective approach to stabilize the channel is to install a series of rock grade control structures throughout the main ravine and two tributaiy ravines to control the channel grade as well as line the entire channel with combination of rounded field stone and angular rip-rap up to the expected 10-year flood elevation. 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 $130/16. based on a project life of 30 years. This reduction in annual phosphorus load would accomplish 15% of the total watershed phosphorus load reduction called for in the TMDL.

Greenfield identified a non-CIP project at Central Park and the Commission cost-shared in this project with multiple benefits. This project will install a diversion swale and stormwater pond to control surface water from the City's Central Park from running into cropland below the park. The project will capture nearly all runoff from City Park and reduce phosphorus loads by 6 lbs. per year into the Dance Hall Creek Watershed and Lake Sarah. As a component to the stormwater pond work the City of Greenfield proposes to install native pollinator and vegetation plantings within the project area to help stabilize, improve and diversify natural resource outcomes of the project.

3. A few stories or neat project descriptions and pictures!

4. Any challenges you are facing and why

Challenges are working in the rural area and getting 'buy-in' from these landowners to install long term sustainable conservation practices that will reduce TMDL/WRAPS impairments in our watershed. Landowner skepticism with government and/or that there is a problem.

5. Your current highest priority issues to tackle in your watershed

See #4, specifically in the rural areas of the Ardmore, Independence, and Dance Hall Creek subwatershed assessments

6. Any additional quantitative water quality metrics you have – for example de-listing of impaired waters, pounds of trash removed, residents engaged or educated, pounds of carp removed

The WRAPS study was approved by the MPCA on July 26, 2017. The EPA approved the Pioneer-Sarah Creek TMDL on September 29, 2017. Both reports are available on the Commission's website, http://www.pioneersarahcreek.org/wraps.html, and the MPCA website at https://www.pca.state.mn.us/water/tmdl/pioneer-sarah-creek-watershed-restoration-and-protection-strategy-tmdl-project.

7. Statistics on what types of projects you are doing – erosion control, carp removals, rain gardens, stream restorations, alum treatments, that type of thing

Commission staff assisted approximately 25 landowners/agency/developer contacts with wetland-related questions. In Greenfield, Loretto and Maple Plain, they reviewed five wetland boundary/type applications; three wetland no-loss/exemptions and one wetland sequencing analysis. No wetlands were impacted in the above mentioned communities.

Four WCA violations were investigated and resolved; two others were determined to not be WCA/Commission violations. The Commission participated in five Technical Evaluation Panels (TEPs) throughout the watershed.

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 Lake. Ardmore, Half Moon, Hafften and Spurzem Lakes were also included in the 2017 lake monitoring program.

2017 was the final year of planned whole-lake CLP treatments for Lake Sarah. The Commission's cost share was $8,823.

8. Future priorities

Expand our education outreach programs

Utilize our BWSR watershed wide grant money for three projects identified in the Lake Ardmore Subwatershed Assessment. 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. 3) Project PD3, Pond Excavation, and Enlarge existing stormwater pond to provide additional treatment for urban runoff. These three projects will reduce nutrient loads into the area lakes by 3.3 lbs/year of phosphorus and approximately 6,000 lbs/year of total suspended solids.

9. Anything else you especially want to highlight

The Commission's Facebook page was introduced in 2017. Content is posted for free and includes links to the Commission and other partner websites. There were 36 posts; largest reach was 194 people and 21 engagements.

JCK

Technical Memo

WENCK
Responsive partner.
Exceptional outcomes.

To: Justin Berndt, Project Manager, US Army Corps of Engineers

From: Lucius Jonett, Wenck Associates, Inc.

Copy: Brian Vlach, Senior Water Resources Manager, Three Rivers Park District

Date: September 24, 2018

Subject: Baker Ravine Stabilization – Basis of Design

Lake Independence is a recreational lake impaired for excess nutrients. In 2007, a TMDL was approved for Lake Independence requiring that the phosphorous load be reduced to an in-lake growing season mean of 36 ug/l for total phosphorus. The TMDL set a target of reducing the TP loading from the watershed by 1,081 lbs./yr., a 45% reduction from the baseline condition. The cities with land that drain to the lake each have an obligation under the TMDL to reduce phosphorus loading to the lake; Independence by 535 pounds per year, Medina by 284 pounds per year, and Loretto by 53 pounds per year. The City of Maple Plain was not assigned a TP load reduction under the TMDL.

In order to meet their TMDL requirements, the City of Independence hired the Anoka Conservation District (ACD) to complete the Lake Sarah and Lake Independence Stormwater Retrofit Analysis. This report was completed in 2014 and identifies several eroding ravines as sources of pollutants to Lake Sarah and Lake Independence. One of the identified ravines (GS-50 or Baker Ravine) discharges to Lake Independence and is located on Three Rivers Park District (TRPD) property at Baker Park Reserve. The study identified GS-50 as a significant source of sediment and phosphorus discharge (300 tons of sediment and 277 lbs. of phosphorous annually) to the lake and was given a high priority for stabilization, though the analysis stopped short of recommending specific remedial actions because the ravine and much if its watershed were outside the City of Independence.

Three Rivers Park District (TRPD), City of Independence, City of Medina, and the Pioneer-Sarah Creek Watershed Management Commission (PSCWMC) were interested in further investigating approaches to reducing the pollutant loading exported to Lake Independence from the ravine. TRPD hired Wenck in 2016 to complete a Ravine and Subwatershed Assessment to prescribe appropriate stormwater management practices in the watershed draining to the ravine as well as stabilizing the ravine itself. One of the key findings from the assessment work was that the most cost-effective project to decrease phosphorus loading to Lake Independence from the project area is to stabilize the main ravine channel. A further reduction in phosphorus loading would be achieved by stabilizing two secondary drainage channels that are tributary to the main ravine.

The recommended approach for stabilization is to install a series of riprap swales and control structures throughout the ravine to control the channel grade as well as line a portion of the channel with vegetated riprap up to the water elevation expected for a 10-year discharge event. Estimated 30-year life cycle costs for the stabilization of the main ravine channel is $376,500 and two tributary channels is $94,500. The estimated annual TP

load reduction from the main channel is 112 pounds and from the two tributary channels is another 22 pounds. The total estimated TP load reduction of 134 pounds accounts for a 12% load reduction from the watershed as required in the TMDL. The lifecycle costs per pound of TP is $112 for the main channel and $143 for the two tributary channels.

TRPD and the Pioneer-Sarah Creek Watershed Management Commission (PSCWMC) used the Ravine and Subwatershed Assessment to apply for and were selected for a BWSR Clean Water Fund grant to help fund the project. Other funding partners include a Hennepin County opportunity grant, PSCWMC, TRPD, City of Independence, City of Medina and the Lake Independence Citizens Association. The following table summarizes the funding sources and amounts:

Funding Source	Funding Amount
BWSR Clean Water Fund	$ 416,000
Hennepin County Opportunity Grant	$ 59,500
Pioneer-Sarah Creek Watershed Management Commission	$ 10,500
City of Independence	$ 10,500
City of Medina	$ 10,500
Three Rivers Park District	$ 10,500
Lake Independence Citizens Association	$ 2,500
Total Funding	**$ 520,000**

Design Considerations

Wenck progressed through final design of the ravine stabilization balancing several goals and priorities to find the best solution that met as many of them as possible while still meeting the requirement of reducing sediment and nutrient load to Lake Independence. These requirements include:

- Reduce long-term maintenance. This project is a “once in a life time” type project due to the construction costs and site access to and through the ravine. It has to be completed effectively and be long-lasting. Once the stabilization practices are installed, getting through the ravine in the future will require driving over the installed practices. If a stabilization feature were to fail in the middle, getting to it would be destructive and require repair to the other features that are driven over.
- Minimize the amount of tree removal to only what is necessary for construction access as governed by Three Rivers Park District ordinances. All TRPD properties must maintain a high percentage of natural vegetation communities, which only allows a fixed percentage of the property to be developed. Major tree removal would change the existing plant community and would constrain any future development activities at the Baker Park Reserve so only the number of trees needed for construction and site access is allowed. All tree removals for access have been strategically proposed on the south sides of the side ravines to maintain the maximum amount of buffer between the ravines and the campground on the north side of the side ravines.
- Use bioengineering practices to the extent possible. Aesthetically, TRPD wants the ravine to look as natural as possible. Wenck proposes to start with the softest practices possible when design ravine stabilization projects; from doing nothing, to resloping and revegetating, using woody material to armor toe of slopes, to using vegetated riprap to

armor toe of slopes. There is no intent to riprap the entire ravine, only what is needed for the long-term success of the project. The same thought process has been applied to Baker Ravine and as a result several areas will have no practices applied where they are not necessary. This assessment method also allows for the avoidance of sensitive resources, such as the delineated wetland within the channel. Revegetation efforts are going to be very limited since the tree removal is also limited. All disturbed areas, vegetated riprap areas, and a buffer along the creek will be seeded with native seed mix to aim for establishment of an understory community from the additional sunlight that will reach the forest floor after the selective tree removal is completed. Woody material as an in-channel practice has also been ruled out based on life expectancy. The best long-term solution is to use angular granite riprap which will outlast woody materials that have an expected life of 15-20 years. Riprap will be installed by shaping slopes and covering the riprap with soil and seeding it to camouflage the practice as much as possible and allow for some native vegetation to establish over the armoring. Soil will not be placed below the 10-year or Normal Water Level elevations as it will likely wash away before any vegetation could establish.

- Minimize impact to existing water and natural resources like wetlands, sensitive plant communities, etc. During the site topography survey, Wenck identified and marked trees and delineated one wetland. The project was designed around the wetland, a 15' no-work buffer added to the wetland boundary and all construction access routed around the wetland so that there would be zero impact.

Wenck went through preliminary design of the project, had a site meeting with TRPD to review and edit the preliminary design, and has finalized the ravine stabilization project design accomplishing the above objectives.

Permitting & Coordination

As part of the preliminary design, we reached out to the regulatory agencies that might have jurisdiction and want to review the project including, Pioneer-Sarah Creek Watershed Management Commission, MN DNR and the US Army Corps of Engineers. The MN DNR has determined that they do not need to review this project.

Prior to submitting a Joint Application and impact figure to the Corps, we requested an onsite meeting with staff to review the site, the project and discuss the best permitting route and Corps jurisdiction of the resource. The ravine water level is driven largely by stormwater and consistently contains no water throughout portions of its reach, making it challenging to identify the extent of regulatory water resource present. During the site visit, the extent of Corps jurisdiction was determined, and the Normal Water Level was established. We are requesting approval to perform this work under Nationwide Permit 13, Bank Stabilization, with a request for a waiver to the 500-linear foot threshold. This project aims to perform the bank stabilization activities as necessary for erosion control after careful thought and consideration towards the level of armoring. We do not anticipate that the discharge will result in any more than minimal adverse environmental effects and have designed the project to provide a significant ecological benefit to downstream water resources. The project does not propose more than an average of one cubic yard per running foot of stabilization practices and no discharges in special aquatic sites (wetland) will occur.

Conclusion

Information gathered and discussed during the site visit with the Corps was used to delineate a Normal Water Level within the ravine the following day and is shown on the plans to describe the physical extent of Corps jurisdiction. We appreciate the Corp staff time in meeting onsite and respectfully submit our application for your review on the Baker Ravine stabilization project.







Pioneer-Sarah Creek Watershed Management Commission

ThreeRivers PARK DISTRICT

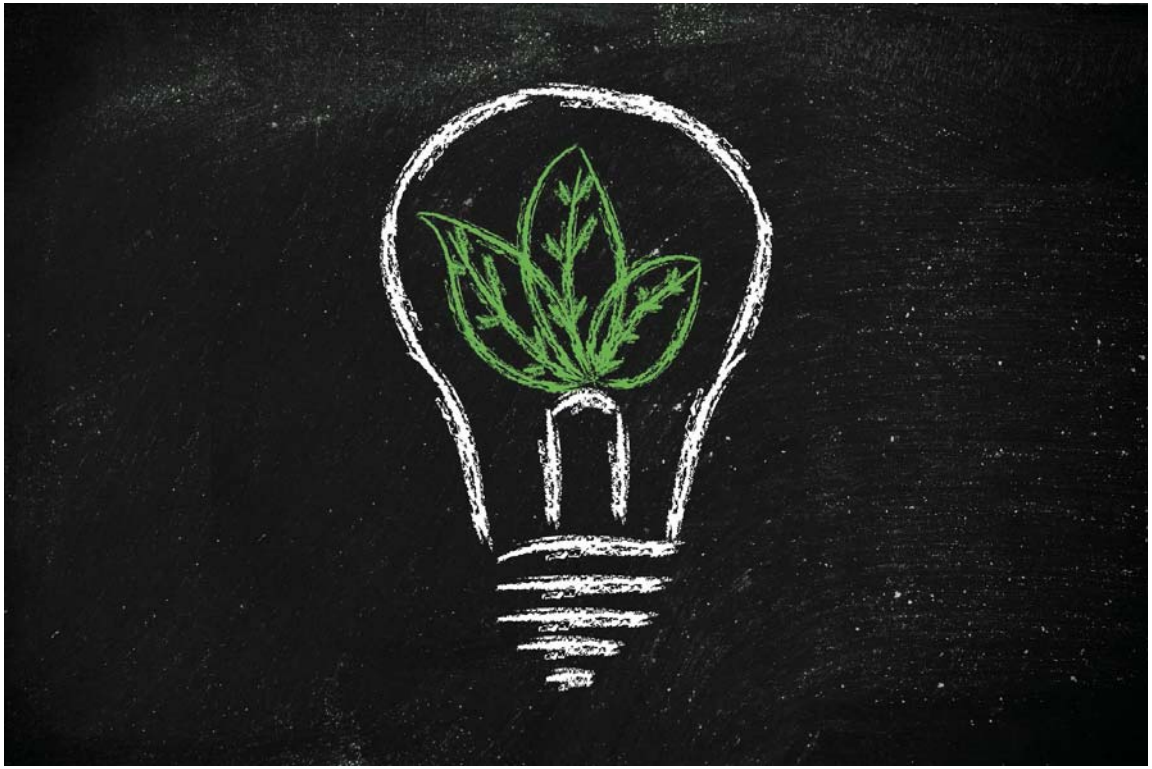
BAKER RAVINE STABILIZATION

Presented by
Lucius Jonett, PLA

WENCK

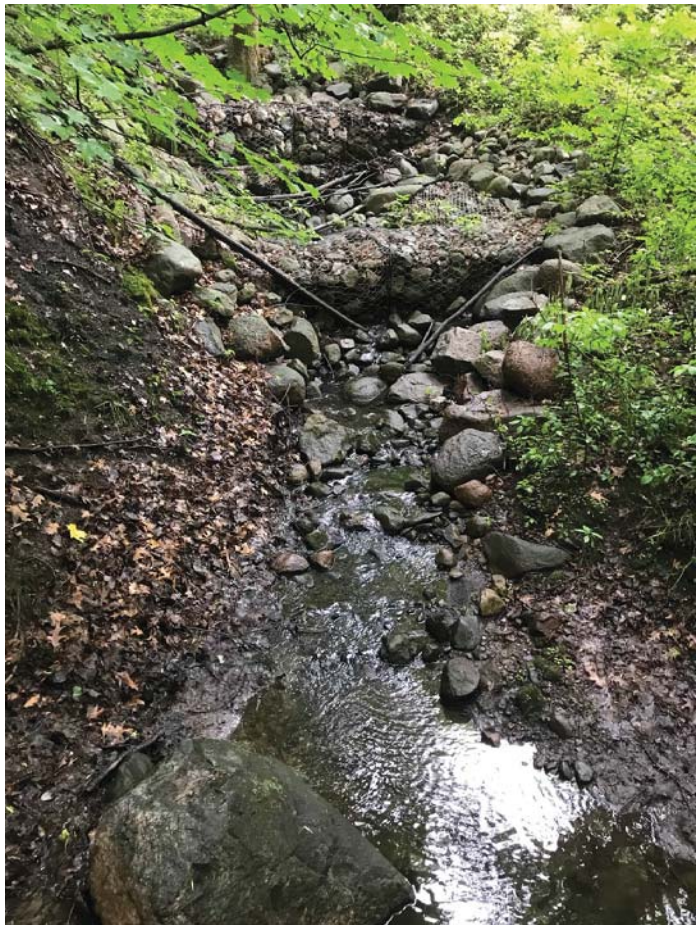
October 2018

WHY



EXISTING CONDITIONS

South Side Channel Looking Downstream



Existing Gabion Basket Grade Control Structures

EXISTING CONDITIONS

Looking Upstream, South Side Channel from Main Ravine

Outside Bend Erosion from Stormwater Flow Through the Ravine Channel

EXISTING CONDITIONS

Outside Bend Erosion from Stormwater Flow Through the Ravine Channel

Looking Upstream, North Side Channel from Main Ravine

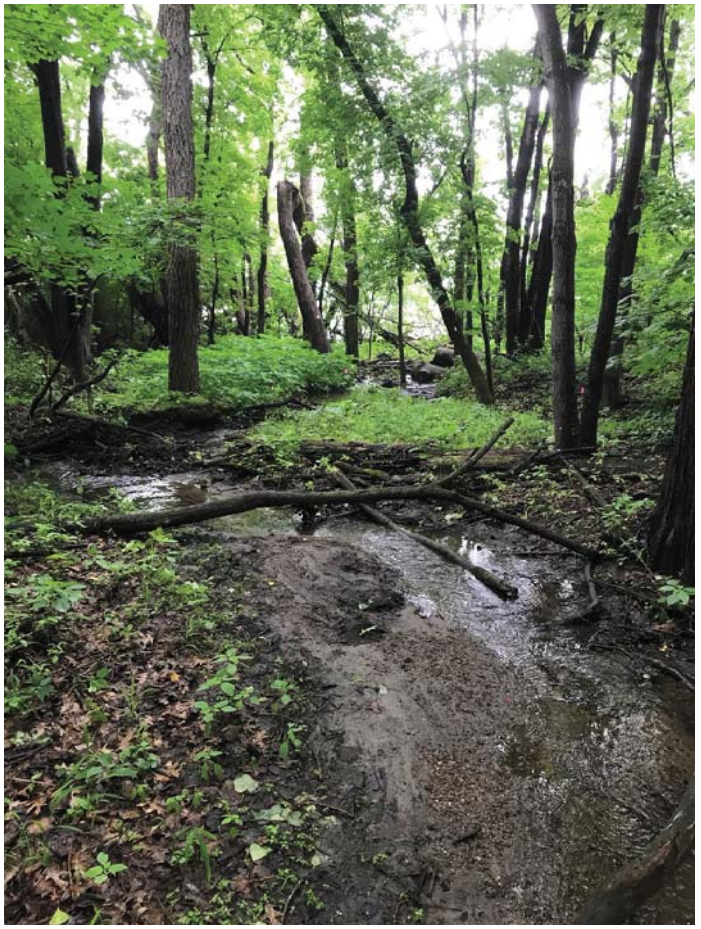
EXISTING CONDITIONS

North Side Channel Looking Downstream

Main Ravine Channel Viewed from North Side Channel

EXISTING CONDITIONS

Without open canopy and sunlight, ground cover vegetation will not establish to stabilize banks.



Pink flags of delineated wetland area. Lake Independence visible downstream.

LAKE INDEPENDENCE

A recreational lake impaired for excess nutrients

- **2007** - TMDL approved for Lake Independence requiring that the phosphorous load be reduced
- **2014** - City of Independence hired the Anoka Conservation District (ACD) to complete the Lake Sarah and Lake Independence Stormwater Retrofit Analysis
- **2016** - Three Rivers Park District (TRPD) hired Wenck to complete a Ravine and Subwatershed Assessment
- **BWSR Clean Water Fund Grant** - Other funding partners are included in the following table:

Funding Source	Funding Amount
BWSR Clean Water Fund	$ 416,000
Hennepin County Opportunity Grant	$ 59,500
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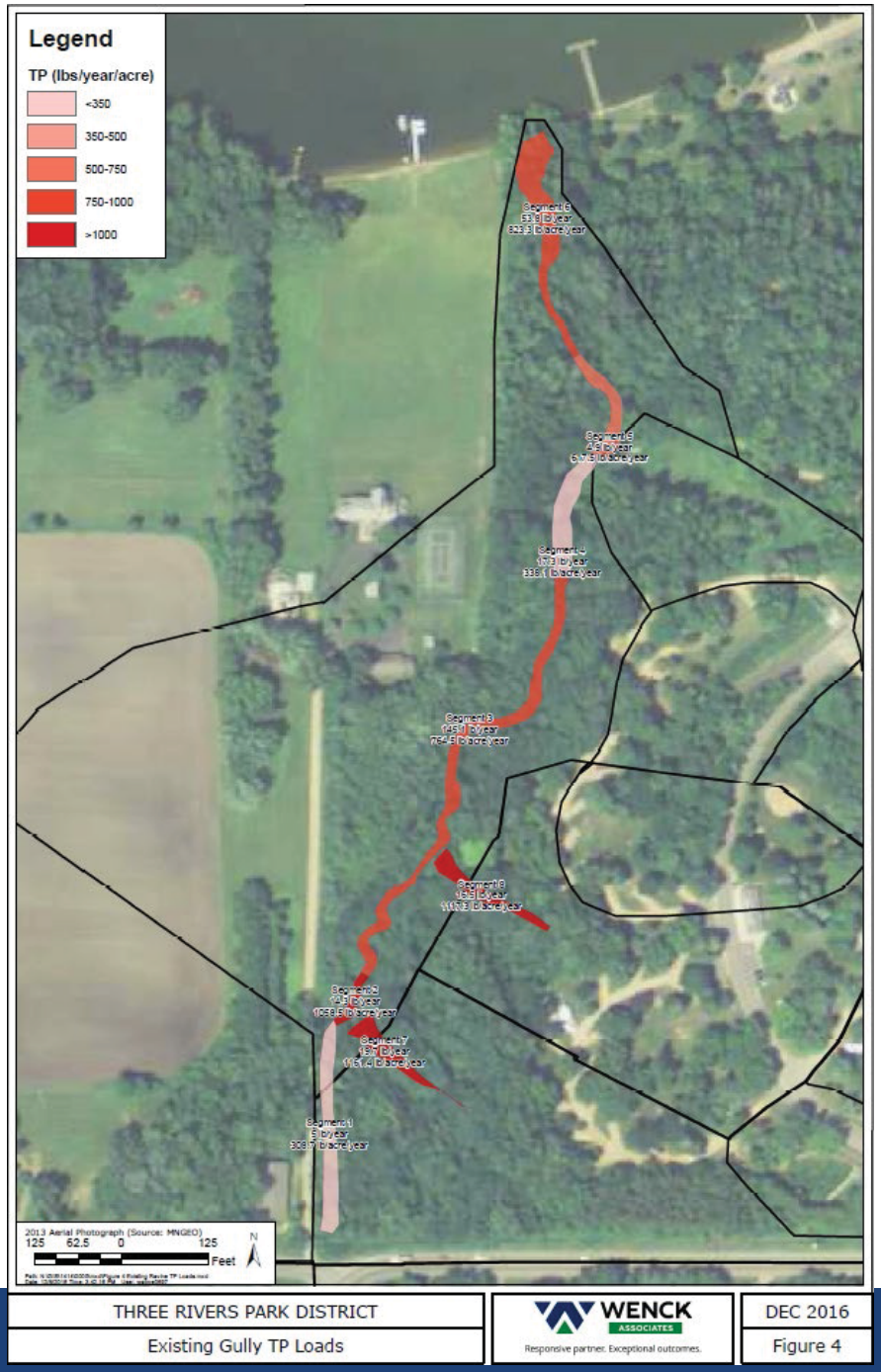
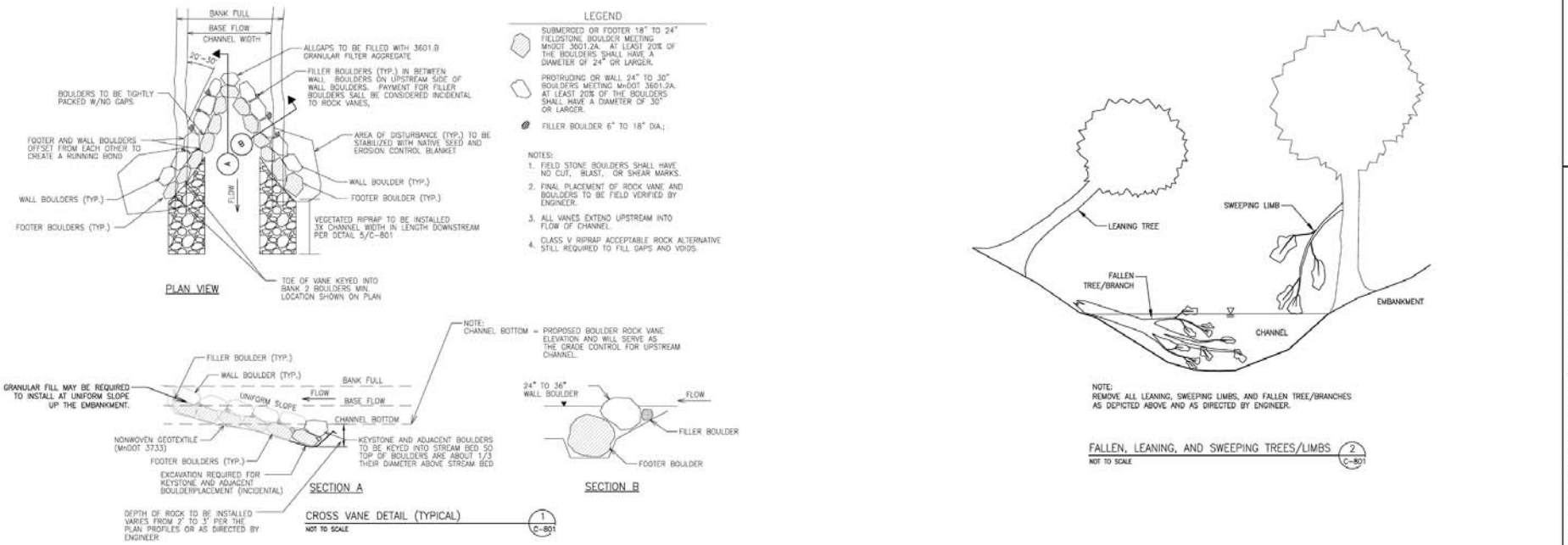
Total Funding	**$ 520,000**

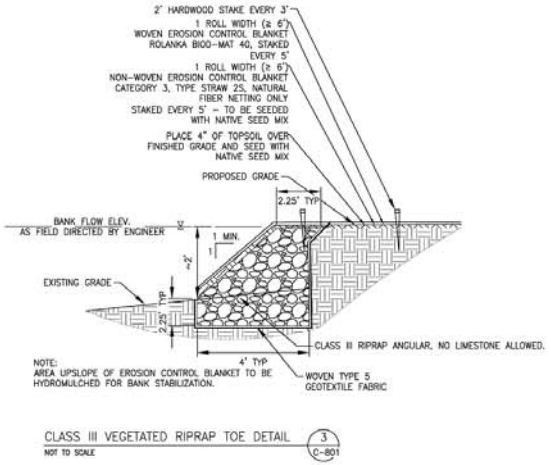
POLLUTANT REMOVAL ESTIMATES

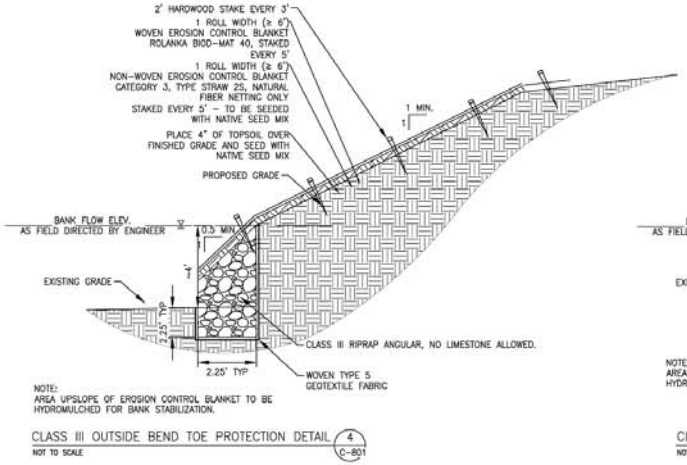
- The estimated annual TP load reduction from the main channel is 112 pounds and from the two tributary channels is another 22 pounds.
- The total estimated TP load reduction of 134 pounds accounts for 15% of the watershed and 12% of the total phosphorus (watershed + internal) removal required to meet water quality goals in the TMDL.
- The lifecycle costs per pound of TP is $130 per pound.

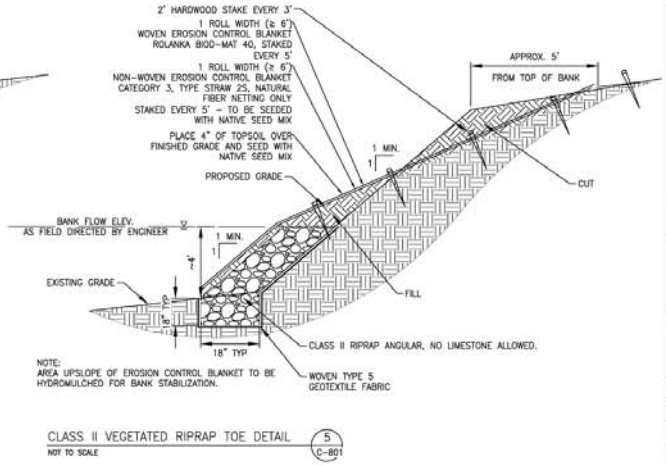


DESIGN









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

Issue #	Date	Description
0	07/18/2018	90% DESIGN FOR REVIEW
1	08/16/2018	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-801

Sheet Title:
DETAILS

SIMILAR PROJECT –
LAKE MINNETONKA REGIONAL PARK CHANNEL STABILIZATION

Before

Tree Clearing

SIMILAR PROJECT –
LAKE MINNETONKA REGIONAL PARK CHANNEL STABILIZATION

More Tree Clearing

Construction

SIMILAR PROJECT –
LAKE MINNETONKA REGIONAL PARK CHANNEL STABILIZATION

Construction

Construction

SIMILAR PROJECT –
LAKE MINNETONKA REGIONAL PARK CHANNEL STABILIZATION

Vegetation

3-Months After Vegetation

SIMILAR PROJECT –
LAKE MINNETONKA REGIONAL PARK CHANNEL STABILIZATION

9-Months After Vegetation

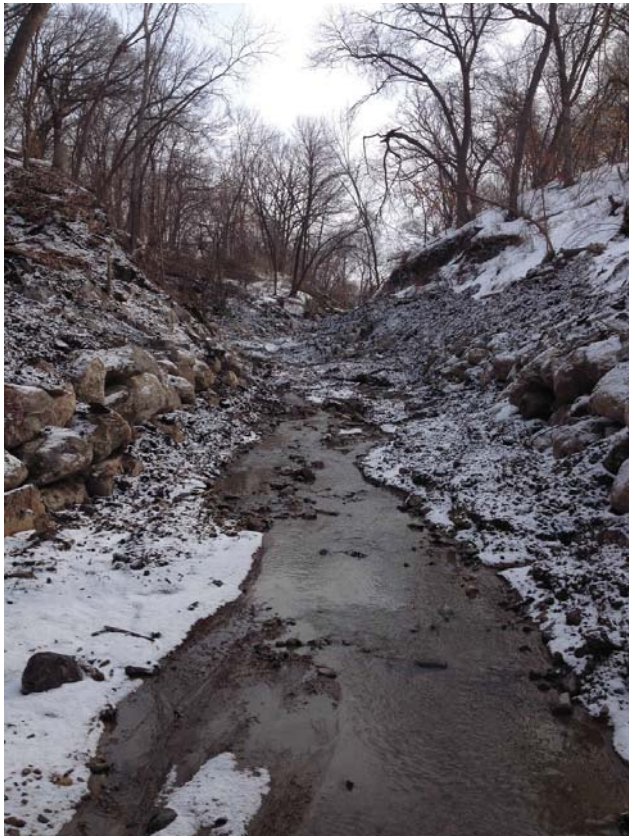
16-Months After Vegetation

SIMILAR PROJECT – GLEN CREEK

Before

SIMILAR PROJECT –
GLEN CREEK

Tree Clearing



Construction

SIMILAR PROJECT – GLEN CREEK

Construction

SIMILAR PROJECT –
GLEN CREEK

Construction

SIMILAR PROJECT – GLEN CREEK

Revegetation

13-Months After Revegetation

SIMILAR PROJECT – GLEN CREEK

13-Months After Revegetation

24-Months After Revegetation

SIMILAR PROJECT –
GLEN CREEK

24-Months After Revegetation

CONSTRUCTION PLANS

CONSTRUCTION PLANS FOR
BAKER RAVINE STABILIZATION
PREPARED FOR
PIONEER–SARAH CREEK WATERSHED MANAGEMENT COMMISSION
AUGUST 2018

PROJECT VICINITY MAP

INDEX OF SHEETS:

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

WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

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3800 COUNTY RD 24 MAPLE PLAIN, MN 55359

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3235 FERNBROOK LANE N PLYMOUTH, MN 55447

Issue #	Date	Description
0	07/15/2019	90% DESIGN FOR REVIEW
1	08/15/2019	100% DESIGN FOR REVIEW

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PRELIMINARY
NOT FOR CONSTRUCTION

License #: _____
Date: _____

Project #	1508-0007
Drawn By:	SJB
Issue Date:	XXXX
Issue #:	1

Sheet #
G-101

Sheet Title
TITLE SHEET & INDEX

CONSTRUCTION PLANS

GENERAL NOTES:

1. 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.
2. ALL QUANTITIES ARE APPROXIMATE AND MAY VARY TO ALLOW COMPLETION OF WORK.
3. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-2 ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".
4. 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.
5. CONTRACTOR SHOULD ANTICIPATE PRIVATE UTILITY CONFLICTS THROUGHOUT THE PROJECT SUB CUT AND TRENCH AREAS AND SHALL COORDINATE WITH PRIVATE UTILITY OWNERS.
6. 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.
7. INSTALL AND MAINTAIN EROSION CONTROL DEVICES AS SPECIFIED OR AS DIRECTED BY ENGINEER.
8. CONTRACTOR SHALL COMPLY WITH ALL STATE, COUNTY, AND CITY PERMITS.
9. MAINTAIN MAIL, GARBAGE, AND RECYCLING SERVICES TO PROPERTIES.
10. PROTECT EXISTING PAVEMENT AND SITE FEATURES, EXCEPT AS NOTED.
11. CONTRACTOR TO COORDINATE AND MAINTAIN ACCESS TO PROPERTIES.
12. MAINTAIN DRAINAGE CONVEYANCE DURING CONSTRUCTION (BOTH PIPED AND OVERLAND).
13. 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:

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

DEWATERING NOTES:

1. NO BID ITEM HAS BEEN PROVIDED FOR DEWATERING AS ALL DEWATERING WORK NECESSARY FOR CONSTRUCTION WILL BE CONSIDERED INCIDENTAL.
2. ENERGY DISSIPATION SHALL BE PROVIDED AT ALL DISCHARGE POINTS TO PREVENT SCOUR.
3. PROVIDE SILT BAGS FOR DEWATERING.
4. 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.
5. 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.
6. 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.
7. 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:

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

TRAFFIC CONTROL NOTES:

1. 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.
2. 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.
3. 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:

1. SEE SHEETS C-201 AND C-202 FOR EROSION AND SEDIMENT CONTROL MEASURES.
2. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED DEPENDING ON SITE CONDITIONS DURING CONSTRUCTION. COORDINATE WITH ENGINEER.
3. 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.
4. REMOVE TRACKED SEDIMENT FROM ALL PAVED SURFACES BOTH ON AND OFFSITE ON A DAILY BASIS (INCIDENTAL).
5. MINIMIZE DUST FROM CONSTRUCTION OPERATIONS BY PROVIDING WATER OR OTHER APPROVED METHOD ON A DAILY BASIS (INCIDENTAL).

HORIZONTAL AND VERTICAL CONTROL:

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

ABBREVIATIONS

BV	BUTTERFLY VALVE
℄	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

- STORM SEWER FLARED END SECTION
- 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
- XXX 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 ACESS 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

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

Issue #	Date	Description
0	01/30/2018	90% DESIGN FOR REVIEW
1	02/15/2018	100% DESIGN FOR REVIEW

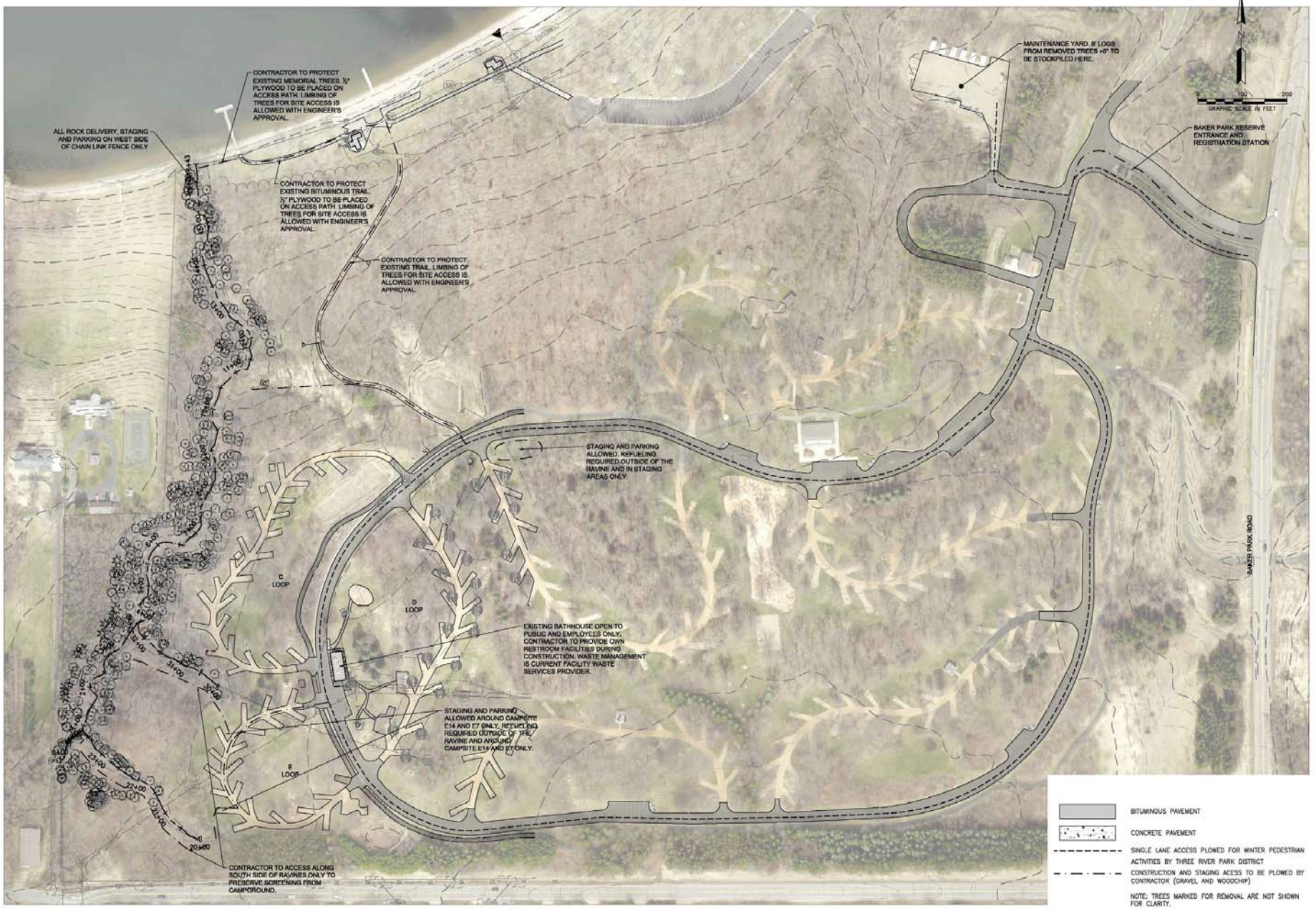
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRELIMINARY
NOT FOR CONSTRUCTION

License #: _____
Date: _____

Project #:	1508-0007
Drawn By:	SJB
Issue Date:	XXXX
Issue #:	1
Sheet #	G-102
Sheet Title:	LEGEND AND NOTES

CONSTRUCTION PLANS



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

Issue #	Date	Description
3	03/15/2019	90% SUBMITTAL REVIEW
2	03/15/2019	60% DESIGN SUBMITTAL REVIEW
1	03/15/2019	

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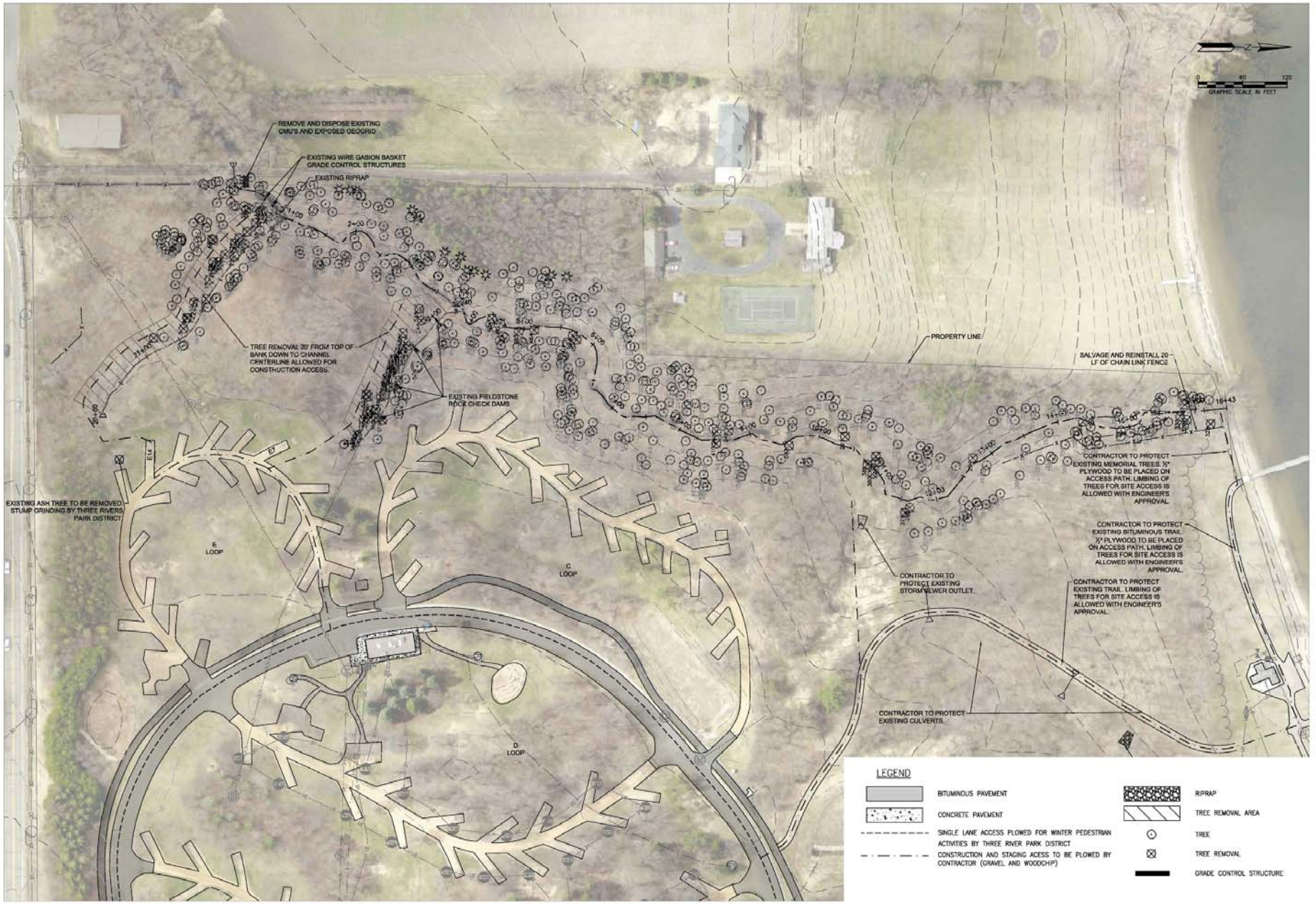
PRELIMINARY
NOT FOR CONSTRUCTION

License #: _____
Date: _____

Project #	1508-0007
Drawn By	SJB
Issue Date	XXXX
Issue #	1
Sheet #	C-100
Sheet Title	SITE ACCESS PLAN

CONSTRUCTION PLANS



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

Issue #	Date	Description
0	07/05/2018	90% DESIGN FOR REVIEW
1	08/15/2018	90% DESIGN FOR REVIEW

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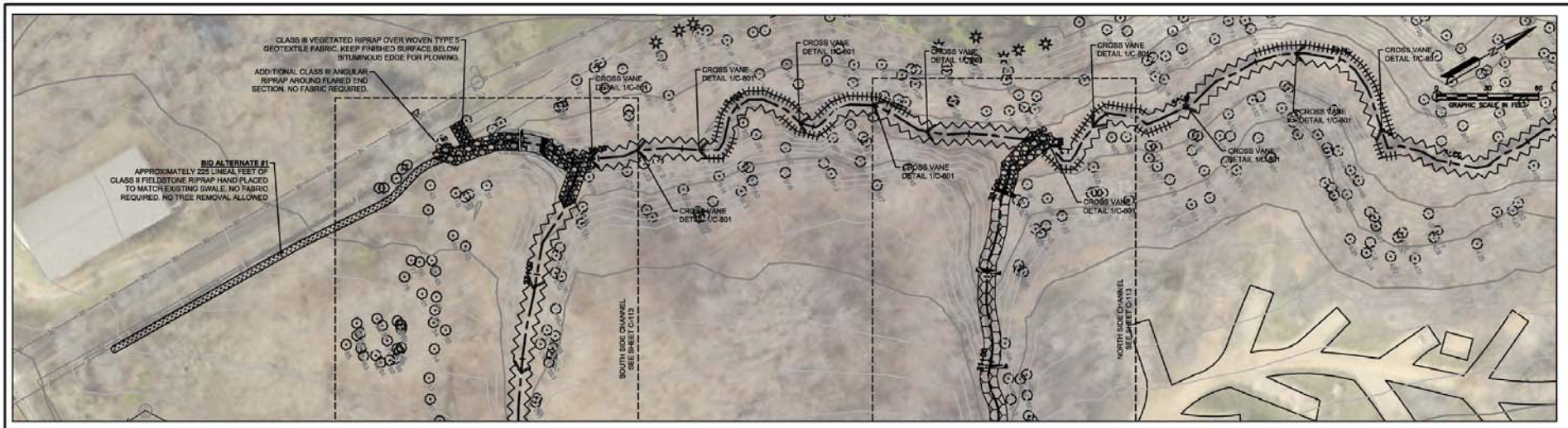
License #:
Date:

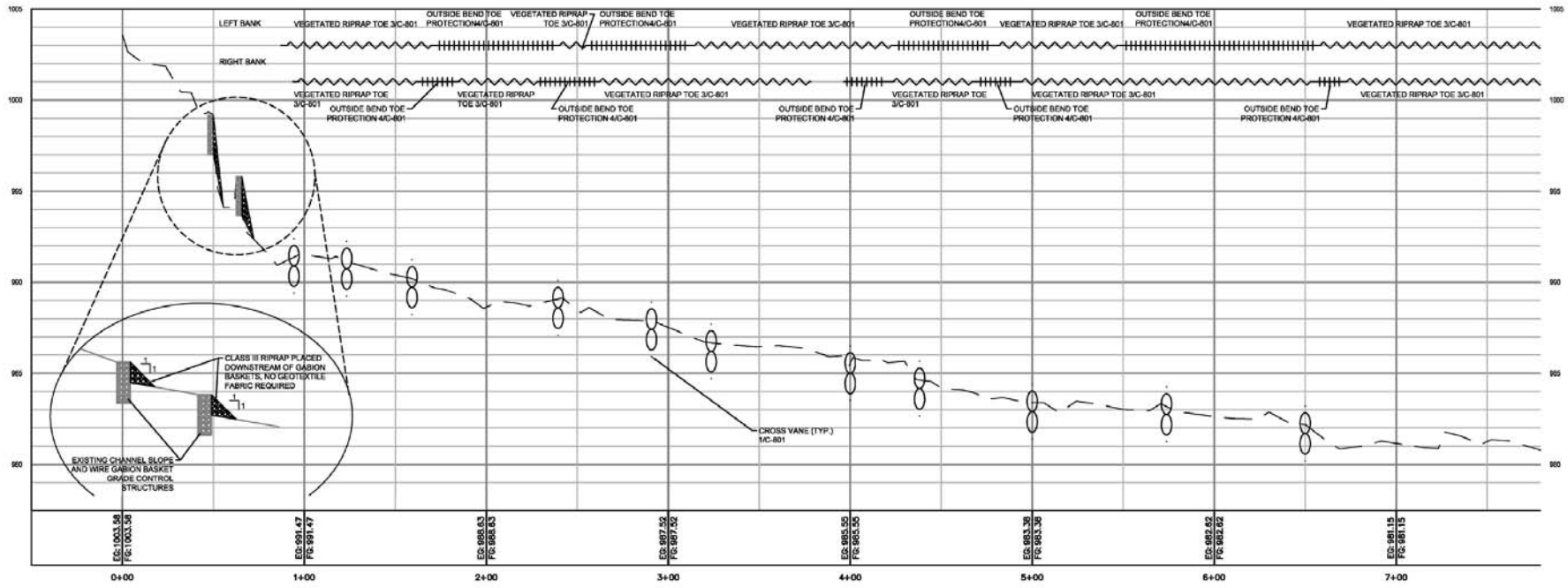
Project #	1508-0007
Drawn By	SJB
Issue Date:	XXXX
Issue: #	1

Sheet #
C-101

Sheet Title
EXISTING CONDITIONS & REMOVALS

CONSTRUCTION PLANS





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

Issue #	Date	Description
1	07/26/18	90% SUBMITTAL FOR REVIEW
2	08/16/18	90% SUBMITTAL FOR REVIEW

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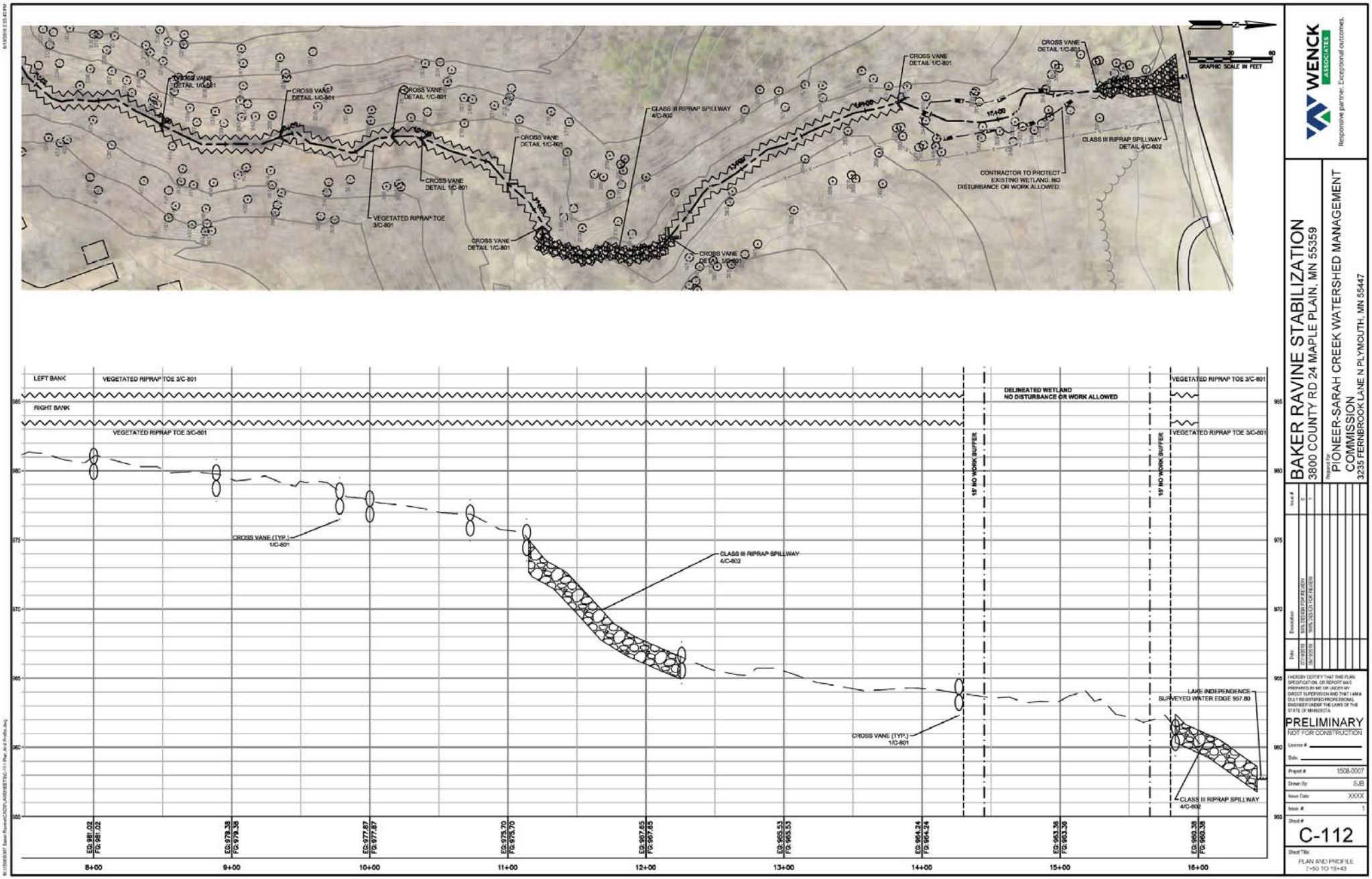
License #
Date:

Project #	1508.0007
Drawn By:	SJB
Issue Date:	XXXX
Issue #	1
Sheet #	C-111

Sheet Title:
PLAN AND PROFILE
0+00 TO 7+00

CONSTRUCTION PLANS



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

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PRELIMINARY
NOT FOR CONSTRUCTION

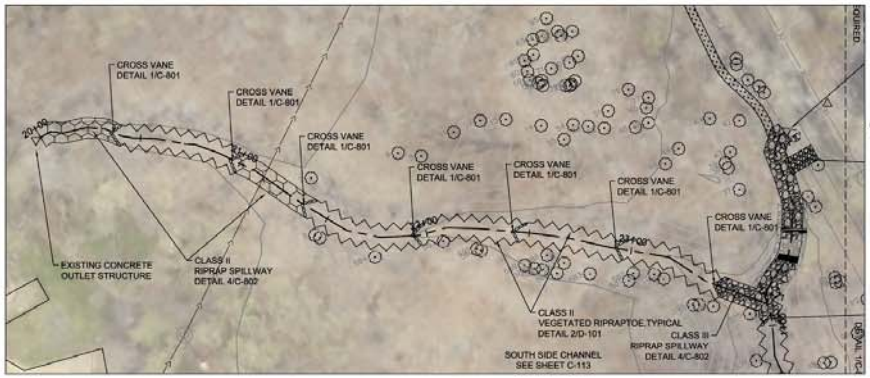
License #:
Date:

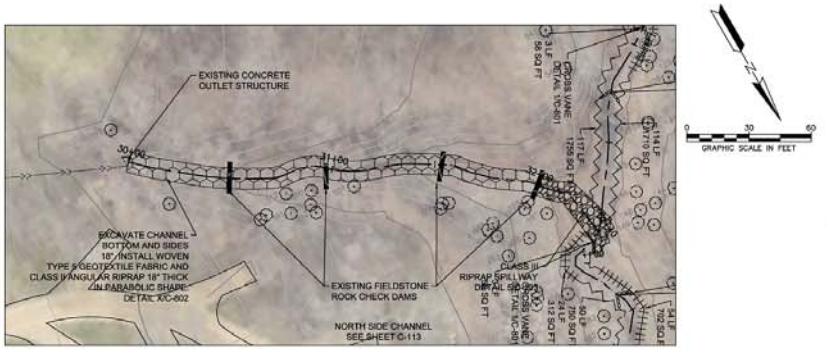
Project #	1508-0007
Drawn By:	SJB
Issue Date:	XXXX
Issue #	1

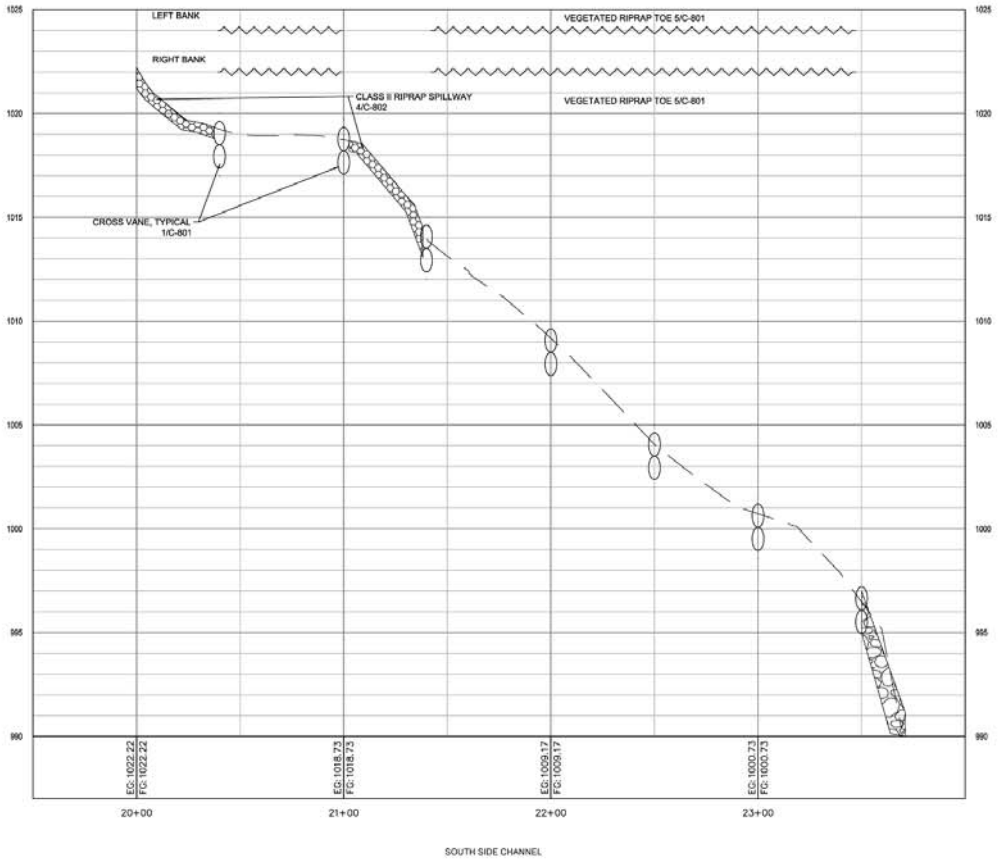
Sheet #
C-112

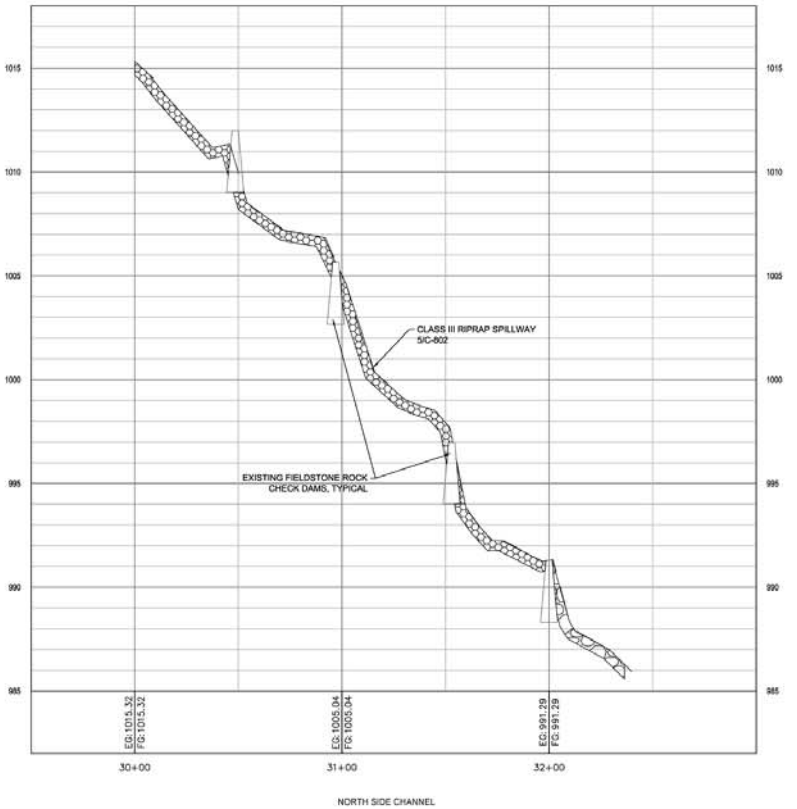
Sheet Title:
PLAN AND PROFILE
7+50 TO 16+43

CONSTRUCTION PLANS









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

Issue #	Date	Description
0	07/18/2018	90% DESIGN FOR REVIEW
1	08/16/2018	FINAL DESIGN FOR REVIEW

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PRELIMINARY
NOT FOR CONSTRUCTION

License #: _____
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

CONSTRUCTION PLANS

PROJECT INFORMATION

PROJECT NAME: BAKER RAVINE STABILIZATION
PROJECT LOCATION: 3800 COUNTY RD 24, MAPLE PLAIN, MN
PROJECT TYPE: STREAM BANK RESTORATION

TOTAL AREA DISTURBED BY CONSTRUCTION: ±1.5 ACRES.
TOTAL SITE AREA: ±1.5 ACRES.
ESTIMATED CONSTRUCTION DATES: FEBRUARY 2019 - JUNE 2019

CUMULATIVE IMPERVIOUS SURFACE/PERMANENT STORMWATER MANAGEMENT REQUIREMENTS:
THERE IS CURRENTLY ±0.0 ACRES OF EXISTING IMPERVIOUS SURFACE IN THE PROVECT AREA.

THE PROPOSED AREA OF IMPERVIOUS IS ±0.0 ACRES RESULTING IN A ±0.0 ACRE NET INCREASE IN IMPERVIOUS SURFACE.

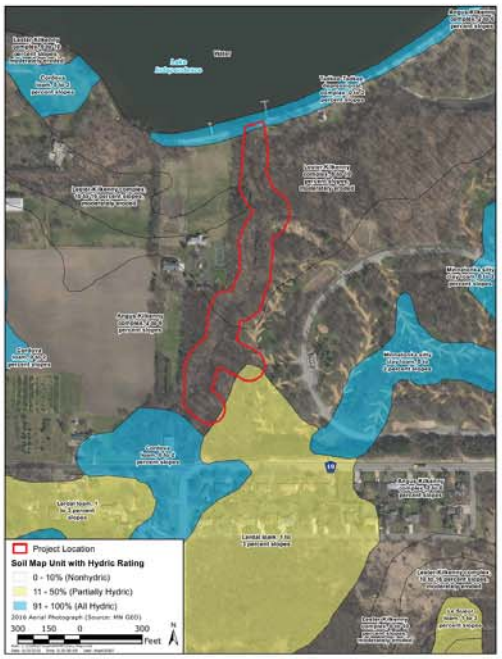
THE SITE ULTIMATELY DRAINS TO LAKE INDEPENDENCE, WHICH IS LISTED AS AN IMPAIRED WATER FOR AQUATIC CONSUMPTION AND AQUATIC RECREATION. THERE ARE CURRENT EPA APPROVED TMDLS FOR THE WATERBODY FOR MERCURY IN FISH TISSUE AND NUTRIENTS.

THE CONSTRUCTION PLANS OUTLINE STABILIZATION PRACTICES INCLUDING RIPRAP, ROCK TOES, SEEDING, AND INSTALLATION OF EROSION CONTROL BLANKET FOR VEGETATIVE RE-ESTABLISHMENT.

PARTY RESPONSIBLE FOR LONG TERM OPERATION AND MAINTENANCE OF THE SITE (OWNER):
THREE RIVERS PARK DISTRICT
CONTACT: XXXXX
CONTACT PHONE: (XXX) XXX-XXXX
CONTACT EMAIL: XXX@XXX

PARTY RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP (CONTRACTOR):
TBD - CONTRACTOR SHALL PROVIDE A CHAIN OF RESPONSIBILITY WITH ALL OPERATORS ON THE SITE FOR INCORPORATION INTO THIS SWPPP DOCUMENT TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE (THROUGH FINAL STABILIZATION AND NOT SUBMITTAL). CONTRACTOR SHALL ALSO PROVIDE DOCUMENTATION OF PERSONNEL TRAINING IN ACCORDANCE WITH THE PERMIT FOR INCORPORATION INTO THIS SWPPP DOCUMENT AS SOON AS THE PERSONNEL FOR THE PROJECT HAVE BEEN DETERMINED. CONTRACTOR IS RESPONSIBLE FOR KEEPING A FINAL SWPPP DOCUMENT, CONTAINING THE INFORMATION REQUIRED ABOVE, AT THE CONSTRUCTION SITE FOR THE DURATION OF THE PROJECT.

SOIL MAP



CERTIFICATION

IN ACCORDANCE WITH PART III.A.2.A.I. OF THE GENERAL PERMIT AUTHORIZATION TO DISCHARGE STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NPDES, THE PREPARER OF THIS DOCUMENT WAS TRAINED UNDER THE UNIVERSITY OF MINNESOTA EROSION AND SEDIMENT CONTROL CERTIFICATION PROGRAM. LOUIS SIGTERMANS' CERTIFICATION IN DESIGN OF SWPPP IS VALID THROUGH MAY 31, 2020.

EROSION AND SEDIMENT CONTROL

PRIOR TO ANY SITE DISTURBANCE, AND AS REQUIRED AS CONSTRUCTION PROGRESSES, ANY PERMIT REQUIRED EROSION PREVENTION MEASURES AND THE SEDIMENT CONTROL DEVICES (BIOLOG, FLOATING SILT CURTAIN, INLET PROTECTION, SEDIMENT TRAP/BASIN, EROSION CONTROL BLANKET) SHOWN ON THE CONSTRUCTION DRAWINGS WILL BE INSTALLED AT THE SITE.

ALL EXPOSED SOIL AREAS WITHIN THE CONSTRUCTION LIMITS WILL BE STABILIZED WITHIN 7 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY (WILL NOT RESUME FOR A PERIOD EXCEEDING 7 CALENDAR DAYS) OR PERMANENTLY CEASED. STABILIZATION WILL BE INITIATED IMMEDIATELY. EXPOSED SOIL AREAS MUST HAVE TEMPORARY EROSION PROTECTION (SLASH MULCH, EROSION CONTROL BLANKET, SEED) OR PERMANENT COVER YEAR ROUND.

CONTRACTOR SHALL IMPLEMENT APPROPRIATE CONSTRUCTION PHASING, VEGETATIVE BUFFER STRIPS, HORIZONTAL SLOPE GRADING, AND OTHER CONSTRUCTION PRACTICES THAT MINIMIZE EROSION WHEN PRACTICAL. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM A CONSTRUCTION SITE, OR DIVERTS WATER AROUND A SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE, OR FROM THE POINT OF DISCHARGE TO ANY SURFACE WATER. STABILIZATION MUST BE COMPLETED WITHIN 24 HOURS OF CONNECTING TO A SURFACE WATER. PIPE OUTLETS MUST BE PROVIDED WITH TEMPORARY OR PERMANENT ENERGY DISSIPATION WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER.

SWPPP IMPLEMENTATION, PHASING, AND SEQUENCE OF CONSTRUCTION

BMP AND EROSION CONTROL INSTALLATION SEQUENCE SHALL BE AS FOLLOWS:
1. INSTALL PERIMETER CONTROL, FLOATING SILT CURTAIN, INLET PROTECTION.
2. PREPARE TEMPORARY STORAGE, ACCESS, PARKING, AND PHASING AREAS.
3. CONSTRUCT AND STABILIZE DIVERSIONS AND TEMPORARY SEDIMENT TRAP/BASIN IN THE LOCATION SHOWN ON THE PLANS.
4. PERFORM CLEARING AND GRUBBING OF THE SITE, IF APPLICABLE.
5. START CONSTRUCTION OF REPAIRS.
6. PERFORM MASS GRADING, ROUGH GRADE TO ESTABLISH PROPOSED DRAINAGE PATTERNS.
7. TEMPORARILY SEED WITH PURE LIVE SEED THROUGHOUT CONSTRUCTION DISTURBED AREAS THAT WILL BE INACTIVE FOR SEVEN (7 DAYS) OR MORE AS REQUIRED BY NPDES PERMIT.

SEDIMENT CONTROL PRACTICES MUST MINIMIZE SEDIMENT FROM ENTERING SURFACE WATERS, INCLUDING CURB AND GUTTER SYSTEMS AND STORM SEWER INLETS. THE FOLLOWING MEASURES WILL BE TAKEN AS SEDIMENT CONTROL PRACTICES IN ORDER TO MINIMIZE SEDIMENTS FROM ENTERING SURFACE WATERS:

1. INSTALLATION OF SEDIMENT CONTROL PRACTICES ON ALL DOWN GRADIENT PERIMETERS PRIOR TO LAND DISTURBING ACTIVITIES.
2. STREET SWEEPING SHALL BE PERFORMED IF VEHICLE TRACKING BMPS ARE NOT ADEQUATE TO PREVENT SEDIMENT TRACKING. TRACKED SEDIMENT MUST BE REMOVED FROM ALL PAVED SURFACES BOTH ON AND OFFSITE WITHIN 24 HOURS OF DISCOVERY PER THE PERMIT.

THE FOLLOWING GUIDELINES WILL BE USED TO DETERMINE IF POLLUTION CONTROL DEVICES REQUIRE MAINTENANCE, REPAIR, OR REPLACEMENT:

-IF SEDIMENT CONTROL DEVICES SUCH AS SILT FENCE ARE FILLED TO 1/3 THE HEIGHT OF THE FENCE, REMOVE ALL SEDIMENT WITHIN 24 HOURS OF DETECTION OR NOTIFICATION.

-IF INLET PROTECTION DEVICES APPEAR PLUGGED WITH SEDIMENT, ARE FILLED TO 1/3 CAPACITY, OR HAVE STANDING WATER AROUND THEM, REMOVE THE SEDIMENT AND CLEAN OR REPLACE THE FILTER WITHIN 24 HOURS OF DETECTION OR NOTIFICATION.

-IF THE GRAVEL CONSTRUCTION ENTRANCE(S) ARE FILLED WITH SEDIMENT EITHER REPLACE THE ENTRANCE OR ADD ADDITIONAL GRAVEL WITH 24 HOURS OF DETECTION OR NOTIFICATION.

-IF SEDIMENT FROM THE SITE IS OBSERVED ON ADJACENT STREETS OR OTHER PROPERTIES, THE INSPECTOR SHALL IDENTIFY THE SOURCE AND DISCHARGE LOCATION OF THE SEDIMENT AND INSTRUCT TO IMPLEMENT ADDITIONAL EROSION AND SEDIMENT CONTROLS AT THOSE LOCATIONS TO PREVENT FUTURE DISCHARGES.

-IF BUILDING MATERIALS, CHEMICALS, OR GENERAL REFUSE IS BEING USED, STORED, DISPOSED OF, OR OTHERWISE MANAGED INAPPROPRIATELY, CORRECT SUCH DEFECTS WITHIN 24 HOURS OF DETECTION OR NOTIFICATION.

-IF EXCESSIVE SEDIMENTS OR DEBRIS ARE OBSERVED AT THE FLARED END SECTION OUTFALLS, THE INSPECTOR SHALL DETERMINE THE SOURCE AND DISCHARGE LOCATIONS OF SUCH MATERIALS. IF THE DISCHARGE HAS OCCURRED ON THE PROPERTY, REMOVE THE SEDIMENTS AND DEBRIS WITHIN 24 HOURS OF NOTIFICATION AND CORRECT THE SOURCE OF SUCH MATERIALS AS DIRECTED BY THE INSPECTOR

POLLUTION PREVENTION MEASURES

SOLID WASTE
SOLID WASTE, INCLUDING BUT NOT LIMITED TO, COLLECTED ASPHALT AND CONCRETE MILLINGS, FLOATING DEBRIS, PAPER, PLASTIC, FABRIC, CONSTRUCTION AND DEMOLITION DEBRIS AND OTHER WASTE MUST BE DISPOSED OF PROPERLY AND MUST COMPLY WITH MPCA DISPOSAL REQUIREMENTS.

HAZARDOUS MATERIALS
HAZARDOUS MATERIALS, INCLUDING BUT NOT LIMITED TO OIL, GASOLINE, PAINT AND ANY HAZARDOUS SUBSTANCE MUST BE PROPERLY STORED INCLUDING SECONDARY CONTAINMENTS, TO PREVENT SPILLS, LEAKS OR OTHER DISCHARGE. RESTRICTED ACCESS TO STORAGE AREAS MUST BE PROVIDED TO PREVENT VANDALISM. STORAGE AND DISPOSAL OF HAZARDOUS WASTE MUST BE IN COMPLIANCE WITH MCPA REGULATIONS.

CONSTRUCTION EQUIPMENT/VEHICLES
EXTERNAL WASHING OF TRUCKS AND OTHER CONSTRUCTION VEHICLES MUST BE LIMITED TO A DEFINED AREA OF THE SITE. RUNOFF MUST BE CONTAINED AND WASTE PROPERLY DISPOSED OF. NO ENGINE DEGREASING IS ALLOWED ON SITE. REASONABLE STEPS TO PREVENT THE DISCHARGE OF SPILLED OR LEAKED CHEMICALS SHALL BE TAKEN. ADEQUATE SUPPLIES MUST BE AVAILABLE AT ALL TIMES TO CLEAN UP DISCHARGED MATERIALS. CONDUCT FUELING IN A CONTAINED AREA UNLESS INFEASIBLE.

CONCRETE WASHOUT AREA
CONCRETE WASHOUT WILL BE PERMITTED ON-SITE; CONTRACTOR SHALL FOLLOW ALL PERMIT REQUIREMENTS FOR CONCRETE WASHOUT. THE CONTRACTOR SHALL PROVIDE EFFECTIVE CONTAINMENT FOR ALL LIQUID AND SOLID WASTES GENERATED BY WASHOUT OPERATIONS. LIQUID AND SOLID WASHOUT WASTES MUST NOT CONTACT THE GROUND AND THE CONTAINMENT MUST BE DESIGNED TO PROHIBIT RUNOFF FROM THE WASHOUT OPERATIONS/AREAS. LIQUID AND SOLID WASTES MUST BE DISPOSED OF PROPERLY AND IN COMPLIANCE WITH MPCA RULES. A SIGN MUST BE INSTALLED ADJACENT TO EACH WASHOUT FACILITY THAT REQUIRES SITE PERSONNEL TO UTILIZE THE PROPER FACILITIES FOR CONCRETE WASHOUT AND DISPOSAL OF WASHOUT WASTES. CONTRACTOR SHALL REVISE SWPPP TO INDICATE WASHOUT LOCATION ONCE THE LOCATION HAS BEEN DETERMINED.

FERTILIZERS AND LANDSCAPE MATERIALS MUST BE UNDER COVER TO PREVENT THE DISCHARGE OF POLLUTANTS OR PROTECTED BY SIMILARLY EFFECTIVE MEANS DESIGNED TO MINIMIZE CONTACT WITH STORMWATER.

PORTABLE TOILETS MUST BE POSITIONED SO THAT THEY ARE SECURE AND WILL NOT BE TIPPED OR KNOCKED OVER - SANITARY WASTE MUST BE DISPOSED OF PROPERLY.

GENERAL SWPPP NOTES

DEWATERING IS NOT ANTICIPATED TO BE REQUIRED. IN THE EVENT THAT DEWATERING IS NECESSARY CONTRACTOR SHALL COMPLY WITH PERMIT PART IV.D. REQUIREMENTS FOR DEWATERING.

THIS SWPPP SHALL BE AMENDED BY THE CONTRACTOR IN ACCORDANCE WITH THE PERMIT AS NECESSARY TO INCLUDE ADDITIONAL REQUIREMENTS TO CORRECT PROBLEMS IDENTIFIED OR ADDRESS SITUATIONS PER PART III.B. OF THE PERMIT.

THE PROJECT MAY DISTURB 5 OR MORE ACRES THAT PROMOTE DRAINAGE TO A COMMON LOCATION. THEREFORE A TEMPORARY SEDIMENT BASIN MAY BE REQUIRED. THIS SWPPP SHALL BE AMENDED BY THE CONTRACTOR IN ACCORDANCE WITH THE GENERAL PERMIT TO INCLUDE TEMPORARY SEDIMENTATION BASINS. BASINS SHALL BE DESIGNED TO ACCOMMODATE NO LESS THAN 3,600 CUBIC FEET OF LIVE STORAGE PER ACRE OF CONTRIBUTING DRAINAGE AREA. BASIN OUTLETS SHALL BE DESIGNED TO WITHDRAW WATER FROM THE SURFACE OF THE BASIN, PREVENT SHORT-CIRCUITING AND THE DISCHARGE OF FLOATING DEBRIS. BASINS SHALL HAVE A STABILIZED EMERGENCY OVERFLOW LOCATION AND BE DESIGNED TO PREVENT THE DISCHARGE OF POLLUTANTS TO THE EXTENT PRACTICAL.

FINAL STABILIZATION

ALL PERVIOUS AREAS DISTURBED BY CONSTRUCTION AS DESIGNATED WILL RECEIVE VEGETATIVE COVER ACCORDING TO THE PLANS AND SPECIFICATIONS AND WITHIN THE SPECIFIED VEGETATIVE TIME SCHEDULE. FINAL STABILIZATION WILL OCCUR WHEN THE SITE HAS A UNIFORM VEGETATIVE COVER WITH A DENSITY OF 70% OVER THE RESTORED PERVIOUS AREAS. ALL TEMPORARY SYNTHETIC EROSION PREVENTION AND SEDIMENT CONTROL BMPS (SUCH AS SILT FENCE) MUST BE REMOVED AS PART OF THE SITE FINAL STABILIZATION. ALL SEDIMENT MUST BE CLEANED OUT OF CONVEYANCES AND TEMPORARY SEDIMENTATION BASINS IF APPLICABLE. NOTICE OF TERMINATION (NOT) MUST BE SUBMITTED WITHIN 30 DAYS OF FINAL STABILIZATION.

IMPAIRED WATERS, SPECIAL WATERS, AND WETLANDS

THIS PROJECT IS LOCATED WITHIN ONE MILE OF, AND ULTIMATELY DISCHARGES TO, AN IMPAIRED WATER. LAKE INDEPENDENCE IS LOCATED DIRECTLY NORTH OF THE PROJECT LOCATION AND IS LISTED AS IMPAIRED FOR AQUATIC CONSUMPTION AND AQUATIC RECREATION. DISCHARGE TO AN IMPAIRED WATER REQUIRES IMPLEMENTATION OF PARTS C.1 AND C.2 OF APPENDIX A OF THE PERMIT AS INCORPORATED INTO THIS SWPPP DOCUMENT.

THE PROJECT WILL NOT TEMPORARILY IMPACT WETLANDS.

SITE SOILS - SITE SOILS ARE SHOWN ON THIS SHEET. THIS PROJECT IS NOT LOCATED IN A KARST AREA.

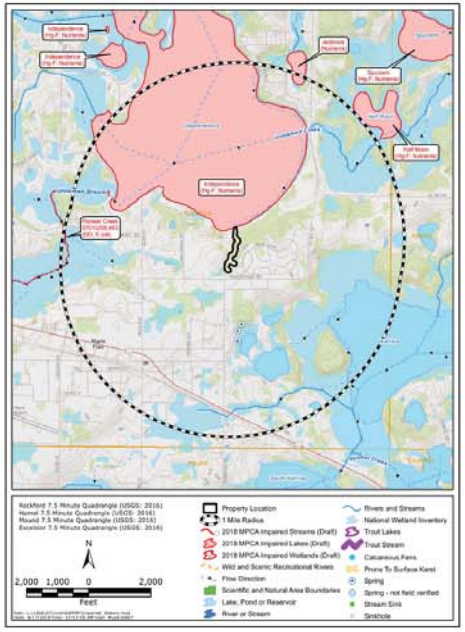
SWPPP DOCUMENTS

THE SWPPP IS COMPOSED OF, BUT NOT LIMITED TO, THE BELOW PROJECT DOCUMENTS. THESE DOCUMENTS SHALL BE KEPT ON THE PROJECT SITE AT ALL TIMES THROUGHOUT CONSTRUCTION. THE SWPPP SHALL BE AMENDED BY THE PERSON RESPONSIBLE TO INCLUDE ANY DOCUMENTS NECESSARY TO ENSURE ADHERENCE TO THE GENERAL PERMIT.

BAKER RAVINE STABILIZATION CIVIL CONSTRUCTION DRAWINGS BY WENCK ASSOCIATES DATED AUGUST 2018

RECORD RETENTION - THE SWPPP, ALL CHANGES TO IT, AND INSPECTION AND MAINTENANCE RECORDS MUST BE KEPT ON-SITE DURING CONSTRUCTION; THE CONSTRUCTION DRAWINGS ARE INCORPORATED HEREIN BY REFERENCE, AND A COPY OF THE PLAN SET SHOULD BE KEPT ON-SITE WITH THE SWPPP RECORDS. THE OWNER MUST RETAIN A COPY OF THE SWPPP ALONG WITH THE FOLLOWING RECORDS FOR THREE (3) YEARS AFTER SUBMITTAL OF THE NOTICE OF TERMINATION:

1. ANY OTHER PERMITS REQUIRED FOR THE PROJECT;
2. RECORDS OF ALL INSPECTION AND MAINTENANCE CONDUCTED DURING CONSTRUCTION;
3. ALL PERMANENT OPERATIONS AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING ALL RIGHT OF WAY, CONTRACT, COVENANTS AND OTHER BINDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE; AND
4. ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORMWATER MANAGEMENT SYSTEMS.



INSPECTIONS

THE INSPECTION LOG WILL BE COMPLETED BY THE CONTRACTOR FOR THE CONSTRUCTION SITE.
INSPECTOR(S): TBD - TRAINING DOCUMENTATION (PER PART IV.E OF THE PERMIT) WILL BE INCORPORATED INTO THIS SWPPP AS SOON AS THE PERSONNEL FOR THE PROJECT HAVE BEEN DETERMINED. THE CONTRACTOR WILL MAKE CORRECTIONS OR REPAIRS REQUIRED TO COMPLY WITH THE PERMIT.

INSPECTIONS AT THE SITE WILL BE COMPLETED IN ACCORDANCE WITH THE PERMIT AS FOLLOWS:
ONCE EVERY SEVEN (7) DAYS DURING ACTIVE CONSTRUCTION AND,
WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS.

1. THE INDIVIDUAL PERFORMING INSPECTIONS MUST BE TRAINED AS REQUIRED BY PART IV.E OF THE PERMIT. TRAINING DOCUMENTATION SHALL BE PROVIDED BY THE CONTRACTOR FOR INCORPORATION INTO THE SWPPP. INSPECTIONS MUST INCLUDE STABILIZED AREAS, EROSION PREVENTION AND SEDIMENT CONTROL BMPS, AND INFILTRATION AREAS. CORRECTIVE ACTIONS MUST BE IDENTIFIED AND DATE OF CORRECTION MUST BE NOTED AS IDENTIFIED IN SECTION IV.E. OF THE PERMIT. ANY OFFSITE DISCHARGE MUST BE DOCUMENTED AS IDENTIFIED IN SECTION IV.E.2.F OF THE PERMIT. ANY AMENDMENTS TO THE SWPPP PROPOSED AS A RESULT OF THE INSPECTION MUST BE DOCUMENTED WITHIN SEVEN (7) CALENDAR DAYS. AN INSPECTION LOG IS ALSO ATTACHED. THE INSPECTION LOG AND SWPPP MUST BE KEPT ON-SITE FOR THE DURATION OF THE CONSTRUCTION PROJECT.

AT A MINIMUM, THE FOLLOWING SHALL BE COMPLETED DURING EACH INSPECTION:

-RECORD DATE AND TIME OF INSPECTION.
-RECORD RAINFALL RECORDS SINCE THE MOST RECENT INSPECTION.
-INSPECT THE SITE FOR EXCESS EROSION AND SEDIMENTATION.
-INSPECT THE SITE FOR DEBRIS, TRASH, AND SPILLS.
-INSPECT TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES.
-INSPECT CONSTRUCTION ENTRANCES FOR SEDIMENT TRACKING ONTO PUBLIC STREETS.
-RECORD RECOMMENDED REPAIRS AND MODIFICATIONS TO EROSION AND SEDIMENT CONTROLS.
-RECOMMEND ANY NECESSARY CHANGES TO THIS SWPPP.
-RECORD REPAIRS AND MODIFICATIONS IMPLEMENTED SINCE PREVIOUS INSPECTIONS.
-INSPECT THE ADJACENT STREETS AND CURB AND GUTTER FOR SEDIMENT, LITTER, AND CONSTRUCTION DEBRIS.

THE QC MUST UPDATE THE SWPPP, INCLUDING THE JOBSITE BINDER AND SITE MAPS, TO REFLECT THE PROGRESS OF CONSTRUCTION ACTIVITIES AND GENERAL CHANGES TO THE PROJECT SITE. UPDATES SHALL BE MADE DAILY TO TRACK PROGRESS WHEN ANY OF THE FOLLOWING ACTIVITIES OCCUR: BMP INSTALLATION, MODIFICATION OR REMOVAL, CONSTRUCTION ACTIVITIES (E.G. PAVING, SEWER INSTALLATION, ETC), CLEARING, GRUBBING, GRADING, OR TEMPORARY AND PERMANENT STABILIZATION.

THE CONTRACTOR MAY UPDATE OR MODIFY THE SWPPP WITHOUT ENGINEER APPROVAL IN AN EMERGENCY SITUATION TO PREVENT SEDIMENT DISCHARGE OR PROTECT WATER QUALITY. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE TO ENSURE COMPLIANCE WITH THE PERMIT AND PROTECTION OF DOWNSTREAM WATER QUALITY.

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

Issue #	Date	Description
0	07/18/2018	90% DESIGN FOR REVIEW
1	08/16/2018	FINAL 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-201
Sheet Title:	SWPPP

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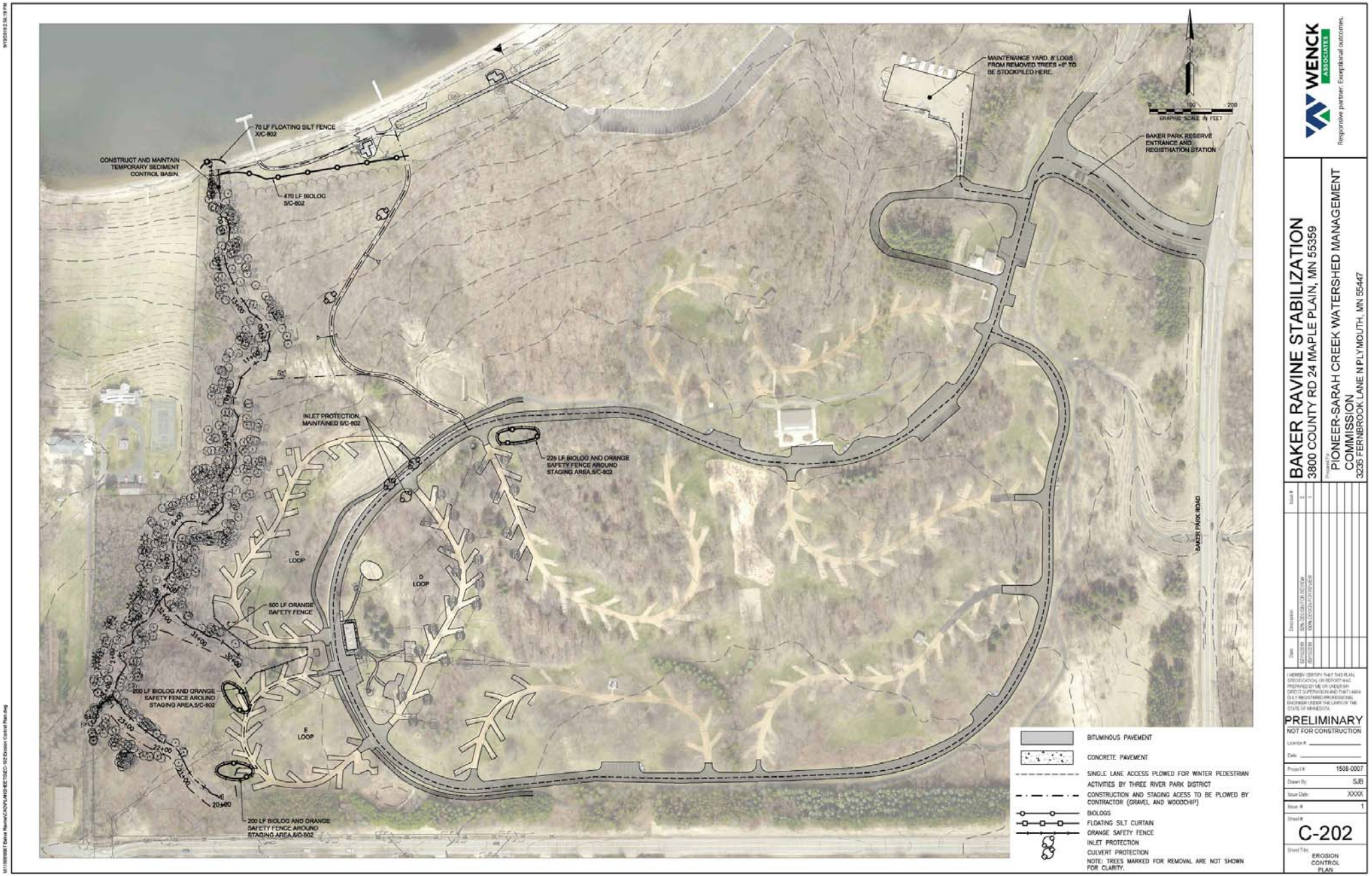
CONSTRUCTION PLANS



WENCK ASSOCIATES
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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 #	Date	Description
3	07/15/19	90% SUBMITTAL REVIEW
2	07/15/19	60% DESIGN SUBMITTAL REVIEW
1	07/15/19	

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.

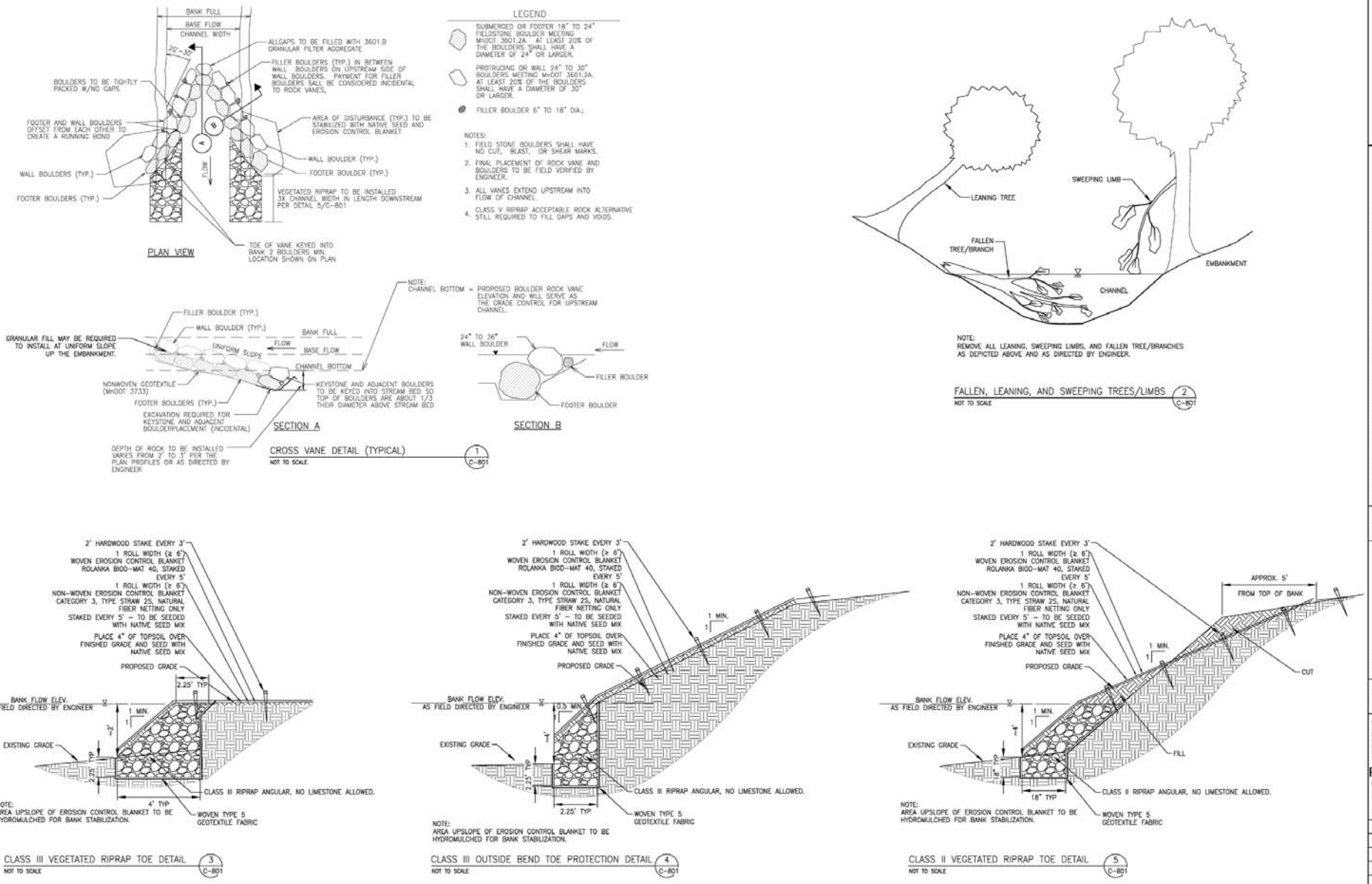
PRELIMINARY
NOT FOR CONSTRUCTION

License #: _____
Date: _____

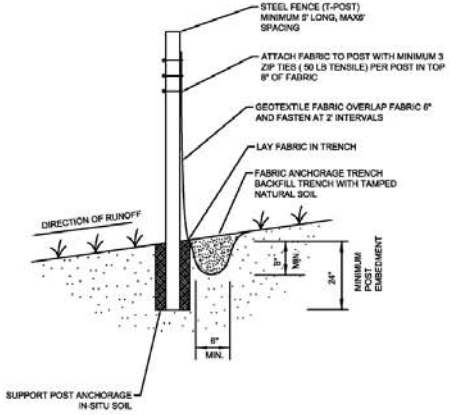
Project #	1508-0007
Drawn By	SJB
Issue Date:	XXXX
Issue #	1
Sheet #	C-202

Sheet Title: EROSION CONTROL PLAN

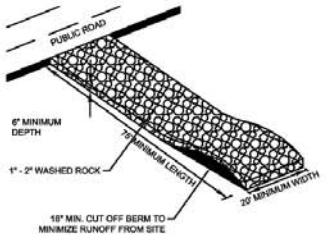
CONSTRUCTION PLANS



CONSTRUCTION PLANS

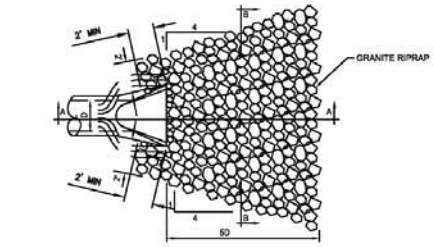


SILT FENCE – MACHINE SLICED (1 / C-802)
NOT TO SCALE



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 (2 / C-802)
NOT TO SCALE



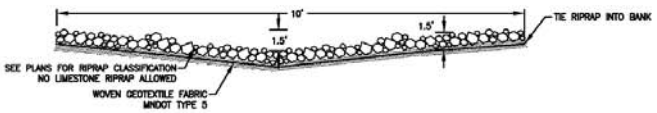
RIPRAP REQUIREMENTS

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

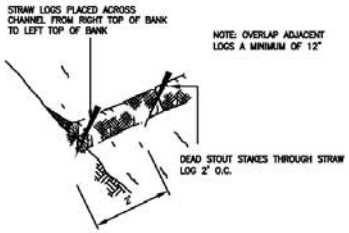
(ONE CUBIC YARD IS APPROXIMATELY 2,600 LBS.)

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.

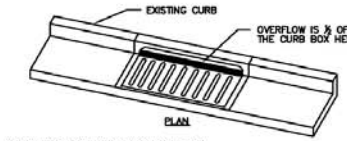
RIPRAP AT OUTLETS (3 / C-802)
NOT TO SCALE



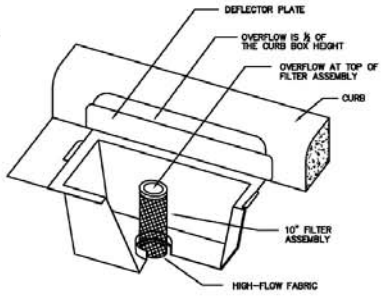
RIPRAP SPILLWAY (4 / C-802)
NOT TO SCALE



BIOROLL DETAIL (5 / C-802)
NOT TO SCALE



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



INLET PROTECTION DETAIL (6 / C-802)
NOT TO SCALE

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

Issue #	Date	Description
1	07/19/18	90% SUBMITTAL FOR REVIEW
2	08/06/18	90% SUBMITTAL FOR REVIEW

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PRELIMINARY
NOT FOR CONSTRUCTION

License #:
Date:

Project #	1508.0007
Drawn By:	SJB
Issue Date:	XXXX
Issue #:	1

Sheet #:
C-802

Sheet Title:
DETAILS

MOVING FORWARD

SCHEDULE


U.S. Army Corp Joint Permit Application Submitted
9/21/2018
PSCWMC Permit Submitted
9/26/2018
Bid Project
5/1/2019
Campground Closes
10/20/2019
Construction Begins
10/21/2019
Construction Substantially Completed
3/15/2020
Construction Final Completion
3/30/2020
2018
Sep
Nov
2019
Mar
May
Jul
Sep
Nov
2020
Mar
2020

CONSTRUCTION COST ESTIMATE

ITEM NO	ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL ESTIMATED COST
	BASE BID - Winter 2019 Construction				
1	Fall/Winter Mobilization and Demobilization	LS	1	$ 19,500.00	$ 19,500.00
2	Construct, Maintain, & Restore Site Access and Staging Areas	LS	1	$ 7,000.00	$ 7,000.00
3	Temporary Orange Safety Fence	LF	1125	$ 4.00	$ 4,500.00
4	Flotation Silt Curtain Type Moving Water - Maintained	LF	70	$ 35.00	$ 2,450.00
5	Sediment Control Log Type Straw (Or Bioroll) - Maintained	LF	1095	$ 6.00	$ 6,570.00
6	Inlet Protection - Maintained	EA	3	$ 500.00	$ 1,500.00
7	Culvert Protection - Maintained	EA	3	$ 500.00	$ 1,500.00
8	Construct and Maintain Temporary Sediment Basin	EA	1	$ 1,000.00	$ 1,000.00
9	Street Sweeper (With Pickup Broom)	HR	10	$ 125.00	$ 1,250.00
10	Tree Clearing & Grubbing	LS	1	$ 25,000.00	$ 25,000.00
11	Chip and Dispose of all Brush & Logs less than 6"	LS	1	$ 10,000.00	$ 10,000.00
12	Limb and Move Logs to Splitting Station (Logs >6")	LS	1	$ 10,000.00	$ 10,000.00
13	Remove & Dispose CMU's and Geogrid	CY	10	$ 50.00	$ 500.00
14	Woven ECB, Rolanka BioD-Mat 40	SY	2180	$ 6.00	$ 13,080.00
15	Non-Woven ECB Cat 3 Type Straw 2S (No Poly Netting)	SY	2180	$ 3.00	$ 6,540.00
16	Seeding	AC	0.5	$ 2,500.00	$ 1,250.00
17	Native Seed Mix	LB	20	$ 50.00	$ 1,000.00
18	Fescue Seed Mix	LB	100	$ 2.50	$ 250.00
19	Straw Mulch	TON	2	$ 100.00	$ 200.00
20	Temporary Sedimentation Basin - Maintained	LS	1	$ 2,500.00	$ 2,500.00
21	Class II Riprap Angular, No Limestone (Veg Riprap Toe)	TON	300	$ 90.00	$ 27,000.00
22	24" to 36" Fieldstone Boulders (Cross Vanes)	TON	110	$ 110.00	$ 12,100.00
23	MN DOT Type V, Non-Woven Geotextile Fabric	SY	4920	$ 5.00	$ 24,600.00
24	Class III Riprap, Angular, No Limestone (Spillways & Veg Riprap in-channel)	TON	705	$ 90.00	$ 63,450.00
25	Class III Riprap No Limestone (Veg Riprap & Outside Bend Toe Protection)	TON	1800	$ 90.00	$ 162,000.00
				Total Base Bid	**$ 404,740.00**

ITEM NO	ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL ESTIMATED COST
	BID Alt #1				
26	Class II Riprap Fieldstone	TON	70	$ 90.00	$ 6,300.00
				Total Bid Alt #1	**$ 6,300.00**

ITEM NO	ITEM	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL ESTIMATED COST
	BID Alt #2				
27	Chip and Deliver all Brush & Logs less than 6" to Three Rivers Park District Nursery Facility	LS	1	$ 10,000.00	$ 10,000.00
				Total Bid Alt #1	**$ 10,000.00**

SUBTOTAL	**$ 421,040.00**
15% CONTINGENCY	$ 63,156.00
TOTAL PROJECT BID	**$ 484,196.00**

DISCUSSION


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Exceptional outcomes.