elm creek
Watershed Management Commission

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October 5, 2016

Representatives
Elm Creek Watershed Management Commission
Hennepin County, MN

The meeting packet for this meeting may be found on the Commission's website, http://www.elmcreekwatershed.org/minutes--meeting-packets.html

Dear Representatives:

A regular meeting of the Elm Creek Watershed Management Commission will be held on **Wednesday, October 12, 2016, at 11:30 a.m.** in the Mayor's Conference Room at Maple Grove City Hall, 12800 Arbor Lakes Parkway, Maple Grove, MN.

The meeting will be preceded at 10:00 a.m. by a meeting of the Commission's Technical Advisory Committee (TAC). Members of the TAC will discuss development of a cost-share policy for watershed projects and review the Commission's standards for infiltration, filtration and abstraction.

During the meeting, Steve Christopher, Board Conservationist, Board of Water and Soil Resources (BWSR), will present an update on the State Buffer Initiative and what can be expected in the next few years.

Please email Kerstin at kerstin@jass.biz to confirm whether you or your Alternate will be attending the meeting. Thank you.

Regards,

Judie A. Anderson
Administrator
JAA:tim

Encls: Meeting Packet

cc:	Alternates	HCEE	BWSR	MPCA
	Joel Jamnik	TAC	Met Council	DNR
	TRPD	Diane Spector	Clerks	Official Newspaper

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AGENDA
October 12, 2016

1. Call Regular Meeting to Order.
   a. Approve Agenda.*
2. Consent Agenda.
   a. Minutes last Meeting.*
   b. Treasurer's Report and Claims.**
3. Open Forum.
   a. Steve Christopher – State Buffer Initiative.*
      1) Implementing Minnesota's BufferLaw.*
      2) DNR Buffer Map.*
4. Action Items.
   a. Project Reviews – *also see Staff Report.**
   b. Model Snow and Ice Policy.*
      1) Request for financial contribution.*
      2) July 20, 2016 Meeting Minutes.*
      3) Snow and Ice Management Model Policy.*
5. Watershed Management Plan.
   a. Request for Reimbursement- CIP2015.
   b. Cost Share Policy.*
      1) Staff Memo.*
      2) Appendix C Rules and Standards.*
      3) Appendix G CIP Project Descriptions.*
   c. Abstraction, Filtration Rules.
6. Elm Creek Watershed-wide TMDL.
7. New Business.
8. Communications.
9. Education.
   a. Iron Enhanced Sand Filtration for Ag Tile Drainage, *Stormwater News,* October 2016.*
   b. *Water Links*, fall issue.*
10. Grant Opportunities.
11. Other Business.

*in meeting packet
**available at meeting

12. Project Updates – *see Staff Report.**

13. Adjourn.

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Project Reviews. (See Staff Report.*)						
				a.	2013-046	Woods of Medina, Medina.
				b.	2014-015	Rogers Drive Extension, Rogers.
				c.	2015-004	Kinghorn Outlet A, Rogers.
				d.	2015-006	Veit Building Expansion, Rogers.
			AR	e.	2015-013	Wayzata High School, Plymouth.
			AR	f.	2015-020	Strehler Estates, Corcoran.
			AR	g.	2015-025	OP3 Outdoor Storage, Rogers.
				h.	2015-030	Kiddiegarten Child Care Center, Maple Grove.
			AR	i.	2015-032	Rogers High School Auditorium Addition.
				j.	2016-001	CSAH 115/CR116 Reconstruction, Medina.
				k	2016-002	The Markets at Rush Creek, Maple Grove.
				l	2016-004	Park Storage Place, Corcoran.
				m.	2016-005W	Ravinia Wetland Bank Plan, Corcoran.
			AR	n.	2016-014	Balsam Apartments, Dayton.
			AR	o.	2016-018	Cambridge Park, Maple Grove.
			AR	p.	2016-019	Just for Kix, Medina.
			AR	q.	2016-020	Ryan Meadows, Rogers.
			AR	r.	2016-021	Diamond View Estates, Dayton.
			AR	s.	2016-022	AutoZone, Maple Grove.
	D	**R**		t.	2016-023	Tri-Care, Maple Grove.
			AR	u.	2016-026	Faithbrook Church, Dayton.
		R		y.	2016-033	Dayton Public Works facility – site improvements, Dayton.
				aa.	2016-035W	20070 Larkin Road – wetland violation, Corcoran.
		R		ac.	2016-037	Lanewood Estates, Plymouth.
				ad.	2016-038	AutoMotor Plex, Medina.
A	**E**			ae.	2016-039	The Fields at Meadow Ridge, formerly Sands Parcel, Plymouth.
				af.	2016-040	Kinghorn 4th Addition, Rogers.
				ag.	2016-041	Bartus, Plymouth.
				ah.	2016-042	Cherrywood of Plymouth.
				ai.	2016-043	Lawndale Lane Improvements, Maple Grove.
				aj.	2016-044	Highway 169 Reconstruction - Wetland Delineation, Champlin.

A = Action item E = Enclosure provided I = Informational update will be provided at meeting RPFI - removed pending further information
R = Will be removed RP= Information will be provided in revised meeting packet….. D = Project is denied AR = awaiting recordation

*in meeting packet
**available at meeting

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Regular Meeting and Public Hearing
Minutes
September 14, 2016

I. CALL TO ORDER.

A regular meeting of the Elm Creek Watershed Management Commission was called to order at 11:30 a.m., Wednesday, September 14, 2016, in the Mayor's Conference Room, Maple Grove City Hall, 12800 Arbor Lakes Parkway, Maple Grove, MN by Chair Doug Baines.

Present were: Gerry Butcher, Champlin; Jon Bottema, Corcoran; Doug Baines, Dayton; Joe Trainor, Maple Grove; Victoria Reid, Medina; Kevin Jullie, Rogers; Ali Durgunoğlu, James Kujawa and Said Matan, Hennepin County Dept. of Environment and Energy (HCEE); Rich Brasch, Three Rivers Park District (TRPD); and Judie Anderson, JASS.

Not represented: Plymouth.

Also present: Todd Tuominen, Champlin; Mark Lahtinen, Maple Grove; Ben Scharenbroich, Plymouth; Andrew Simmons, Rogers; and Dave Haas, Jim Greenwood, and Mike Winegar, Fish Lake Area Residents Association (FLARA).

A. Motion by Bottema, second by Jullie to approve the **revised agenda**.* *Motion carried unanimously.*

B. Motion by Butcher, second by Bottema to approve the **minutes*** of the August 10, 2016 regular and Technical Advisory Committee (TAC) meetings. *Motion carried unanimously.*

C. Motion by Bottema, second by Butcher to approve the **September Treasurer's Report and Claims*** totaling $15,283.69. *Motion carried unanimously.*

[The meeting was suspended at 11:33 a.m.]

II. PUBLIC HEARING.

On February 10, 2016 the Elm Creek Watershed Management Commission's Technical Advisory Committee (TAC) recommended to the Commission that Table 4.5 of its Third Generation Plan Capital Improvement Program be revised in order to add five projects to the CIP and to update six projects already listed there. At its February 10, 2016 regular meeting, the Commission approved the TAC's recommendation.

MN Rule 8410.0140 and Section 4.6 Plan Review, Update and Revision of the Commission's Third Generation Plan set forth the requirements for plan amendments. Steve Christopher, BWSR Board Conservationist, determined that the Commission could add/revise these projects with a Minor Plan Amendment. Following a public meeting conducted by the Commission on May 11, 2016, the Commission adopted Resolution 2016-01 Adopting a Minor Plan Amendment. On July 28, 2016, the Hennepin County Board approved the Minor Plan Amendment and adopted a 2016 maximum levy of $492,812 for the Elm Creek Commission for the following projects:

2016-01 Fox Creek at Creekview Restoration Project, Rogers. Total project cost $321,250 | Proposed Levy $80,312.

2016-02 Mississippi River Shoreline Repair and Stabilization Project, Champlin. Total project cost $300,000 | Proposed Levy $75,000.

2016-03 Elm Creek Dam at the Mill Pond Project, Champlin. Total project cost $7,001,220 | Proposed Levy $187,500.

2016-04 Rush Creek Main Stem Restoration, Maple Grove. Total project cost $300,000 | Proposed Levy $75,000.

2016-05 Fish Lake Alum Treatment Phase 1, Maple Grove. Total project cost $300,000 | Proposed Levy $75,000.

*in meeting packet

The Commission called for a public hearing on September 14, 2016 to consider the five projects. Member cities and the County have been notified and notice has been duly published. The purpose of the public hearing is to present the proposed projects and proposed financing and to take comment from the member cities and the public.

[The public hearing was opened at 11:35 a.m.]

No comments were received from the member cities. Haas, Greenwood, and Winegar, FLARA, were present from the public and spoke in support of project 2016-05.

[The public hearing was closed at 11:45 a.m.]

A brief discussion was conducted by the Commissioners.

Motion by Butcher, second by Jullie to adopt Resolution 2016-02 Ordering the 2016 Improvement Projects … and Designating Commission Cost-Share Funding.* *Motion carried unanimously.*

Motion by Jullie, second by Bottema to approve the Cooperative Agreements with the cities of Champlin, Maple Grove and Rogers contingent upon review by their respective attorneys. *Motion carried unanimously.*

[The regular meeting resumed at 11:47 a.m.]

III. RESUME REGULAR MEETING.

D. Open Forum.

Victoria Reid, newly appointed Alternate Commissioner from the City of Medina, was introduced.

E. Action Items.

1. Project Review 2016-033 Dayton Public Works Garage, Dayton.* This is a 17-acre site located on the east side of Zanzibar Lane about half-way between North and South Diamond Lake Roads. The site is currently agricultural field. It will be developed into a public works facility with a new building and parking lot area. Staff reviewed the project for compliance with the Third Generation stormwater management plan. Staff's September 9, 2016 findings were included in the meeting packet. Motion by Bottema, second by Butcher to approve this project with the recommendation that irrigation water reuse from the NURP pond be seriously considered. *Motion carried unanimously.*

2. Project Review 2016-037 Lanewood Estates, Plymouth.* This is a 5.9 acre site located north of County Road 47, at the extension of Lanewood Lane within the Taryn Hills community. Current use of the property is a single house and barn on the property with a large lawn. Surrounding land use on the north, west and south is single family houses and vacant on the east. About one-third of the northeast portion of the parcel is wetland which is also a Public Water Wetland. The applicant is proposing to build 7 single-family houses. On August 30, 2016, Staff requested revisions to complete the review. Revisions were submitted on September 7, 2016. Staff findings dated September 12, 2016, were included in the revised meeting packet. Motion by Bottema, second by Reid to approve this project with two conditions: a) A copy of the revised HydroCAD model must be submitted; and 2) The proposed pond access road must be a reinforced turf road within the buffer area. *Motion carried unanimously.*

F. Watershed Management Plan.

The Commission's Rules pertaining to **filtration, infiltration and abstraction** will be reviewed at the October meeting of the Technical Advisory Committee.

G. Elm Creek Watershedwide TMDL. The public comment period for the draft TMDL and WRAPS Reports closed on August 4, 2016**.** Comments were received from MnDOT, Dept. of Agriculture, and the cities of Corcoran, Medina and Plymouth. Brasch is working with MPCA Project Manager Brooke Asleson to respond to the comments. This task should be completed in time for the October meeting.

H. New Business.

Steve Christopher, BWSR, will be present at the October 12 regular meeting to provide an update on the

*in meeting packet

State Buffer Law. The August 2016 Buffer Update* is included in the meeting packet. Also included in the packet is the DNR Buffer Map* which identifies public waters and public ditches in the watershed. More information can be found at http://www.bwsr.state.mn.us/buffers/.

I. Communications.

J. Education.

1. Minnesota Water Resources Conference,* October 18-19, 2016, Saint Paul RiverCentre. Register at wrc.umn.edu/waterconf.

2. Clean Water Summit, September 22, 2016, Minnesota Landscape Arboretum. Register at http://www.arboretum.umn.edu/2016cleanwatersummit.aspx.

3. Baines recapped the October WMWA meeting. The **next WMWA meeting** is scheduled for Tuesday, November 8, 2016, at Plymouth City Hall. All Commissioners are encouraged to attend.

K. Grant Opportunities.

Hennepin County Good Steward grant applications are being accepted until November 4. These grants are primarily for smaller projects that improve water quality, enhance natural areas and promote environmental stewardship to the community. A typical grant amount is $5,000 to $15,000, with a maximum amount of $25,000. http://www.hennepin.us/residents/environment/natural-resources-funding.

L. Other Business.

M. The following **projects** are discussed in the September Staff Report.* ("W" denotes wetland project.)

1. 2013-046 Woods of Medina, Medina.
2. 2014-015 Rogers Drive Extension, Rogers.
3. 2015-004 Kinghorn Outlet A, Rogers.
4. 2015-006 Veit Building and Parking Lot Addition, Rogers.
5. 2015-013 Wayzata High School, Plymouth.
6. 2015-020 Strehler Estates, Corcoran.
7. 2015-025 OP3 Outdoor Storage, Rogers.
8. 2015-030 Kiddiegarten Child Care Center, Maple Grove.
9. 2015-032 Rogers High School Auditorium Addition, Rogers.
10. 2016-001 CSAH 115/CR 116 Reconstruction, Medina.
11. 2016-002 The Markets at Rush Creek, Maple Grove.
12. 2016-004 Park Place Storage Site Plans, Corcoran.
13. 2016-005W Ravinia Wetland Bank, Corcoran.*
14. 2016-014 Balsam Apartments, Dayton.
15. 2016-018 Cambridge Park, Maple Grove.
16. 2016-019 Just for Kix, Medina.
17. 2016-020 Ryan Meadows, Rogers.
18. 2016-021 Diamond View Estates, Dayton.
19. 2016-022 AutoZone, Maple Grove.
20. 2016-023 Tri-Care, Maple Grove.
21. 2016-026 Faithbrook Church, Dayton.*
22. 2016-027 Rogers Drive/Brockton Lane Intersection Improvements, Rogers.*
23. 2016-030 Elm Creek Meadows, Plymouth.
24. 2016-032 CSAH 19 Cross Culvert, Corcoran.
25. 2016-033 Dayton Public Works Garage, Dayton.*
26. 2016-034 French Lake Golf Course AUAR, Dayton.
27. 2016-035W 20070 Larkin Road, Corcoran.*
28. 2016-036 K-Manufacturing 3rd Addition, Dayton.

*in meeting packet

29. 2016-037 Lanewood Estates, Plymouth.*
30. 2016-038 AutoMotorPlex, Medina.
31. 2016-039 Sands Parcel, Plymouth.

N. Adjournment. There being no further business, motion by Bottema, second by Jullie to adjourn. *Motion carried unanimously.* The meeting was adjourned at 12:50 p.m.

Respectfully submitted,

Recording Secretary
JAA:tim
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*in meeting packet

MINNESOTA'S BUFFER INITIATIVE

Minnesota's New Buffer Initiative will soon require public waters in the state - lakes, rivers and streams - to be surrounded by vegetated buffers 50-feet wide (on average) and public ditches to have 16.5-foot wide buffers as well. Buffers will need to be installed on public waters by November, 2017 and on public drainage systems by November, 2018.

The Minnesota Department of Natural Resources recently released buffer maps that show which waters are subject to the new requirements. Landowners can use these maps to determine if buffers are needed on their property. The buffer maps can be found at http://dnr.state.mn.us/buffers/index.html.

A buffer is vegetated land adjacent to a stream, river, lake or wetland. Buffers help slow the flow of water and filter out phosphorous, nitrogen, and sediment, which are all pollutants that degrade water quality. The buffer initiative will reduce erosion and pollution from runoff by establishing about 110,000 acres of buffers along Minnesota waterways.

The new rules will not impact lakeshore residents who have beaches, docks or landscaping. However, those properties will still have to comply with existing DNR, county and watershed district rules.

The Hennepin County Environment and Energy Department will be contacting landowners who may be affected by this new law in late-2016 and early-2017. If you have questions contact Jim Kujawa at 612-348-7338 or Kirsten Barta at 612-543-3373.

Implementing Minnesota's Buffer Law

Summer 2016

In June of 2015, Governor Dayton signed into law a new buffer initiative aimed at enhancing protection of Minnesota's waters. The law was further clarified in 2016, and policies are currently being developed by the Board of Water and Soil Resources (BWSR) to implement the law.

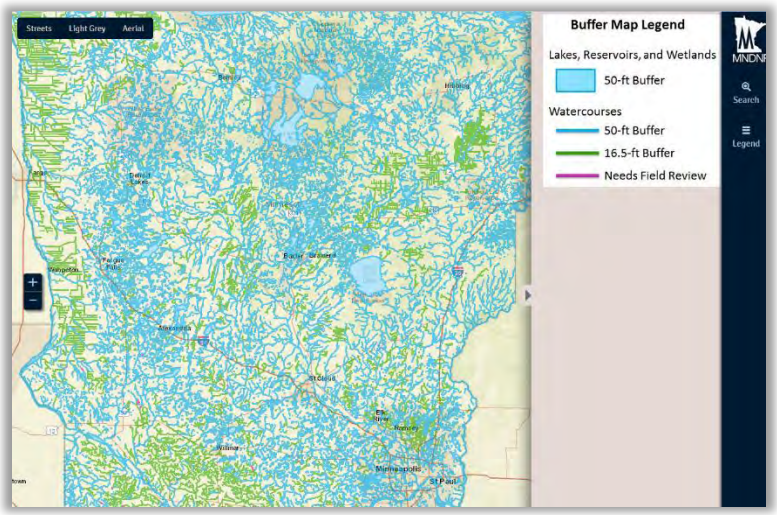
What is a buffer?

A buffer, also known as a riparian filter strip, is vegetated land adjacent to a stream, river, lake or wetland. Buffers help filter out phosphorus, nitrogen, and sediment, and are an important conservation practice for helping keep water clean.

Where are buffers required?

Under the law, buffer widths will be:

- An average of 50 feet, minimum of 30 feet, on public waters, as determined by the Department of Natural Resources (DNR)
- A minimum of 16.5 feet on public drainage systems, as determined by the local Drainage Authority (usually the County or Watershed District)
- Soil and Water Conservation Districts (SWCDs) will identify other watercourses for inclusion in the county or watershed district water plan, who will then determine appropriate water quality actions for those watercourses.
- Alternative Water Quality Practices which provide a comparable water quality benefit are allowed on ***Agricultural lands***.



The DNR recently released its statewide buffer map, which allows landowners to determine whether they are impacted by the Buffer Law. The DNR Buffer Protection Map can be found here: http://dnr.state.mn.us/buffers/index.html

How will the program work?

BWSR is working to get program details developed. Landowners may install buffers on their own at any time before the implementation deadlines. SWCDs will provide technical assistance and answer questions about financial assistance options. Landowners also have the option of working with their SWCD to determine if other alternative practices aimed at protecting water quality can be used.

A grass buffer strip in Redwood County.

Is there financial assistance available?

Yes. The 2015 Buffer Law relies on long-standing federal, state, and local programs to provide financial and technical support to landowners to implement buffers or alternative water quality practices. Landowners may use federal Farm Bill resources, such as the Conservation Reserve Program (CRP), Continuous CRP, and the Environmental Quality Incentives Program to get buffers installed. State resources include programs such as the Reinvest in Minnesota (RIM) easement program, Conservation Cost-Share, and the Minnesota Agricultural Water Quality Certification Program (AWQCP). The BWSR Board recently approved a policy that all farms who are certified under the AWQCP are deemed compliant with the buffer law requirements.

A buffer in Olmsted County.

What's the timeline?

The new law specifies:

- November 1, 2017: Buffers in place on all public waters
- November 1, 2018: Buffers in place on all public drainage systems

Who is responsible for enforcement?

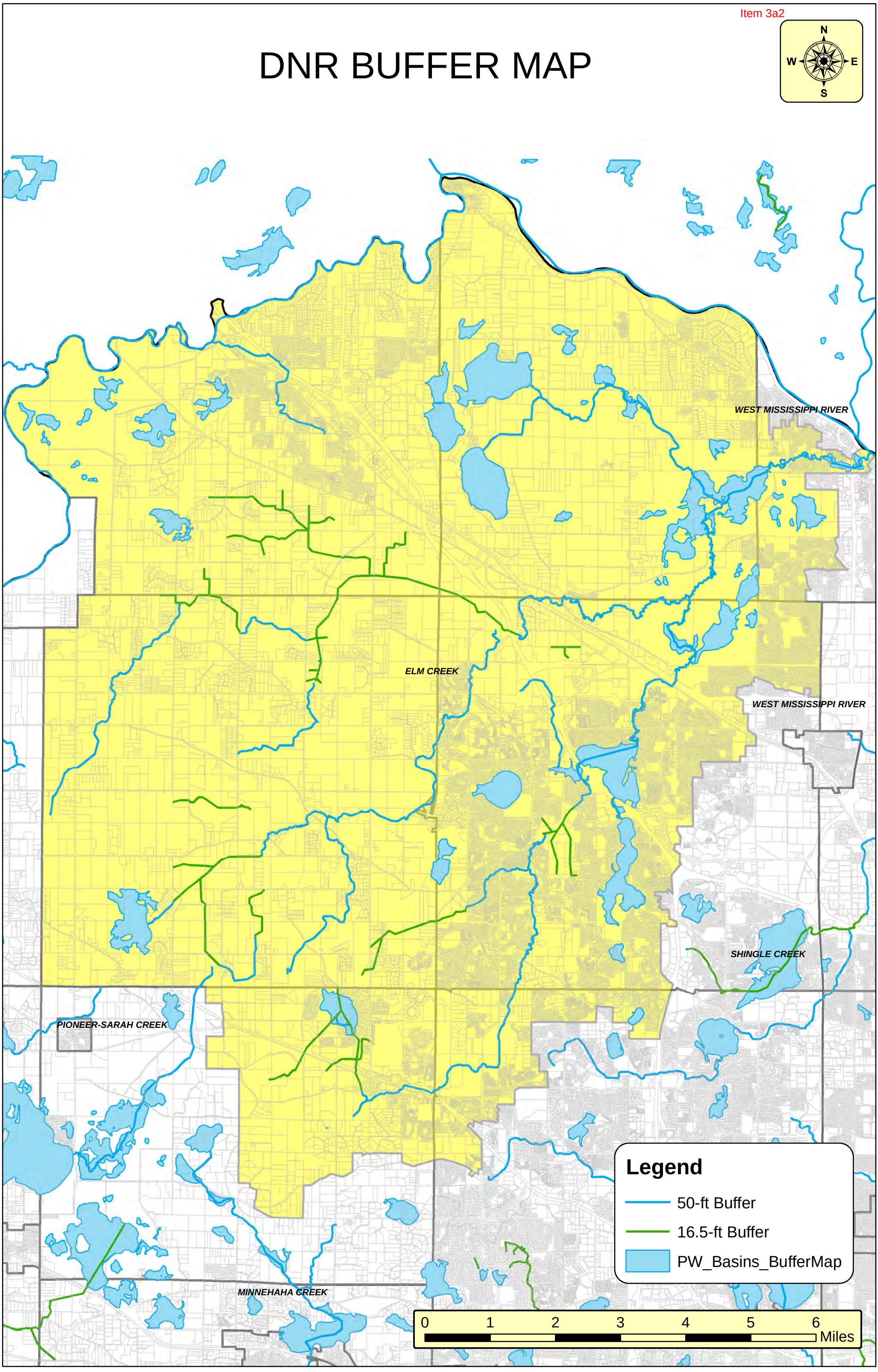
Counties and Watershed Districts have the option to choose whether to be the enforcement agency for the Buffer Law. If they elect not to do so, BWSR is responsible.

Where do I go for more information?

Contact your local SWCD for more information about buffers and local requirements. For more information on the new buffer law, please visit: www.bwsr.state.mn.us/buffers/. The DNR map and more information about their process can be found at http://dnr.state.mn.us/buffers/index.html.

Item 3a2

DNR BUFFER MAP



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STAFF REPORT
October 5, 2016

2013-046 Woods of Medina. Medina. This is two parcels totaling 9.5 acres located east of CR 116 and south of Hackamore Road. The site is proposed to be developed into 16 single-family residential lots. At its January 13, 2015, meeting the Commission approved this project with two conditions: 1) a pond operations and maintenance agreement must be provided, approved by the City and the Commission, and recorded on the title to the property. The recording must be done within 90 days of the final plat approval; and 2) a copy of the approved wetland replacement plan must also be provided. Final platting will be done when the landowner sells the property or decides to develop it himself. On August 3, 2016, Staff contacted the City seeking an update on the status of this project.

2014-015 Rogers Drive Extension, Rogers. This project involves improvements along Rogers Drive, extending from Vevea Lane to Brockton Lane. The project is located east of I-94, south of the Cabela development. The total project area is 8.0 acres; proposed impervious surfaces total 5.6 acres. Site plans received July 1, 2014 meet the requirements of the Commission with the exception of the nutrient control. Due to limited options to treat the nutrient loads on the east 1.7 acre portion of Rogers Drive, the Commission approved the site plan contingent upon the City deferring 4.6 pounds of phosphorus for treatment in future ponding opportunities as the easterly corridor of Rogers Drive develops. 2.3 pounds will be accounted for in the Kinghorn Spec. Building site plan with 2.3 pounds still outstanding. This item will remain on the report until the total deferral is accounted for.

2015-004 Kinghorn Outlot A, Rogers. This is a 31 acre site located between the Clam and Fed Ex sites in Rogers on the west side of Brockton Road and I-94. The proposed site will have two warehouse buildings, 275,000 and 26,000 SF in size, with associated parking and loading facilities. The Commission standards require review of stormwater management, grading and erosion controls and buffers. A complete plan was received May 14, 2015. At their June 2015 meeting the Commission approved this project with three conditions. Numerous revised plans have been received for Staff review. Once Rogers has authorized Staff to proceed, Staff will provide updated findings when the conditions are met.

2015-006 Veit Building and Parking Lot Addition, Rogers. This site is located at the Veit Headquarters Building, 14000 Veit Place. It is bound by I-94 to the north and Industrial Boulevard to the south and east. Fox Creek/DNR wetland #27-02920 is west of this property. The owner proposes to extend the main building entrance with a 6,500 SF building expansion. The existing surface lot adjacent to the main building entrance will be reconfigured and relocated slightly east of its current location. Soil boring tests performed since the Commission meeting determined infiltration will not work on this pond. Reducing the impervious area on site by 0.74 acres and installing a SAFL-Baffle weir in the storm sewer system will combine to meet the Commission standards for this site. The project was approved by the Commission at their May meeting pending the SAFL-Baffle weir being covered by an easement and the appropriate operation and maintenance agreement being obtained and recorded with the property. The applicant's agent indicated the O&M plan has been submitted to Rogers for approval. On August 3, 2016, Staff contacted the City seeking an update on the status of this project. The City responded that they are working with Veit to obtain additional easements to a wetland restoration project that took place adjacent to their property. The only access to the restored wetland is through their property. The City will continue to push them to finalize the easement and O&M.

2015-030 Kiddiegarten Child Care Center, Maple Grove. This is a 2.2-acre undeveloped/vacant parcel platted with the Dalton Commons PUD. The applicant proposes to build a kindergarten that will have about 50% impervious cover. The PUD was approved in the early 2000s for 75% impervious cover. The site was designed to drain to Target Pond, which is located south of CSAH 30 and west of I-94. This project was approved by the Commission at their December 9, 2015 meeting with three conditions. No new information has been received. On August 3, 2016, Staff contacted the City seeking an update on the status of this project.

2016-001 CSAH 115/CR 116 Reconstruction, Medina. This project will include reconstruction of the roadway, including widening the road from the existing two-lane roadway, constructing dedicated turn lanes, drainage improvements, and construction of a paved pedestrian and bicycle trail. The project will increase the capacity of the intersection and improve mobility and safety for all transportation system users. It includes removal of the existing roadway and storm sewer; grading; placement of aggregate base and a new bituminous base and surface; addition of curb and gutter, storm sewer, and stormwater management facilities; and new signals, lighting, and related pedestrian facilities. A complete application was submitted on April 1, 2016. The Commission approved this project at their April 2016 meeting pending minor design modifications to reduce the 2-year peak flow; completion of the wetland mitigation plan and approval by the LGU; and final document recordings of the O & M plans/agreements. The design has been modified to reduce the 2-year peak flow. *Total impacts of about 1,800 SF are eligible for the MN Local Government Road Wetland Replacement Program (LGRWRP). Once the project is completed, the County will turn over the stormwater treatment structures to the City. This project will be removed from the report.*

2016-002 The Markets at Rush Creek, Maple Grove. This is a proposal to develop 40 acres of a 123 acre planned unit development located on the southwest quadrant of the intersection of CSAH 101 and CSAH 10. County Ditch 16 (Maple Creek) runs along the south property line on this project. The 40-acre project area includes a Hy-Vee grocery store (16.8 acres), a Hy-Vee gas station (2.5 acres) and 11 outlots (18.76 acres). Right-of-way accounts for the remaining 2.3 acres. The remaining acreage (83 acres) consists of 5 outlots and right-of-way. The additional outlot areas are not part of the stormwater review for this project but will be reviewed for compliance with the Commission's buffer and floodplain requirements. At their May 2016 meeting, the Commission granted Staff authority to administratively approve the project and report any updates. On August 3, 2016, Staff contacted the City seeking an update on the status of this project. *The project has been placed on hold by Hy-Vee.*

2016-004 Park Place Storage Site Plans, Corcoran. The applicant is proposing to develop a 22-acre site in the southwest portion of the city into a multi-unit storage facility with associated access roads, utilities, and stormwater features. This will be an addition to the existing storage facility located west of the proposed project. New wetland permit revisions were received on May 25, 2016 and approved by the Commission at their July 2016 meeting contingent upon final escrow and easement establishment for the wetlands during the site plan review process. New site plan information has been received but still does not meet the Commission standards. The applicant extended the 15.99 deadline to December 7, 2016. *Revised plans were received September 29. Additional information has been requested on the filtration basins/benches. If available, an update will be provided to the Commission at their meeting.*

2**016-005W Ravinia Wetland Bank, Corcoran.** In February, Lennar Corporation submitted a Wetland Banking Concept Plan for Phase II of their Ravinia Development in Corcoran. This plan has since been withdrawn in favor of an onsite wetland replacement plan. Wetland impacts from the final phases of this development will be 1.17 acres. They are proposing to restore, enhance and create 3.3 acres of wetland credits and 1.24 acres upland buffer credits on site. The original wetland delineation was approved by the LGU September 9, 2013. The project was been noticed per MN WCA requirements on August 27. *Comments were accepted until September 30, 2016. A TEP was held on October 3 on the replacement plan. The TEP and applicant agreed to revise the plan so wetland restoration and creation were limited on one basin for a better wetland. Revised plans will be submitted for additional review and action.*

2016-023 Tri-Care, Maple Grove. Plans were submitted on May 13, 2106 for this project located along the north side of County Road 30, at Garland Lane (northeast corner of Garland Lane and CR 30). The project will disturb approximately 10.3± acres. The project consists of constructing a stormwater pond, temporary road and utilities. The site currently is mostly grass-covered and was previously used as farm field. There is a wetland on the west end of the site. Staff extended the decision timeline 60-days to September 10, 2016. Revised site plans were received July 6. During a site visit Staff observed this project has already been constructed and is functioning. Staff requested the applicant provide the Commission with as-builts along with proof and certification that the stormwater filtration pond will meet its abstraction volume requirements. *A visual inspection of the filtration pond verifies it does not filter enough volume during a 48 hour period to meet Commission requirements. Staff have asked the developer for their resolution to the issue. No response was received within the review period. Staff notified the applicant that the project was automatically denied. It will be removed from the report.*

2016-033 Dayton Public Works Garage, Dayton. This is a 17-acre farm field located on the east side of Zanzibar Lane about half-way between North and South Diamond Lake Roads. It will be developed into a public works facility with a new building and parking lot area. Staff will review for compliance with the Third Generation SWMP and provide a recommendation to the Commission. *At their September meeting the Commission approved this project. This project will be removed from the report.*

2016-035W 20070 Larkin Road, Corcoran. This is a wetland violation where filling occurred during site improvements at the back of an existing storage facility. Work appears to have been done around the week of July 18. Filling was done to accommodate additional outside storage area. A TEP was held on site September 6. It was determined that approximately 4,125 SF of wetland was filled. A restoration order was issued for the violation and for the landowner to comply with the Commission and WCA requirements. *The landowner has until October 24 to restore the wetland or October 17 to request an exemption/no loss or submit a complete wetland replacement plan.*

2016-037 Lanewood Estates, Plymouth. This is a 5.9 acre site located north of CR 47, at the extension of Lanewood Lane (PID 0411822120006), within the Taryn Hills community. Current use of the property is a single house and barn on the property with a large lawn. Surrounding land use on the north, west and south is single family houses and vacant on the east. About one-third of the northeast portion of the parcel is wetland which is also a Public Water Wetland. The applicant is proposing to build 7 single-family houses. On August 30, 2016, Staff requested revisions to complete the review. Revisions were submitted on September 7, 2016. *The Commission approved this project at their September meeting with two conditions: a) A copy of the revised HydroCAD model must be submitted; and 2) The proposed pond access road must be a reinforced turf road within the buffer area. Both items have been verified by Staff to meet the conditions. This project will be removed from the report.*

2016-038 AutoMotorPlex, Medina. This 22.17 site owned by Loram is located on the northeast corner of County Roads 115 and 118. The site will be re-platted into two lots, 19.17 acres and 3 acres. At this phase only the northern 19.17 acres will be developed into commercial automobile condominiums and retail area. Staff requested revisions on September 1, 2106. *Revisions were received on September 6, September 23 and October 3. The most recent revisions have not been reviewed at the time of this report. If available, an update will be provided to the Commission at their meeting.*

2016-039 Sands Parcel (The Fields at Meadow Ridge), Plymouth. This is a 20.5-acre site located on the northeast side of the intersection of County Road 47 and Troy Lane North. The site is proposed for a 46 single-residential home development. *The plans were submitted together with the adjacent 2016-041 Bartus site. Staff findings and recommendations are included in the meeting packet. Staff recommends approval of the final revised plan with the following condition: If required by the City, an O&M plan must be recorded within 90 days following the final plat approval.*

2016-040 Kinghorn 4th Addition, Rogers. *This is a 13.7 acre parcel located in the NW corner of the intersection of Brockton Lane and Rogers Drive. An industrial warehouse is proposed for the site. 8.8 acres of new impervious area is proposed. This plan was received too late for Staff's review to be included in this report. If available, an update will be provided to the Commission at their meeting.*

2016-041 Bartus Subdivision, Plymouth. *This site is approximately 10 acres and adjacent to 2016-039 Sands parcel. It is located on the northwest side of the intersection of CR 47 and Troy Lane. It is located to the west of Sands parcel. The stormwater management plan was reviewed with the Sands parcel. Staff is reviewing the plan and may have a recommendation at the meeting.*

2016-042 Cherrywood of Plymouth. *This is a 4.7-acre site located where Old Rockford Road and Highway 55 intersect. A senior living building is proposed. It will create approximately 1.8 acres of new impervious area. This plan was received too late for Staff's review to be included in this report. If available, an update will be provided to the Commission at their meeting.*

2016-043 Lawndale Lane Reconstruction, Maple Grove. *Maple Grove is proposing to reconstruct and improve Lawndale Lane for 1,500 feet north of CR 30. Site plans were received September 29, which was too late for Staff's review to be included in this report. If available, an update will be provided to the Commission at their meeting.*

2016-044W TH169 Wetland, Champlin. *This is a wetland delineation report received October 4. It is for the TH 169/ CR12 corridor between the Mississippi River, the Elm Creek Dam and Hayden Lake Road. Staff will notice and review the report and provide a decision after the public review and comment period expires.*

FINAL RECORDINGS ARE DUE ON THE FOLLOWING PROJECTS.

2015-013 Wayzata High School, Plymouth. Approved with conditions on July 8, 2015. Awaiting final recording of the plan.

2015-020 Strehler Estates, Corcoran. Approved on January 10, 2015 contingent upon a conservation easement being recorded on the property title.

2015-025 OP3 Outdoor Storage, Rogers. Approved with conditions on September 9, 2015. A stormwater pond operation and maintenance plan must be submitted for review and approval and recorded.

2015-032 Rogers High School Auditorium Addition, Rogers. Approved on December 9, 2015, with conditions. Awaiting recordation of the O&M agreement.

2016-014 Balsam Apartments, Dayton. Approved April 13, 2016, pending recordation of an Operation and Maintenance agreement with an O&M plan.

2016-018 Cambridge Park, Maple Grove. Approved on July 13, 2016, subject to recorded preservation easements and pond maintenance provided by the City or through an approved operation and maintenance agreement recorded on the property title. Preliminary easements and operation and maintenance agreements for the ponds and preservation areas were received and approved by Commission Staff. Final proof of recording of the documents is still needed.

2016-019 Just for Kix, Medina. Approved June 8, 2016. Awaiting recordation of corrected O & M plan agreement for the bio-filtration basins.

2016-020 Ryan Meadows, Rogers. Approved June 8, 2016, contingent upon an operations and maintenance agreement being approved by the City and the Commission and recorded on the property title within 90 days after final plat recording.

2016-021 Diamond View Estates, Dayton. Approved June 8, 2016, contingent that, if the City of Dayton/homeowners are to maintain the ponds and the bio-filtration basin, an operation and maintenance plan agreement must be submitted for approval to the City and the Commission and recorded within 90 days of the final plat approval.

2016-022 AutoZone, Maple Grove. At their June 8, 2016 meeting, the Commission approved Staff's findings dated June 1, 2016, with the condition of recording an approved O & M Plan within 90 days of the final plat approval.

2016-026 Faithbrook Church, Dayton. Approved August 10, 2016, with the stipulation that an approved O&M plan must be recorded with the property within 90 days following final plat approval.

Z:\Elm Creek\StaffReports\Staff Reports 2016\October Staff Report.docx

elm creek
Watershed Management Commission

ADMINISTRATIVE OFFICE
3235 Fernbrook Lane
Plymouth, MN 55447
PH: 763.553.1144
E-mail: judie@jass.biz
www.elmcreekwatershed.org

TECHNICAL OFFICE
Hennepin County Public Works
Department of Environment and Energy
701 Fourth Ave. South, Suite 700
Minneapolis, MN 55415
PH: 612.348.7338
E-mail: ali.durgunoglu@hennepin.us

SANDS Parcel
The Fields at Meadow Ridge
Plymouth, Project #2016-039

Project Overview: This is a 20.4 acre site located at the north side of County Road 47 and Troy Lane North intersection. The project consists of three parcels (PIDs: 0611822210002, 0611822120004 and 0611822120005). PID 0611822210002 is not contiguous with the other two parcels. Current land use of the properties are crop and small buildings on the southeast corner. Surrounding land use is rapidly developing into residential. There are small wetlands on the property. The applicant is proposing to build 46 single family houses. There is no floodplain in the vicinity.

Applicant: NORTH47, LLC, Attn. Jake Walesch, 10850 Old County Road 15, Plymouth, MN 55441. Phone: 612-749-1360. Email: Jake@jakewalesch.com. Application form is signed by Justin Bannwarth.

Agent/Engineer: Sathre Bergquist Inc., Attn. Tom Welshinger, 150 South Broadway Ave., Wayzata, MN 55391. Phone; 952-476-6000. Email: Twelshinger@sathre.com

Exhibits:

1) ECWMC Request for Plan Review and Approval, received August 24, 2016.
2) Site Plans by Sathre Bergquist dated July 9, 2016 (final revision was received on September 30, 2016) (Signed by Robert Molstad, P.E. on August 10, 2016).
    a. Final Plat and Lot Tab (4 Sheets)
    ALTA/NSPS Land Title Survey
    Proposed Plat
    Lot Tab
    Plat Monitoring
    b. Spec Book (16 Files)
    c. SWMP and GEO Reports
    There is no Geotechnical Report
    Wetland Delineation Report
    Updated Stormwater Management Report (last updated September 26, 2016), signed by Justin Klabo, PE. Advanced Engineering and Environmental Services, Inc.

d. Plan Set
   Title Sheet
   Final Street Plan
   Final Utility Plan
   Final Storm Plan
   Final Grading Plan
   Final Erosion Control Plan
   City Details (5 pages)
   Pond and filtration basin/bench cross sections

Findings;

1) A complete application was received August 26, 2016. The initial 60 day review period per MN Statute 15.99 expires October 25, 2016.
2) Applicant is asking this project to be reviewed in conjunction with the adjacent 10-acre parcel to its west (BARTUS Development). The Stormwater Management Plan is designed for the combined 30 acre site. A separate review will be done for the BARTUS site.
3) The combined impervious ratio of the two projects (SANDS and BARTUS), excluding the offsite drainage, but including the County Road 47 right-of-way, is about 28%. For the SANDS project that will equate to about 5.8 acres of impervious cover.

Rule D. Stormwater Management

4) The existing stormwater from the SANDS parcel site drains north/northeast, south and southeast. The south discharge point is routed through an existing culvert beneath County Road 47. The north discharge point goes into a wetland that eventually drains into another wetland on Bonair Addition in Maple Grove. The southeast discharge point enters into the small wetland located on that corner.

5) Soils present throughout the site are predominately Hydrologic Soil Group (HSG) Type C and C/D soils, which have low permeability.

6) The proposed new impervious area is about 5.8 acres (SANDS project only). The abstraction volume requirement for 1.1 inches of runoff from the new impervious area is 23,160 cubic feet (0.532 ac-ft).

7) The stormwater management within the SANDS site will be provided by the construction of three wet ponds.

   a) Pond 1 will outlet into the wetland located along the north property line and will incorporate a filtration basin.
   b) Pond 2 will be located adjacent to the central wetland.
   c) Pond 3 will be located on the southeast corner of the project and discharge into the small wetland adjacent to it. This pond will have a filtration bench.
   d) A small area of backyards along County Road 47 will be treated by a rain garden filtration system before discharging into the County Road 47 culvert. This rain garden was not included in the watershed's stormwater treatment analysis.

8) The revisions requested on the September 21, 2016, staff report have been submitted and reviewed. They meet the watershed standards.

Rate requirements. The existing and proposed discharge rates are as follows: (these rates have changed slightly due to the final revision of the HydroCad model). Rate control meets the watershed's standards.

	Discharge Point	2-Year Event	10-Year Event	100-Year Event
Existing Conditions (cfs)	Northeast	11.7	23.7	47.8
	South	4.3	8.0	10.2
	Southeast	9.0	18.9	44.4
	West (BARTUS)	6.7	14.0	29.5
Proposed Conditions (cfs)	Northeast	7.2	14.9	35.6
	South	4.1	7.2	8.8
	Southeast	4.5	15.4	22.0
	West (BARTUS)	2.5	4.9	18.0
Change in Peak Flows (cfs)	Northeast	-4.5	-8.8	-12.2
	South	-0.2	-0.8	-1.4
	Southeast	-4.4	-3.5	-22.3
	West (BARTUS)	-4.2	-9.1	-11.5

Nutrient and TSS

All nutrient calculations were made by using the P8 model and for the SANDS site only. Nutrient control meets the watershed's standards.

9) Phosphorus
   a. Pre-development phosphorus load = 7.5 lb/year.
   b. Post development phosphorus load without BMPs = 16.6 lbs/year.
   c. Post development phosphorus load with BMPs = 4.6 lbs/year
10) TSS
   a. Pre-development = 1,882 lbs/year
   b. Post development without BMPs = 5,188 lbs/year
   c. Post development with BMPs = 699 lbs/year

Volume abstraction and filtration requirements. (23,160 cubic feet of abstraction or equivalent is required)

11) Storm hydrographs of Pond 1 and Pond 3 show that at the minimum the abstraction volume will be filtered within 48 hours during the 2-year event.

12) Abstraction by infiltration is not possible on this site due to clay soils. As required by the rules, the applicant has demonstrated that the abstraction volume is filtered through the sand filtration basin and the sand filter bench and the nutrient levels are maintained below the pre-development levels. That meets the watershed's standards.

13) Storm water summary is as follows:

Development Name:.....SANDS
Total Parcel Area: .....20.4 acres
Total Disturbed ("Buildable") Area: .....~18.5 acres
Review Month/Year:.....August-October 2016
Nearest Downstream Surface Water: .....Elm Creek, 0.5 miles east

Condition	TP Load (lbs./yr)[1]	TSS Load (lbs./yr)[1]	Filtered Volume (per event) (cu-ft)	Runoff volume (AF/yr.)[1]
Pre-development (baseline) Load	7.5	1,882		
Post-development Without Mitigation	16.6	5,188		
Post-development With Mitigation	4.6	699		
Net Change ("baseline" compared to "post-development with mitigation")	**-2.9**	**-1,183**	N/A	N/A
[1] Average annual values				

Rule F. Floodplain Alteration:
There are no established FEMA or ECWMC flood plains within the project area.

Rule G. Wetland Alteration:
The City of Plymouth is the LGU in charge of administering the MN Wetland Conservation Act on this parcel.

a. Wetland boundary survey was conducted and a report was prepared on June 15, 2016, by Sambatek.
b. The application for wetland boundary was posted on July 14, 2106 by the city.
c. Notice of decision for the wetland boundary approval has been posted on August 10, 2016.

Rule I. Buffer Strip Requirements.

14) The proposed wetland buffers meet the watershed's standards. The average and minimum buffer widths are shown on the plans with buffer marks placed at the intersection of buffer line and property lines, as well as where the buffer line changes.

Rule E. Erosion and Sediment Control

15) The ponds should be used as a temporary sediment basins during the construction and fitted with the appropriate outlets until the site is stabilized.

Recommendation:

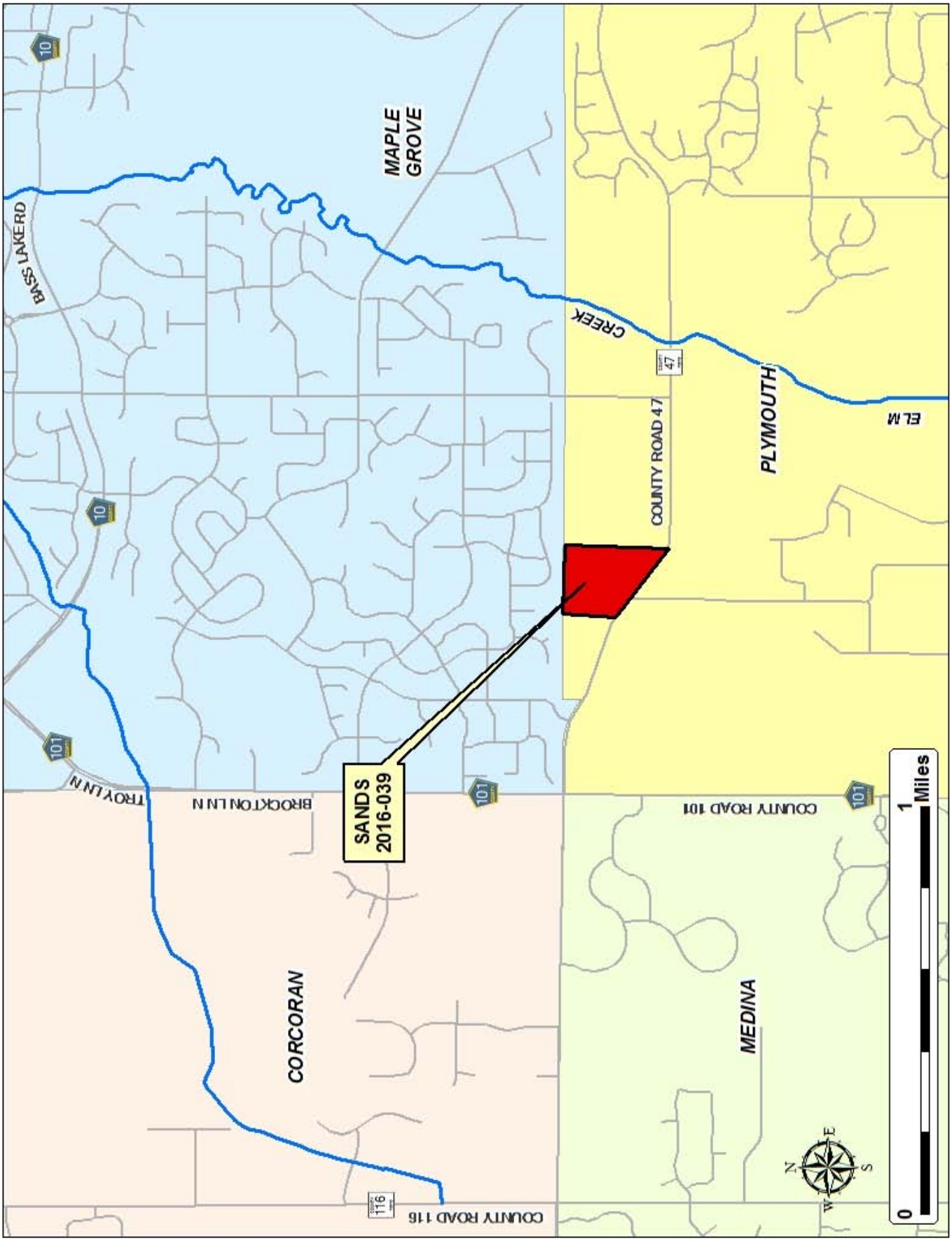
Staff recommends the approval of the final revised plan with the following condition.

- Please submit a copy of the O&M plan within 3 months following the final plat approval, if required by the city.

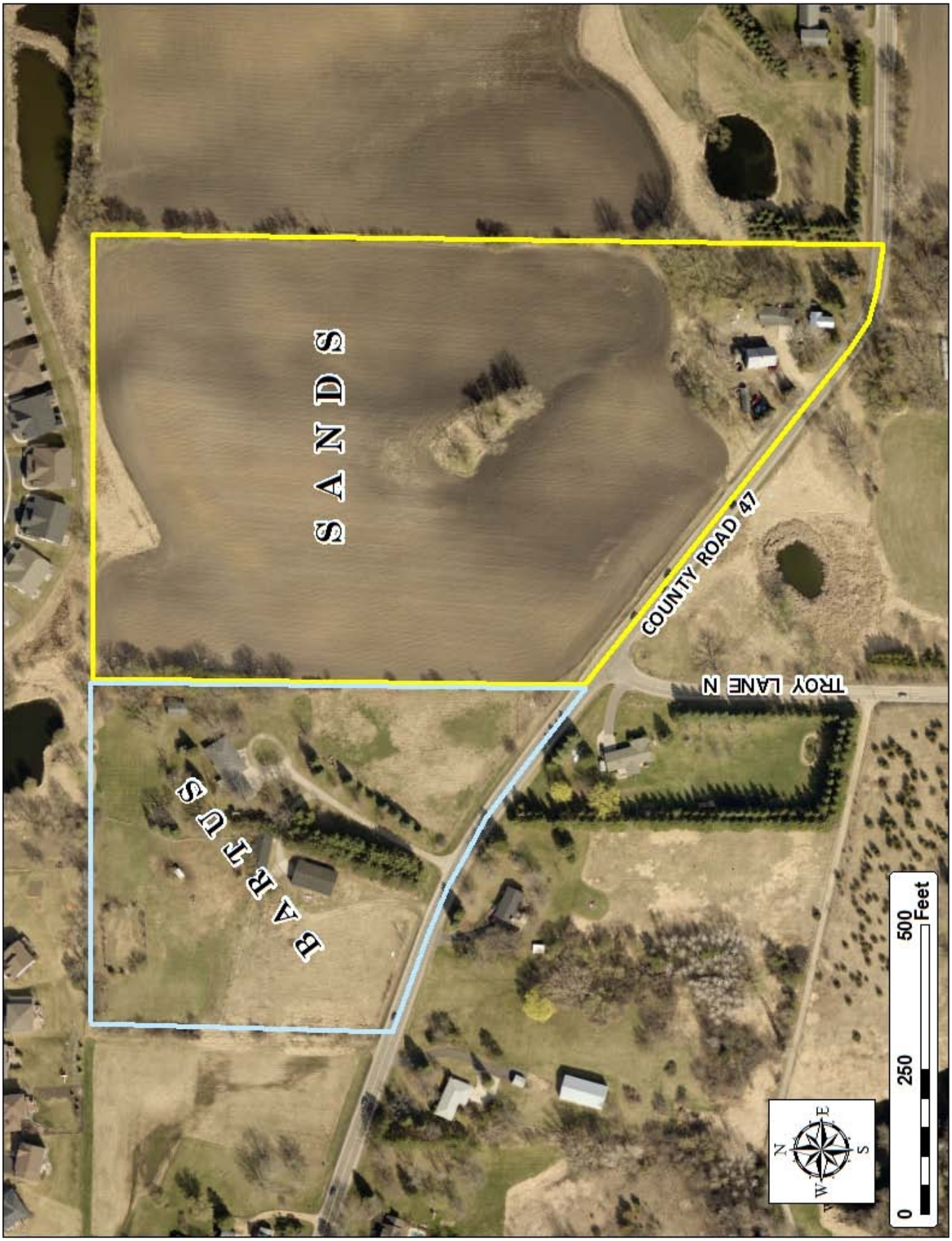
Ali Durgunoglu, Ph.D., P.E.
Technical Advisor to the Commission

October 4, 2016

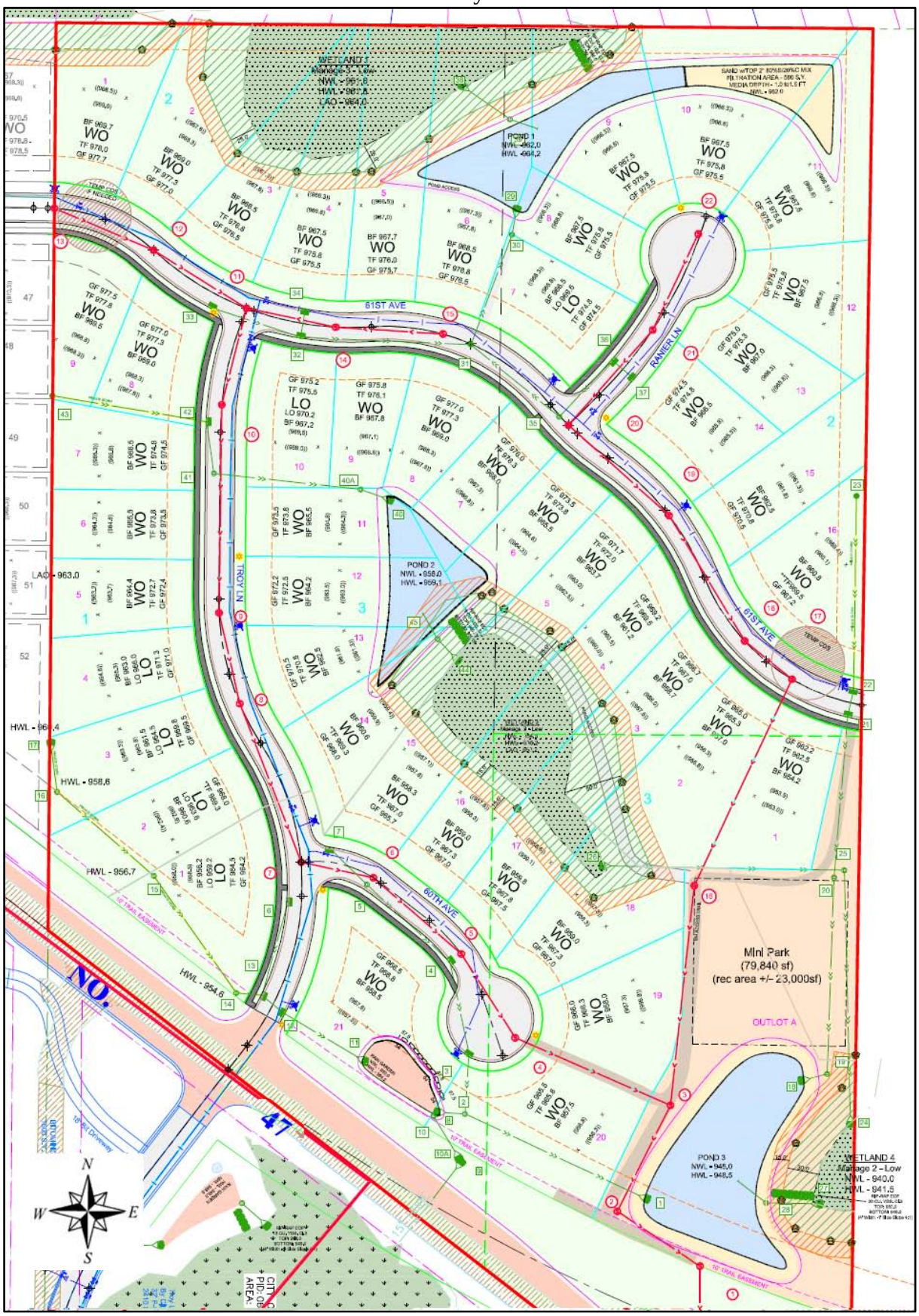
Site Location



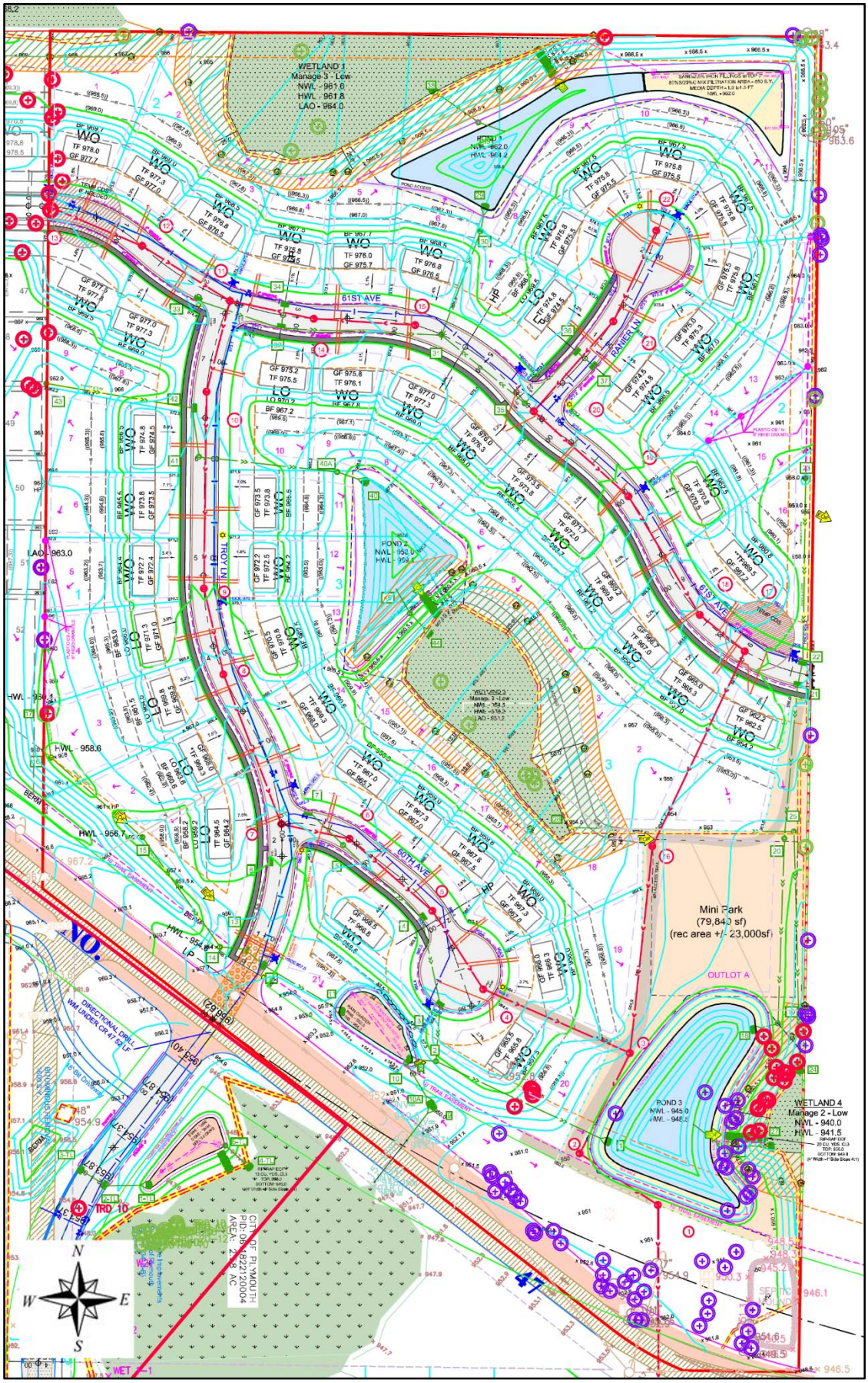
Aerial View



Site Layout


WETLAND 1
POND 1
POND 2
POND 3
61ST AVE
60TH AVE
RAINER LN
TROY LN
Mini Park
(79,840 sf)
(rec area +/- 23,000sf)
OUTLOT A
WETLAND 4
N
S
E
W

Grading Plan



City of Plymouth

Adding Quality to Life

October 5, 2016

Ms. Judie Anderson, JASS
Elm Creek Watershed Management Commission
3235 Fernbrook Lane North
Plymouth, MN 55447

SUBJECT: Elm Creek Stream Restoration Project
City Project No. 14006

Dear Ms. Anderson,

Enclosed/attached you will find photos, as-builts and payment documentation totaling $483,617.21 for construction of the Elm Creek Stream Restoration Project in Plymouth. Per the "Cooperative Agreement for Plymouth Elm Creek Stream Restoration Project" between the City of Plymouth and the Elm Creek Watershed Management Commission, the City is requesting reimbursement of up to $250,000 (less Commission expenses) for this project.

The City is grateful for the partnership with the Elm Creek Watershed Management Commission and looks forward to future endeavors.

Sincerely,

Derek Asche

Derek Asche
Water Resources Manager

enc

PAYMENT REQUEST FORM

OWNER: City of Plymouth
PROJECT: Elm Creek Stream Restoration and Water Quality Improvements City Project No. 14006
CONTRACTOR: Minnesota Native Landscapes, Inc.

PAY ESTIMATE NO. 1

Original Contract Amount	$ 588,720.00
Contract Changes approved to Date (List Change Order Numbers)	$ 12,500.00 (FA1)
	$ 40,451.60 (FA2)
Revised Contract Price	$ 641,671.60
Work Completed to Date (attached)	$ 146,951.00
Retainage to Date, 5%	$ 7,347.55
Work Completed to Date Less Retainage to Date	$ 139,603.45
Total Amount Previously Certified	$ 0.00
Payment Request This Estimate	$ 139,603.45

I declare under penalty of perjury that this account, claim, or demand is just and correct and that no part of it has been paid.

CONTRACTOR

CERTIFICATE OF CONTRACTOR

I hereby certify that the work and the materials supplied to date, as shown on the request for payment, represents the actual value of accomplishment under the terms of the contract dated

December 2, 2015 between the City of Plymouth (OWNER)

and Minnesota Native Landscapes, Inc. (CONTRACTOR) and all authorized changes thereto.

By _____

Title VP

Approval:

(CONTRACTOR) _____ Date 2-9-16

WENCK ASSOCIATES, INC. _____ Date 2-11-16
Ed Matthiesen, P.E.

CITY OF PLYMOUTH _____ Date _____

END OF SECTION

CERTIFICATE OF CONTRACTOR

I hereby certify that the work and the materials supplied to date, as shown on the request for payment, represents the actual value of accomplishment under the terms of the contract dated

December 2, 2015 between the City of Plymouth (OWNER)

and Minnesota Native Landscapes, Inc. (CONTRACTOR) and all authorized changes thereto.

By _____

Title VP

Approval:

(CONTRACTOR) _____ Date 2-9-16

WENCK ASSOCIATES, INC. _____ Date 2-11-16
Ed Matthiesen, P.E.

CITY OF PLYMOUTH _____ Date _____

END OF SECTION

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

Monthly Payment Estimate

Project Title: Elm Creek Stream Restoration and Water Quality Improvements
Client: City of Plymouth
Project Number: 1756-07
Project Manager: Lucius Jonett
Date: 1/8/2016

Pay Item No.	Nature of Work	Unit	Quantity 1/8/16	2/1/16	6/1/16	7/1/16	To Date	Budget	Unit Bid	Earnings 1/8/16	2/1/16	6/1/16	7/1/16	Budget	% Spent
1	Mobilization and Demobilization	LS	0.5				0.5	1	$ 27,000.00	$ 13,500.00	$ -	$ -	$ -	$ 27,000.00	50.0%
2	Invasive Species Management	AC	2.0				2.0	7.7	$ 2,250.00	$ 4,500.00	$ -	$ -	$ -	$ 17,325.00	26.0%
3	Tree Clearing & Harvesting	LS	0.3				0.3	1	$ 60,000.00	$ 20,000.00	$ -	$ -	$ -	$ 60,000.00	33.3%
4	Chip Onsite and Spread Woodchips on Existing Trails	LS					-	1	$ 20,000.00	$ -	$ -	$ -	$ -	$ 20,000.00	0.0%
5	Haul and Dispose Offsite All Unchipped Wood	LS					-	1	$ 100.00	$ -	$ -	$ -	$ -	$ 100.00	0.0%
6	Construct, Maintain, & Restore Site Access and Staging Areas	LS	0.5				0.5	1	$ 15,000.00	$ 7,500.00	$ -	$ -	$ -	$ 15,000.00	50.0%
7	Bank Resloping	LF	2075.0				2,075.0	3625	$ 17.00	$ 35,275.00	$ -	$ -	$ -	$ 61,625.00	57.2%
8	Woven ECB, Rolanka BioD-Mat 40	SY	3480.0				3,480.0	4350	$ 5.50	$ 19,140.00	$ -	$ -	$ -	$ 23,925.00	80.0%
9	Non-Woven ECB Cat 3 Type Straw 2S (No Poly Netting)	SY	3480.0				3,480.0	9200	$ 1.75	$ 6,090.00	$ -	$ -	$ -	$ 16,100.00	37.8%
10	Footer Log	LF	622.0				622.0	1275	$ 25.00	$ 15,550.00	$ -	$ -	$ -	$ 31,875.00	48.8%
11	Cross Log	EA	94.0				94.0	193	$ 210.00	$ 19,740.00	$ -	$ -	$ -	$ 40,530.00	48.7%
12	Nursery Log	EA					-	10	$ 550.00	$ -	$ -	$ -	$ -	$ 5,500.00	0.0%
13	Seating Log	EA					-	10	$ 300.00	$ -	$ -	$ -	$ -	$ 3,000.00	0.0%
14	Silt Fence, Type MS - Maintained	LF					-	750	$ 3.00	$ -	$ -	$ -	$ -	$ 2,250.00	0.0%
15	Flotation Silt Curtain Type Moving Water - Maintained	LF	30.0				30.0	500	$ 10.00	$ 300.00	$ -	$ -	$ -	$ 5,000.00	6.0%
16	Sediment Control Log Type Straw (Or Bioroll) - Maintained	LF					-	400	$ 2.50	$ -	$ -	$ -	$ -	$ 1,000.00	0.0%
17	Inlet Protection - Maintained	EA	1.0				1.0	8	$ 200.00	$ 200.00	$ -	$ -	$ -	$ 1,600.00	12.5%
18	Temporary Construction Entrance - Maintained	EA	1.0				1.0	3	$ 1,500.00	$ 1,500.00	$ -	$ -	$ -	$ 4,500.00	33.3%
19	Street Sweeper (With Pickup Broom)	HR	10.0				10.0	40	$ 50.00	$ 500.00	$ -	$ -	$ -	$ 2,000.00	25.0%
20	Temporary Sedimentation Basin - Maintained	LS	0.8				0.8	1	$ 1,000.00	$ 800.00	$ -	$ -	$ -	$ 1,000.00	80.0%
21	Cross Vane (No Limestone)	TON					-	300	$ 95.00	$ -	$ -	$ -	$ -	$ 28,500.00	0.0%
22	Class II Riprap Spillway (No Limestone)	TON					-	26	$ 75.00	$ -	$ -	$ -	$ -	$ 1,950.00	0.0%
23	Class III Riprap at FES (No Limestone)	TON					-	24	$ 75.00	$ -	$ -	$ -	$ -	$ 1,800.00	0.0%
24	MN DOT Type V, Non-Woven Geotextile Fabric	SY					-	600	$ 4.00	$ -	$ -	$ -	$ -	$ 2,400.00	0.0%
25	24" to 36" Fieldstone Cover Boulders	EA					-	5	$ 250.00	$ -	$ -	$ -	$ -	$ 1,250.00	0.0%
26	Common Excavation - On-site (EV)	CY					-	250	$ 20.00	$ -	$ -	$ -	$ -	$ 5,000.00	0.0%
27	Iron Enhanced Sand Filter	LF					-	300	$ 350.00	$ -	$ -	$ -	$ -	$ 105,000.00	0.0%
28	6" Solid PVC Pipe	LF					-	100	$ 25.00	$ -	$ -	$ -	$ -	$ 2,500.00	0.0%
29	NURP Pond #1 Baffled Weir Modification	LS					-	1	$ 500.00	$ -	$ -	$ -	$ -	$ 500.00	0.0%
30	NURP Pond #2 Outlet Structure Modification	LS					-	1	$ 500.00	$ -	$ -	$ -	$ -	$ 500.00	0.0%
31	Dewatering NURP Pond #1	LS					-	1	$ 750.00	$ -	$ -	$ -	$ -	$ 750.00	0.0%
32	Dewatering NURP Pond #2	LS					-	1	$ 750.00	$ -	$ -	$ -	$ -	$ 750.00	0.0%
33	Seeding	AC	1.00				1.0	8.7	$ 1,500.00	$ 1,500.00	$ -	$ -	$ -	$ 13,050.00	11.5%
34	Native Seed Mix	LB	107.0				107.0	930	$ 8.00	$ 856.00	$ -	$ -	$ -	$ 7,440.00	11.5%
35	Hydraulic Matrix, Type Bonded Fiber Matrix (BFM)	LB					-	14000	$ 2.00	$ -	$ -	$ -	$ -	$ 28,000.00	0.0%
36	Vegetation Establishment and Maintenance	LS					-	1	$ 50,000.00	$ -	$ -	$ -	$ -	$ 50,000.00	0.0%
										$ 146,951.00	$ -	$ -	$ -	**$ 588,720.00**	25.0%

Field Add's		Unit	Qty						Unit Bid	Total				
FA01-01	Constuction Schedule Revision	LS					-	1	$ -					$ -
FA01-02	Alternate Site Access	LS					-	1	$ -					$ -
FA01-03	Modified Iron Filter Dimensions	LS					-	1	$ 12,500.00	$ -	$ -	$ -	$ -	$ -
FA02-01	Additional Woven ECB, Rolanka BioD-Mat 40	SY					-	2500	$ 5.50	$ -	$ -	$ -	$ -	$ -
FA03-01	Addtl Bank Resloping	LF					-	3625	$ 17.00	$ -	$ -	$ -	$ -	$ -
FA03-02	Addtl Woven ECB, Rolanka BioD-Mat 40	SY					-	4350	$ 5.50	$ -	$ -	$ -	$ -	$ -
FA03-03	Addtl Non-Woven ECB Cat 3 Type Straw 2S (No Poly Netting)	SY					-	9200	$ 1.75	$ -	$ -	$ -	$ -	$ -
FA03-04	Addtl Footer Log	LF					-	1275	$ 25.00	$ -	$ -	$ -	$ -	$ -
FA03-05	Addtl Cross Log	EA					-	193	$ 210.00	$ -	$ -	$ -	$ -	$ -
FA03-06	Addtl Class III Riprap	TON					-	24	$ 75.00	$ -	$ -	$ -	$ -	$ -
FA03-07	Addtl Seeding	AC					0.00	8.7	$ 1,500.00	$ -	$ -	$ -	$ -	$ -
FA03-08	Addtl Native Seed Mix	LB					-	930	$ 8.00	$ -	$ -	$ -	$ -	$ -
										$ -	$ -	$ -	$ -	**$ -**

Project Total: $ 588,720.00

CM 1002 (Revised 1/03)
T:\1756 Plymouth\07 Elm Creek Stream Restoration\03 - Construction Observation\Pay Requests\Pay App 1 2016-01-xx\CM1002 Monthly Payment Estimate 2016-01-08.xlsx

Item 4b-2

PAYMENT REQUEST FORM

OWNER: City of Plymouth
PROJECT: Elm Creek Stream Restoration and Water Quality Improvements City Project No. 14006
CONTRACTOR: Minnesota Native Landscapes, Inc.

PAY ESTIMATE NO. 2

Original Contract Amount	$ 588,720.00
Contract Changes approved to Date (List Change Order Numbers)	$ 12,500.00 (FA1)
	$ 40,451.60 (FA2)
Revised Contract Price	$ 641,671.60
Work Completed to Date (attached)	$ 509,070.75
Retainage to Date, 5%	$ 25,453.54
Work Completed to Date Less Retainage to Date	$ 483,617.21
Total Amount Previously Certified	$ 139,603.45
Payment Request This Estimate	$ 344,013.76

I declare under penalty of perjury that this account, claim, or demand is just and correct and that no part of it has been paid.

CONTRACTOR

CERTIFICATE OF CONTRACTOR

I hereby certify that the work and the materials supplied to date, as shown on the request for payment, represents the actual value of accomplishment under the terms of the contract dated

February 5, 2016 between the City of Plymouth (OWNER)

and Minnesota Native Landscapes, Inc. (CONTRACTOR) and all authorized changes thereto.

By _____

Title VP

Approval:

(CONTRACTOR) _____ Date 2-9-16

WENCK ASSOCIATES, INC. _____ Date 2-5-2016

Ed Matthiesen, P.E. c/o Lucius Jorett, PLA

CITY OF PLYMOUTH _____ Date _____

END OF SECTION

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

Monthly Payment Estimate

Project Title: Elm Creek Stream Restoration and Water Quality Improvements
Client: City of Plymouth
Project Number: 1756-07
Project Manager: Lucius Jonett
Date: 2/5/2016

Pay Item No.	Nature of Work	Unit	Quantity 1/8/16	2/1/16	6/1/16	7/1/16	To Date	Budget	Unit Bid	Earnings 1/8/16	2/1/16	6/1/16	7/1/16	To Date	Budget	% Spent
1	Mobilization and Demobilization	LS	0.5	0.4			0.9	1	$ 27,000.00	$ 13,500.00	$ 10,800.00	$ -	$ -	$ 24,300.00	$ 27,000.00	90.0%
2	Invasive Species Management	AC	2.0	2.0			4.0	7.7	$ 2,250.00	$ 4,500.00	$ 4,500.00	$ -	$ -	$ 9,000.00	$ 17,325.00	51.9%
3	Tree Clearing & Harvesting	LS	0.3	0.7			1.0	1	$ 60,000.00	$ 20,000.00	$ 40,000.00	$ -	$ -	$ 60,000.00	$ 60,000.00	100.0%
4	Chip Onsite and Spread Woodchips on Existing Trails	LS		0.7			0.7	1	$ 20,000.00	$ -	$ 14,000.00	$ -	$ -	$ 14,000.00	$ 20,000.00	70.0%
5	Haul and Dispose Offsite All Unchipped Wood	LS		1.0			1.0	1	$ 100.00	$ -	$ 100.00	$ -	$ -	$ 100.00	$ 100.00	100.0%
6	Construct, Maintain, & Restore Site Access and Staging Areas	LS	0.5				0.5	1	$ 15,000.00	$ 7,500.00	$ -	$ -	$ -	$ 7,500.00	$ 15,000.00	50.0%
7	Bank Resloping	LF	2075.0	1550.0			3,625.0	3625	$ 17.00	$ 35,275.00	$ 26,350.00	$ -	$ -	$ 61,625.00	$ 61,625.00	100.0%
8	Woven ECB, Rolanka BioD-Mat 40	SY	3480.0	870.0			4,350.0	4350	$ 5.50	$ 19,140.00	$ 4,785.00	$ -	$ -	$ 23,925.00	$ 23,925.00	100.0%
9	Non-Woven ECB Cat 3 Type Straw 2S (No Poly Netting)	SY	3480.0	5405.0			8,885.0	9200	$ 1.75	$ 6,090.00	$ 9,458.75	$ -	$ -	$ 15,548.75	$ 16,100.00	96.6%
10	Footer Log	LF	622.0	653.0			1,275.0	1275	$ 25.00	$ 15,550.00	$ 16,325.00	$ -	$ -	$ 31,875.00	$ 31,875.00	100.0%
11	Cross Log	EA	94.0	99.0			193.0	193	$ 210.00	$ 19,740.00	$ 20,790.00	$ -	$ -	$ 40,530.00	$ 40,530.00	100.0%
12	Nursery Log	EA		5.0			5.0	10	$ 550.00	$ -	$ 2,750.00	$ -	$ -	$ 2,750.00	$ 5,500.00	50.0%
13	Seating Log	EA		10.0			10.0	10	$ 300.00	$ -	$ 3,000.00	$ -	$ -	$ 3,000.00	$ 3,000.00	100.0%
14	Silt Fence, Type MS - Maintained	LF					-	750	$ 3.00	$ -	$ -	$ -	$ -	$ -	$ 2,250.00	0.0%
15	Flotation Silt Curtain Type Moving Water - Maintained	LF	30.0				30.0	500	$ 10.00	$ 300.00	$ -	$ -	$ -	$ 300.00	$ 5,000.00	6.0%
16	Sediment Control Log Type Straw (Or Biorolls) - Maintained	LF					-	400	$ 2.50	$ -	$ -	$ -	$ -	$ -	$ 1,000.00	0.0%
17	Inlet Protection - Maintained	EA	1.0				1.0	8	$ 200.00	$ 200.00	$ -	$ -	$ -	$ 200.00	$ 1,600.00	12.5%
18	Temporary Construction Entrance - Maintained	EA	1.0	1.0			2.0	3	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ -	$ -	$ 3,000.00	$ 4,500.00	66.7%
19	Street Sweeper (With Pickup Broom)	HR	10.0				10.0	40	$ 50.00	$ 500.00	$ -	$ -	$ -	$ 500.00	$ 2,000.00	25.0%
	Temporary Sedimentation Basin - Maintained	LS	0.8				0.8	1	$ 1,000.00	$ 800.00	$ -	$ -	$ -	$ 800.00	$ 1,000.00	80.0%
21	Cross Vane (No Limestone)	TON		296.0			296.0	300	$ 95.00	$ -	$ 28,120.00	$ -	$ -	$ 28,120.00	$ 28,500.00	98.7%
22	Class II Riprap Spillway (No Limestone)	TON		20.0			20.0	26	$ 75.00	$ -	$ 1,500.00	$ -	$ -	$ 1,500.00	$ 1,950.00	76.9%
23	Class III Riprap at FES (No Limestone)	TON		24.0			24.0	24	$ 75.00	$ -	$ 1,800.00	$ -	$ -	$ 1,800.00	$ 1,800.00	100.0%
24	MN DOT Type V, Non-Woven Geotextile Fabric	SY		600.0			600.0	600	$ 4.00	$ -	$ 2,400.00	$ -	$ -	$ 2,400.00	$ 2,400.00	100.0%
25	24" to 36" Fieldstone Cover Boulders	EA		5.0			5.0	5	$ 250.00	$ -	$ 1,250.00	$ -	$ -	$ 1,250.00	$ 1,250.00	100.0%
26	Common Excavation - On-site (EV)	CY		250.0			250.0	250	$ 20.00	$ -	$ 5,000.00	$ -	$ -	$ 5,000.00	$ 5,000.00	100.0%
27	Iron Enhanced Sand Filter	LF		300.0			300.0	300	$ 350.00	$ -	$ 105,000.00	$ -	$ -	$ 105,000.00	$ 105,000.00	100.0%
28	6" Solid PVC Pipe	LF		185.0			185.0	100	$ 25.00	$ -	$ 4,625.00	$ -	$ -	$ 4,625.00	$ 2,500.00	185.0%
29	NURP Pond #1 Baffled Weir Modification	LS		1.0			1.0	1	$ 500.00	$ -	$ 500.00	$ -	$ -	$ 500.00	$ 500.00	100.0%
30	NURP Pond #2 Outlet Structure Modification	LS		1.0			1.0	1	$ 500.00	$ -	$ 500.00	$ -	$ -	$ 500.00	$ 500.00	100.0%
31	Dewatering NURP Pond #1	LS		1.0			1.0	1	$ 750.00	$ -	$ 750.00	$ -	$ -	$ 750.00	$ 750.00	100.0%
32	Dewatering NURP Pond #2	LS					-	1	$ 750.00	$ -	$ -	$ -	$ -	$ -	$ 750.00	0.0%
33	Seeding	AC	1.00	1.00			2.0	8.7	$ 1,500.00	$ 1,500.00	$ 1,500.00	$ -	$ -	$ 3,000.00	$ 13,050.00	23.0%
34	Native Seed Mix	LB	107.0	107.0			214.0	930	$ 8.00	$ 856.00	$ 856.00	$ -	$ -	$ 1,712.00	$ 7,440.00	23.0%
35	Hydraulic Matrix, Type Bonded Fiber Matrix (BFM)	LB					-	14000	$ 2.00	$ -	$ -	$ -	$ -	$ -	$ 28,000.00	0.0%
36	Vegetation Establishment and Maintenance	LS					-	1	$ 50,000.00	$ -	$ -	$ -	$ -	$ -	$ 50,000.00	0.0%
										$ 146,951.00	$ 308,159.75	$ -	$ -	$ 455,110.75	**$ 588,720.00**	77.3%

Field Add's		Unit	Qty						Unit Bid	Total						
FA01-01	Constuction Schedule Revision	LS					-	1	$ -						$ -	
FA01-02	Alternate Site Access	LS					-	1	$ -						$ -	
FA01-03	Modified Iron Filter Dimensions	LS		1.0			1.0	1	$ 12,500.00	$ -	$ 12,500.00	$ -	$ -	$ 12,500.00	$ 12,500.00	
FA02-01	Additional Woven ECB, Rolanka BioD-Mat 40	SY					-	2500	$ 5.50	$ -	$ -	$ -	$ -	$ -	$ -	
FA03-01	Addtl Bank Resloping	LF		770.0			770.0	620	$ 17.00	$ -	$ 13,090.00	$ -	$ -	$ 13,090.00	$ 10,540.00	
FA03-02	Addtl Woven ECB, Rolanka BioD-Mat 40	SY		3600.0			3,600.0	3600	$ 5.50	$ -	$ 19,800.00	$ -	$ -	$ 19,800.00	$ 19,800.00	
FA03-03	Addtl Non-Woven ECB Cat 3 Type Straw 2S (No Poly Netting)	SY					-	1100	$ 1.75	$ -	$ -	$ -	$ -	$ -	$ 1,925.00	
FA03-04	Addtl Footer Log	LF		110.0			110.0	110	$ 25.00	$ -	$ 2,750.00	$ -	$ -	$ 2,750.00	$ 2,750.00	
FA03-05	Addtl Cross Log	EA		22.0			22.0	22	$ 210.00	$ -	$ 4,620.00	$ -	$ -	$ 4,620.00	$ 4,620.00	
FA03-06	Addtl Class III Riprap	TON		16.0			16.0	10	$ 75.00	$ -	$ 1,200.00	$ -	$ -	$ 1,200.00	$ 750.00	
FA03-07	Addtl Seeding	AC					0.00	0.03	$ 1,500.00	$ -	$ -	$ -	$ -	$ -	$ 45.00	
FA03-08	Addtl Native Seed Mix	LB					-	2.7	$ 8.00	$ -	$ -	$ -	$ -	$ -	$ 21.60	
										$ -	$ 12,500.00	$ -	$ -	$ 53,960.00	**$ 52,951.60**	
										$ 146,951.00	$ 320,659.75	$ -	$ -	$ 509,070.75	**$ 641,671.60**	Project Total:

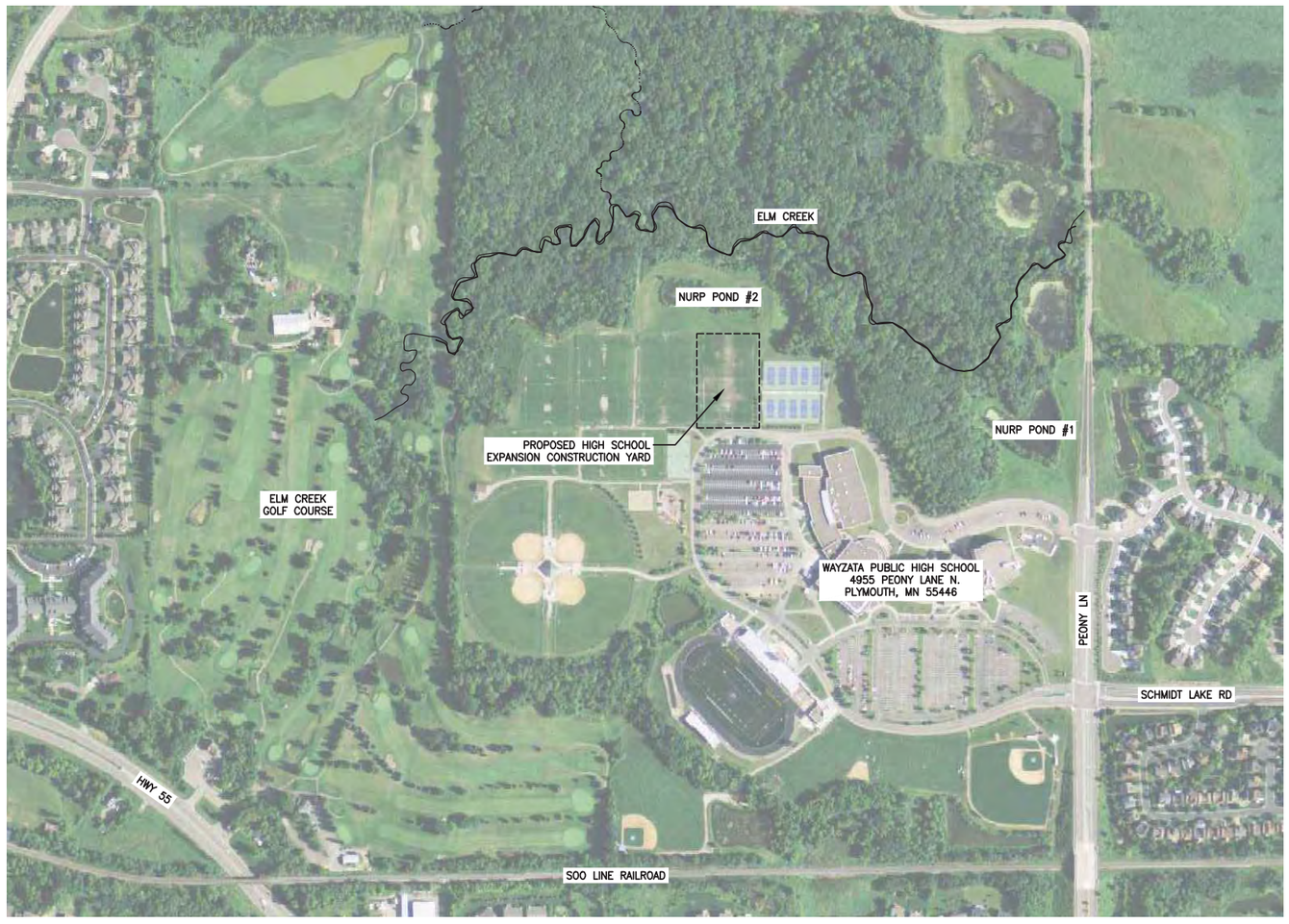
Item 4b-2

Item 4b-3

CONSTRUCTION PLANS FOR ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS CITY PROJECT NO. 14006

PREPARED FOR CITY OF PLYMOUTH,MN

MARCH 2015



PROJECT VICINITY MAP

INDEX OF SHEETS

CIVIL

NOTE: 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".

EXACT LOCATION OF UNDERGROUND UTILITIES SUCH AS GAS, TELEPHONE, FIBER OPTIC, PIPELINES, ELECTRIC, AND CABLE TV ARE UNKNOWN.

WARNING:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CALLING FOR LOCATIONS OF ALL EXISTNG 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

N

0 200 400
GRAPHIC SCALE IN FEET

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES
DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

REV	REVISION DESCRIPTION	DWN	APP	REV DATE
2	AS BUILT			6/15/16
1	ISSUED FOR BID			3/17/15
0	ISSUED FOR REVIEW			11/13/14

SEAL

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

ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

PROJECT TITLE
ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE
TITLE AND INDEX SHEET

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	G-101	2

Plot Date & Time: 17 June 2016 8:09 AM

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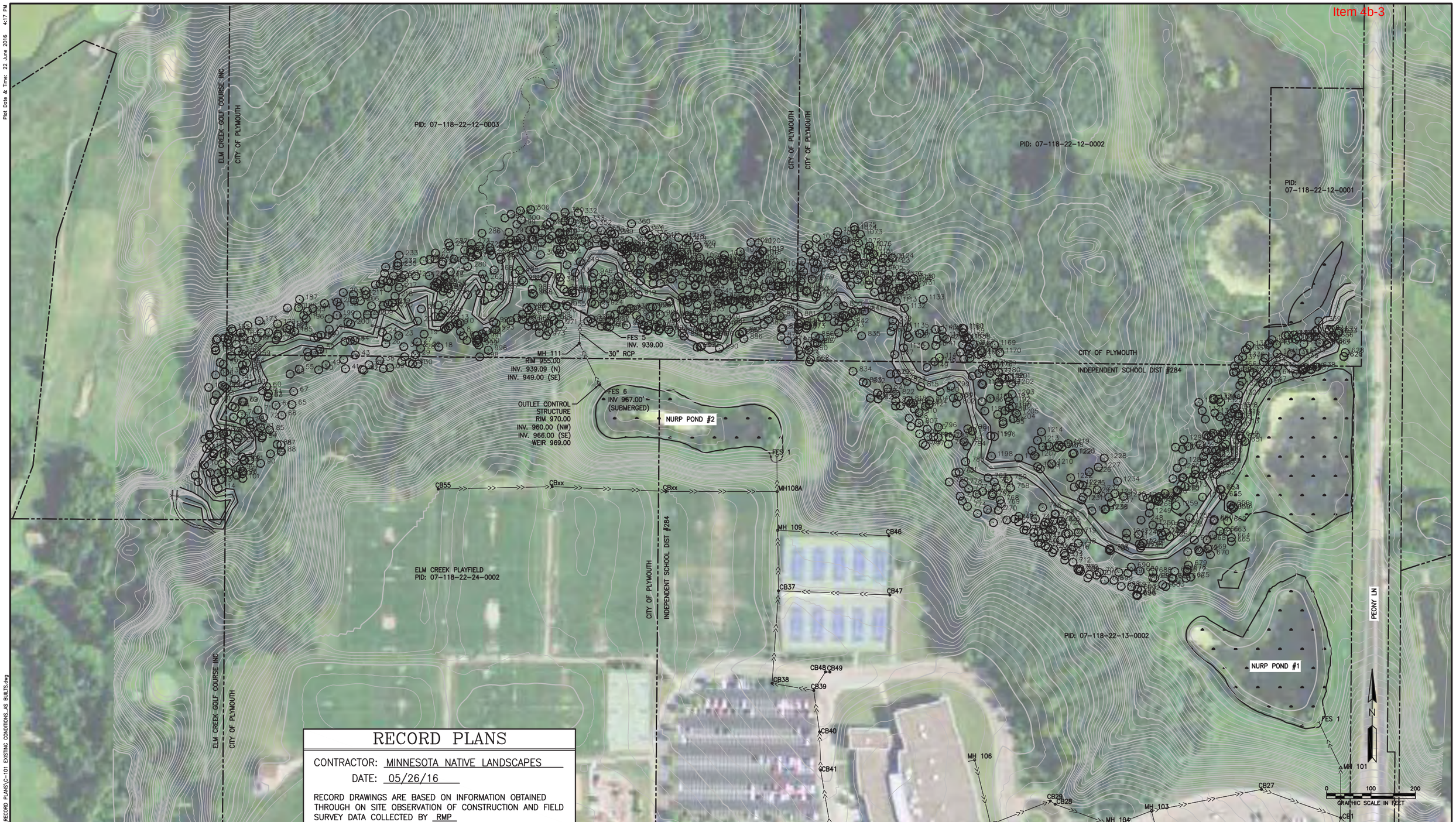
Item 4b-3



RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

LEGEND

- XXX DECIDUOUS TREE
- XXX CONIFEROUS TREE
- DELINEATED WETLAND
- EXISTING CONTOUR – MINOR (1')
- EXISTING CONTOUR – MAJOR (5')
- CBxx CATCH BASIN
- EXISTING STORM SEWER
- PARCEL LINE

REV	REVISION DESCRIPTION	DWN	APP	REV DATE
2	AS BUILT			6/15/16
1	ISSUED FOR BID			3/17/15
0	ISSUED FOR REVIEW			11/13/14

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

EXISTING CONDITONS

DWN BY	CHK'D	APP'D	DWG DATE	
LNJ	EAM	EAM	NOV 2014	
			SCALE	AS SHOWN
PROJECT NO.	SHEET NO.			REV NO.
1756-07	C-101			2

Plot Date & Time: 22 June 2016 4:17 PM

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Item 4b-3

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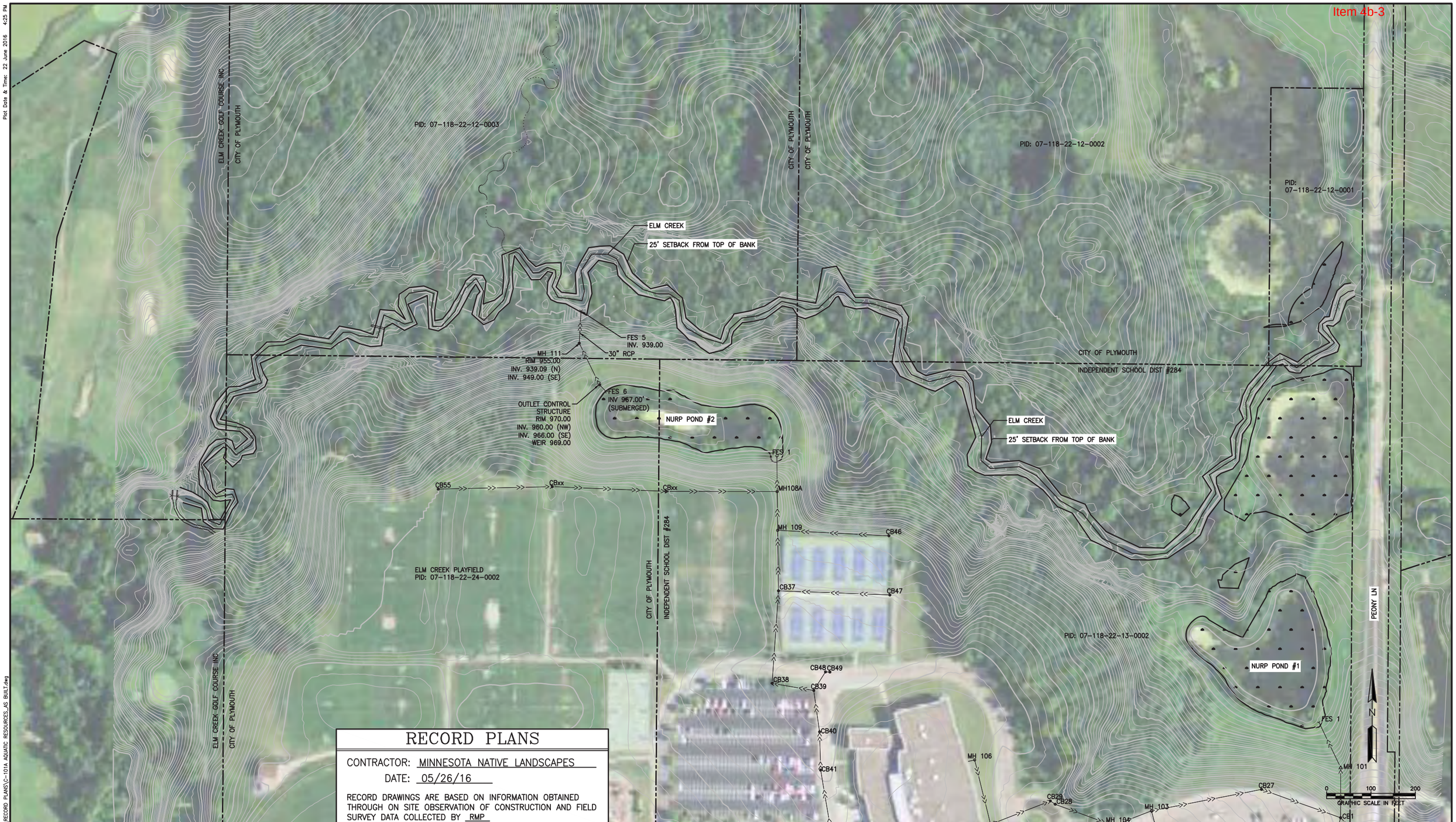

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

LEGEND

- XXX DECIDUOUS TREE
- XXX CONIFEROUS TREE
- DELINEATED WETLAND
- EXISTING CONTOUR – MINOR (1')
- EXISTING CONTOUR – MAJOR (5')
- CBxx CATCH BASIN
- EXISTING STORM SEWER
- PARCEL LINE

REV	REVISION DESCRIPTION	DWN	APP	REV DATE
2	AS BUILT			6/15/16
1	ISSUED FOR BID			3/17/15
0	ISSUED FOR REVIEW			11/13/14

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

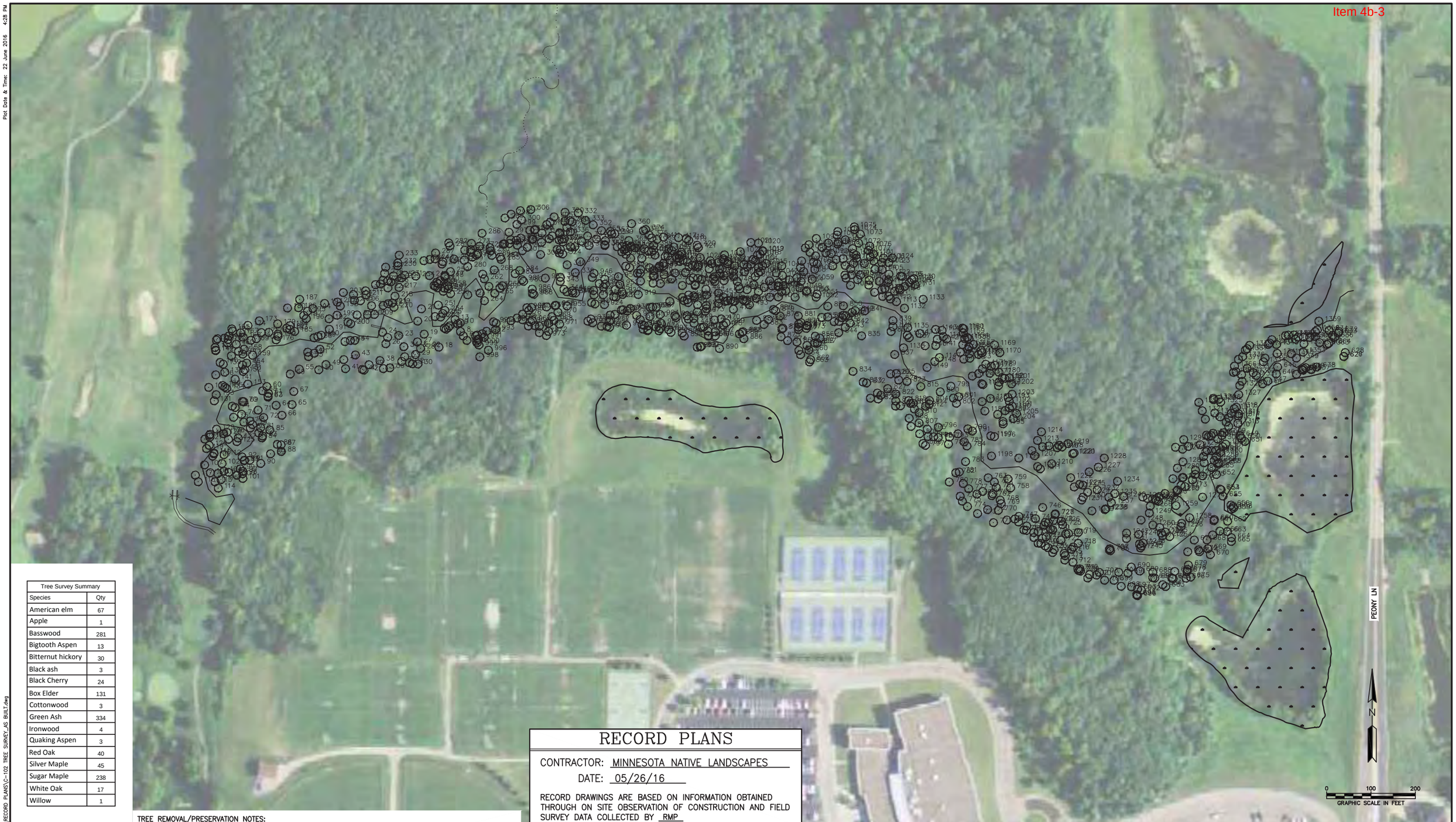
AQUATIC RESOURCES

DWN BY	CHK'D	APP'D	DWG DATE	
LNJ	EAM	EAM	NOV 2014	
			SCALE	AS SHOWN
PROJECT NO.	SHEET NO.			REV NO.
1756-07	C-101A			2

M:\1756\07 Elm Creek Design\CAD\CIV\RECORD PLANS\C-101A AQUATIC RESOURCES_AS BUILT.dwg

Plot Date & Time: 22 June 2016 4:28 PM

Item 4b-3



Tree Survey Summary	
Species	Qty
American elm	67
Apple	1
Basswood	281
Bigtooth Aspen	13
Bitternut hickory	30
Black ash	3
Black Cherry	24
Box Elder	131
Cottonwood	3
Green Ash	334
Ironwood	4
Quaking Aspen	3
Red Oak	40
Silver Maple	45
Sugar Maple	238
White Oak	17
Willow	1

LEGEND

XXX DECIDUOUS TREE

XXX CONIFEROUS TREE

DELINEATED WETLAND

TREE REMOVAL/PRESERVATION NOTES:

1. SEE SHEET C-103 FOR TREE REMOVALS.
2. SEE APPENDIX C OF THE SPECIFICATIONS FOR A DETAILED LIST OF THE TREES.
3. CONTRACTOR SHALL MEET WITH OWNER AND ENGINEER PRIOR TO BEGINNING TREE AND BRUSH REMOVALS.
4. ALL BRUSH REMOVAL IS CONSIDERED INCIDENTAL. ANY COMPENSATION SHALL BE INCLUDED IN THE BID ITEM TREE CLEARING AND HARVESTING.
5. PROTECT EXISTING TREES THAT ARE NOT TO BE REMOVED.
6. WHEN TREE ROOTS ARE ENCOUNTERED THAT MUST BE REMOVED, CUT ROOTS CLEANLY AS FAR FROM THE TREE AS POSSIBLE AND IMMEDIATELY WATER AND BACKFILL OVER THE ROOTS TO PREVENT DRYING.

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

REV	REVISION DESCRIPTION	DWN	APP	REV DATE
2	AS BUILT			6/15/16
1	ISSUED FOR BID			3/17/15
0	ISSUED FOR REVIEW			11/13/14

SEAL

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

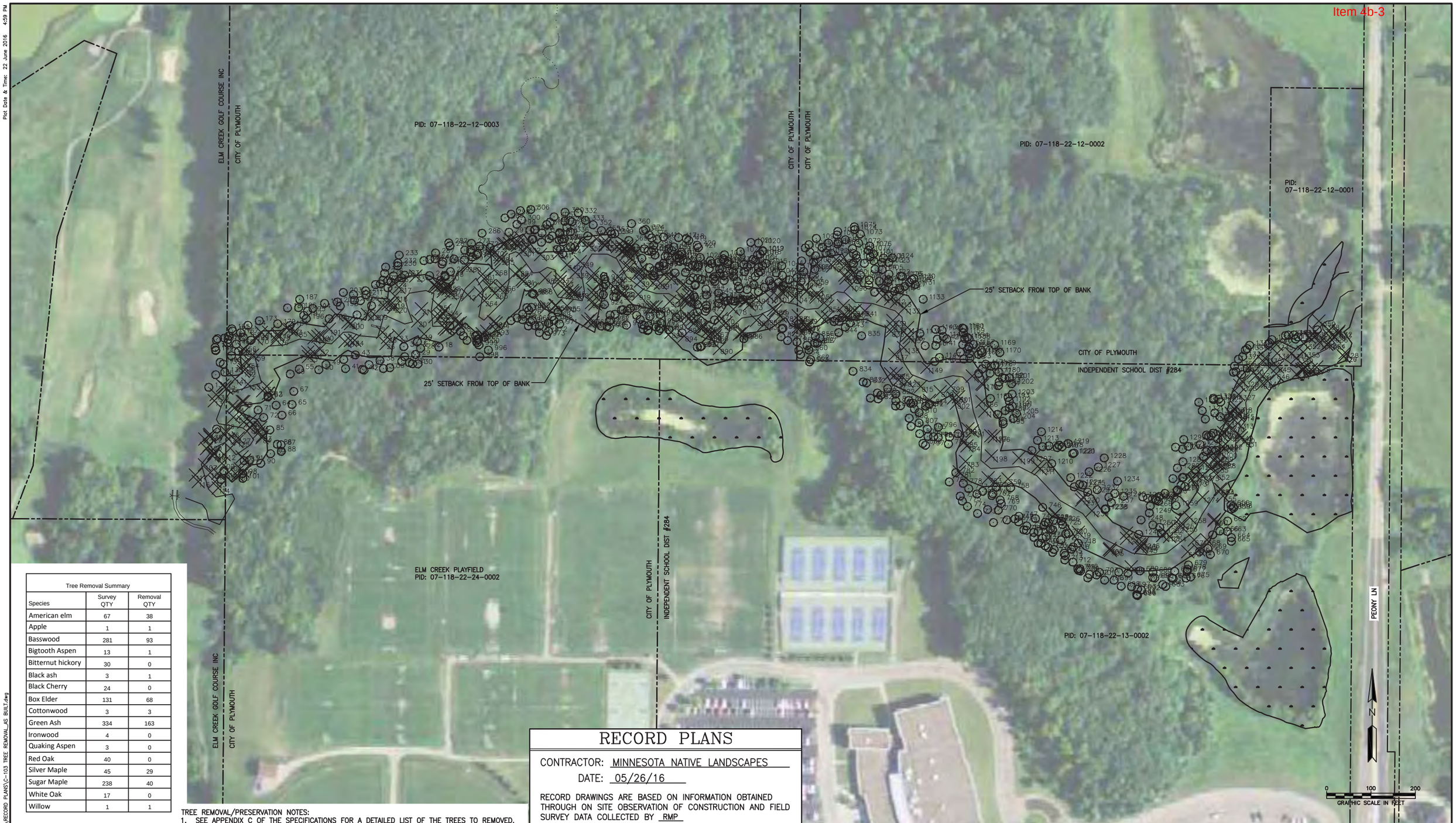
TREE SURVEY

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-102	2

M:\1756\07 Elm Creek Design\CAD\CITY\RECORD PLANS\C-102 TREE SURVEY_AS BUILT.dwg

Plot Date & Time: 22 June 2016 4:59 PM



Tree Removal Summary		
Species	Survey QTY	Removal QTY
American elm	67	38
Apple	1	1
Basswood	281	93
Bigtooth Aspen	13	1
Bitternut hickory	30	0
Black ash	3	1
Black Cherry	24	0
Box Elder	131	68
Cottonwood	3	3
Green Ash	334	163
Ironwood	4	0
Quaking Aspen	3	0
Red Oak	40	0
Silver Maple	45	29
Sugar Maple	238	40
White Oak	17	0
Willow	1	1

LEGEND

- XXX DECIDUOUS TREE
- XXX CONIFEROUS TREE
- DELINEATED WETLAND
- XXX TREE TO BE REMOVED
- PARCEL LINE

TREE REMOVAL/PRESERVATION NOTES:

1. SEE APPENDIX C OF THE SPECIFICATIONS FOR A DETAILED LIST OF THE TREES TO REMOVED.
2. CONTRACTOR SHALL MEET WITH OWNER AND ENGINEER PRIOR TO BEGINNING TREE AND BRUSH REMOVALS/HARVESTING.
3. ALL BRUSH REMOVAL IS CONSIDERED INCIDENTAL. ANY COMPENSATION SHALL BE INCLUDED IN THE BID ITEM TREE CLEARING AND HARVESTING.
4. PROTECT EXISTING TREES THAT ARE NOT TO BE REMOVED.
5. WHEN TREE ROOTS ARE ENCOUNTERED THAT MUST BE REMOVED, CUT ROOTS CLEANLY AS FAR FROM THE TREE AS POSSIBLE AND IMMEDIATELY WATER AND BACKFILL OVER THE ROOTS TO PREVENT DRYING.
6. TREES SHALL BE HARVESTED FOR USE AS LOG TOE WITH ROOT WADS, NURSERY LOGS, AND SEATING LOGS (SEE SHEETS C-104 TO C-106). REMAINING TREES SHALL BE CHIPPED AND SPREAD ON EXISTING TRAILS OR DISPOSED OF OFFSITE.

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

REV	REVISION DESCRIPTION	DWN	APP	REV DATE
2	AS BUILT			6/15/16
1	ISSUED FOR BID			3/17/15
0	ISSUED FOR REVIEW			11/13/14

SEAL

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

TREE REMOVAL & HARVESTING PLAN

DWN BY	CHK'D	APP'D	DWG DATE	SCALE
LNJ	EAM	EAM	NOV 2014	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-103	2

M:\1756\07 Elm Creek Design\CAD\CIV\RECORD PLANS\C-103 TREE REMOVAL_AS BUILT.dwg

Plot Date & Time: 22 June 2016 4:59 PM

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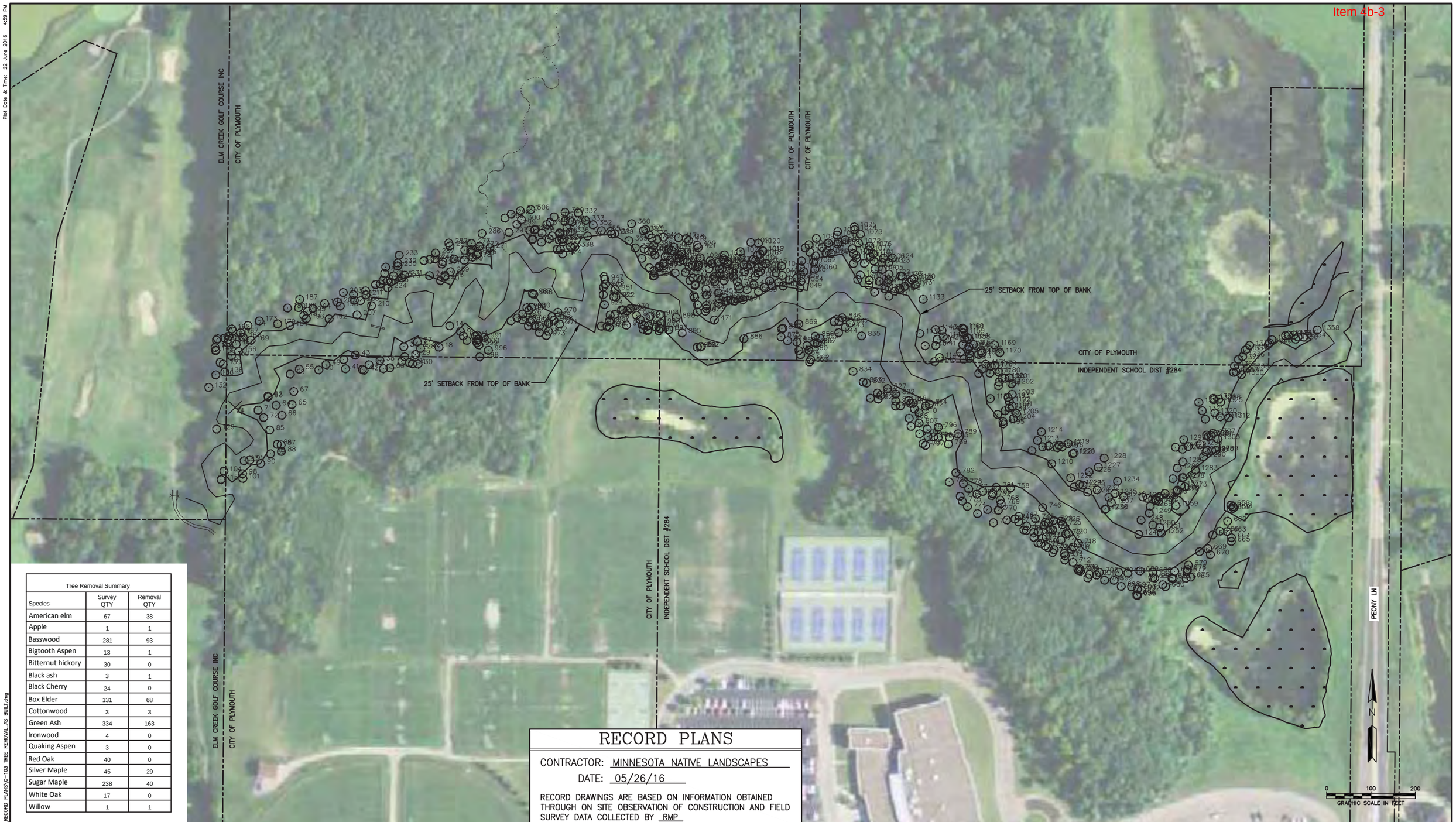

Tree Removal Summary		
Species	Survey QTY	Removal QTY
American elm	67	38
Apple	1	1
Basswood	281	93
Bigtooth Aspen	13	1
Bitternut hickory	30	0
Black ash	3	1
Black Cherry	24	0
Box Elder	131	68
Cottonwood	3	3
Green Ash	334	163
Ironwood	4	0
Quaking Aspen	3	0
Red Oak	40	0
Silver Maple	45	29
Sugar Maple	238	40
White Oak	17	0
Willow	1	1

LEGEND

- XXX DECIDUOUS TREE
- XXX CONIFEROUS TREE
- DELINEATED WETLAND
- XXX TREE TO BE REMOVED
- PARCEL LINE

TREE THINNING NOTES:

THE PRIORITY FOR TREE AND SHRUB REMOVAL SHALL BE IN THE ORDER OF:

1. INVASIVE SPECIES – BUCKTHORN.
2. SOFTWOOD & DISEASE PRONE SPECIES – BOXELDER, ASH AND ELM.
3. FALLEN, LEANING AND SWEEPING TREES AND LIMBS.
4. OTHERS AS APPROVED BY PROJECT ENGINEER AND LANDOWNER.

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

TREE REMOVAL & HARVESTING PLAN

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-103a	2

Item 4b-3

Plot Date & Time: 18 August 2016 4:27 PM

REVEGETATION NOTES:
1. REVEGETATE 25' STREAM BUFFER (FROM TOP OF BANK OR AREAS STABILIZED BY EROSION CONTROL BLANKET) WITH NATIVE SEED MIX AND HYDRAULIC MATRIX TYPE BONDED FIBER MATRIX.
2. PROVIDE EROSION CONTROL BLANKET AND SEEDING ACCORDING APPLICABLE DETAIL.
3. REVEGETATE NURP POND DISTURBED AREAS AS INDICATED ON SHEETS C-107 AND C-108.
4. REVEGETATE SITE ACCESS AND STAGING AREAS AS INDICATED ON SHEET C-109.

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

ELM CREEK PLAYFIELD
PID: 07-118-22-24-0002

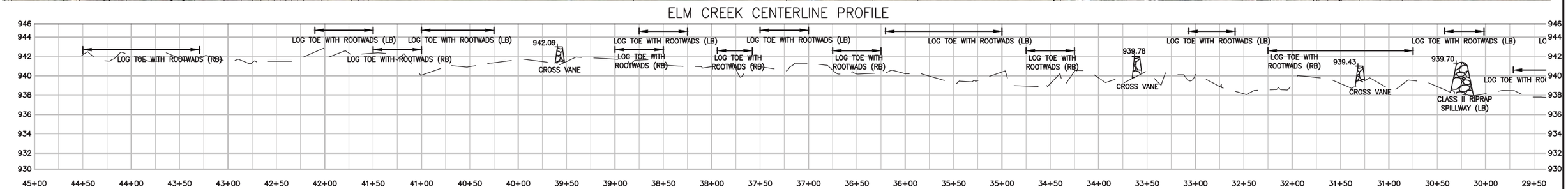
ELM CREEK GOLF COURSE INC.
CITY OF PLYMOUTH

CITY OF PLYMOUTH
INDEPENDENT SCHOOL DIST #284

CITY OF PLYMOUTH

WORK ALLOWED ON ELM CREEK GOLFCOURSE

ELM CREEK CENTERLINE PROFILE



LEGEND
- DELINEATED WETLAND
- BANK RESLOPING
- LOG TOE WITH ROOD WADS
- SHRUB PLANTING
- CBxx CATCH BASIN
- EXISTING STORM SEWER
- PARCEL LINE

NOTES:
1. TREES USED FOR NURSERY LOGS AND SEATING LOGS SHALL BE LIMITED TO STRAIGHT SECTIONS OF MAPLE, ELM, AND BASSWOOD. LOCATIONS OF NURSERY LOGS AND SEATING LOGS SHALL BE AS DIRECTED BY ENGINEER. SEE DETAILS 1 & 2 OF SHEET D-102
2. FLOTATION SILT CURTAIN IS REQUIRED TO CONTAIN SOIL MATERIAL DURING BANK RESLOPING OPERATIONS. FLOTATION SILT CURTAIN SHALL BE MAINTAINED AND RELOCATED AS OPERATIONS OF BANK RESLOPING PROGRESS. FLOTATION SILT CURTAIN SHALL NOT BE RELOCATED UNTIL CURRENT SITE IS STABILIZED.

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE
ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE
45+00 TO 29+50
STREAM RESTORATION
PLAN & PROFILE

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-104	2

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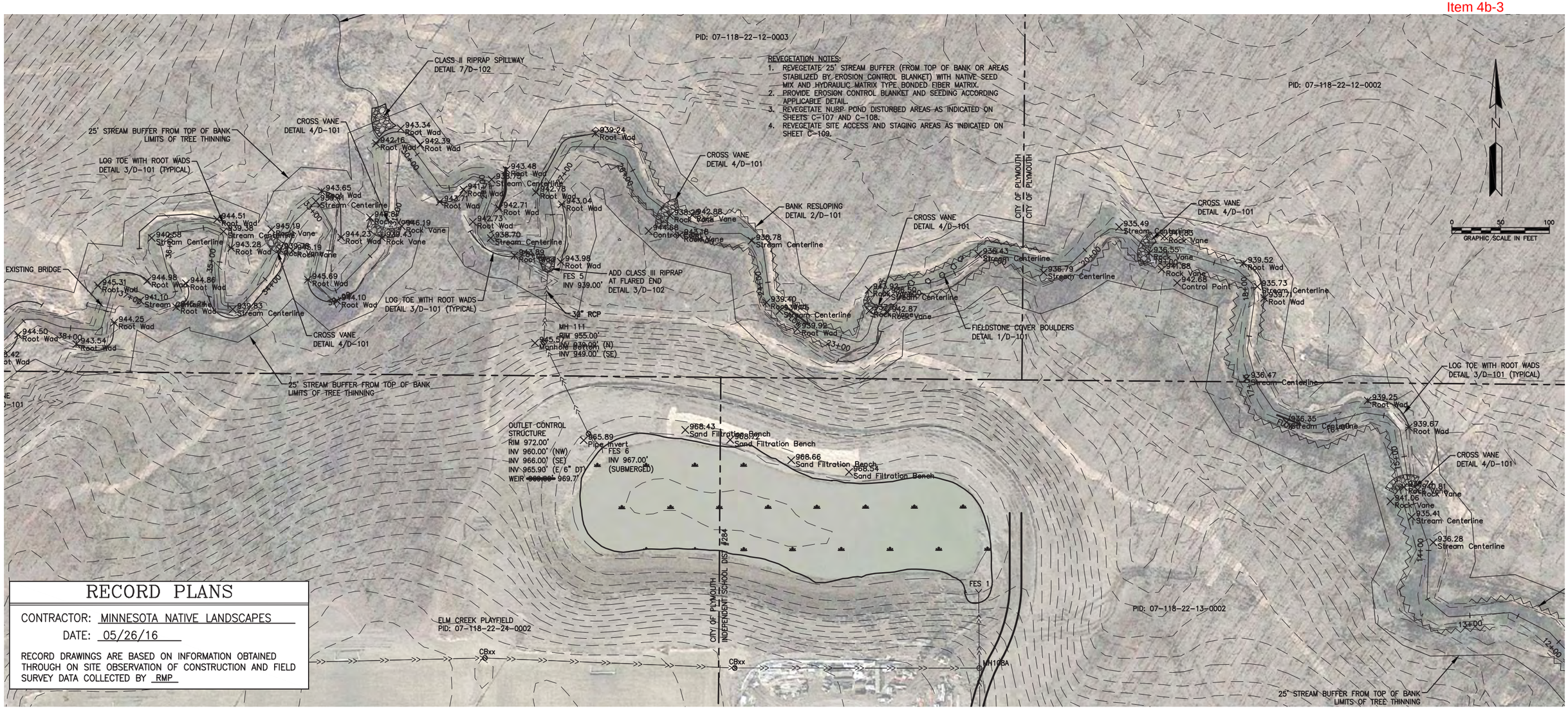
Item 4b-3

Plot Date & Time: 18 August 2016 4:27 PM



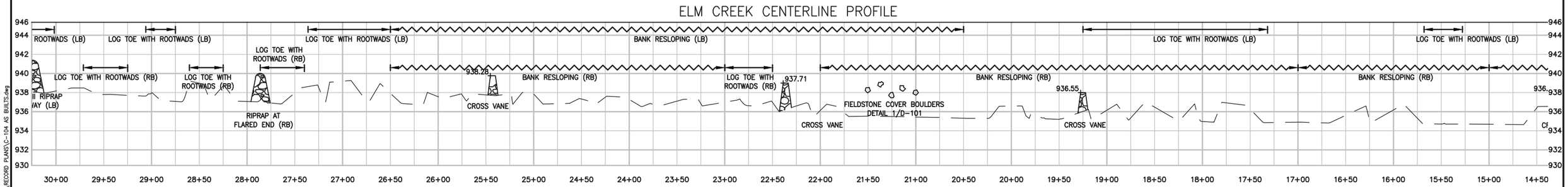
RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

ELM CREEK CENTERLINE PROFILE



LEGEND

- DELINEATED WETLAND
- BANK RESLOPING
- LOG TOE WITH ROOD WADS
- SHRUB PLANTING
- CBxx CATCH BASIN
- EXISTING STORM SEWER
- PARCEL LINE

NOTES:

1. TREES USED FOR NURSERY LOGS AND SEATING LOGS SHALL BE LIMITED TO STRAIGHT SECTIONS OF MAPLE, ELM, AND BASSWOOD. LOCATIONS OF NURSERY LOGS AND SEATING LOGS SHALL BE AS DIRECTED BY ENGINEER. SEE DETAILS 1 & 2 OF SHEET D-102
2. FLOTATION SILT CURTAIN IS REQUIRED TO CONTAIN SOIL MATERIAL DURING BANK RESLOPING OPERATIONS. FLOTATION SILT CURTAIN SHALL BE MAINTAINED AND RELOCATED AS OPERATIONS OF BANK RESLOPING PROGRESS. FLOTATION SILT CURTAIN SHALL NOT BE RELOCATED UNTIL CURRENT SITE IS STABILIZED.

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

30+25 TO 14+50
STREAM RESTORATION
PLAN & PROFILE

DWN BY	CHK'D	APP'D	DWG DATE	SCALE
LNJ	EAM	EAM	NOV 2014	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-105	2

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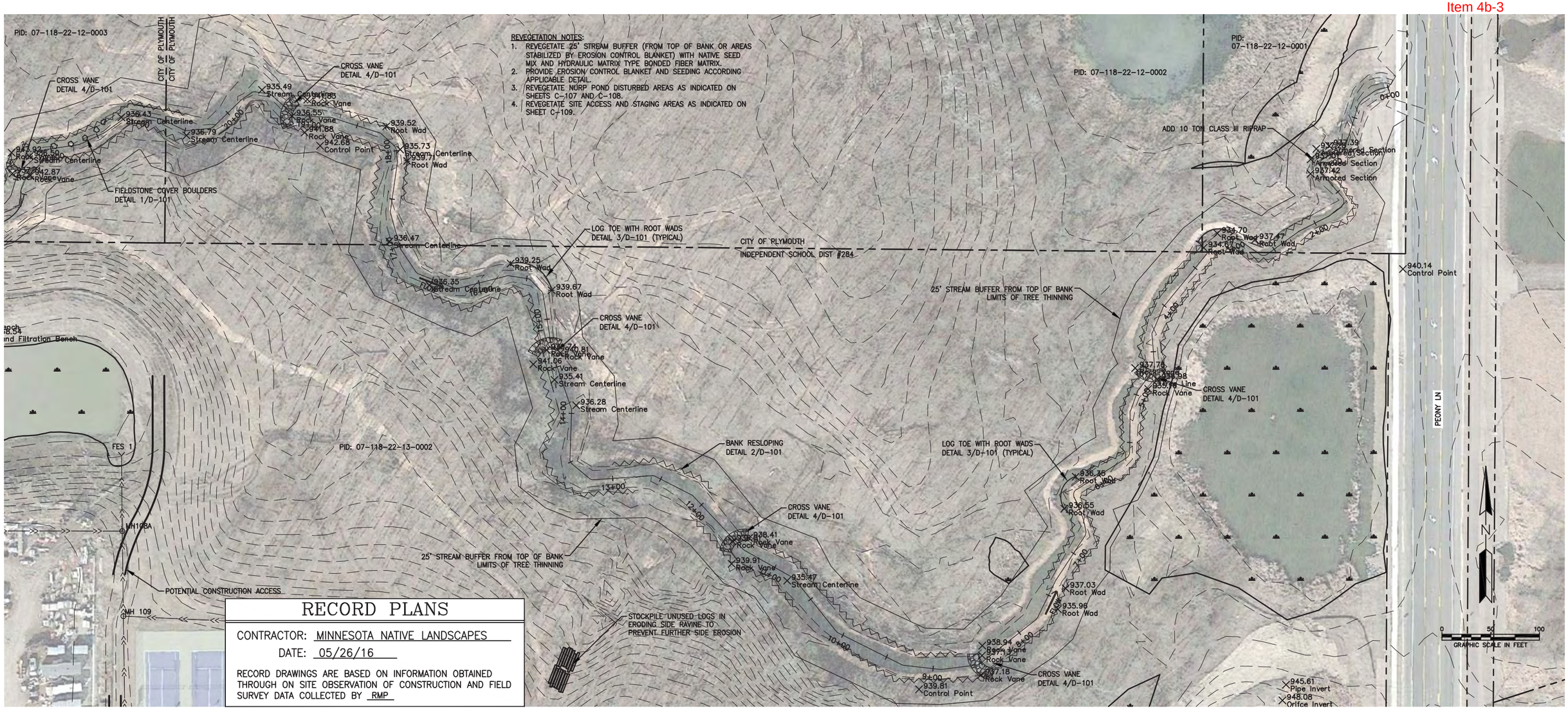
Item 4b-3

Plot Date & Time: 18 August 2016 4:27 PM



REVEGETATION NOTES:

1. REVEGETATE 25' STREAM BUFFER (FROM TOP OF BANK OR AREAS STABILIZED BY EROSION CONTROL BLANKET) WITH NATIVE SEED MIX AND HYDRAULIC MATRIX TYPE BONDED FIBER MATRIX.
2. PROVIDE EROSION CONTROL BLANKET AND SEEDING ACCORDING APPLICABLE DETAIL.
3. REVEGETATE NURP POND DISTURBED AREAS AS INDICATED ON SHEETS C-107 AND C-108.
4. REVEGETATE SITE ACCESS AND STAGING AREAS AS INDICATED ON SHEET C-109.

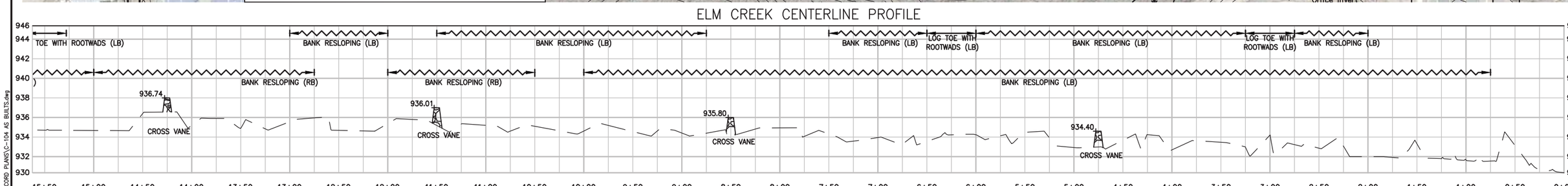
RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

ELM CREEK CENTERLINE PROFILE



LEGEND

- DELINEATED WETLAND
- BANK RESLOPING
- LOG TOE WITH ROOD WADS
- SHRUB PLANTING
- CBxx CATCH BASIN
- EXISTING STORM SEWER
- PARCEL LINE

NOTES:

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ED MATTHIESEN

DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

15+50 TO 0+00
STREAM RESTORATION
PLAN & PROFILE

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-106	2

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Item 4b-3

REVEGETATION NOTES:

1. REVEGETATE ALL DISTURBED AREAS AROUND BUT NOT OVER IRON ENHANCED SAND FILTER WITH NATIVE SEED MIX AND NON-WOVEN EROSION CONTROL BLANKET.

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

LEGEND

- DELINEATED WETLAND
- CBxx CATCH BASIN
- EXISTING STORM SEWER
- PARCEL LINE

DEWATERING NOTE:

1. A BID ITEM HAS BEEN PROVIDED FOR DEWATERING AS ALL DEWATERING WORK NECESSARY TO CONSTRUCT THE IRON ENHANCED SAND FILTERS.
2. ENERGY DISSIPATION SHALL BE PROVIDED AT ALL DISCHARGE POINTS TO PREVENT SCOUR.
3. PROVIDE SILT BAGS FOR DEWATERING.

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WENCK ASSOCIATES

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PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

NURP POND 1
IRON ENHANCED SAND FILTER

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-107	2

Plot Date & Time: 18 August 2016 11:45 AM

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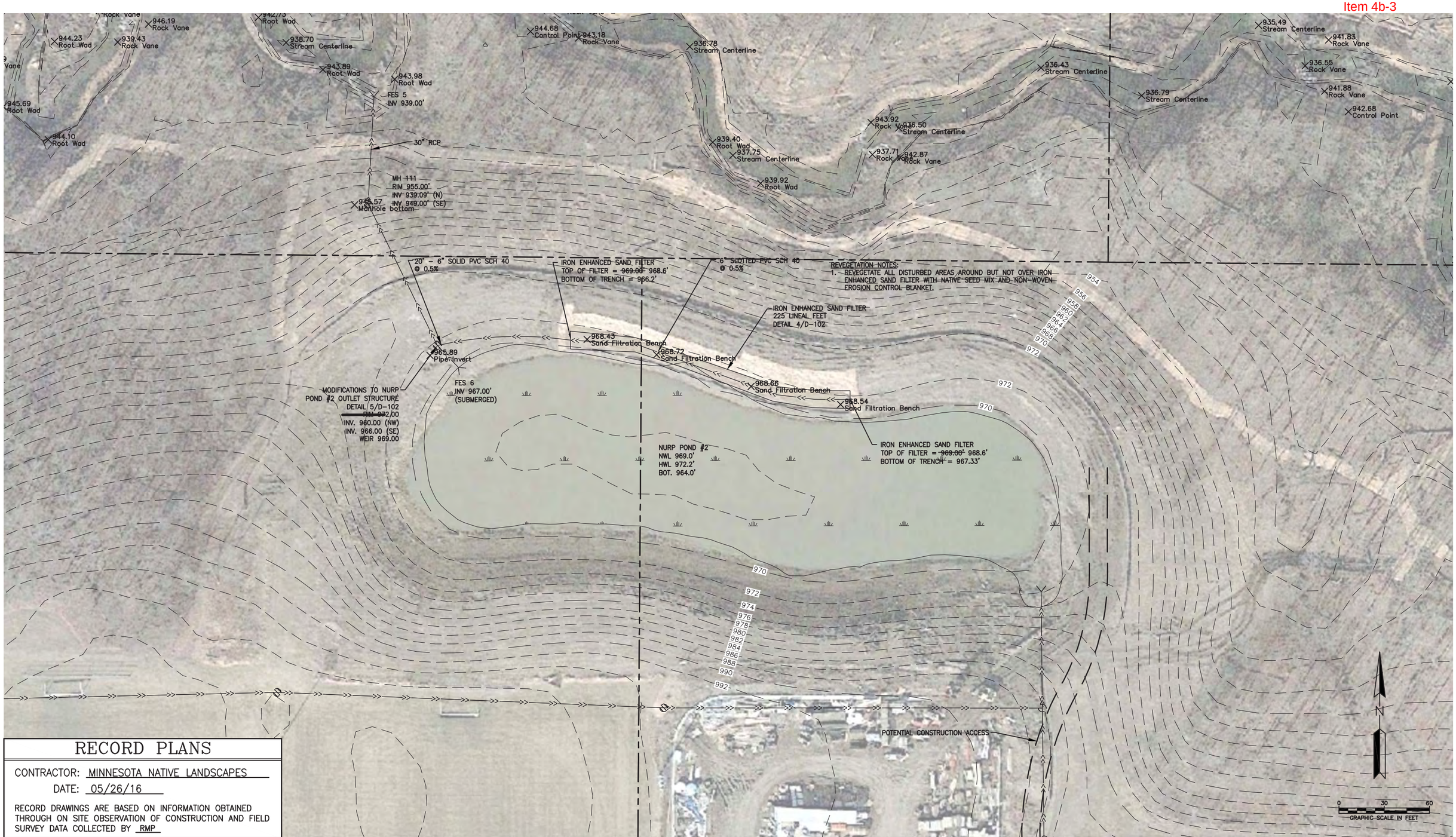
Item 4b-3



RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

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LEGEND

- DELINEATED WETLAND
- CBxx CATCH BASIN
- EXISTING STORM SEWER
- PARCEL LINE

DEWATERING NOTE:

1. A BID ITEM HAS BEEN PROVIDED FOR DEWATERING AS ALL DEWATERING WORK NECESSARY TO CONSTRUCT THE IRON ENHANCED SAND FILTERS.
2. ENERGY DISSIPATION SHALL BE PROVIDED AT ALL DISCHARGE POINTS TO PREVENT SCOUR.
3. PROVIDE SILT BAGS FOR DEWATERING.

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PRIME CONSULTANT

WENCK ASSOCIATES

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PROJECT TITLE

ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006

CITY OF PLYMOUTH

3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE

NURP POND 2
IRON ENHANCED SAND FILTER

DWN BY	CHK'D	APP'D	DWG DATE	
LNJ	EAM	EAM	NOV 2014	
			SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	C-108	2

Plot Date & Time: 18 August 2016 11:45 AM

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Item 4b 3

EROSION AND SEDIMENT CONTROL PRACTICES
All exposed soil areas must have temporary erosion protection (slash mulch, erosion control blanket, seed) as soon as possible or within 7 days of no longer working the area.

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.

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 including silt curtain and a sedimentation basin on the down gradient perimeter as shown on sheet D-103 prior to land disturbing activities. Silt curtain and sediment basin shall be located as shown on sheet EC-102 to trap sediment from creek discharge.
2. Installation of silt fence and inlet protection around construction staging area perimeters as shown on sheet EC-102 prior to site disturbance.
3. Minimize vehicle tracking with use of rock construction entrances as shown on sheet D-103.
4. Street sweeping of tracked sediment when necessary.

Final Stabilization

All areas disturbed by construction will receive seed and mulch or sod 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 entire disturbed area. 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.

Record Retention

The SWPPP, all changes to it, and inspection and maintenance records must be kept on-site during construction. 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.
Inspections at the site will be completed 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.

The individual performing inspections must be trained as required by part IV.E of the Permit. CONTRACTOR to provide OWNER with proof of training. 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.

Impervious Surface
Proposed added impervious surface - 0 acres

Total Area Disturbed by Construction - 11 acres

Construction Dates: June 2015 - October 2015

Party Responsible for Long Term Operation and Maintenance of the Site - OWNER
City of Plymouth, MN
3400 Plymouth Blvd.
Plymouth, MN 55447

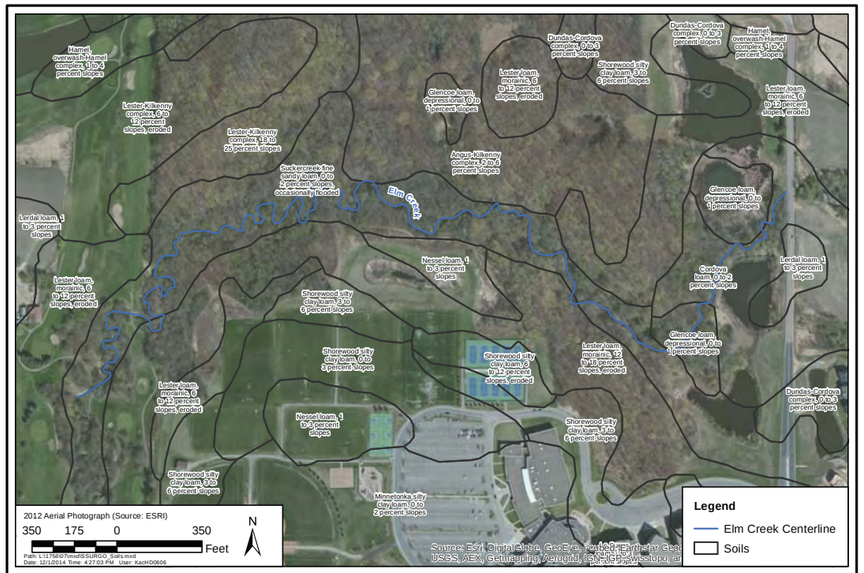
Party Responsible for Implementation of the SWPPP - CONTRACTOR (TBD)

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.

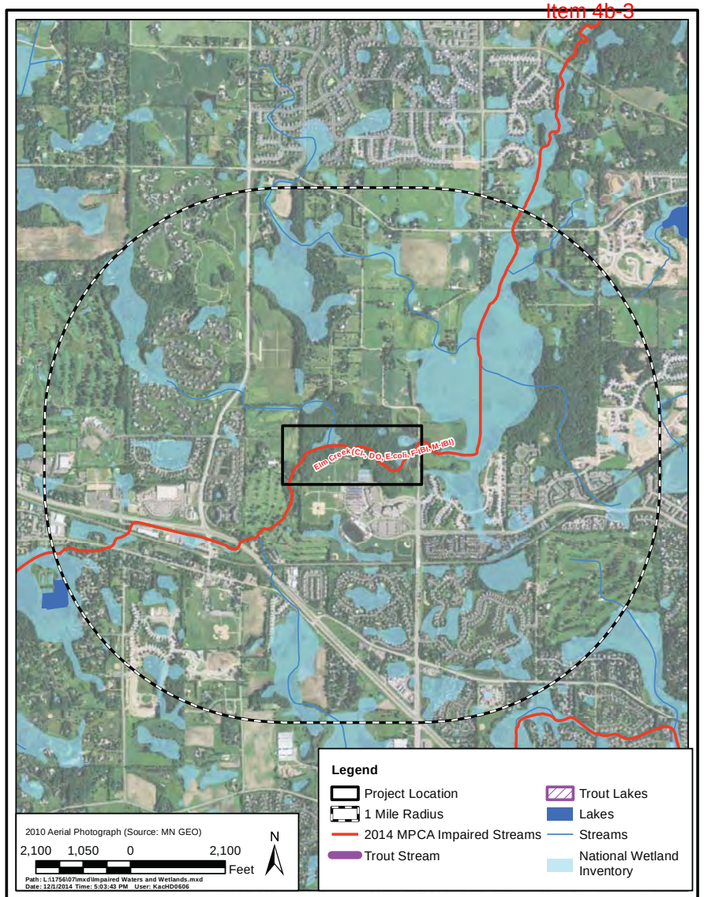
Hazardous Materials
Hazardous materials, including but not limited to oil, gasoline, paint and any hazardous substance must be properly stored including secondary containments, to prevent spills, leaks or other discharge. Restricted access to storage areas must be provided to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with MCPA regulations.

Washing of Construction 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.

Concrete Washout Area
The contractor shall use means to washout concrete offsite.



CITY OF PLYMOUTH
SSURGO Soils
Wenck — Engineers - Scientists, Business Professionals — 1800 Pioneer Creek Center, Maple Plain, MN 55359-0429, 1-800-472-2232, www.wenck.com
DEC 2014
Figure 3



CITY OF PLYMOUTH
303(d) Impaired Waters and Wetlands Map
Wenck — Engineers - Scientists, Business Professionals — 1800 Pioneer Creek Center, Maple Plain, MN 55359-0429, 1-800-472-2232, www.wenck.com
DEC 2014
Figure 4

IMPAIRED WATERS, SPECIAL WATERS, AND WETLANDS
This Project is not located within 1 mile of a special water.

This Project is located within 1 mile of an impaired waters (Figure 4 this sheet):
Elm Creek impaired for Cl-, DO, E. coli, F-IBI, M-IBI.
Because of the proximity of the project to an impaired water during construction:
1. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased.
2. Temporary sediment basins are required to handle runoff for common drainage locations that serve an area with 5 or more acres disturbed at one time.

This Project will not disturb wetlands.

GENERAL SWPPP NOTES
- Dewatering is not anticipated for this project.
- CONTRACTOR shall implement construction phasing to limit disturbed areas to less than 5 acres at one time. Site is unfeasible for properly sized temporary sediment basins required for handling runoff from areas with 5 or more disturbed acres.

CERTIFICATION
In accordance with Part III.A.2 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. Mr. Louis Sigtermans' certification in Design of SWPPP is valid through May 31, 2017.

UNIVERSITY OF MINNESOTA

Louis H Sigtermans
Saint Paul, MN

Design of Construction SWPPP (May 31, 2017)

REV	REVISION DESCRIPTION	DWN	APP	REV DATE
1	ISSUED FOR BID			3/17/15
0	ISSUED FOR REVIEW			11/13/14

SEAL
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ED MATTHIESEN
DATE 3/17/15 REG. NO. 16800

PRIME CONSULTANT
WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

PROJECT TITLE
ELM CREEK STREAM RESTORATION AND WATER QUALITY IMPROVEMENTS
CITY PROJECT NO. 14006
CITY OF PLYMOUTH
3400 PLYMOUTH BOULEVARD
PLYMOUTH, MN 55447

SHEET TITLE
SWPPP

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	EC-101	1

Plot Date & Time: 18 March 2015 5:49 PM
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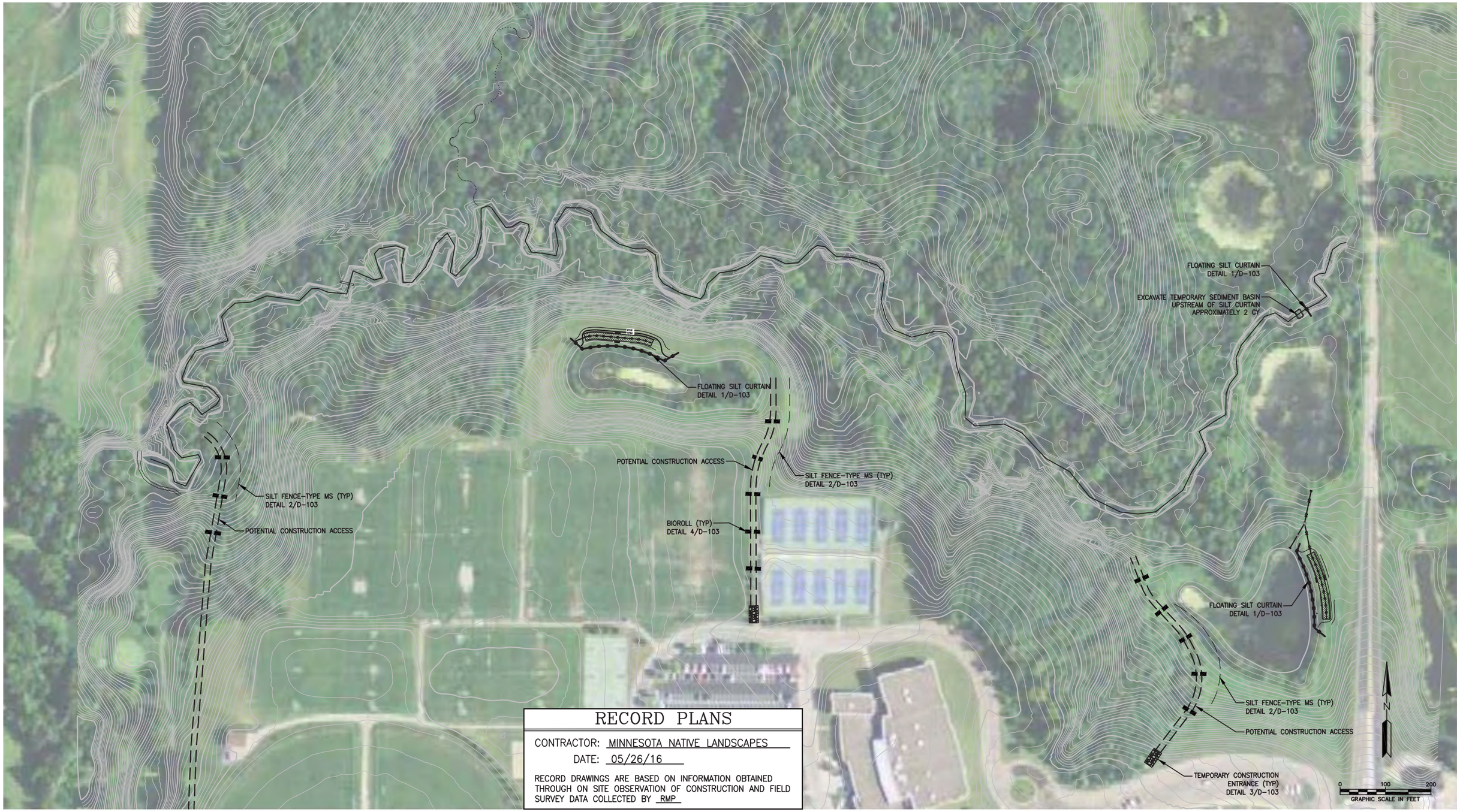
Item 4b-3

Plot Date & Time: 22 June 2016 5:36 PM



RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

RECORD DRAWINGS ARE BASED ON INFORMATION OBTAINED THROUGH ON SITE OBSERVATION OF CONSTRUCTION AND FIELD SURVEY DATA COLLECTED BY RMP

EROSION CONTROL NOTES:

1. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED DEPENDING ON SITE CONDITIONS DURING CONSTRUCTION. COORDINATE WITH ENGINEER.
2. SEE EC-101 FOR TEMPORARY STABILIZATION REQUIREMENTS.
3. RESTORE DISTURBED AREAS AS INDICATED ON SHEETS C-104 TO C-106.
4. MAINTENANCE FOR BIOROLLS WILL REQUIRE SHIFTING BIOROLLS SWAY FROM ACCESS ROAD IN USE PRIOR TO STARTING WORK EACH DAY AND SHIFTING THEM BACK OVER ACCESS ROAD AFTER OPERATION HAVE CONCLUDED EACH DAY.

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EROSION CONTROL PLAN

DWN BY	CHK'D	APP'D	DWG DATE	NOV 2014
LNJ	EAM	EAM	SCALE	AS SHOWN

PROJECT NO.	SHEET NO.	REV NO.
1756-07	EC-102	2

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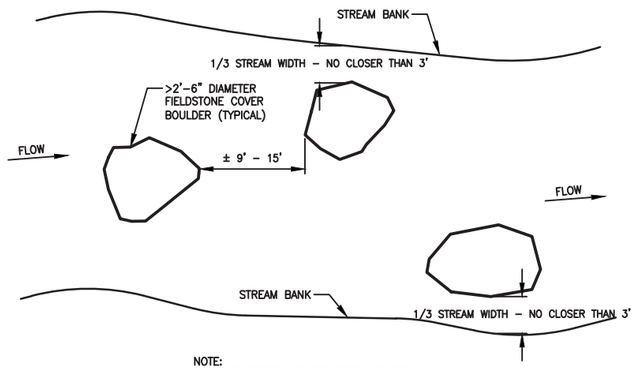
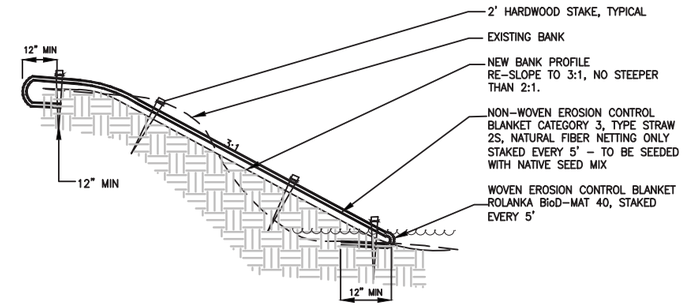


NOTE:
COVER BOULDERS TO BE FIELD LOCATED.
COORDINATE W/ ENGINEER.

COVER BOULDERS

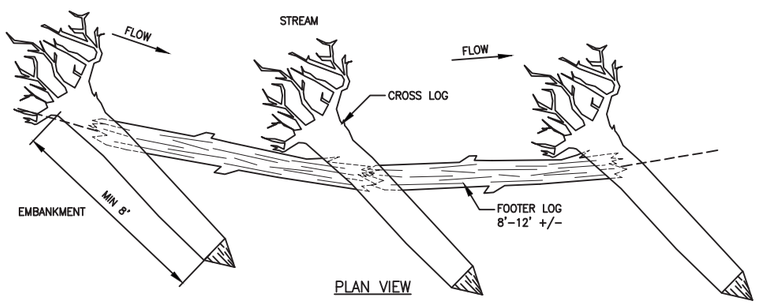
NOT TO SCALE — 1 / D–101



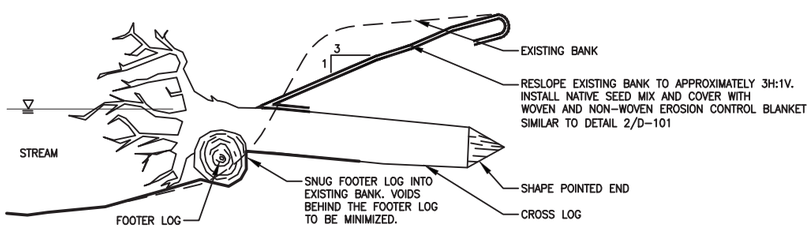
NOTE: PROVIDE FLOTATION SILT CURTAIN TO CONTAIN SOIL MATERIAL DURING BANK RESLOPING OPERATIONS. FLOTATION SILT CURTAIN SHALL BE MAINTAINED AND RELOCATED AS OPERATIONS OF BANK RESLOPING PROGRESS. FLOTATION SILT CURTAIN SHALL NOT BE RELOCATED UNTIL CURRENT SITE IS STABILIZED.

BANK RESLOPING

NOT TO SCALE — 2 / D–101



PLAN VIEW

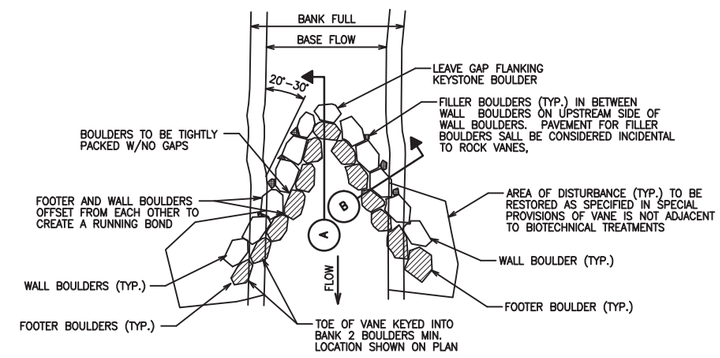


SECTION VIEW

NOTE:
1. A MINIMUM OF TWO CROSS LOGS PER FOOTER LOG IS REQUIRED TO ANCHOR FOOTER LOG.
2. MINIMUM LOG DIAMETER IS 12" +/–

LOG TOE WITH ROOT WADS

NOT TO SCALE — 3 / D–101



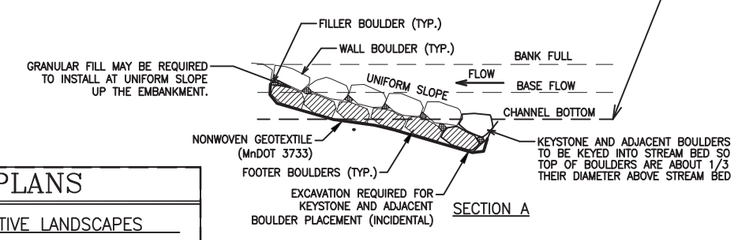
PLAN VIEW

LEGEND

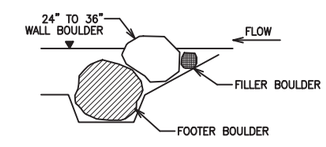
- SUBMERGED OR FOOTER 18" TO 24" FIELDSTONE BOULDER MEETING MnDOT 3601.2A. AT LEAST 20% OF THE BOULDERS SHALL HAVE A DIAMETER OF 24" OR LARGER.
- PROTRUDING OR WALL 24" TO 30" BOULDERS MEETING MnDOT 3601.2A. AT LEAST 20% OF THE BOULDERS SHALL HAVE A DIAMETER OF 30" OR LARGER.
- FILLER BOULDER 6" TO 12" DIA.;

NOTE:
1. FIELD STONE BOULDERS SHALL HAVE NO CUT, BLAST OR SHEAR MARKS.
2. ENOUGH WALL BOULDERS TO BE FLAT TOPPED AND SET TO CREATE A DRY CROSSING/WALKWAY ACROSS THE CREEK.
3. FINAL PLACEMENT OF ROCK VANE AND BOULDERS TO BE FIELD VERIFIED BY ENGINEER.
4. ALL VANES EXTEND UPSTREAM INTO FLOW OF CREEK.
5. CLASS V RIPRAP ACCEPTABLE ROCK ALTERNATIVE

NOTE:
CHANNEL BOTTOM = PROPOSED BOULDER ROCK VANE ELEVATION AND WILL SERVE AS THE GRADE CONTROL FOR UPSTREAM CHANNEL.



SECTION A



SECTION B

CROSS VANE DETAIL

NOT TO SCALE — 4 / D–101

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES

DATE: 05/26/16

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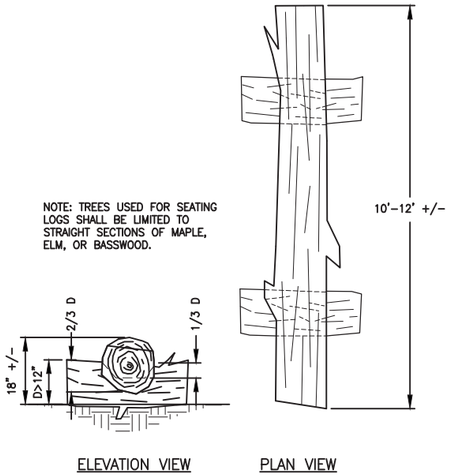
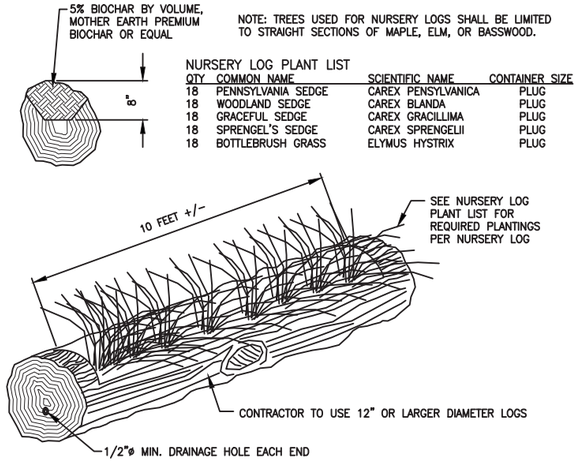
1756–07	D–101	2



SEATING LOGS (1 / D-102)
NOT TO SCALE

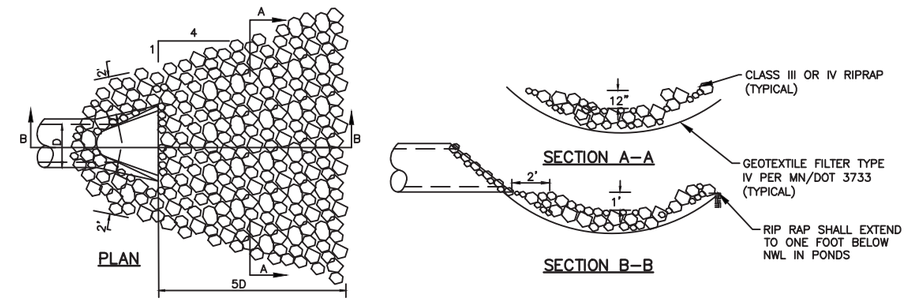


NOTE: TREES USED FOR NURSERY LOGS SHALL BE LIMITED TO STRAIGHT SECTIONS OF MAPLE, ELM, OR BASSWOOD.

NURSERY LOG PLANT LIST

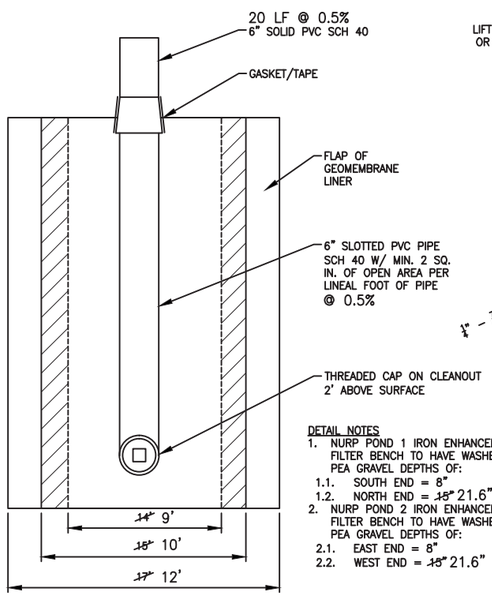
QTY	COMMON NAME	SCIENTIFIC NAME	CONTAINER SIZE
18	PENNSYLVANIA SEDGE	CAREX PENSYLVANICA	PLUG
18	WOODLAND SEDGE	CAREX BLANDA	PLUG
18	GRACEFUL SEDGE	CAREX GRACILLIMA	PLUG
18	SPRENGEL'S SEDGE	CAREX SPRENGELII	PLUG
18	BOTTLEBRUSH GRASS	ELYMUS HYSTRIX	PLUG

NURSERY LOG DETAIL (2 / D-102)
NOT TO SCALE

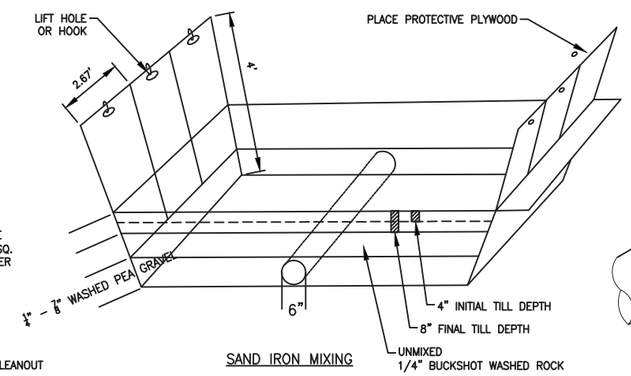


PIPE DIAMETER	RIPRAP
12"-24"	8-12 CY CLASS III
27"-33"	12-20 CY CLASS III
36"-48"	23-38 CY CLASS III
54" AND UP	62 CY CLASS IV

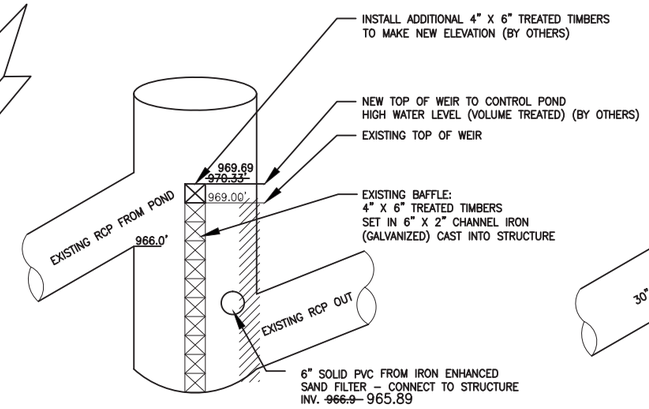
RIPRAP AT FLARED END SECTIONS DETAIL (3 / D-102)
NOT TO SCALE



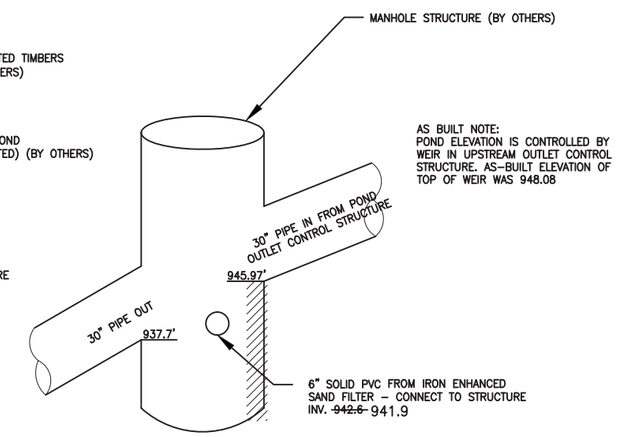
DETAIL NOTES
1. NURP POND 1 IRON ENHANCED FILTER BENCH TO HAVE WASHED PEA GRAVEL DEPTHS OF:
   1.1. SOUTH END = 8"
   1.2. NORTH END = ~~15"~~ 21.6"
2. NURP POND 2 IRON ENHANCED FILTER BENCH TO HAVE WASHED PEA GRAVEL DEPTHS OF:
   2.1. EAST END = 8"
   2.2. WEST END = ~~15"~~ 21.6"



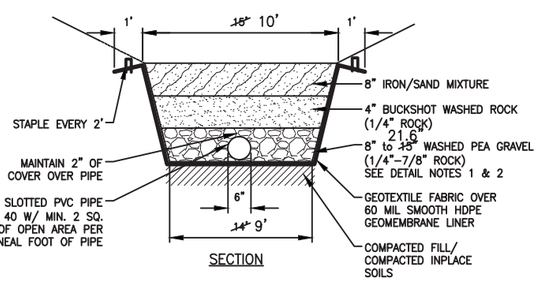
SUGGESTED CONSTRUCTION SEQUENCE
1. DEWATER.
2. GRADE 20' BENCH. 10' WIDE X VARYING DEPTH
3. EXCAVATE ~~15' WIDE X 1.5'~~ DEEP BENCH.
4. COMPACT IN-PLACE SUBSOIL.
5. ROLL OUT GEOTEXTILE FABRIC/60 MIL HDPE GEOMEMBRANE LINER.
6. INSTALL 6" DIAMETER SLOTTED/PERFORATED PVC PIPE AND CLEANOUTS.
7. PLACE ¼"-7/8" WASHED PEA GRAVEL TO A ~~DEPTH OF 6".~~ VARYING DEPTH WITH A MIN. 2' COVER OVER PIPE AND LEVEL WITH SURFACE.
8. PUT TEMPORARY PROTECTIVE PLYWOOD IN PLACE (OR OTHER METHOD
9. APPROVED BY ENGINEER TO PREVENT PUNCTURE OF EPDM).
10. PLACE ¼" "BUCKSHOT" WASHED ROCK TO A DEPTH OF 4".
11. PLACE FINE FILTER AGGREGATE TO A DEPTH OF 8" (TOP OF BENCH).
12. PLACE 3.7 LBS/SF (PER 8" THICK SECTION) IRON FILINGS [ETI-CC-1004(-8+50) CONNELLY GPM,
13. INC. OR APPROVED EQUAL] ON TOP OF FINE FILTER AGGREGATE.
14. TILL IN IRON FILINGS TO 4" DEPTH USING SMALL GARDEN STYLE TILLER.
15. HAND MIX SIDES NEAR 2.67' X 4' PROTECTIVE PLYWOOD.
16. SET TILLER DEPTH TO 8" AND MIX AGAIN WITH SAME PROCESS.
17. REMOVE PROTECTIVE PLYWOOD AND RAKE SURFACE FLAT.
18. STAKE LINER DOWN EVERY TWO FEET.



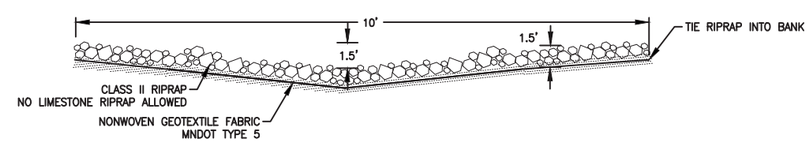
MODIFICATIONS TO NURP POND #2 OUTLET STRUCTURE (5 / D-102)
NOT TO SCALE



MODIFICATIONS TO NURP POND #1 MANHOLE (6 / D-102)
NOT TO SCALE



IRON ENHANCED SAND FILTER (4 / D-102)
NOT TO SCALE



CLASS II RIPRAP SPILLWAY DETAIL (7 / D-102)
NOT TO SCALE

RECORD PLANS

CONTRACTOR: MINNESOTA NATIVE LANDSCAPES
DATE: 05/26/16

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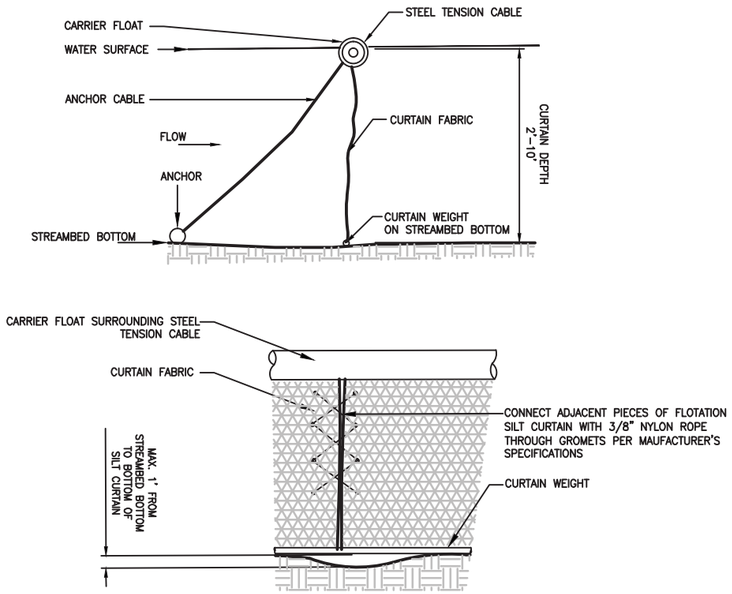
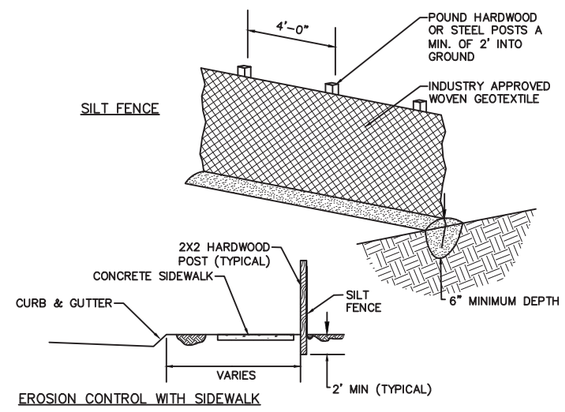


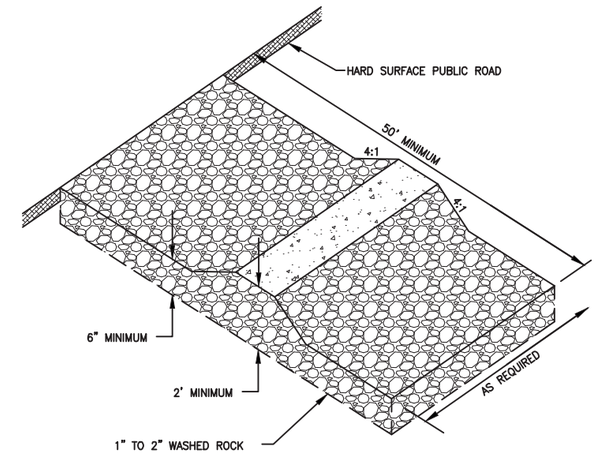
FLOTATION SILT CURTAIN (1 / D-103)
NOT TO SCALE



NOTES:

1. INSTALL SILT FENCE PER PLAN SET BEFORE BEGINNING CONSTRUCTION
2. INSTALL SILT FENCE AND EROSION CONTROL BLANKET BEHIND CURB & GUTTER AS SHOWN
3. REPLACE TORN, OVERBURDENED, OR DECOMPOSING SILT FENCE WITHIN 24 HOURS
4. TO JOIN SECTIONS OF SILT FENCE, POSITION POSTS TO OVERLAP. FABRIC SHOULD FOLD AROUND EACH POST ONE FULL TURN

SILT FENCE (2 / D-103)
NOT TO SCALE

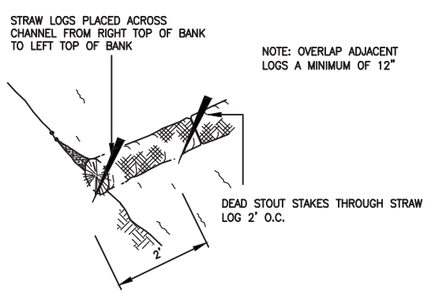


NOTES:

ROCK SIZE SHOULD BE 1" TO 2" IN SIZE SUCH AS MN/DOT CA-1 OR CA-2 COURSE AGGREGATE. (WASHED)

A GEOTEXTILE FABRIC MAY BE USED UNDER THE ROCK TO PREVENT MIGRATION OF THE UNDERLYING SOIL INTO THE STONE.

ROCK ENTRANCE TO CONSTRUCTION SITE (3 / D-103)
NOT TO SCALE



BIOROLL DETAIL (4 / D-103)
NOT TO SCALE

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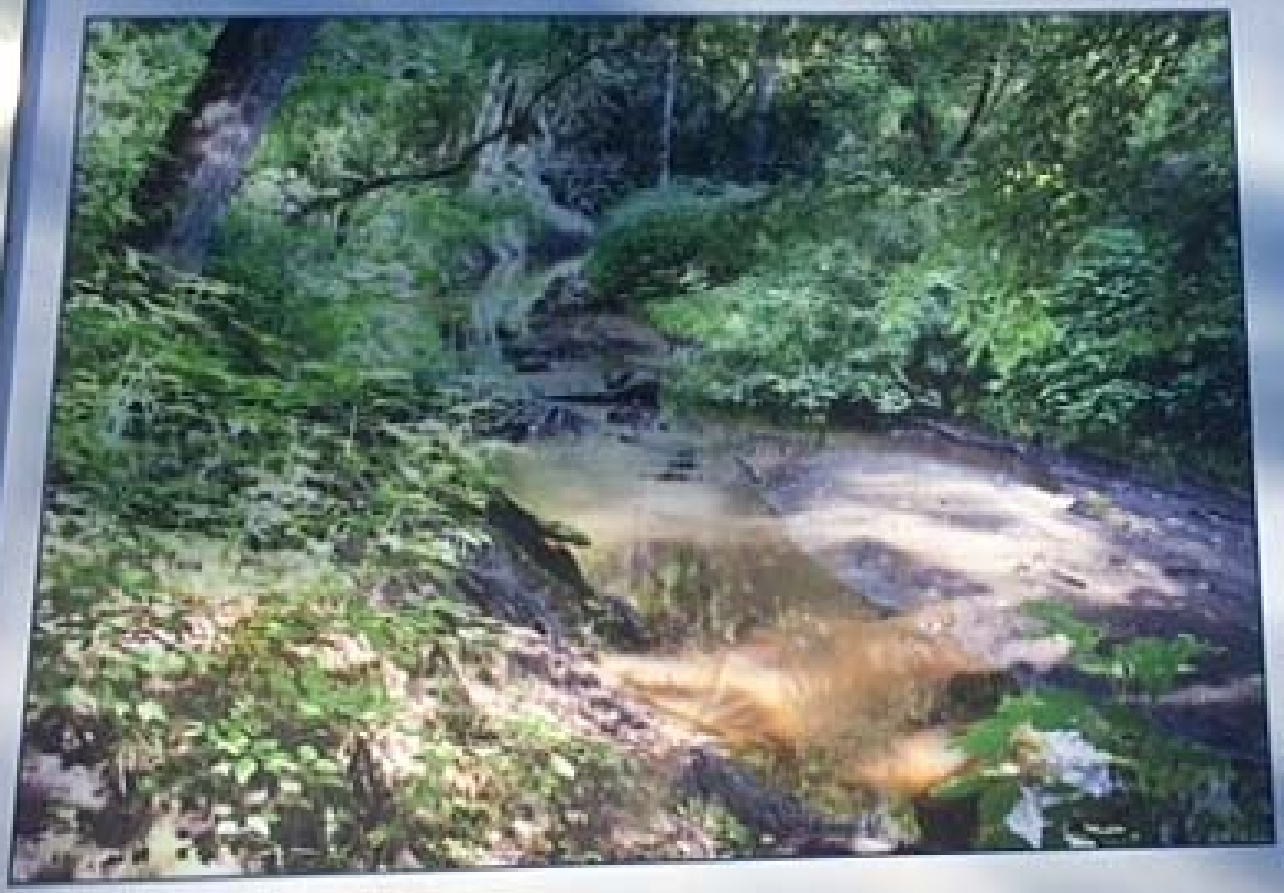
Elm Creek CIP 2015_Pix 1 March 11 2016 West Pond Iron Enhanced Sand Filter

Elm Creek CIP 2015 June 11, 2016 Plymouth Stream Restoration Pix 2

Elm Creek CIP 2015 Sept 14, 2016 Plymouth Stream Restoration Pix 3

Elm Creek CIP 2015 Sept 14 2016 Plymouth Stream Restoration Pix 4

Elm Creek Restoration



Project Overview

The stream restoration project of Elm Creek took place in the fall and winter of 2015-2016. Its main goal was to stabilize the streambank of Elm Creek to prevent further erosion and downstream nutrient loading from occurring.

This was achieved using several techniques such as rock cross vanes, root wads, cover boulders, and bank resloping. Each of the features mentioned is highlighted in signs later along the trail. Each sign describes what the feature is, its purpose, and the benefits.

In addition, all signs are equipped with before pictures of what the stream looked like prior to the restoration project. Hopefully, you will be able to see the impact that this project has had on Elm Creek and erosion in general.


Elm Creek CIP 2015 Sept 14 2016 Plymouth Stream Restoration Pix 5


Elm Creek CIP 2015 Sept 14 2016 Plymouth Stream Restoration Pix 6


Elm Creek CIP 2015 Sept 14 2016
Plymouth Stream Restoration Pix 7

From: Steve Woods [mailto:SWoods@freshwater.org]
Sent: Monday, July 18, 2016 2:01 PM
To: Judie Anderson (judie@jass.biz)
Subject: model snow and salt policy

This email is asking if the watershed is willing to join a consortium of other watersheds to provide a state of the art model snow and ice removal policy for municipal use.

As I shared over the phone with you, we are launching a quick cooperative project to develop a model snow and ice policy for road authorities and private commercial snow removal contractors. The project grew out of the February 2016 Road Salt Symposium where Louis presented on liability issues in the world of providing traction. The Symposium has been convened by Freshwater Society and Fortin Consulting for fifteen years. We've seen the big technical hurdles get mostly addressed and excessive road salt use now is driven in part by legal liability concerns—real and imagined.

The post-symposium feedback forms showed us we had a homerun of an issue that was very much on the minds of public works and maintenance supervisors. They WANT the public awareness and elected official support that comes with sound liability management achieved through careful policy adoption. Cities fully get that they have to balance multiple public goals for safety, water quality, operation costs, asset management all while weather conditions fluctuate. A good policy reference these multiple goals is desired by *everyone*.

We developed a scope of work that totals $20,000. The scope includes these steps:

1. Form advisory committee
2. Review legal framework, sample policies; identify key issues and best practices; prepare memo and outline of model policy
3. Advisory Committee Mtg #1; Review and comment on memo and outline
4. Prepare Draft #1 of Model Policy; review with at least 3 city attorneys
5. Advisory Committee Mtg #2; Review and comment on Draft #1
6. Prepare Draft #2 and Statement of Need and Reasonableness (memo explaining research, best practices, reasoning of advisory committee)
7. Advisory Committee Mtg #3; Review, refine final Draft Model Policy & SONAR
8. Present Model Policy to larger forums (e.g. League of Minnesota Cities, Water Resources Conference, CEAM, APWA)
9. Integrate model policy(s) into training materials for Road Salt Applicator (certification) program.

We are hoping your WMO shares in the sense of value for this project and would consider a financial contribution of approximately $1500. (We are estimating that there will be about 6-7 funding partners among watershed districts, WMOs and others.) Freshwater Society has agreed to serve as fiscal lead, Louis Smith is the legal sub-consultant, and Connie Fortin is the chloride sub-consultant in this endeavor.

I would be pleased to answer any questions you may have.

Steve Woods, PE,
Executive Director
The Freshwater Society
2424 Territorial Road, Ste. B
Saint Paul, MN 55114
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Model Snow and Ice Policy Advisory Committee

Meeting Minutes

July 20, 2016

Present: Connie Fortin (Fortin Consulting), Becky Christopher (Minnehaha Creek Watershed District), Jeff Davies (City of Grand Rapids), Mark Maloney (City of Shoreview), Brooke Asleson (Minnesota Pollution Control Agency), Steven Lawrence (City of St. Cloud), Leslie Larson (Minnesota Nursery and Landscape Association), John Wickenhauser (Carver County), Craig Eldred (City of Waconia), Katrina Hilton (City of Saint Paul), Steve Woods (Freshwater Society), Louis Smith, Elizabeth Henley.

1. Welcome and Introductions

Ms. Fortin welcomed everyone to the meeting at the offices of the Freshwater Society and invited a round of introductions.

2. Review of June 29, 2016 Meeting Minutes

Ms. Fortin and Mr. Smith introduced the June 29 meeting minutes and invited comments, corrections, and additions. Mr. Smith noted that the intent is to capture the discussion at the Committee meetings to assist in creating the SONAR document that will accompany the model policy. Committee members expressed their appreciation for the detailed minutes. No corrections were requested. Ms. Fortin invited Committee members to email to her any corrections to the June 29, 2016 meeting minutes by July 22 (none were received).

3. Discussion of Draft Model Policy

a. Section A, Introduction

Mr. Smith asked the Committee to offer guidance on the Introduction section of the Model Policy. Mr. Smith asked Mr. Lawrence his opinion on whether the base template for the Model Policy should be the League of Minnesota Cities' model policy. Mr. Lawrence stated that he did not think it necessary to use the League's model policy as a template for the Committee's Model Policy. Mr. Lawrence noted that not many cities adhere to the entirety of the League of Minnesota Cities' model policy, and that some small cities look to the League's model policy for guidance. Mr. Maloney noted that the League's policy is helpful, but that there are opportunities for expansion.

Mr. Smith noted the formatting question – how the document could be formatted to be most usable for cities, counties, and private operators. Mr. Woods suggested that certain terms in the Policy could be highlighted or bolded to indicate different options for counties, cities, and others using the Policy. Mr. Davies noted that while the policy preferences of cities and counties can

vary with changes in city or county administration, it is important that current city councils and counties adopt the Policy. Mr. Smith stated that the introduction to the SONAR document will explain how the Policy is adaptable to different users, and will identify specific places where different users can enter different information.

Mr. Maloney asked whether sentence one discussing city and country streets and public property is too specific. He asked whether the policy should cover parking lots at city parks, sidewalks, and other public spaces, and noted that every city and county is different in what it plows. Mr. Davies suggested describing the property that would be plowed as improved public property. He noted that cities and counties need to show a reasonable effort to reasonably maintain public facilities and entrances. Mr. Davies noted that different policies are in place at the intersection of city and county roadways, and suggested that the policy differentiate between what is maintained by one entity compared to another. Mr. Smith suggested that the language could be changed to city/county streets under the city's/county's jurisdiction. Mr. Davies commented that it is not reasonable or appropriate for a city to plow county or state roads located within that city because the city. Mr. Smith said that he will also bring this issue to the attention of the attorneys who will review the entire draft Policy. Mr. Wickenhauser noted that not every publicly owned property will be plowed.

i. Section A, Paragraphs 1 (Public safety) and 4 (Priority setting to optimize outcomes)

Turning to Section A, paragraph 1, the Committee discussed public safety. Mr. Maloney appreciated that public safety was the first thing mentioned in the list of considerations. Under paragraph 4, Ms. Fortin commented that environment should also be empahsized as a priority, and suggested reversing the order of paragraph 4, priority setting to optimize outcomes, and paragraph 5, environment.

ii. Section A, Paragraph 5 (Environment)

Mr. Smith asked if paragraph 5 was clear and detailed enough about the damage that salt causes to the environment. Mr. Davies suggested adding something more to paragraph 5 about the environment, given the importance of the issue. Mr. Wickenhauser suggested that the language could mention focusing on environmental concerns through extended operator trainings. Ms. Asleson noted that language could be added discussing sand and salt impacts such as toxicity to fish. Mr. Maloney suggested using language about TMDLs and other science-based standards that salt users are affected by in their work. Mr. Maloney mentioned that some people who read about environmental concerns in the Policy will not be aware of chloride effects on the environment. Mr. Woods noted that the MS4 regulatory requirements include some of this environmental language. Ms. Christopher suggested including language that the de-icers are permanent pollutants to the environment. Mr. Maloney suggested using the word impairment in

the paragraph. Ms. Asleson offered to provide the Committee with the MPCA fact sheet that MPCA prepared as part of its chloride management plan.

Ms. Fortin mentioned that the Policy and/or SONAR will offer separate recommendations for private applicators. Mr. Woods noted that paragraph 1 about public safety is only three sentences long, and that there should not be many more sentences than three in the environment paragraph. Mr. Smith said that there would be an effort to preserve an appropriate balance of emphasis in the next draft.

Mr. Maloney commented that once his team better understood BMP maintenance, they stopped using sand because of their MS4 responsibilities. Now communities need to reduce chlorides, and are interested in the impacts of agricultural byproducts on chloride concentrations to determine the extent of road salt responsibility for chloride levels in water. Ms. Fortin mentioned that sand and deicers pose different environmental risks, and have separate impacts. Ms. Asleson commented that alternatives to traditional de-icing materials are being tested in different areas. Mr. Maloney asked what is considered a pollutant, and if sand is considered a pollutant. Ms. Asleson said that a pollutant could even be beet juice from an alternative practice that makes its way into waterways.

iii. Section A, Paragraph 6 (Administrative/technical judgment)

Mr. Woods noted that the need for clearer policy statements about operator discretion based on judgment emerged from the February 2016 road salt conference where presenters noted that weather can be very different over a range of just a few miles. Operators needed to feel protected in using their judgment to flexibly respond to differing weather conditions. Mr. Maloney asked what the term “administrative” means in the Policy. Mr. Smith explained that it means administrative knowledge and general management responsibility for the city or county. Mr. Maloney asked how other cities and counties respond to feedback from the public that operators should have been out on the roads at a time when they were not. Mr. Davies said that his city explains why they pulled equipment and operators off of the road, and that he thinks that is what is described by “administrative” in paragraph 6.

Mr. Smith asked the Committee if they thought it was important to include a more specific statement about professional judgment, such as the priorities and practices—timing of snowfall, starting ice control—paragraphs in the League of Minnesota Cities’ model policy. Mr. Davies commented that his city does not wait for a specific depth of snow to fall, and sometimes begins management activities before any snow, if it is the best decision in the judgment of operators and others managing snow and ice management decisions. Mr. Maloney asked if “administrative” meant decisions made at a higher level than operators. Mr. Eldred asked if “management” would be a better word to use than administrative. Mr. Maloney said that his city purposefully does not use the word “administrative.” Mr. Eldred noted that management may be a better word because those that may often be thought of as occupying an administrative role generally do not

understand the technicalities of snow and ice management, and managers are the individuals using professional judgment to manage snow and ice.

iv. Section A, Paragraph 7 (Need for Adaptability) and Final Paragraph

Mr. Lawrence noted that he liked the sentence that the public has a need to practice due care. Mr. Maloney asked if the statement about public practice should be expanded to include when the public will be ticketed for irresponsible winter activity. Mr. Davies said that his city's equipment has stickers on the back that warn motorists and others to stay back 50-100 feet. Mr. Maloney noted that footage is hard to gauge from a moving vehicle. Mr. Wickenhauser said that on his equipment, it would be difficult to read any warning language because the equipment becomes covered by snow.

b. Section B, Snow and Ice Management Priorities

Mr. Smith noted that in the model policies and city and county policies, there are different options for prioritizing snow and ice management locations. Ms. Fortin provided the MNDOT statement about prioritization. Mr. Smith asked the Committee if it would be useful to include a brief statement detailing how operators will plow streets, and what amount of detail is useful and generally applicable to all types of jurisdictions. Mr. Maloney noted that in cities, downtown areas are the priority. Mr. Davies said that in his city, the central business district gets plowed first, before sidewalks and before streets. Mr. Maloney commented that his city receives more calls and concerns about sidewalks and trails. Mr. Eldred mentioned that his city has two policies, one for sidewalks and trails, and one for roads. Mr. Davies said that sidewalks are also a priority in his city because people want their sidewalks to be open. Ms. Asleson suggested breaking the prioritization table in the draft Policy into more categories. Ms. Fortin suggested including language in Section B stating "insert level of service chart" where cities, counties and private operators may insert their own charts. Mr. Davies and Mr. Eldred commented that each city, county, or private operator will want to modify the priority and level of service information to fit their practices. Mr. Wickenhauser noted that his county's policy states that it does not distinguish between different priority roads and makes safe and open travel conditions on all roads an equal priority. Mr. Davies asked how Carver County defines bare pavement. Mr. Eldred noted that it is challenging to achieve bare pavement with blowing snow. Mr. Wickenhauser suggested that bare pavement is realistically considered about 75% clear roadways.

Mr. Smith asked the Committee if every jurisdiction has their own chart that they want to use in the priorities section of the policy. He asked the Committee if it would be useful to include in the Model Policy a chart listing downtown central business districts and sidewalks as priorities, and high priority route content similar to that in the league of Minnesota Cities' model policy. Mr. Lawrence noted that the League's model policy priorities are not relevant to his city, where bus routes get priority, along with heavily travelled streets and the central business district.

Mr. Lawrence asked about the reference to City/County Engineers under Section B. He suggested changing the sentence to read: “The City/County Administrator or delegated authority directs resources within policies and directives set by the City/County Administrator or delegated authority.” Mr. Lawrence, Mr. Davies, and Mr. Maloney agreed that in their cities, the city engineer does not have a role in snow and ice management decisions. Mr. Maloney commented that it is important that it is clear in the Policy that the point of the Policy is operator discretion. Mr. Smith stated that more variables, including central business districts, will be included in the discussion of priority areas in the first sentences of Section B. Mr. Maloney noted that cities and counties are constrained by equipment, resources, and budget, which is why the policy is needed. Mr. Lawrence noted that it is not possible to simultaneously identify and address all problem areas.

Ms. Fortin noted that operators do not want to be held to the requirements of a table, should priority routes change in any given snow or ice event. Specifically, the Policy should not include regain times or targets, because these can change depending on the snow or ice event. Mr. Smith said that the SONAR document will include examples of what priority information is included in the manuals for reference, but suggested that is seems to be the Committee’s recommendation that priority tables will not be included in the Policy. Mr. Smith stated that the SONAR document will explain the Committee’s thought process and discussion, and go through the Model Policy section by section. The document will also consider the different perspectives in the different snow and ice manuals.

Mr. Maloney asked about other jurisdictions and road authorities operating within city and county limits and how the Model Policy would interact with the policies of those jurisdictions. Mr. Smith responded that the Model Policy will operate alongside those of other jurisdictions. Ms. Asleson suggested that an additional consideration be added as paragraph 8 under Section A stating that business areas and bus routes will be taken into account and affect priorities of city/county snow and ice management. Mr. Smith noted that paragraph 1 under Section A included public safety information that can be referenced elsewhere in the Policy as a significant operational consideration. Mr. Davies said he was reluctant to rely on public demand as part of the Policy for snow and ice management because public requests may be unreasonable, and there is a value in relying on engineers and operators who understand traffic volume and road type.

c. Section C, Training

Mr. Smith introduced Section C, explaining that it discussed the importance of training for more than road maintenance crews. Ms. Fortin suggested that education for the public be added. Mr. Maloney noted that it is the road authority’s responsibility to do education and outreach. Mr. Davies commented that in his experience, the public responds to the city website and its Facebook page information. Ms. Fortin noted that the Policy should be careful not to establish additional responsibilities and duties for cities and counties. Mr. Wickenhauser noted that MNDOT offers education and training on snow and ice management. Ms. Asleson commented

that it is part of cities' MS4 requirement that they provide information to the public. Mr. Smith stated that a legal document is not necessarily the appropriate place to include an education and outreach statement requiring cities and counties to make sure that the road traveling public is aware of city and county Policy to manage snow and ice conditions. The goal of the Policy is not to create a new duty to inform the public of the weather. Ms. Fortin agreed that cities and counties do not want to take on additional risk.

Mr. Maloney commented that he likes the approach of including education and outreach information in the Policy's SONAR background document. Mr. Maloney added that the SONAR document will do a good job of internally informing the city or county organizations about the Policy. Ms. Larson asked that the Policy require that training be documented. Ms. Fortin added that documentation should be done with all aspects of snow and ice management. Mr. Smith suggested that documentation suggestions be included in the SONAR.

d. Section D, Delegation of Authority

Mr. Smith asked if the Policy should include a complaint procedure. Mr. Wickenhauser noted that in his county, the on-call supervisor usually gets the complaint call, and deals with the issue immediately. Mr. Eldred commented that in his city, there is usually a period of time (about 24 hours) before someone responds to a complaint. Mr. Smith asked what the response is when someone reports a hazardous condition. Mr. Eldred said that if the issue is small, someone from the city will take care of the issue. Ms. Asleson noted that it is important to know who is calling, and whether there is actually a hazardous condition.

Mr. Smith stated that the issue of notice is relevant to the liability analysis. Mr. Smith asked the Committee to discuss whether it would make sense to have in the Policy an explanation of the City's or County's response to calls, and how the response is managed in terms of priority of services. Mr. Maloney commented that he would not want such a policy inadvertently to create new duties for cities and counties. His city's approach is to explain to callers that operators are out with equipment, and will get to the issue as soon as possible. A policy that requires operators to log all complaints, and track and process them, creates new expectations for how cities and counties handle complaints. Mr. Davies commented that his city divides the day into the normal working day, when operators consider the complaint situation and determine how to respond, and after hours, when law enforcement decides whether the issue warrants calling out public workers. Mr. Davies said that while the city does follow up on complaints, it may not always document the complaints or follow up. Mr. Smith stated that it is important for the Policy to demonstrate that the operators responsibly considered how best to respond. Mr. Lawrence commented that his city logs all calls and all methods by which it receives information, and documents the city's response.

Ms. Fortin commented that different preferences were being expressed, with cities and counties not wishing to add documentation requirements to the Policy, but wanting the Policy to protect

them for their actions. Mr. Smith noted that in Section D, paragraph 2, the draft Policy states that the administrator will establish procedures for reports. This leaves discretion to the cities, counties, and operators as to how systems will be established. The SONAR document will explain the various considerations.

Mr. Smith asked the Committee if they thought it would be in the interest of the Policy's goals to include language like that in the League of Minnesota Cities' model policy discussing what triggers snow and ice management. Mr. Maloney said that tools are constantly changing and information improving, and cities, counties, and other operators are doing an ever-better job of timing and anticipating their responses to snow and ice conditions. Mr. Maloney suggested that the Policy not be too prescriptive about what triggers commencement of snow and ice management. His city has never had a defined accumulation of snow that triggers start of service because that model has not been helpful in delivering services. Mr. Maloney said that in his community, one of the timing priorities is related to traffic, and it is important that the city plow from 2:00 a.m. to 6:00 a.m. whenever possible to reduce conflicts with traffic. Mr. Maloney noted that it is important that Policy separate technical from operational decision making. Mr. Smith asked the Committee how much of the specific policy information or reference to content in manuals they would like to see in the Model Policy. Mr. Eldred noted that Section D, paragraph 2, part (c), regarding salt storage, is in MS4 requirements for facilities management. Mr. Eldred added that Section D, paragraph 2, parts (b) and (d) are already included in other parts of local policies.

e. Section E, Operational Framework

i. Section E, Paragraph 1 (Training Program)

Mr. Smith asked the Committee if the Policy should include details specific to the training programming. Ms. Fortin suggested that the prescriptive guidance about Smart Salting level 1 training should be included in the supporting SONAR document rather than the policy. Ms. Asleson commented that the supporting document could include Smart Salting level 2 and MS4 permit requirements. Mr. Maloney asked who the target audience for the SONAR document will be. Mr. Smith stated that audiences include city council members so that they understand the thinking behind the Policy, other communities, and perhaps judges so that they are guided and understand the Policy document and its development into a policy by a group of knowledgeable people with diverse expertise.

Mr. Maloney asked if watershed districts offer winter maintenance trainings. Ms. Christopher said that MCWD hosts and provides funding for trainings conducted alongside Ms. Fortin and the MPCA. Ms. Asleson added that the MPCA and others are trying to brand Smart Salting, which is funded through a federal 319 grant. The training is offered through partnerships. Ms. Asleson noted that MNDOT does its own training for MNDOT staff. LTAP is another training program similar to Smart Salting, but does not require those trained to implement BMPs and

does not require trainees to take a test. Ms. Asleson commented that MPCA has a chloride management plan that includes all of its training and educational resources in one document. This document could be referenced in the SONAR and policy. Ms. Larson noted that the snow and ice management association offers training for private operators and works with Smart Salting 1. Mr. Smith commented that Section C of the policy acknowledges that cities and counties determine what training to provide and require.

ii. Section E, Paragraph 4 (Damage to Personal Property)

Mr. Maloney commented that different agencies have different responses to dealing with calls for damage. Every jurisdiction has a different policy for what is replaced or included under the jurisdiction's damage replacement policy. Mr. Smith noted that the city and county attorneys will want to include this provision and will likely already have expected that. The Policy will include a brief version. Mr. Eldred said that the damage to personal property statement needs to be included in the Policy. Mr. Smith suggested that cities and counties cross reference their claims policy, and retain the no landscaping portion of paragraph 4 in the Model Policy.

4. Summary of Next Steps

Mr. Smith will coordinate with other jurisdictions to invite further review and comment. The July 20, 2016 Committee meeting discussion will be incorporated into the second draft of the Policy. Mr. Smith will be in touch with the St. Cloud City Attorney, and several other attorneys, for peer review of the policy. Mr. Smith asked for ideas about who to reach out to at the League of Minnesota Cities, and Mr. Lawrence, Mr. Larson, and Mr. Maloney offered contacts who worked the MPCA's chloride management plan. By August 10, the Committee will make a courtesy call to the League and invite review and comment on the draft Policy. The August 10, 2016 Committee Meeting will include review of the next draft of the Policy, an appendix for private operators, and the draft SONAR document. Mr. Lawrence requested a copy of the Minnesota House and Senate portions of the snow and ice legislation. Ms. Fortin and Ms. Asleson agreed to follow up on this request.

Ms. Fortin thanked everyone for coming and adjourned the meeting at 10:59 a.m. The next Advisory Committee meeting will be held on August 10, 2016.

Respectfully submitted,

Louis Smith
Elizabeth Henley

Snow and Ice Management

Model Policy

A. Introduction

It is among the responsibilities of the **[City/County]** of _____ to manage snow and ice on **[City/County]** streets and public property under the **[City / County]**'s jurisdiction. The purpose of this document is to set policies for how the [City/County] will fulfill this responsibility and to identify those **[City/County]** officials and employees who are authorized to set subordinate policies and make judgments in the course of carrying out snow and ice management activities.

Setting policies for snow and ice management involves evaluating and weighing a number of considerations, including the following:

1. Public safety. The safety of those traveling by motor vehicle, on foot and by other modes of transportation is of high priority. The goal of the **[City/County]** is to provide for surface conditions that are safe for travel in consideration of surrounding conditions and circumstances. Also, vehicles and personnel engaged in snow and ice management activity can increase risk to the public by virtue of their presence on public ways during times when travel conditions and vision are impaired.

2. Personnel safety. **[City/County]** personnel incur risk by their presence on public ways while managing snow and ice. The safety of **[City/County]** personnel as well is of the utmost importance.

3. Cost. **[City/County]** funds are limited and taxpayers require that they be spent cost-effectively. It is not possible to address all snow and ice issues simultaneously and completely. It is not practical to maintain equipment and personnel availability at a level that is sufficient for all circumstances.

4. Environment. Materials to maintain or improve surface traction contribute pollutants such as sand and chlorides to surface waters and to **[City/County]** stormwater basins and other facilities, which in turn can increase the cost of maintaining those facilities. It is important not to use an excess of these materials.

Salt can be harmful to fish and other freshwater aquatic life and can also negatively affect infrastructure, vehicles, plants, soil, pets, wildlife as well as impair groundwater and drinking water supplies. Once in the water, chloride becomes a permanent pollutant and continues to accumulate in the environment over time. The data show that salt concentrations are increasing impairments to both surface waters and groundwater across the state.

5. Priority setting to optimize outcomes. Because consideration must be given to all factors, it is necessary to set priorities for snow and ice management activities. Considerations include, though are not limited to, road classification and vehicle use level, need for emergency vehicle access, areas of known safety risk, reported conditions, costs, and impact on the environment.

6. Management/professional/technical judgment. Policies and practices rest on management, professional, and technical knowledge, on prevailing weather and travel conditions and on other circumstances that operators encounter. As to important policy elements, the **[Council/Board]** cannot state a policy but instead must delegate the authority to establish and adjust the policy to the professional judgment of appropriate **[City/County]** personnel.

7. Need for adaptability. Particularly with respect to effectiveness, cost and environmental consequences, snow and ice management is a realm of innovation. It is important that **[City/County]** policy allow for personnel to maintain awareness of developments and allow for practices to be adjusted as appropriate. The public must practice due care given the continuously changing hazards presented by natural snow and ice concerns

The policies stated in this document, as well as any delegations of authority to set subordinate policies, rest on an assessment and balancing of these considerations. It is not possible or practicable for snow and ice to be fully removed from all surfaces or prevented from accumulating on surfaces. The **[City/County]** encourages and expects that **[City/County]** residents and other members of the traveling public will at all times conduct their activities mindful of conditions, hazards, and what is necessary to remain safe.

B. Snow and Ice Management Priorities

The **[City/County]** differentiates among maintenance areas based on a variety of factors, including traffic volume and location (e.g., business district). The established **[City/County]** priority is as follows:

[Insert City/County "level of service" chart, or use default chart below. modeled on MNDOT's Bare Lane Indicator Guidelines (Table 2-3.02A).]

Classification	Target Regain Time	Lane Description
Super Commuter Arterials Central Business District/ Downtown	0-3 hours	The goal of the jurisdiction is to achieve driving lanes that are as free of snow and ice as reasonably possible in a northern climate. Drivers should take due care when driving on snow and ice surfaces, including reducing their speed. Jurisdictions will log the date and time when a satisfactory road condition is obtained.
Urban Commuter	2-5 hours	
Rural Commuter Remaining streets, including cul-de-sacs	4-9 hours	
Alleys, parking lots, sidewalks, trails, and other surfaces for non-motorized travel	9-36 hours	

However, the **[City/County]** will also consider localized safety concerns, reported hazard conditions and other relevant information in adjusting priorities. The **[City/County]** Administrator, or delegated authority has discretion to direct the resources contained in this Policy, and those directives set by the **[City/County]** Administrator or delegated authority. **[City/County]** Administrator delegated authority directs resources and adjusts priorities during an event with due attention to the considerations listed in Section A, above. Within the policies and directives set by the **[City/County]** Administrator or delegated authority, operations personnel may adjust their activity as well to address safety concerns, improve effectiveness, reduce costs, and limit environmental impacts. Section A, paragraph 1, is a significant operational consideration for **[Cities/Counties]** when making such adjustments.

The **[City/County]** is not responsible for managing snow and ice on streets, sidewalks, or other areas not within **[City/County]** jurisdiction.

C. Training

It is important that personnel involved in snow and ice management receive appropriate training to inform their operational capacities and the judgment that they must exercise in performing their responsibilities. The **[City/County]** Administrator is delegated the authority to determine and provide for appropriate training and tasked to inform the **[Council/Board]** of training funding needs during budgeting. The Administrator will consider training for police, emergency response and other **[City/County]** personnel who may not have specific responsibilities for snow and ice management but whose awareness and coordination is important to the **[City/County]'s** efforts.

The **[City/County]** will document, or require documentation of, all training that it requires or conducts.

D. Delegations of Authority

Authority with respect to snow and ice management decisions is delegated as follows:

1. **[City/County]** Administrator or delegated authority. The **[City/County]** Administrator or delegated authority will exercise general oversight of snow and ice management activities and will make recommendations to the **[Council/Board]** on staffing, purchases and funding as a part of annual budgeting. The Administrator or delegated authority will exercise responsibility with respect to personnel training as indicated in Section C, above.

The Administrator or delegated authority will establish procedures for reports on snow and ice conditions from **[City/County]** personnel or the public to be documented and routed to appropriate **[City/County]** personnel so that such reports inform snow and ice management activities. Operators will consider how best respond to snow and ice management complaints, pursuant to the following **[City/County]** policy:

[Insert individual [City/County] complaint documentation and response policy here. Include how the [City/County] response is management in terms of priority of services.]

The Administrator or delegated authority may enter into contracts for snow and ice management services or may recommend such contracts to the **[Council/Board],** in accordance with **[City/County]** policy. All contracts will provide the following:

a. All personnel performing the contract on behalf of the contracting party are trained to the same extent as would be **[City/County]** personnel performing the same work.

b. The contracting party will perform the work in accordance with all applicable **[City/County]** policies and directives, copies of which will be provided to the contracting party.

c. The contracting party will be insured for general and automotive liability to the same limits and under the same standard conditions as in other **[City/County]** contracts, or to such other limits and under such other conditions as the **[City/County]** Attorney may advise.

d. The contracting party will perform all work with due care, and will indemnify the **[City/County]** and hold it harmless for its negligent and willful acts and omissions.

2. [City/County] Engineer or delegated authority. The [City/County] Engineer or delegated authority is authorized to establish subordinate policies and directives with respect to the following:

a. Adjustments to snow and ice management priorities as indicated in Section B, above.

b. Protocols and directives concerning the initiation and cessation of snow and ice management activities. Cessation protocols and directives will consider conditions that endanger employee or equipment safety, or that cause management activities to be ineffective.

c. Protocols and practices for snow plowing and other operations, including snow storage. In determining snow storage locations and conditions, the Engineer or delegated authority will consider the debris and pollutant load held within stored snow and the potential water pollution impact of snowmelt within surface runoff. **[Insert more specific [City/County] policy here.]**

d. Protocols for application of sand, salt and other means to preserve/reestablish traction. The Engineer or delegated authority will give particular consideration to safety, environmental, and cost concerns, will maintain **[City/County]** awareness of best practices and innovations, and in his or her judgment will adjust protocols in accordance with such practices and innovations.

In making the judgments underlying these actions, the **[City/County]** Engineer or delegated authority will give due attention to the considerations listed in Section A, above. The **[City/County]** Engineer or delegated authority should consider providing for awareness of best practices, including those contained in the Winter Parking Lot and Sidewalk Maintenance Manual (MPCA, 2015) and the Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012), as they may be updated, and to provide for incorporation of best practices as appropriate.

Until such time as applicable policies and directives are established, the **[City/County]** Engineer or delegated authority will direct operations in his or her best judgment and with attention to the considerations listed in Section A, above.

3. Operators. **[City/County]** personnel engaged in snow and ice management operations are authorized to adjust activities in accordance with Section B, above. Such personnel, in their judgment, also may adjust plowing and other operational methods and may implement hazard warnings, consistent with the policies and directives set by the **[City/County]** Engineer or delegated authority.

E. Operational Framework

1. Documentation. ***[Insert [City/County] policy for documentation of control practices, decisions, and written or printed records.***

Model statement:

The **[City/County]** and its operators will document control practices and decisions and keep written or printed records of application and other decisions in carrying out this Policy.A storm record will be completed by the **[City/County]** for each storm event and should include operating times, weather conditions, and personnel and equipment resources committed.]

2. Emergency Situations. The **[City/County]** will dispatch operators and equipment as soon as possible to the routes required by emergency vehicles—fire, medical, police—responding to an emergency situation within the jurisdiction of the **[City/County]**, Fire Department, or Police Department.

The **[City/County]** will plow private property only if emergency vehicles require access.

3. Damage to Personal Property. ***[Insert [City/County] policy for responding to damage to personal or private property. This may cross reference the [City/County] policy for damage replacement.***

Model statement:

The [City/County] will consider for repair or replacement at [City/County] expense property that is (1) properly installed, (2) permitted by [City/County] ordinance to be located adjacent to the street, and (3) damaged by contact with city equipment. The [City/County] will not repair or replace damaged trees, shrubs, or landscaping.]

4. Deviation from Policy. If a person with delegated authority determines deviation from this Policy to be in the best interest of the **[City/County]**, or that a change is needed, the deviation will be documented. Documentation includes identifying: the cause, why the response was necessary, and how long the deviation will be in effect.

5. Review and Modification of Policy. **[*Insert jurisdiction's annual review or other review policy.*]**

F. Assuming Responsibility for Private Roadways, Parking Areas, Sidewalks, and Trails

The **[City/County]** is not responsible for snow and ice management on any roadway or parking area not owned by or dedicated to the **[City/County]**, except as may be provided in a legally

binding, written acceptance of that responsibility in the context of a development approval or otherwise. ***[Insert further [City/County] policy statement here.]***

G. Coordination with Other Jurisdictions

The table below lists the jurisdiction responsible for each **[City/County]** boundary street.

Street Segment	Responsibility	Telephone No.
	[City, County, State]	

The following streets owned by the **[City/County]** are maintained and managed for snow and ice by the Minnesota Department of Transportation:

[***List streets in jurisdiction that are maintained by MNDOT***].

The **[City/County]** will coordinate with neighboring or regional jurisdictions as warranted to realize better management outcomes, cost savings or environmental benefits.

No Rights Created

This policy is for internal use only in order to specify the policies and distribution of authority for snow and ice management. The policy is for the benefit of serving the general public and not for the benefit of any individual or specific group of individuals. It is not intended to and does not create any right or expectation in any third party. The **[City Council/Board of Commissioners]** may amend this policy or make exceptions to it as it deems appropriate.

Disclaimer

The **[City/County]** will begin snow and ice management as soon as reasonably possible. Cold, wind, visibility, equipment failure or disability, rapid snow and ice accumulation, and/or other unforeseen conditions or emergencies may prevent safe or effective management and cause delays in management operations.

Distribution

This policy will be distributed to the following:

Snow and Ice Management

Model Policy

A. Introduction

It is among the responsibilities of the **[City-/-County]** of _____ to manage snow and ice on **[Ceity-/-Ceounty]** streets and public property under the **[City / County]**'s jurisdiction. The purpose of this document is to set policies for how the [City/County] will fulfill this responsibility and to identify those **[Ceity/Ceounty]** officials and employees who are authorized to set subordinate policies and make judgments in the course of carrying out snow and ice management activities.

Setting policies for snow and ice management involves evaluating and weighing a number of considerations, including the following:

1. Public safety. The safety of those traveling by motor vehicle, on foot and by other modes of transportation is of the highest priority. The goal of the **[City/County]** is to provide for surface conditions that are safe for travel in consideration of surrounding conditions and circumstances. Also, vehicles and personnel engaged in snow and ice management activity can increase risk to the public by virtue of their presence on public ways during times when travel conditions and vision are impaired.

2. Personnel safety. **[City/County]** personnel incur risk by their presence on public ways while managing snow and ice. The safety of **[City/County]** personnel as well is of the utmost importance.

3. Cost. **[City/County]** funds are limited and taxpayers require that they be spent cost-effectively. It is not possible to address all snow and ice issues simultaneously and completely. It is not practical to maintain equipment and personnel availability at a level that is sufficient for all circumstances.

~~4. Priority setting to optimize outcomes. Because consideration must be given to costs, it is necessary to set priorities for snow and ice management activities. Considerations include, though are not limited to, road classification and vehicle use level, need for emergency vehicle access, areas of known safety risk, and reported conditions.~~

~~4~~5. Environment. Materials to maintain or improve surface traction contribute pollutants such as sand and chlorides to surface waters and to **[Ceity/Ceounty]** stormwater basins and other facilities, which in turn can increase the cost of maintaining those facilities. It is important not to use an excess of these materials.

~~High levels of s~~Salt can be harmful to fish and other freshwater aquatic life and can also negatively affect infrastructure, vehicles, plants, soil, pets, wildlife as well as impair

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Comment [EH1]: Connie finds this sentence hard to understand. She asks if what we mean by this sentence is :

"There is a risk to the driving public when winter operations are taking place and if a person chooses to be driving in that situation then they need to understand they are at greater risk than if they stayed at home."

and if we might substitute something similar to her language for that currently in the policy.

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Comment [I2]: Mr. Woods cautioned against including more sentences under the "Environment" section than under "Public safety." We many want to take away some content from within the "Environment" section, or include additional content in the "Public Safety" section.

Comment [I3]:

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groundwater and drinking water supplies. Once in the water, chloride becomes a permanent pollutant and continues to accumulate in the environment over time. The data show that salt concentrations are ~~continuing to~~ increasinge ~~in~~impairments to both surface waters and groundwater across the state.

5. Priority setting to optimize outcomes. Because consideration must be given to all factors ~~costs~~, it is necessary to set priorities for snow and ice management activities. Considerations include, though are not limited to, road classification and vehicle use level, need for emergency vehicle access, areas of known safety risk, reported conditions, costs, and impact on the environment.

6. ~~Administrative~~Management/professional/technical judgment. Policies and practices rest on management, professional,~~administrative~~ and technical knowledge, on prevailing weather and travel conditions and on other circumstances that operators encounter. As to important policy elements, the **[Council/Board]** cannot state a policy but instead must delegate the authority to establish and adjust the policy to the professional judgment of appropriate **[C~~c~~ity/C~~c~~ounty]** personnel.

7. Need for adaptability. Particularly with respect to effectiveness, cost and environmental consequences, snow and ice management is a realm of innovation. It is important that **[City/County]** policy allow~~provide~~ for personnel to maintain awareness of developments and allow for practices to be adjusted as appropriate. The public must practice due care given the continuously changing hazards presented by natural snow and ice concerns

~~8. Management Priorities. Business areas, bus routes, sidewalks, and **[any others that individual City/County prioritizes]** will be prioritized first, and will affect the priorities of **[City/County]** snow and ice management.~~

The policies stated in this document, as well as any~~the~~ delegations of authority to set subordinate policies, rest on an assessment and balancing of these considerations. It is not possible or practicable for snow and ice to be fully removed from all surfaces or prevented from accumulating on surfaces. The **[City~~-~~/~~-~~County]** encourages and expects that **[C~~c~~ity/C~~c~~ounty]** residents and other members of the traveling public will at all times conduct their activities mindful of conditions, hazards, and what is necessary to remain safe.

B. Snow and Ice Management Priorities

The **[City~~-~~/~~-~~County]** differentiates among maintenance areas~~streets~~ based on a variety of factors, including traffic volume~~, and street function,~~ and location (e.g., business district). ~~The [City / County] normally will prioritize attention to more heavily traveled streets, streets with higher posted speed limits, and streets of primary importance for emergency vehicles.~~ The established **[City~~-~~/~~-~~County]** priority is as follows:

Comment [l4]: Sentence from Brooke Asleson suggested for inclusion in 7-20-16 post-meeting email. Mr. Maloney suggested inclusion of the word "impairment" in the Policy at the 7-20-16 meeting.

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Comment [l5]: Ms. Fortin's edit.

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[Insert City/County "level of service" chart, or use default chart below, modeled on MNDOT's Bare Lane Indicator Guidelines (Table 2-3.02A).]

Classification	**Target Regain Time**	**Lane Description**
Super Commuter Arterials Central Business District/ Downtown	0-3 hours	The goal of the jurisdiction is to achieve driving lanes that are as free of snow and ice as reasonably possible in a northern climate. Drivers should take due care when driving on snow and ice surfaces, including reducing their speed. Jurisdictions will log the date and time when a satisfactory road condition is obtained.
Urban Commuter	2-5 hours	
Rural Commuter Remaining streets, including cul-de-sacs	4-9 hours	
Alleys, parking lots, sidewalks, trails, and other surfaces for non-motorized travel	9-36 hours	

~~Arterials~~ ~~Central Business District or Downtown~~	~~First Priority~~
~~Remaining streets, including cul-de-sacs~~	~~Second Priority~~
~~Alleys, parking lots, sidewalks, trails, and other surfaces for non-motorized travel~~	~~Third priority~~

However, the **[City/County]** will also consider localized safety concerns, reported hazard conditions and other relevant information in adjusting priorities. The **[City/County]** Administrator, or delegated authority has discretion to direct the resources contained in this Policy, and those directives set by the **[City/County]** Administrator or delegated authority. **[City/County]** ~~The [City/County] Engineer is~~ Administrator delegated ~~the~~ authority ~~to~~ directs resources and adjusts priorities during an event with due attention to the considerations listed in Section A, above. Within the policies and directives set by the **[City/County]** Administrator~~Engineer~~ or delegated authority, operations personnel may adjust their activity as well to address safety concerns, improve effectiveness, reduce costs, and limit environmental impacts. Section A, paragraph 1, is a significant operational consideration for **[Cities/Counties]** when making such adjustments.

The **[City/County]** is not responsible for managing snow and ice on streets, sidewalks, or other areas not within **[City/County]** jurisdiction. ~~In the event that the **[City/County]** manages snow and ice in an area outside of **[City/County]** jurisdiction, the **[City/County]** is not responsible for the snow and ice condition of that area.~~

C. Training

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Comment [l6]: Based on the 7-20-16 meeting, most cities and counties will likely insert their own priorities table here.
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Comment [l7]: Steve Lawrence insertion suggested at 7-20-16 meeting.
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Comment [l8]: Some discussion during the 7-20-16 meeting suggested concern that C. Training creates new responsibilities for cities and counties. I think that, as drafted, this section may or may not be pursued at the discretion of

It is important that personnel involved in snow and ice management receive appropriate training to inform their operational capacities and the judgment that they must exercise in performing their responsibilities. The **[City/County]** Administrator is delegated the authority to determine and provide for appropriate training and tasked to inform the **[Council/Board]** of training funding needs during budgeting. The Administrator will consider training for police, emergency response and other **[City/County]** personnel who may not have specific responsibilities for snow and ice management but whose awareness and coordination is important to the **[City'~~s~~/County'~~s~~]'s** efforts. ~~The Administrator will also consider education for the public on the [City/County]'s snow and ice management policy.~~

The **[City/County]** will document, or require documentation of, all training that it requires or conducts.

D. Delegations of Authority

Authority with respect to snow and ice management decisions is delegated as follows:

1. **[City/County]** Administrator or delegated authority. The **[City/County]** Administrator or delegated authority will exercise general oversight of snow and ice management activities and will make recommendations to the **[Council/Board]** on staffing, purchases and funding as a part of annual budgeting. The Administrator or delegated authority will exercise responsibility with respect to personnel training as indicated in Section C, above.

The Administrator or delegated authority will establish procedures for reports on snow and ice conditions from **[City/County]** personnel or the public to be documented and routed to appropriate **[City/County]** personnel so that such reports inform snow and ice management activities. Operators will consider how best respond to snow and ice management complaints, pursuant to the following **[City/County]** policy:

[Insert individual [City/County] complaint documentation and response policy here. Include how the [City/County] response is management in terms of priority of services.]

The Administrator or delegated authority may enter into contracts for snow and ice management services or may recommend such contracts to the **[Council/Board],** in accordance with **[City/County]** policy. All contracts will provide the following:

a. All personnel performing the contract on behalf of the contracting party are trained to the same extent as would be **[City/County]** personnel performing the same work.

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Comment [l9]: Ms. Fortin requested adding this language at the 7-20-16 meeting. It may be better suited for inclusion in the SONAR document than in the actual policy.
Comment [l10]: Ms. Larson requested at the 7-20-16 meeting that this language be included in the Policy.
Comment [l11]: Ms. Fortin noted that she has never spoken to a city or county ... [1]
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Comment [l12]: The 7-20-16 meeting ... [2]
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Comment [EH13]: Connie says that th ... [3]

b. The contracting party will perform the work in accordance with all applicable **[City/County]** policies and directives, copies of which will be provided to the contracting party.

c. The contracting party will be insured for general and automotive liability to the same limits and under the same standard conditions as in other **[City/County]** contracts, or to such other limits and under such other conditions as the **[City/County]** Attorney may advise.

d. The contracting party will perform all work with due care, and will indemnify the **[City/County]** and hold it harmless for its negligent and willful acts and omissions.

2. [City/County] Engineer or delegated authority. The [City/County] Engineer or delegated authority is authorized to establish subordinate policies and directives with respect to the following:

a. Adjustments to snow and ice management priorities as indicated in Section B, above.

b. Protocols and directives concerning the initiation and cessation of snow and ice management activities. ~~These protocols will consider factors including the expected timing, nature, scale and duration of precipitation; wind conditions; temperature trends; and expected severity of ice conditions.~~ Cessation protocols and directives will consider conditions that endanger employee or equipment safety, or that cause management activities to be ineffective.

c. Protocols and practices for snow plowing and other operations, including snow ~~and salt~~ storage. In determining snow ~~and salt~~ storage locations and conditions, the Engineer or delegated authority will consider the debris and pollutant load held within stored snow and the potential water pollution impact of snowmelt ~~and of salt dissolved~~ within surface runoff. **[Insert more specific [City/County] policy here.]**

d. Protocols for application of sand, salt and other means to preserve/reestablish traction. The Engineer or delegated authority will give particular consideration to safety, environmental, and cost concerns, will maintain **[City/County]** awareness of best practices and innovations, and in his or her judgment will adjust protocols in accordance with such practices and innovations.

In making the judgments underlying these actions, the **[City/County]** Engineer or delegated authority will give due attention to the considerations listed in Section A, above. The **[City/County]** Engineer or delegated authority ~~is tasked to~~ should consider

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Comment [l14]: Cities and Counties at the 7-20-16 meeting stated that they prefer to apply their own criteria to starting or ending snow and ice operations, which is why I removed this language.

Comment [l15]: Delete? Mr. Eldred noted that this information is already included in other sections of city and county policies.

Comment [EH16]: Connie noted that cessation usually happens when snow and ice managers reach the appropriate level of service. She also suggested including conditions that endanger the environment or exceed budget constraints.

Comment [l17]: Mr. Eldred noted at the 7-20-16 meeting that slat storage is covered in the MS4 requirements for facilities management.

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Comment [l18]: Delete? Mr. Eldred noted that this information is included in other parts of local policies.

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providing~~e~~ for awareness of best practices, including those contained in the Winter Parking Lot and Sidewalk Maintenance ~~m~~Manual (MPCA, 2015) and the Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012), as they may be updated, and to provide for incorporation of best practices as appropriate.

Until such time as applicable policies and directives are established, the **[City/County]** Engineer or delegated authority will direct operations in his or her best judgment and with attention to the considerations listed in Section A, above.

3. Operators. **[City/County]** personnel engaged in snow and ice management operations are authorized to adjust activities in accordance with Section B, above. Such personnel, in their judgment, also may adjust plowing and other operational methods and may implement hazard warnings, consistent with the policies and directives set by the **[City/County]** Engineer or delegated authority.

E. Operational Framework

~~***NOTE: this Section includes operational issues to be considered; some of these issues may not be appropriate for the Policy document, but would instead be attached as part of the explanation in the Statement of Need and Reasonableness that will accompany the Policy.***~~

~~1.Training Program. The **[City/County]** training program will include MPCA's Smart Salting level 1 training.~~

1~~2~~. Documentation. ***[Insert [City/County] policy for documentation of control practices, decisions, and written or printed records.***

Model statement:

The **[City-/-County]** and its operators will document control practices and decisions and keep written or printed records of application and other decisions in carrying out this ~~Snow and Ice Management~~ Policy.

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Comment [l19]: The Committee did not want to include a prescriptive training requirement in the Policy document.

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A storm record will be completed by the **[City-/-County]** for each storm event and should include operating times, weather conditions, and personnel and equipment resources committed.]

23. Emergency Situations. The **[City/County]** will dispatch operators and equipment as soon as possible to the routes required by emergency vehicles—fire, medical, police—responding to an emergency situation within the jurisdiction of the **[City/County]**, Fire Department, or Police Department.

The **[City/County]** will plow private property only if emergency vehicles require access.

34. Damage to Personal Property. ***[Insert [City/County] policy for responding to damage to personal or private property. This may cross reference the [City/County] policy for damage replacement.***

Model statement:

The [City-/-County] will consider for repair or replacement at [City-/-County] expense property that is (1) properly installed, (2) permitted by [City-/-County] ordinance to be located adjacent to the street, and (3) damaged by contact with city equipment. The [City-/-County] will not repair or replace damaged trees, shrubs, or landscaping.]

45. Deviation from Policy. If a supervisor or operator person with delegated authority determines deviation from this Policy to be in the best interest of the **[City/County]** [city, etc], or that a change is needed, the deviation will be documented. Documentation includes identifying: the cause, why the response was necessary, and how long the deviation will be in effect.

56. Review and Modification of Policy. ***[Insert jurisdiction's annual review or other review policy.]*** [e.g. annual review]

F. Assuming Responsibility for Private Roadways, or Parking Areas, Sidewalks, and Trails

The **[City/County]** is not responsible for snow and ice management on any roadway or parking area not owned by or dedicated to the **[City/County]**, except as may be provided in a legally binding, written acceptance of that responsibility in the context of a development approval or otherwise. ***[Insert further [City/County] policy statement here.]***

G. Snow and Ice Management on [City/County] Property

The delegations of authority under Section D, above, apply as well to snow and ice management on [City/County] property other than roadways.

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Comment [I20]: This section is not necessary because of the change in the introductory paragraph of Part A stating that this Policy applies to property under the City/County's jurisdiction.

~~H~~G. Coordination with Other Jurisdictions

The table below lists the jurisdiction responsible for each **[City/County]** boundary street.

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Street Segment	Responsibility	Telephone No.
	[City, County, State]	

The following streets owned by the **[City/County]** are maintained and managed for snow and ice by the Minnesota Department of Transportation:

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[***List streets in jurisdiction that are maintained by MNDOT***].

~~[***List streets***].~~

The **[City/County]** will coordinate with neighboring or regional jurisdictions as warranted to realize better management outcomes, cost savings or environmental benefits.

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No Rights Created

This policy is for internal use only in order to specify the policies and distribution of authority for snow and ice management. The policy is for the benefit of serving the general public and not for the benefit of any individual or specific group of individuals. It is not intended to and does not create any right or expectation in any third party. The **[City Council/Board of Commissioners]** may amend this policy or make exceptions to it as it deems appropriate.

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Disclaimer

The **[City/County]** will begin snow and ice management as soon as reasonably possible. Cold, wind, visibility, equipment failure or disability, rapid snow and ice accumulation, and/or other unforeseen conditions or emergencies may prevent safe or effective management and cause delays in management operations.

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Distribution

This policy will be distributed to the following:

MODEL SNOW AND ICE POLICY ADVISORY COMMITTEE

GUIDANCE DOCUMENT

accompanying the

Model Snow and Ice Management Policy

August 10, 2016

This Guidance Document presents background on and explains the structure of the Model Policy finalized August 10, 2016 by the Model Snow and Ice Management Policy Advisory Committee. The Model Policy is the product of coordination among diverse snow and ice management professionals from different areas of Minnesota. It is intended to serve as the foundation for city and county snow and ice management policies and follows the following structure:

- Section A: Introduction
- Section B: Snow and Ice Management Priorities
- Section C: Training
- Section D: Delegations of Authority
- Section E: Operational Framework
- Section F: Assuming Responsibility for Private Roadways or Parking Areas
- Section G: Coordination with Other Jurisdictions

The Model Policy is a framework that: (a) identifies the competing public considerations that are weighed in setting specific policy and (b) allocates roles in setting and carrying out these policies as between the policymaking body (city council or county board of commissioners) and the administrative and field employees of the local government unit. The administrative and technical details of snow and ice management as developed by the city or county are intended to integrate into this framework.

The purpose of this framework is both to offer a tool for cities and counties to prepare clear and complete snow and ice management policies and to help them limit the

potential liability risk from these activities. Snow and ice management requires balancing public interests including, as paramount, public safety but also equipment and material cost, environmental impact, and other concerns. Judgments must be made based on weather and ground circumstances as they develop. The law governing public agency operations such as this largely protects cities and counties from liability, in recognition of the fact that in order to perform this important public function, these local units must exercise judgment based on expertise, experience, and the circumstances of the occasion. The law says, however, that to merit this protection, a city or county must be able to show that competing public concerns are in play, that these concerns have been weighed, and that judgment was used in making both policy and operational decisions. The Model Policy is a tool for cities and counties to establish this foundation for their snow and ice management policies and practices.

The Policy was developed specifically to allow for cities and counties to incorporate environmental considerations into their policies and operations and thereby better manage liability risk. Private operators serving private clients do not benefit from the above-referenced legal doctrines that afford liability immunity to local units of government. However, where a private client would like to reduce the environmental impact of ice and snow management on its property, private contract language can reduce the operator's liability risk from instituting more environmentally friendly practices. The accompanying private operator Model Contract Language is offered for this purpose.

The MPCA's Green Leases template includes a sample provision, "Storm water," that the Committee considered as one resource available for private operators.

(*see* https://www.pca.state.mn.us/living-green/green-leases)

> Landlord shall use its best efforts to prevent run-off of snow and ice removal products to the extent possible by having all contractors or workers applying de-icer attend MPCA Smart Salting level 1 training, receive certification, and keep certification current. Landlord, or its building managers and operators must be MPCA Smart Salting level 2 certified and develop and follow a Snow and Ice Policy.

Planning Background

In February 2016, Freshwater Society and Fortin Consulting joined with Smith Partners in a presentation at the 15th Annual Road Salt Symposium titled "Is Salt Your Only Defense?" The presentation responded to requests from cities, counties, and private operators, increasingly interested in reducing application of salt, sand, and other deicers as part of their winter maintenance operations, for legal guidance on how to manage risk and liability for their snow and ice management practices. Fortin Consulting and Freshwater Society pursued the strong interest of symposium attendees to understand and limit legal liability risk for snow and ice management by organizing an Advisory Committee comprising snow and ice management professionals from around Minnesota. This Advisory Committee was to meet and develop a Model Snow and Ice Management Policy. Smith Partners provided legal background, framework, and guidance on snow and ice management risks and liability to the Advisory Committee, and helped to draft the Model Policy.

The Advisory Committee, comprising city, county, and watershed district management professionals, representation from the Minnesota Pollution Control Agency (MPCA), and private operator representatives (Minnesota Nursery and Landscape Association), met three times during Summer 2016 to draft the Model Policy.

Authority

The comments on the drafts of the Model Policy focused on the substantive policies proposed. State law authorizes cities and counties to manage snow and ice within their jurisdictions. Private snow and ice management operators are required under Minnesota law to manage their risks and adhere to a duty of care.

Development of the Model Policy

City, County, and Private Snow and Ice Management Professional Engagement and Draft Policy

The development of the Model Policy relied on Fortin Consulting's strong relationships with snow and ice professionals throughout Minnesota and history of working with state and local agencies to develop snow and ice management handbooks, manuals,

trainings, and other resources. To best ensure that the Model Policy integrates most effectively and productively with existing city, county, and private operator policies, the Model Snow and Ice Management Policy Advisory Committee framed the Model Policy drafting through three key meetings:

The Advisory Committee first met on June 29, 2016 at the Freshwater Society office. The Committee reviewed a summary of legal decisions in snow and ice management cases; sample snow and ice management policies; and examples of different city, county, and private operator snow and ice management policies and contracts. By the end of the June 29 meeting, the Advisory Committee determined the priority content for the Model Policy.

At its second meeting on July 20, 2016, the Advisory Committee reviewed the first draft Snow and Ice Management Model Policy. The first draft Model Policy was developed using the comments, discussion, and feedback from the June 29 Advisory Committee meeting. Based on its review of the first draft, the Committee agreed on a policy framework that would express the discretionary elements of snow and ice management decisionmaking, while also anticipating opportunity for cities and counties to insert actual substantive and technical details.

Smith Partners incorporated the comments, discussion, and feedback from the July 20 Advisory Committee meeting into a second draft Model Snow and Ice Management Policy for Advisory Committee review. In addition, the Advisory Committee incorporated other reviewers in the process to offer feedback. The second draft was circulated among several Minnesota local government attorneys for legal peer review and feedback. The Committee invited review of the second draft Model Policy by the League of Minnesota Cities.

Smith Partners incorporated feedback on the second draft from city and county attorneys, the League of Minnesota Cities, the Advisory Committee, and other reviewers into a third draft Model Policy.

At its final meeting on August 10, the Advisory Committee approved the third draft Model Policy, contingent on the incorporation of changes decided upon at the meeting.

The Model Policy – Guidance and Explanations

The remainder of this Guidance Document summarizes comments and discussion on the Model Policy, and explains how the Advisory Committee structured the Model Policy in response. This Guidance Document then provides background and insights into the operation of each section of the Model Policy.

Overarching Discussion and the Advisory Committee's Responses

MODEL POLICY INCORPORATION OF TECHNICAL GUIDANCE

Members of the Advisory Committee considered numerous times the question of whether, and how much, the Model Policy should include snow and ice management technical practices and guidance. Snow and ice management professionals from cities and counties expressed concern that the Model Policy would duplicate the technical guidance content already contained in other resources, including city and county technical manuals and snow and ice guidance manuals published by the MPCA. Among other discussion, city and county snow and ice management professionals expressed concern about attempting to recreate the level of detail in existing guidance documents developed based on years of snow and ice management experience.

After much discussion about inclusion of detailed operational and technical guidance sections, the Committee elected to eliminate specific technical guidance from the Model Policy. The framework of the Model Policy instead structures the discretion of authorized individuals to make administrative and operational decisions about snow and ice management. The Model Policy includes a reference to the best practices and other technical resources contained in the snow and ice manuals published by the MPCA (*see* section D-2) and assumes that individual cities and counties will develop and insert appropriate substantive and technical policies and practices as appropriate.

DETERMINING SNOW AND ICE MANAGEMENT PRIORITIES

Several Committee members observed that snow and ice management priorities established by the Committee in the Model Policy (see section B) would not be consistent in all particulars with other city and county management priorities. The cities and counties agreed that the Model Policy would provide a structure to help

secure for cities and counties the strongest possible liability protection for judgments made in forming the specifics of their snow and ice policies. Cities and counties should insert their management priorities into this policy structure.

COORDINATION AND REASONABLE EXPECTATIONS

The Committee identified coordination among operators from different jurisdictions, and reasonable expectations about different roads and public responsibility to practice due care, as two main policy needs for the Model Policy to address.

Section-by-Section Review – Substantive Rules

The balance of this Guidance Document explains the rationale supporting the framework of each Model Policy section. While this document attempts to be fully explanatory, it is important for all interested parties to analyze the actual text of the sections to gain a complete understanding of the Model Policy.

The Model Policy has been drafted and refined first and foremost to implement the snow and ice management responsibilities and support the discretion of cities and counties in allocating authority and making snow and ice management decisions.

SECTION A – INTRODUCTION

The Introduction paragraphs (1-7) express the elements to be considered and weighed by cities and counties engaged in snow and ice management.

Importantly, this section provides a framework for judgments made by authorized individuals in making snow and ice management decisions. Some of the information in these paragraphs is articulated in other manuals and policies relied on by snow and ice management professionals in Minnesota. Specifically, the Committee agreed that a foundation for liability protection is of critical importance if cities and counties are to be comfortable in considering the environmental impact of snow and ice management practices, where incorporating such considerations may result, for example, in moderating the use of salt or sand in appropriate instances.

As explained elsewhere in this Guidance Document, individual city councils and county boards will make the decision to use this Model Policy. Sections B, D, E, and F of the Model Policy provide strong backing for the exercise of discretion by such bodies in snow and ice management policy making.

SECTION B – SNOW AND ICE MANAGEMENT PRIORITIES

The purpose of this section is to clearly state that authority is delegated to the decision maker to balance numerous considerations (*see* Section A-1-8).

The Committee discussed how distinct local service priorities are based on local roads, temporary and permanent conditions, and public expectations. Committee members agreed that level of service policies as decided and maintained by individual cities and counties are a better foundation for best management practices than a uniform level of service policy for all cities and counties. The Committee agreed that, like other actual substantive and technical details, level of service details will be inserted into the Policy by cities and counties. The Committee discussed the substantial experience of cities and counties to effectively and efficiently manage snow and ice conditions.

Additional considerations

The Committee considered the additional technical element of re-directing snow and ice management in response to snow and ice conditions. Committee members agreed that cities and counties may at their discretion develop or rely on existing policies for modifying normal level of service.

SECTION C – TRAINING

Section C defers authority to cities and counties to determine training requirements and programs for snow and ice management professionals and other personnel. This training section provides a structure for cities and counties to use and delegate judgment to determine appropriate training.

The Committee references training best practices, included in the MPCA-published manuals and existing policies, in the Model Policy. The Committee did not create new responsibilities for cities and counties in this section. The Committee agreed that more cities and counties would adopt the model policy and consider appropriate training

opportunities for operators, and education for the public, without a requirement in this section that training be conducted. However, liability protection of a city or county will be strengthened when administrative or operational personnel exercising delegated discretion under the policy have received training and the training is documented. The Committee agreed that documentation of training is already practiced among snow and ice management entities, and included this requirement in the policy.

The Committee agreed that requiring specific training in the Model Policy would make it difficult for private operators that would need to navigate different city-by-city training requirements, and opted to instead encourage non-mandatory training. The Committee agreed that training such as Smart Salting level 1 and level 2, should be considered by jurisdictions and private operators for inclusion in a training program.

Other useful snow and ice management tools that the Committee discussed as beneficial resources are the MPCA web-based report card reflecting compliance with snow and ice management best practices, and the MPCA's Twin Cities Metropolitan Area Chloride Management Plan (2016), which includes training and educational resources.

Finally, Committee discussions noted that other city or county departments, in particular those with emergency response authorities, have a role in ice and snow management. This section includes an important reminder that training may be important not only for public works personnel or other city or county personnel within the department specifically responsible for ice and snow management, but also, and in some respects, even more so, for personnel in other departments with a coordinative or supportive role.

SECTION D – DELEGATIONS OF AUTHORITY

It is not practical for the city council or county board of commissioners to craft the details of ice and snow management policies. More so, these details and the judgments necessary to determine them require expertise that these policymaking bodies do not have. Policies must leave room for judgment to be exercised under the immediate circumstances of a weather event.

The law governing liability protection recognizes this and therefore extends protection for discretionary decisionmaking beyond the policymaking body to city and county employees who must exercise judgment in carrying out their responsibilities. It is important, however, for the delegation of such discretionary decisionmaking authority from the city council or county board to be clearly evident. This section creates a framework for the city or county policymaking body to delegate authority to establish and implement local snow and ice management policies.

The section includes space to insert an individualized city or county complaint documentation and response policy to accommodate individual city and county complaint handling practices, which reflect different abilities to manage timing and response to complaints. The Committee discussed how some jurisdictions have the resources to respond to complaints immediately, others have a different policy for complaints received during the day and those received at night, and others have a 24-hour response policy. Committee members agreed that allowing the flexibility for jurisdictions to incorporate these specific policies in the Model Policy is the most workable approach.

Authority to enter into contracts for services

Paragraph 1 of this section concerns contracting for snow and ice management services. It does not state the policy of the city or county personnel as to whether it will enter into such contracts and, if so, whether the city council or county board must approve a particular contract; each city or county should incorporate its policy in this regard. What the section does do, however, is mandate a specific set of terms that any such contract must include to provide a basic framework of contract-based liability protection for the city or county.

Operational and technical policy authority

Paragraph 2 of this section delegates to a specific administrative employee (which may be a city/county engineer, a director of public works, or similar) the authority to establish and modify operational and technical snow and ice management policies. As noted above, this delegation recognizes that while certain judgments such as overall safety risk level and program funding lie at the level of the policymaking body, other

judgments critical to setting management policies rely on expertise and experience held at the administrative level.

The Committee agreed to leave to cities and counties the discretion to determine protocols for snow and ice management, but to require balancing of considerations listed in Section A, as well as specific environmental considerations (*see* Section D-2-c). The criteria in this section reference the two MPCA-published manuals (Parking Lot Sidewalk and Maintenance Manual (MPCA, 2015), and Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012)) on which cities, counties, and private operators rely. It is advised that city and county personnel maintain awareness of best practices and conform to them as appropriate. That a particular policy or practice conforms to best practices tends to be evidence that the policy or practice reflects a sound balancing of relevant public concerns and tends to show that personnel are operating with due care.

Exercise of judgment by field personnel

Paragraph 3 of this section authorizes snow and ice management personnel to adjust snow and ice management operations consistent with city or county policy. The Committee agreed that trained and experienced operators are constantly balancing numerous considerations when managing snow and ice operations. A common, agreed upon thread in the Committee's discussion is that each snow and ice event is different, and that operator discretion and professional judgment always is in play in managing snow and ice operations. Because operational activity that does not involve judgment and discretion does not fall within the liability protections afforded by law, it is important to document that during snow and ice operations, even field personnel are engaged in discretionary activity that rests on their experience and training.

SECTION E – OPERATIONAL FRAMEWORK

This section establishes a framework for operational considerations in snow and ice management, and delegates authority to cities and counties to insert the substantive and technical details of these provisions.

Snow and ice management entities have extensive experience in managing operations. The Advisory Committee agreed that, rather than prescribing new policies duplicating existing, locally created and functional operational frameworks, this Model Policy section should have as its purpose to not duplicate what exists and works. This section provides spaces for snow and ice management entities to insert current policies, and also offers model language for jurisdictions without these policies, or that are interested in revising their policies. This section reflects the Committee's agreement that snow and ice managers and operators with extensive discretion under this Model Policy to manage snow and ice must document a deviation from the Model Policy. Some paragraphs, such as E-4, Damage to Personal Property, may be cross-referenced with the existing jurisdictional claims policy for each city and county.

SECTION F – ASSUMING RESPONSIBILITY FOR PRIVATE ROADWAYS OR PARKING AREAS

Section F generally applies to snow and ice management by a city or county with respect to roadways or other surfaces that are not owned by or otherwise under the operational responsibility of that public entity. The Committee noted that different jurisdictions may have policies in place regarding snow and ice management on private property, and agreed that a space should be included for existing city or county policies. The purpose of this statement in the Policy, however, is to establish explicitly that the public body does not have a responsibility unless there is an affirmative, documented agreement to the contrary.

RULE G – COORDINATION WITH OTHER JURISDICTIONS

Section G aims to minimize conflict and ensure mutual understanding with other jurisdictions by clarifying snow and ice management responsibilities on boundary roads, parking lots, sidewalks, and other areas. The section includes a space for cities and counties to list those streets managed by the state. In response to discussion among Committee members, the Advisory Committee agreed that the section should require cities and counties to coordinate with nearby jurisdictions to better be able to balance the considerations in Section A, and facilitate the operation of the Model Policy alongside the policies of other jurisdictions.

Table 1 – Technical Advisory Committee participants

Name	Affiliation
Jeff Davies	City of Grand Rapids
Mark Maloney	City of Shoreview
Dan Plizga	City of Rochester
Steven Lawrence	City of St. Cloud
John Wickenhauser	Carver County
Matt Morreim	City of Saint Paul
Craig Eldred	City of Waconia
Becky Christopher	Minnehaha Creek Watershed District
Erica Sniegowski	Nine Mile Creek Watershed District
Claire Bleser	Riley Purgatory Bluff Creek Watershed District
Leslie Larson	Minnesota Nursery and Landscape Association
Brooke Asleson	Minnesota Pollution Control Agency
Steve Woods	Freshwater Society
Connie Fortin	Fortin Consulting

MODEL LANGUAGE for PRIVATE SNOW & ICE SERVICE CONTRACT

1. The following terms apply to CONTRACTOR's use of anti-icing, de-icing and traction-enhancing materials and methods (together, "ice management materials and methods").

2. Under this Contract, CONTRACTOR exercises judgment as to ice management materials and methods, including when application of material is appropriate, choice of material, method of application and application rates. In making these decisions, CONTRACTOR in its judgment considers, among other things, weather conditions, traction needs, cost and damage from materials to paved surfaces and vegetation. The Contract states OWNER's recognition that snow removal and ice management services will not necessarily result in bare pavement or sidewalks.

3. Further, ice management materials contribute pollutants including sand and chlorides to the environment. Chloride accumulates in the environment, and high chloride levels: (a) are harmful to fish and other freshwater aquatic life; (b) may impair groundwater and drinking water supplies; and (c) may cause injury to infrastructure and vehicles, plants, soil, pets and wildlife. Sand may affect surface water habitat and may increase public cost by accumulating in downstream conveyances and basins.

4. In recognition of these concerns, the approach to ice management and reliance on ice management materials presently is subject to innovation and evolution of best practices. CONTRACTOR provides training to its employees so that they are knowledgeable as to best practices, including those contained in the Winter Parking Lot and Sidewalk Maintenance Manual (Minnesota Pollution Control Agency, 2015) and the Minnesota Snow and Ice Control Field Handbook for Snowplow Operators (Minnesota Local Road Research Board, 2012), as they may be updated.

5. CONTRACTOR and OWNER agree that consideration of these impacts is appropriate and should be taken into account in CONTRACTOR's judgment as to ice management materials and methods along with the other conditions described above.

6. Accordingly, OWNER agrees as follows:

a. OWNER will not claim that CONTRACTOR has violated or breached this Contract by giving consideration to pollutant impacts in its ice management materials and methods, unless CONTRACTOR has deviated substantially from best practices.

b. In any claim, dispute or proceeding concerning damage or injury to OWNER or any third party, OWNER will not claim that CONTRACTOR has violated a duty of care or any other applicable legal standard by giving consideration to pollutant impacts in its ice management materials and methods, unless CONTRACTOR has deviated substantially from best practices.

Page 11: [1] Comment [l11] **lizabeth** **8/8/2016 9:24:00 AM**

Ms. Fortin noted that she has never spoken to a city or county administrator about winter maintenance.

Page 11: [2] Comment [l12] **lizabeth** **8/8/2016 9:24:00 AM**

The 7-20-16 meeting discussion suggested that cities and counties have different policies and timing abilities for responding to complaints, and prefer to include their own policies rather than modify practices to fit a complaint procedures section in the Policy.

Page 11: [3] Comment [EH13] **Elizabeth Henley** **8/8/2016 9:24:00 AM**

Connie says that this is probably not possible.

Item 5a1

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To: Elm Creek Commissioners

From: Judie Anderson

Date: October 12, 2016

Subject: Cost Share Policy

During the Commission's July 13, 2016 meeting the members discussed the Rush Creek Headwaters Subwatershed Assessment (SWA) grant application. Much of the discussion centered on cooperative funding of the grant. Ultimately the Commission voted to approve the application with a $500 contribution from the City of Corcoran pending City approval. City Council minutes of July 28 reflect that that approval was given.

It was noted that, since the Commission does not have a policy for cost-sharing SWAs or other significant projects, this should be a topic for consideration by the TAC.

As a starting point, Staff was directed to investigate how other watershed organizations fund "special projects." Nine organizations were contacted – Bassett Creek WMO, Minnehaha Creek WD, Mississippi WMO, Nine Mile Creek WD, Pioneer-Sarah Creek WMO, Ramsey-Washington WD, Rice Creek WD, Shingle Creek WMO, and West Mississippi WMO. In many cases, projects such as subwatershed assessments are funded using the ad valorem process. In all cases, where projects are not funded through the ad valorem process, they are funded out of the general fund with no city match.

What criteria should be used to prioritize special projects? (These are among the criteria identified by other WMOs, in no particular order of importance.)

1. Total cost
2. Total impacted area
3. Number of impacted cities
4. Load reductions
5. Timing of project
6. In city's CIP
7. Multiple benefits
8. On priority list (CIP?) - Developed by whom?
9. City request
10. Commission-derived schedule
11. Included in Operating Budget
12. Grant opportunity
13. Result of regulatory mandate.
14. Go beyond city management activities

Appendix G of the Elm Creek Commission's Third Generation Watershed Management Plan states the following:

> Both by itself and also in partnership with member cities the Commission will undertake special studies to target BMP implementation and to perform feasibility analyses to develop grant applications. These special studies will be solicited and identified each year through the budget/CIP review process. Some examples of these are:
>
> *Stream Segment Prioritization.* The Commission will periodically conduct stream surveys to better define stream restoration needs and to guide future improvement projects. General needs include:
>
> *TMDL Implementation.* The Elm Creek Watershed TMDL implementation actions include a number of strategies that would require additional, more detailed study to identify specific BMPs and their costs and benefits. The Commission will share 50% of the cost of feasibility studies and subwatershed assessments.
>
> *High Priority Stream Restoration Projects.* The 2007 Elm Creek Channel Study identified a number of locations on Elm, Rush, North Fork Rush, and Diamond Creeks experiencing streambank erosion and mass wasting. This erosion not only threatens the structural integrity of the creek channels, but also contributes to in-stream and downstream water

quality issues, including impairments to the biologic communities. The Commission annually will be undertaking subwatershed assessments in high-loading potential areas of the watershed, and those assessments may identify additional priority projects.

High Priority Wetland Improvements. Wetlands provide numerous functions and ecological services, including upland and aquatic habitat, flood storage and attenuation, and groundwater recharge. Key wetland restoration projects have been identified for potential implementation in 2015-2024.

Lake TMDL Implementation. Reducing lake internal loading is an essential component of achieving lake water quality standards. This may include options such as chemical treatment with alum, rough fish management aquatic and vegetation management.

Urban BMPs . Within urbanized areas, nutrient and sediment load reductions may require modifying existing infrastructure or adding BMPs where possible. As noted under Special Studies, the Commission will partner with the cities and Hennepin County to undertake subwatershed assessments in urbanized areas to identify these BMP opportunities, and then to share in the cost of installation. Some retrofits have already been identified.

Livestock Exclusion, Stream and Channel Buffer, and Stabilized Access . There are numerous locations in the Elm Creek watershed where livestock (cattle, horses, etc.) graze adjacent to streams and channels, and have free access to the stream for water. This can result in broken-down streambanks and denuded pastures and paddocks. Sediment and animal waste is conveyed directly into the stream every time it rains, and the physical destruction of the banks and the lack of a rooted buffer lead to erosion and sediment accumulation in the stream.

Agricultural BMPs Cost Share. Agricultural fields are a significant source of sediment and nutrient loading to impaired waters. Modeling being conducted for the TMDL identified areas at highest risk, based on soil type, slope, and other factors, for erosion and sediment transport.

Hydrologic and Hydraulic Modeling. The existing Flood Insurance models for streams in the watershed are based on the critical 10-day snowmelt event. Commission rules requiring rate control have been in place since the models were developed, and were subsequently amended to require management of the Channel Protection Volume. As a part of this Plan the Commission has adopted volume management requirements intended to limit the creation of new volumes of runoff.

(See *Appendix G* for complete text.)

In an email dated August 2, 2016, Steve Christopher, BWSR, noted, *If the Commission chooses to include subwatershed assessments within its 'special studies' category as mentioned within **3.2.1 Commission** of its Watershed Management Plan, it would be a clarification and would not necessitate a plan amendment. As written, these are funded through the general fund. I would support this decision and maintain that the additional city contribution should take place at time of implementation.*

Staff further queried Christopher as to whether all special projects should be included on the Commission's CIP. What should the minimum total cost of those projects be? Christopher responded on October 4: *The Commission should be including all of its Special Projects on its CIP regardless of the cost to the Commission. This will establish greater transparency and predictability for the member cities, County and its partners. As previously stated, many projects could be added without requiring an amendment to the Commission Plan.*

At the time this topic arose, the Commission was discussing the SWA in terms of a grant application, thus a second scenario should also be addressed:

> *Should the Commission require partners to provide a specific percentage of the matching funds required by the grants? If multiple partners, how would percentages be determined?*

Appendix C
Rules and Standards

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Elm Creek
Watershed Management Commission

Rules and Standards

Adopted: October 8, 2014

Effective: January 1, 2015

Revised: October 14, 2015

ELM CREEK
WATERSHED MANAGEMENT COMMISSION
RULES AND STANDARDS

POLICY STATEMENT

The Elm Creek Watershed Management Commission is a Joint Powers Association of the State under the Minnesota Watershed Act, and a watershed management organization as defined in the Metropolitan Surface Water Management Act. These acts provide the Commission with power to accomplish its statutory purpose: the conservation, protection, and management of water resources in the boundaries of the watershed through sound scientific principles. The Commission has adopted a water resources management plan pursuant to the Acts. These Rules implement the plan's principles and objectives.

Land alteration and utilization can affect the rate and volume and degrade the quality of surface water runoff. Sedimentation from ongoing erosion and construction activities can reduce hydraulic capacity of waterbodies and degrade water quality. Water quality problems already exist in many waterbodies in the watershed. Most of these waterbodies have been designated by the State of Minnesota as Impaired Waters, and do not meet state water quality standards.

Activities that increase the rate or volume of stormwater runoff will aggravate existing flooding problems and contribute to new ones. Activities that degrade runoff quality will cause quality problems in receiving water. Activities that fill floodplain or wetland areas will reduce flood storage and hydraulic capacity of waterbodies, and will degrade water quality by eliminating the filtering capacity of such areas.

These Rules and Standards protect the public health, welfare, and natural resources of the watershed by regulating the alteration of land and waters in the watershed to 1) reduce the severity and frequency of high water, 2) preserve floodplain and wetland storage capacity, 3) improve the chemical and physical quality of surface waters, 4) reduce sedimentation, 5) preserve the hydraulic and navigational capacities of waterbodies, 6) promote and preserve natural infiltration areas, and 7) preserve natural shoreline features. In addition to protecting natural resources, these Rules and Standards are intended to minimize future public expenditures on problems caused by land and water alterations.

RELATIONSHIP WITH MUNICIPALITIES AND COUNTY

The Commission recognizes that the control and determination of appropriate land use is the responsibility of the municipalities. The Commission will review projects involving land-disturbing activities in accordance with these Rules and Standards. The Commission intends to be active in the regulatory process to ensure that water resources are managed in accordance with its goals and policies.

The Commission desires to provide technical advice to the municipalities in the preparation of local stormwater management plans and the review of projects that may affect water resources prior to investment of significant public or private funds.

RULE A. DEFINITIONS

For the purposes of these Rules, unless the context otherwise requires, the following words and terms shall have the meanings set forth below. References in these Rules to specific sections of the Minnesota Statutes or Rules include amendments, revisions or recodifications of such sections. The words "shall" and "must" are mandatory; the word "may" is permissive.

100 Year Event. The rainfall depth with a 1 percent chance of occurring in a given year.

Abstraction. Removal of stormwater from runoff, by such methods as infiltration, evaporation, transpiration by vegetation, and capture and reuse, such as capturing runoff for use as irrigation water.

Agricultural Activity. The use of land for the production of agronomic, horticultural or silvicultural crops, including dairy animals, food animals, nursery stock, sod, fruits, vegetables, flowers, cover crops, grains, Christmas trees, and for grazing.

Alteration or Alter. When used in connection with public waters or wetlands, any activity that will change or diminish the course, current, or cross-section of public waters or wetlands.

Applicant. Any person or political subdivision that submits an application to the Commission for a project review under these Rules.

Best Management Practices (BMPs). Techniques proven to be effective in controlling runoff, erosion and sedimentation including those documented in the Minnesota Construction Site Erosion and Sediment Control Planning Handbook (BWSR 1988), Protecting Water Quality in Urban Areas (MPCA 2000), and the Minnesota Stormwater Manual (MPCA 2005) as revised.

Biofiltration. Using living material to capture and/or biologically degrade or process pollutants prior to discharging stormwater, such as directing runoff through a vegetated buffer or to a rain garden or vegetated basin with an underdrain.

Bioretention. A terrestrial-based (upland, as opposed to wetland) water quality and water quantity control process. Bioretention employs a simplistic, site-integrated design that provides opportunity for runoff infiltration, filtration, storage and water uptake by vegetation.

Buffer Strip. An area of natural, unmaintained, vegetated ground cover abutting or surrounding a watercourse or wetland.

BWSR. The Minnesota Board of Water and Soil Resources.

Commission. The Elm Creek Watershed Management Commission.

Commissioners. The Board of Commissioners of the Elm Creek Watershed Management Commission.

Compensatory Storage. Excavated volume of material below the floodplain elevation required to offset floodplain fill.

County. Hennepin County, Minnesota.

Dead Storage. The permanent pool volume of a water basin or the volume below the runout elevation of a water basin.

Detention Basin. Any natural or manmade depression for the temporary storage of runoff.

Development. Any proposal to subdivide land, any land-disturbing activity or creation of impervious surface.

Directly Connected Impervious Surface. Any hard surface (rooftop, driveway, sidewalk, roadway, etc.) from which runoff is not subject to loss beyond initial abstraction before being routed to the downstream collection and conveyance system.

Disturbance. See Land Disturbing Activity.

Drain or Drainage. Any method for removing or diverting water from waterbodies, including excavation of an open ditch, installation of subsurface drainage tile, filling, diking, or pumping.

Erosion. The wearing away of the ground surface as a result of wind, flowing water, ice movement, or land disturbing activities.

Erosion and Sediment Control Plan. A plan of BMPs or equivalent measures designed to control runoff and erosion and to retain or control sediment on land during the period of land disturbing activities in accordance with the standards set forth in these Rules.

Excavation. The artificial removal of soil or other earth material.

Fill. The deposit of soil or other material by artificial means.

Filtration. A process by which stormwater runoff is captured, temporarily stored, and routed through a filter bed to improve water quality and slow down stormwater runoff.

Floodplain. The area adjacent to a waterbody that is inundated during a 1% chance (100-year) flood as defined by the FEMA Flood Insurance Study for the member city or the Commission's flood study.

Impaired Water. A waterbody that does not meet state water quality standards and that has been included on the MPCA Section 303(d) list of Impaired Waters of the state.

Impervious Surface. A surface compacted or covered with material so as to be highly resistant to infiltration by runoff. Impervious surface shall include roads, driveways and parking areas,

whether or not paved, sidewalks greater than 3 feet wide, patios, tennis and basketball courts, swimming pools, covered decks and other structures. Open decks with joints at least ¼ inch wide, areas beneath overhangs less than 2 feet wide, and sidewalks 3 feet or less wide shall not constitute impervious surfaces under these Rules.

Infiltration. The passage of water into the ground through the soil.

Infiltration Area. Natural or constructed depression located in permeable soils that capture, store and infiltrate the volume of stormwater runoff associated with a particular design event.

Interested Party. A person or political subdivision with an interest in the pending subject matter.

Land Disturbing Activity. Any change of the land surface to include removing vegetative cover, excavation, fill, grading, and the construction of any structure that may cause or contribute to erosion or the movement of sediment into waterbodies. The use of land for agricultural activities, or improvements such as mill and overlay or concrete rehabilitation projects that do not disturb the underlying soil shall not constitute a land disturbing activity under these Rules.

Landlocked Basin. A basin that is 1 acre or more in size and does not have a natural outlet at or below the 1% chance (100-year) flood elevation as determined by the 1% chance (100-year), 10-day runoff event.

Low Floor. The finished surface of the lowest floor of a structure.

Member City. Any city wholly or partly within the Commission's boundary that has executed the Joint Powers Agreement.

MnDOT. The Minnesota Department of Transportation.

MPCA. The Minnesota Pollution Control Agency.

Municipality. Any city wholly or partly within the Commission's boundary.

NPDES. National Pollutant Discharge Elimination System.

NURP. The Nationwide Urban Runoff Program developed by the Environmental Protection Agency to study stormwater runoff from urban development.

Ordinary High Water Level (OHW). The elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHW level is the elevation of the top of the bank of the channel. An OHW established for a waterbody by the Minnesota Department of Natural Resources will constitute the OHW under this definition.

Owner. The owner of a parcel of land or the purchaser under a contract for deed.

Parcel. A parcel of land designated by plat, metes, and bounds, registered land survey, auditor's subdivision, or other accepted means and separated from other parcels or portions by its designation.

Person. Any individual, trustee, partnership, unincorporated association, limited liability company or corporation.

Political Subdivision. A municipality, county or other political division, agency or subdivision of the state.

Project. A space, parcel, or parcels of real property owned by one or more than one person which is being or is capable of being developed or redeveloped as a single project.

Public Health and General Welfare. Defined in Minnesota Statutes, Section 103D.011, Subdivisions 23 and 24.

Public Waters. Any waters as defined in Minnesota Statutes, Section 103G.005, Subdivision 15.

Public Waters Wetland. Any wetland as defined in Minnesota Statutes, Section 103G.005, Subdivision 15a.

Redevelopment. Any proposal to re-subdivide land, or any land-disturbing activity or addition of impervious surface to a developed site.

Runoff. Rainfall, snowmelt or irrigation water flowing over the ground surface.

Sediment. Soil or other surficial material transported by surface water as a product of erosion.

Sedimentation. The process or action of depositing sediment.

Shoreland Protection Zone. Land located within a floodplain or within 1,000 feet of the OHW of a public water or public waters wetland or 300 feet of a public waters watercourse.

Site. A space, parcel, or parcels of real property owned by one or more than one person which is being or is capable of being developed or redeveloped as a single project.

Standard. A required level of quantity, quality, or value.

Stormwater Management Plan. A plan for the permanent management and control of runoff prepared and implemented in accordance with the standards set forth in these Rules.

Structure. Anything manufactured, constructed or erected which is normally attached to or positioned on land, including portable structures, earthen structures, walls, roads, water and storage systems, drainage facilities and parking lots.

Subdivision or Subdivide. The separation of a parcel of land into two or more parcels.

TMDL. A Total Maximum Daily Load is the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. "TMDL" can also refer to a study that calculates that load, or to the allocation of that allowable load to its various sources. An Implementation Plan may be part of the TMDL study or it may be a separate document that sets forth the steps that will be taken to achieve the TMDL.

Volume Management. The retention and abstraction of a certain volume of stormwater runoff onsite through techniques such as infiltration, evapotranspiration, and capture and reuse.

Water Basin. An enclosed natural depression with definable banks capable of containing water that may be partly filled with public waters.

Waterbody. All water basins, watercourses and wetlands as defined in these Rules.

Watercourse. Any natural or improved stream, river, creek, ditch, channel, culvert, drain, gully, swale, or wash in which waters flow continuously or intermittently in a definite direction.

Water Resources Management Plan. The watershed management plan for the Commission adopted and implemented in accordance with Minnesota Statutes, Section 103B.231.

Watershed. Region draining to a specific watercourse or water basin.

Wetland. Land transitional between terrestrial and aquatic systems as defined in Minnesota Statutes, Section 103G.005, Subdivision 19.

Wetland Conservation Act (WCA). Minnesota Wetland Conservation Act of 1991 as amended.

RULE B. PROCEDURAL REQUIREMENTS

1. **APPLICATION REQUIRED**. Any person or political subdivision undertaking an activity for which a project review is required by these Rules shall first submit to the Commission a project review application, design data, plans, specifications, fees, and such other information and exhibits as may be required by these Rules. Applications shall be signed by the owner, or the owner's authorized agent, except for activities of a political subdivision which may be signed by either the owner or the general contractor. All project review applications must be authorized by the municipality where the proposed project is located.

2. **FORMS**. Project review applications shall be submitted on forms provided by the Commission. Forms are available at the Commission office or Web site.

3. **ACTION BY COMMISSION**. The Commission shall act within 60 days after receipt of a complete application, including all required information, exhibits and fees. If a state or federal law or court order requires a process to occur before the Commission acts on an application, or if an application requires prior approval of a state or federal agency, the deadline for the Commission to act is extended to 60 days after completion of the required process or the required prior approval is granted. The Commission may extend the initial 60-day period by providing written notice of the extension to the applicant. The extension may not exceed 60 days unless approved by the applicant.

4. **SUBMITTAL**. A complete project review application with all required information and exhibits shall be filed with the Commission at least 14 calendar days prior to the scheduled meeting date of the Commission. Late or incomplete submittals will be scheduled to a subsequent meeting date.

5. **CONDITIONS**. A project review may be approved subject to reasonable conditions to assure compliance with these Rules. The conditions may include a requirement that the applicant and owner enter into an agreement with the member city in a form acceptable to the Commission to a) specify responsibility for the construction and future maintenance of approved structures or facilities, b) document other continuing obligations of the applicant or owner, c) grant reasonable access to the proper authorities for inspection, monitoring and enforcement purposes, d) affirm that the Commission or other political subdivisions can require or perform necessary repairs or reconstruction of such structures or facilities, e) require indemnification of the Commission for claims arising from issuance of the approved project review or construction and use of the approved structures or facilities, and f) reimburse the reasonable costs incurred to enforce the agreement. Project reviews and agreements may be filed for record to provide notice of the conditions and continuing obligations.

6. **ISSUANCE OF PROJECT REVIEWS**. The Commission will issue a project review approval only after the applicant has satisfied all requirements of these Rules and paid all required fees.

7. **VALIDITY**. Issuance of a project review approval based on plans, specifications, or other data shall not prevent the Commission from thereafter requiring the correction of errors in the approved plans, specifications and data, or from preventing any activity being carried on thereunder in violation of these Rules.

8. **MODIFICATIONS**. The applicant shall not modify the approved activity or plans and specifications on file with the Commission without the prior approval of the Commission.

9. **INSPECTION AND MONITORING**. With permission of the property owner and under the authority of the member city, the Commission may perform such field inspections and monitoring of the approved activity as the Commission deems necessary to determine compliance with the conditions of the project review and these Rules. Any portion of the activity not in compliance shall be promptly corrected. In applying for a project review, the applicant consents to entry upon the land for field inspections and monitoring, or for performing any work necessary to bring the activity into compliance.

10. **SUSPENSION OR REVOCATION**. The Commission may suspend or revoke a project review approved under these Rules whenever the project review approval is issued in error or on the basis of incorrect information supplied, or in violation of any provision of these Rules, or if the preliminary and final project approvals received from the municipality or county are not consistent with the conditions of the approved project review.

11. **EXPIRATION OF COMMISSION APPROVALS.** An approved project review shall expire and become null and void if the approved activity is not commenced within one year from date of approval, or if the approved activity is suspended or abandoned for a period of one year from the date the activity originally commenced. With the approval of the affected member city, applicants may apply for an extension of that period if the city review process is extended beyond the usual review period. Before an activity delayed for one year or more can recommence, the project approval must be renewed. Any applicant may apply for an extension of time to commence the approved activity under an unexpired project review approval.

    An application for renewal or extension must be in writing, and state the reasons for the renewal or extension. Any plan changes and required fees must be included with the application. There must be no unpaid fees or other outstanding violations of the approval being renewed or extended. An application for extension must be received by the Commission at least 30 days prior to the approval's expiration. The Commission shall consider the application for renewal or extension on the basis of the Rules in effect on the date the application is being considered. The Commission may extend the time for commencing the approved activity for a period not exceeding one year upon finding that circumstances beyond the control of the applicant have prevented action from being taken.

12. SEVERABILITY. If any provision of these Rules is adjudged unconstitutional or invalid by a court of competent jurisdiction, the remainder of these Rules shall not be affected thereby.

RULE C. GENERAL STANDARDS

1. POLICY. It is the policy of the Commission to protect the water resources of the watershed by requiring that all activities within the watershed comply with minimum standards for the protection of water quality and the environment.

2. REGULATION.

a) All land disturbing activities, whether requiring a project review under these Rules or otherwise, shall be undertaken in conformance with BMPs.

b) Project reviews are required of any land disturbing activity meeting the review thresholds set forth in Rule D Section 2.

c) In areas that drain to Impaired Waters, TMDL Implementation Plans may include site-specific requirements for any land-disturbing activities that are in addition to these rules and standards.

d) No person shall conduct land-disturbing activities without protecting adjacent property and waterbodies from erosion, sedimentation, flooding, or other damage.

e) Development shall be planned and conducted to minimize the extent of disturbed area, runoff velocities, and erosion potential, and to reduce and delay runoff volumes. Disturbed areas shall be stabilized and protected as soon as possible and facilities or methods used to retain sediment on-site.

f) Existing natural watercourses and vegetated soil surfaces shall be used to convey, store, filter, and retain runoff before discharge into public waters or a stormwater conveyance system.

g) Runoff from roof gutter systems shall discharge onto lawns or other pervious surfaces to promote infiltration where possible.

h) Use of fertilizers and pesticides in the shoreland protection zone shall be so done as to minimize runoff into public waters by the use of earth material, vegetation, or both. No phosphorus fertilizer shall be used unless a soil nutrient analysis shows a need for phosphorus or in the establishment of new turf.

i) When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle runoff using natural features and vegetation, various types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. The Commission encourages designs using surface drainage, vegetation and infiltration rather than buried pipes and man-made materials and facilities.

j) Whenever the Commission determines that any land disturbing activity has become a hazard to any person or endangers the property of another, adversely affects water quality or any waterbody, increases flooding, or otherwise violates these Rules, the Commission shall notify the member city where the problem occurs and the member city shall require the owner of the land upon which the land disturbing activity is located, or other person or agent in control of such land, to repair or eliminate such condition within the time period specified therein. The owner of the land upon which a land disturbing activity is located shall be responsible for the cleanup and any damages from sediment that has eroded from such land. The Commission may require the owner to submit a project review application under these Rules before undertaking any repairs or restoration.

RULE D. STORMWATER MANAGEMENT

1. POLICY. It is the policy of the Commission to control excessive rates and volumes of runoff by:

a) Requiring that peak runoff rates not exceed existing conditions or the capacity of downstream conveyance facilities or contribute to flooding or streambank erosion.

b) Managing subwatershed discharge rates and flood storage volumes to be consistent with the goals of the Commission's water resources management plan and the local water resources management plans.

c) Controlling runoff rates by the use of on-site or if feasible regional detention or infiltration facilities.

d) Reviewing stormwater management structures based on the 1% (100-year) critical storm event for the drainage area.

e) Routing runoff to water treatment ponds or other acceptable facilities before discharging into waterbodies.

f) Promoting the use of natural resources for storing runoff and improving water quality and other amenities where appropriate.

g) Promoting natural infiltration of runoff.

2. REGULATION. No person or political subdivision shall commence a land disturbing activity or the development or redevelopment of land for the following types of projects without first submitting to and obtaining approval of a project review from the Commission or the city in which the project is located that incorporates a stormwater management plan for the activity, development or redevelopment:

a) Plans of any land development or site development that disturbs more than 1 acre of land.

b) Linear projects that create one acre or more of new impervious surface must meet all Commission requirements for the net new impervious surface. Sidewalks and trails that

do not exceed twelve feet (12’0”) in width, are not constructed with other improvements, and have a minimum of five feet (5’0”) of vegetated buffer on both sides are exempt from Commission requirements

c) Plans of any land development or individual site development adjacent to or containing a lake, wetland, or a natural or altered watercourse as listed in the Hennepin County wetland inventory or the final inventory of Protected Waters and Wetlands for Hennepin County, as prepared by the DNR.

d) Any culvert installation or replacement, bridge construction, stream cross-section alteration, or activity requiring a DNR Waters Permit on Elm, Rush, North Fork Rush, or Diamond Creeks or their tributaries.

e) Plans for any land development or site development within the 1% chance (100-year) floodplain as defined by the Flood Insurance Study for the member city or the Commission’s flood study.

f) Plans of any land development or site development regardless of size, if such review is requested by a member city.

g) Land disturbing activity that drains to more than one watershed, for that portion of the site draining into the Elm Creek Watershed.

3. **CRITERIA**. Stormwater management plans shall comply with the following criteria regarding runoff rate restrictions, volume control requirements, and water quality requirements.

a) A hydrograph method based on sound hydrologic theory will be used to analyze runoff for the design or analysis of flows, volumes, water quality, and water levels.

b) *Runoff rates* for the proposed activity shall not exceed existing runoff rates for the 2-year, 10-year, and 100-year critical storm events and rainfall distribution for the project location as set forth in NOAA Atlas 14 Volume 8, published June 2013, or its successor, using the online NOAA Precipitation Frequency Data Server or a similar data source. Applicant must document the location and event depths used. If an approved local water management plan requires more restrictive rate control, then the more restrictive rate shall govern. Runoff rates may be restricted to less than the existing rates when necessary for the public health and general welfare of the watershed.

i) If detention basins are used to control rate of runoff they shall be designed to provide:

(1) An outlet structure to control the 2-year, 10-year, and 100-year critical storm events to predevelopment runoff rates. Said outlet structure will be required to control critical storm events to less than predevelopment runoff rates if downstream facilities have insufficient capacity to handle the increased flow.

(2) Alternative to (1), runoff may be directed to a downstream facility within the same hydrologic subwatershed that has sufficient capacity to provide the required rate control. This means that no rate control may be required for an

individual development provided there is a regional facility designed and constructed to accommodate the flow from this property.

(3) An identified overflow spillway sufficiently stabilized to convey a 1% (100-year) critical storm event.

(4) A normal water elevation above the OHW of adjacent waterbodies.

(5) Access for future maintenance.

(6) An outlet skimmer to prevent migration of floatables and oils for at least the two year storm event.

(7) The low floor elevation shall be at minimum two feet above the critical event 100-year elevation and at minimum one foot above the emergency overflow elevation of nearby waterbodies and stormwater ponds.

ii) Regional detention basins may be used to manage peak flow rates and meet water quality objectives when feasible.

iii) Analysis of flood levels, storage volumes and flow rates for waterbodies and detention basins shall be based on the range of rainfall and snow melt duration producing the critical flood levels and discharges, whichever is most critical.

iv) Landlocked water basins may be provided with outlets that:

(1) Retain a hydrologic regime complying with floodplain and wetland alterations.

(2) Provide sufficient storage below the outlet run-out elevation to retain back-to-back 100-year, 24-hour rainfalls and runoff above the highest anticipated groundwater elevation and prevent damage to property adjacent to the basin.

(3) Do not create adverse downstream flooding or water quality conditions.

c) Stormwater runoff volume must be *infiltrated/abstracted* onsite in the amount equivalent to one point one inch (1.1”) of runoff generated from new impervious surface.

i) Applicant must minimize the creation of new impervious surface, reduce existing impervious surfaces where possible, and minimize the amount of directly connected impervious surface.

ii) When using infiltration for volume reduction, runoff must be infiltrated within 48 hours. Infiltration volumes and facility sizes shall be calculated based on the measured infiltration rate determined by a double-ring infiltrometer test(s) conducted to the requirements of ASTM Standard D3385 at the proposed bottom elevation of the infiltration area. Other testing methods may be used with the approval of the Commission’s Engineer. The measured infiltration rate shall be divided by the appropriate correction factor selected from the Minnesota Stormwater Manual. This site investigation must be conducted by a licensed soil scientist or engineer.

iii) A post-construction percolation test must be performed on each infiltration practice and must demonstrate that the constructed infiltration rate meets or exceeds the design infiltration rate prior to project acceptance by the city.

iv) Infiltration areas will be limited to the horizontal areas subject to prolonged wetting.

v) Areas of permanent pools tend to lose infiltration capacity over time and will not be accepted as an infiltration practice.

vi) Stormwater runoff must be pretreated to remove solids before discharging to infiltration areas to maintain the long term viability of the infiltration areas.

vii) Design and placement of infiltration BMPs shall be done in accordance with the Minnesota Department of Health guidance "Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas," as amended.

viii) Constructed bioretention and infiltration practices such as rain gardens, infiltration trenches, and infiltration benches shall not be used in:

(1) Fueling and vehicle maintenance areas;

(2) Areas with less than 3 feet separation from the bottom of the infiltration system to the elevation of seasonal high groundwater;

(3) Areas with runoff from industrial, commercial and institutional parking lots and roads and residential arterial roads with less than 5 feet separation distance from the bottom of the infiltration system to the elevation of seasonal high groundwater;

(4) Areas within 400 feet of a community water well, within 100 feet of a private well, or within a delineated 1-year time of travel zone in a wellhead protection area;

(5) Sites documented to contain contaminated soils or groundwater.

ix) Credit towards compliance with the abstraction requirement in (c) may be achieved by:

(1) Meeting post construction soil quality and amendment depth requirements. Areas that will be subjected to clearing, grading, or compaction that will not be covered by impervious surface, incorporated into a drainage facility, or engineered as structural fill or slope may be included in the credit calculation if they meet post construction soil quality and amendment depth requirements. Soil amendment areas become part of the site's storm drainage system, and must be protected by a utility and drainage easement and be included in the site's utility maintenance agreement. The applicant may compute a credit of 0.5 inches over the soil amendment area and apply that toward the abstraction volume requirement.

(a) A minimum 8-inch depth of compost amended soil or imported topsoil shall be placed in all areas of the project site being considered for the abstraction

credit. Before the soil is placed, the subsoil must be scarified (loosened) at least 4 inches deep, with some incorporation of the amended soil into the existing subsoil to avoid stratified layers.

(b) Soil amendment may be achieved by either mixing 2 inches of approved compost into the 8 inches of soil depth, or by mixing a custom-calculated amount of compost to achieve 8 inches of uncompacted soil depth with a minimum organic content of five percent.

(c) The amended areas must pass a 12-inch probe test during the site final inspection, in accordance with the Commission's testing procedure. Once amended, soil areas must be protected from recompaction.

(2) Preserving undisturbed forest or grassland conservation areas. Conservation areas must remain undisturbed during construction and must be protected by a permanent conservation easement prescribing allowable uses and activities on the parcel and preventing future development. A long-term vegetation management plan describing methods of maintaining the conservation area in a natural vegetative condition must be submitted with the stormwater management plan. The applicant may compute a credit of 0.5 inches over the conservation area and apply that toward the abstraction volume requirement.

(3) Providing wetland buffers in excess of minimum requirements. Areas eligible for credit must meet all wetland buffer requirements, must be monumented and shown on the construction plans. The applicant may compute a credit of 0.5 inches over the excess buffer area and apply that toward the abstraction volume requirement.

(4) Disconnecting impervious surface by redirecting runoff across a pervious surface or into an engineered bioinfiltration facility. Impervious disconnection must be designed to prevent any reconnection of runoff with the storm drain system. The applicant may subtract the disconnected impervious surface area from the total impervious surface area used to compute the required abstraction volume.

x) Alternative to (c), runoff may be directed to a downstream facility within the same hydrologic subwatershed that has sufficient capacity to provide the required volume management. This means that no volume management may be required for an individual development provided there is a regional facility designed and constructed to accommodate the volume from this property.

d) Where infiltration is not advisable or infeasible due to site conditions, *biofiltration* must be provided for that part of the abstraction volume that is not abstracted by other BMPs. Where biofiltration is infeasible, at a minimum filtration through a medium that incorporates organic material, iron fillings, or other material to reduce soluble phosphorus must be provided.

e) There shall be *no net increase in total phosphorus (TP) or total suspended solids (TSS)* from pre-development land cover to post-development land cove. Pre-development land cover is defined as the predominant land cover over the previous 10 years. The TP

and TSS export coefficients to be used to calculate predevelopment and post-development land use loadings are set forth in Commission project review guidance.

i) Full infiltration of one point one (1.1) inches of runoff from all impervious surface will satisfy (e).

ii) If it is not feasible to achieve the full 1.1 inch infiltration requirement, a combination of BMPs may be used to achieve the no-net-increase requirement.

iii) If permanent sedimentation and water quality ponds are used they shall be designed to the Wet Pond Design Standards set forth on Appendix A to these Rules and provide:

(1) Water quality features consistent with NURP criteria and best management practices.

(2) A permanent wet pool with dead storage of at least the runoff from a 2.5-inch storm event.

iv) Alternative to (e), runoff may be directed to a downstream facility within the same hydrologic subwatershed that has sufficient capacity to provide the required treatment. This means that no treatment may be required for an individual development provided there is a regional facility designed and constructed to accommodate the flow from this property.

4. WAIVERS.

a) The Commission may waive the on-site runoff rate, volume and water quality control design criteria as noted above, if a municipality has an off-site stormwater facility that provides equivalent control and treatment of runoff that conforms to Commission standards.

b) The design criteria for infiltration may be waived for sites with total impervious surface of less than one acre if infiltration BMPs have been incorporated to the maximum extent possible.

5. EXHIBITS. The following exhibits shall accompany the project review application (one set full size, one set reduced to a maximum size of 11" x 17", and one electronic set in pdf format). All plans must be signed by a licensed professional engineer registered in Minnesota.

a) Property lines and delineation of lands under ownership of the applicant.

b) Delineation of the subwatershed contributing runoff from off-site, proposed and existing subwatersheds on-site, emergency overflows and watercourses.

c) Proposed and existing stormwater facilities location, alignment and elevation.

d) Delineation of existing on-site wetland, marsh, shoreland and floodplain areas.

e) Where infiltration or filtration is used as a stormwater management practice, identification, description, results of double-ring infiltrometer tests, and permeability and approximate delineation of site soils and seasonal high groundwater elevation in both existing and proposed as-developed condition.

f) Existing and proposed ordinary high and 1% chance (100-year) water elevations on-site.

g) Existing and proposed site contour elevations at 2-foot intervals, referenced to NAVD (1988 datum). If NAVD 1988 is not used, applicant must specify the datum used and the appropriate conversion factor.

h) Construction plans and specifications of all proposed stormwater management facilities, including design details for outlet controls.

i) Runoff volume and rate analysis for the 2-year, 10-year, and 100-year critical storm events, existing and proposed.

j) Pre-construction and post-construction annual runoff volume (ac-ft), annual total phosphorus (lbs/yr), and annual total suspended solids (lb/yr).

k) All hydrologic, water quality and hydraulic computations made in designing the proposed stormwater management facilities.

l) A narrative describing the pre-and post-construction drainage conditions and the post-construction BMPs incorporated in the plans.

m) Applications requesting a soil management credit must include a Soil Management Plan (SMP) that shall include an 11” x 17” or larger site map indicating areas where soils will be amended, and calculations for soil volumes to be stockpiled and amounts and specifications of amendment or topsoil to be imported to achieve specified minimum organic matter content.

n) Delineation of any ponding, flowage or drainage easements, or other property interests, to be dedicated for stormwater management purposes.

6. **MAINTENANCE**. All stormwater management structures and facilities shall be maintained in perpetuity to assure that the structures and facilities function as originally designed. The owner of any water quality treatment device if not a governmental unit shall provide to the member city, in a form acceptable to the Commission, a recordable agreement detailing an operations and maintenance plan that assures that the structure(s) will be operated and maintained as designed.

7. **EASEMENTS**. The member city shall obtain from the applicant, in form acceptable to the Commission, recordable temporary and perpetual easements for ponding, flowage and drainage purposes over hydrologic features such as waterbodies, wetlands, buffers, floodplain, and stormwater basins and other permanent BMPs. The easements shall include the right of reasonable access for inspection, monitoring, maintenance and enforcement purposes.

8. **COVENANTS**. The Commission may require as a condition of project review approval that the member city shall require that the land be subjected to restrictive covenants or a conservation easement, in form acceptable to the Commission, to prevent the future expansion of impervious surface and the loss of infiltration capacity.

RULE E. EROSION AND SEDIMENT CONTROL

1. **POLICY**. It is the policy of the Commission to control runoff and erosion and to retain or control sediment on land during land disturbing activities by requiring the preparation and implementation of erosion and sediment control plans.

2. **REGULATION**. No person or political subdivision shall commence a land disturbing activity or the development or redevelopment of land for which a project review is required under Rule D without first submitting to and obtaining approval of a project review from the Commission that incorporates an erosion and sediment control plan for the activity, development or redevelopment.

3. **CRITERIA**. Erosion and sediment control plans shall comply with the following criteria:

   a) Erosion and sediment control measures shall be consistent with best management practices as demonstrated in the most current version of the MPCA manual "Protecting Water Quality in Urban Areas," and shall be sufficient to retain sediment on-site.

   b) Erosion and sediment controls shall meet the standards for the General Permit Authorization to Discharge Storm Water Associated with Construction Activity Under the National Pollutant Discharge Elimination System/State Disposal System Permit Program Permit MN R100001 (NPDES General Construction Permit) issued by the Minnesota Pollution Control Agency, except where more specific requirements are required.

   c) All erosion and sediment controls shall be installed before commencing the land disturbing activity, and shall not be removed until completion.

   d) The activity shall be phased when possible to minimize disturbed areas subject to erosion at any one time.

4. **EXHIBITS**. The following exhibits shall accompany the project review application (one set full size, one set reduced to a maximum size of 11" x 17", and one electronic set in pdf format). Erosion and sediment control plans must be prepared by a qualified professional.

   a) An existing and proposed topographic map showing contours on and adjacent to the land, property lines, all hydrologic features, the proposed land disturbing activities, and the locations of all runoff, erosion and sediment controls and soil stabilization measures.

   b) Plans and specifications for all proposed runoff, erosion and sediment controls, and temporary and permanent soil stabilization measures.

c) Detailed schedules for implementation of the land disturbing activity, the erosion and sediment controls, and soil stabilization measures.

d) Detailed description of the methods to be employed for monitoring, maintaining and removing the erosion and sediment controls, and soil stabilization measures.

e) Soil borings if requested by the Commission.

5. **MAINTENANCE**. The project review applicant shall be responsible for proper operation and maintenance of all erosion and sediment controls and soil stabilization measures, in conformance with best management practices and the NPDES permit. The project review applicant shall, at a minimum, inspect and maintain all erosion and sediment controls and soil stabilization measures daily during construction, weekly thereafter, and after every rainfall event exceeding 0.5 inches, until vegetative cover is established.

RULE F. FLOODPLAIN ALTERATION

1. **POLICY**. It is the policy of the Commission to prevent and control flooding damage by:

a) Preserving existing water storage capacity below the 100-year critical flood elevation on all waterbodies in the watershed to minimize the frequency and severity of high water.

b) Minimizing development in the floodplain that will unduly restrict flood flows or aggravate known high water problems.

c) Requiring compensatory storage for floodplain fill.

2. **REGULATION**. No person or political subdivision shall alter or fill land below the 100-year critical flood elevation of any public waters watercourse, public waters wetland, or other wetland without first obtaining an approved project review from the Commission.

3. **CRITERIA**.

a) Floodplain alteration or filling shall not cause a net decrease in flood storage capacity below the projected 1% (100-year) critical flood elevation or alter the timing of flooding unless it is shown that the proposed alteration or filling, together with the alteration or filling of all other land on the affected reach of the waterbody to the same degree of encroachment as proposed by the applicant, will not cause high water or aggravate flooding on other land and will not unduly restrict flood flows.

b) All new structures shall be constructed with the low floor at the elevation required in the municipality's ordinance, however, in no case shall the low floor be less than two feet above the regulatory elevation.

4. **EXHIBITS**. The following exhibits shall accompany the project review` application (one set full size, one set reduced to a maximum size of 11" x 17", and one electronic set in pdf format):

   a) Site plan showing boundary lines, delineation and existing elevation contours of the work area, ordinary high water level, and 1% (100-year) critical flood elevation. All elevations shall be referenced to the NAVD 1988 datum. If NAVD 1988 is not used, applicant must specify the datum used and the appropriate conversion factor.

   b) Grading plan showing any proposed elevation changes.

   c) Preliminary plat of any proposed subdivision.

   d) Determination by a registered professional engineer of the 100-year critical flood elevation before and after the proposed activity.

   e) Computation of the change in flood storage capacity as a result of the proposed alteration or fill.

   f) Erosion and sediment control plan which complies with these Rules.

   g) Soil boring logs and report if available.

5. **EXCEPTIONS**. If a municipality has adopted a floodplain ordinance that prescribes an allowable degree of floodplain encroachment, the applicable ordinance shall govern the allowable degree of encroachment and no project review will be required under this Floodplain Alteration Rule.

RULE G. WETLAND ALTERATION

1. **POLICY**. It is the policy of the Commission to preserve and protect wetlands for their water quality, stormwater storage, habitat, aesthetic, and other attributes by:

   a) Achieving no net loss in the quantity, quality and biological diversity of wetlands in the watershed.

   b) Increasing the quantity, quality and biological diversity of wetlands in the watershed by restoring or enhancing diminished or drained wetlands.

   c) Enforcing mitigation of direct or indirect impacts from activities that destroy or diminish the quantity, quality and biological diversity of watershed wetlands.

   d) Replacing affected wetlands where sequencing demonstrates that avoidance is not feasible.

2. **REGULATION**. No person or political subdivision shall drain, fill, excavate or otherwise alter a wetland without first obtaining the approval of a wetland replacement plan from the local government unit with jurisdiction over the activity. Mitigation of wetland impacts will be considered in the following sequence: 1) mitigated by enhancing the impacted wetland; 2) mitigated within the subcatchment of the impacted wetland; 3)

mitigated in the drainage area of the impacted wetland; 4) mitigated in the watershed of the impacted wetland; 5) mitigated through purchase of wetland bank credits.

3. CRITERIA.

a) Any drainage, filling, excavation or other alteration of a wetland shall be conducted in compliance with Minnesota Statutes, section 103G.245, the Wetland Conservation Act, and regulations adopted thereunder.

b) A wetland may be used for stormwater storage and treatment only if pre-treatment is provided and the use will not adversely affect the function and public value of the wetland as determined by the local government unit.

c) Other activities which would change the character of a wetland shall not diminish the quantity, quality or biological diversity of the wetland.

4. LOCAL GOVERNMENT UNIT. The Commission will serve as the local government unit (LGU) for administration of the Wetland Conservation Act (WCA) for those cities that have designated the Commission to serve in that capacity. If a member city has not designated the Commission as the LGU for the administration of the WCA, they shall be responsible for administering the WCA. MnDOT serves as the LGU on its right of way.

RULE H. BRIDGE AND CULVERT CROSSINGS

1. POLICY. It is the policy of the Commission to maintain channel profile stability and conveyance capacity by regulating crossings of watercourses for driveways, roads and utilities.

2. REGULATION. No person or political subdivision shall construct or improve a road, driveway or utility crossing across any public waters watercourse or county ditch without first submitting to the Commission and receiving approval of a project review.

3. CRITERIA. Crossings shall:

a) Retain adequate hydraulic capacity to pass the 100-year flow and maintain the 100-year flow profile, if available.

b) Mimic the existing base flow (1-year, 2-year) conditions.

c) Not adversely affect water quality.

d) Represent the "minimal impact" solution to a specific need with respect to all reasonable alternatives.

e) Allow for future erosion, scour, and sedimentation maintenance considerations.

f) If the project proposes changing the FEMA FIS profile, a FEMA map revision must be obtained.

g) If the project requires a DNR Work in Public Waters permit, the conditions of that permit must be satisfied.

4. **EXHIBITS**. The following exhibits shall accompany the project review application (one set full size, one set reduced to a maximum size of 11" x 17", and one electronic set in pdf format):

a) Construction plans and specifications.

b) Analysis prepared by a registered professional engineer showing the effect of the project on hydraulic capacity and water quality.

c) An erosion and sediment control plan that complies with these Rules.

5. **MAINTENANCE**.

a) The maintenance, reconstruction and stabilization of any public crossing shall be the responsibility of the political subdivision with jurisdiction over the crossing.

b) The maintenance, reconstruction and stabilization of any private crossing shall be the responsibility of the owner of the crossing.

c) If a crossing over any public waters watercourse is determined by the Commission to be causing significant erosion, the Commission may notify the member city where said crossing is located and the member city may order the owner of the crossing to make necessary repairs or modifications to the crossing and outlet channel.

RULE I. BUFFER STRIPS

1. **POLICY**. It is the policy of the Commission to maintain the water quality and ecological functions provided by watercourses, lakes and wetlands by requiring the development of vegetated buffers around watercourses, lakes and wetlands where development and redevelopment occurs, and to encourage the installation of vegetated buffers around all watercourses and wetlands. Vegetative buffers reduce the impact of surrounding development and land use on watercourse, lake and wetland functions by stabilizing soil to prevent erosion, filtering sediment from runoff, and moderating water level fluctuations during storms. Buffers provide essential habitat for wildlife. Requiring buffers recognizes that watercourse, lake and wetland quality and function are related to the surrounding upland.

2. **REGULATION**. No person or political subdivision shall commence a land disturbing activity or the development or redevelopment of land for which a project review is required under Rule D on land that contains or is adjacent to a watercourse, lake or wetland without first submitting to and obtaining approval of a project review from the Commission that incorporates a vegetated buffer strip between the development or redevelopment and the watercourse or wetland.

3. GENERAL PROVISIONS.

a) This Rule shall apply to all lands containing or abutting watercourses, lakes or wetlands that are subject to a project review under these Rules. Watercourses, lakes and wetlands shall be subject to the requirements established herein, and other applicable federal, state and local ordinances and regulations. If a municipality has a buffer strip requirement that has been reviewed and approved by the Commission, the municipal regulation shall have precedence over the Commission's Rules.

b) An applicant shall determine whether any watercourse, lake or wetland exists, and shall delineate the boundary for any wetland on the land. An applicant shall not be required to delineate wetlands on adjacent property, but must review available information to estimate the wetland boundary.

c) Documentation identifying the presence of any watercourse, lake or wetland on the applicant's land, including wetland delineation and buffer strip vegetation evaluation, must be provided to the Commission with a project review application.

d) Wetland and buffer strip identifications and delineations shall be prepared in accordance with state and federal regulations.

4. CRITERIA. The following standards apply to all lands that contain or abut a watercourse, lake or wetland:

a) BMPs shall be followed to avoid erosion and sedimentation during land disturbing activities.

b) When a buffer strip is required the applicant shall, as a condition to issuance of an approved project review:

i) Submit to the member city, in a form acceptable to the Commission, a recordable conservation easement for protection of approved buffer strips. The easement shall describe the boundaries of the watercourse or wetland and buffer strips, identify the monuments and monument locations, and prohibit any of the alterations set forth in Paragraph 5(e) below and the removal of the buffer strip monuments within the buffer strip or the watercourse or wetland.

ii) Submit to the member city, in a form acceptable to the Commission, an executed buffer maintenance plan and agreement for the first two growing seasons following establishment, and providing an escrow or an alternate surety to assure successful vegetation establishment.

iii) Install the wetland monumentation required by Paragraph 7 below.

c) All open areas within the buffer strip shall be seeded or planted in accordance with Paragraph 8 below. All seeding or planting shall be completed prior to removal of any erosion and sediment control measures. If construction is completed after the end of

the growing season, erosion and sediment control measures shall be left in place and all disturbed areas shall be mulched for protection over the winter season.

5. BUFFER STRIPS.

a) A buffer strip shall be maintained around the perimeter of all watercourses, lakes or wetlands. The buffer strip provisions of this Rule shall not apply to any parcel of record as of the date of this Rule until such parcel is developed or redeveloped or unless required by a previous project review. The Commission does, however, strongly encourage the installation of buffer strips on all parcels in the watershed.

b) Buffer strips on Elm Creek, Rush Creek, North Fork Rush Creek, and Diamond Creek shall be an average of 50 feet wide and a minimum of 25 feet wide, measured from the top of bank. Buffer strips on other watercourses, lakes, and wetlands shall be an average 25 feet wide and a minimum of 10 feet wide. It is recommended that all structures have a minimum 15 foot setback from the buffer strip.

c) Buffer strips shall apply whether or not the watercourse or wetland is on the same parcel as a proposed development.

d) Buffer areas disturbed by grading operations must be finish graded to a slope of 6:1 or less or an increase in width of five (5) feet for each one (1) foot decrease in horizontal width (i.e., a 25 required foot buffer width at a 5:1 slope must be 30 feet wide, 4:1 must be 35 feet wide, and 3:1 must be 40 feet wide.)

e) Buffer strip vegetation shall be established and maintained in accordance with Paragraph 8 below. Buffer strips shall be identified within each parcel by permanent monumentation in accordance with Paragraph 7 below.

f) Subject to Paragraph 5(g) below, alterations including building, storage, paving, mowing, plowing, introduction of noxious vegetation, cutting, dredging, filling, mining, dumping, grazing livestock, agricultural production, yard waste disposal or fertilizer application, are prohibited within any buffer strip. Noxious vegetation shall be removed to meet state standards. Alterations would not include plantings that enhance the natural vegetation or selective clearing or pruning of trees or vegetation that are dead, diseased or pose similar hazards.

g) The following activities shall be permitted within any buffer strip, and shall not constitute prohibited alterations under Paragraph 5(f) above:

    i) Use and maintenance of an unimproved access strip through the buffer, not more than 20 feet in width, for recreational access to the watercourse, lake or wetland and the exercise of riparian rights.

    ii) Placement, maintenance, repair or replacement of utility and drainage systems that exist on creation of the buffer strip or are required to comply with any subdivision approval or building permit obtained from the municipality or county, so long as any adverse impacts of utility or drainage systems on the function of the buffer strip have been avoided or minimized to the extent possible.

iii) Construction, maintenance, repair, reconstruction, or replacement of existing and future public roads crossing the buffer strip, so long as any adverse impacts of the road on the function of the buffer strip have been avoided or minimized to the extent possible.

6. ALTERNATE WETLAND PROTECTION METHODS.

a) Should application of the buffer standards in Paragraph 5 above render a parcel of record as of the date of this Rule unbuildable based on current city ordinances, the Watershed engineer may allow alternative methods to protect the wetland. Such methods must include a buffer strip no less than ten feet wide, supplemented by redirection of drainage to a wider area of buffer, or to a Best Management Practice such as a rain garden or vegetated swale.

b) The use of alternative wetland protection methods will be evaluated as part of the review of a stormwater management plan under these Rules. Alternative wetland protection methods must be in keeping with the spirit and intent of this Rule.

7. MONUMENTATION. A monument shall be required at each parcel line where it crosses a buffer strip and shall have a maximum spacing of 200 feet along the edge of the buffer strip. Additional monuments shall be placed as necessary to accurately define the edge of the buffer strip. A monument shall consist of a post and a buffer strip sign meeting Commission standards. The signs shall include warnings about mowing, disturbing or developing the buffer strip.

8. VEGETATION.

a) Where acceptable natural vegetation exists in buffer strip areas, the retention of such vegetation in an undisturbed state is required unless an applicant receives approval to replace such vegetation. A buffer strip has acceptable natural vegetation if it:

i) Has a continuous, dense layer of native vegetation that has been uncultivated or unbroken for at least 5 consecutive years; or

ii) Has an overstory of native trees and/or shrubs that has been uncultivated or unbroken for at least 5 consecutive years; or

iii) Contains a mixture of the plant communities described in Subparagraphs 8(a)(i) and (ii) above that has been uncultivated or unbroken for at least 5 years.

b) Notwithstanding the performance standards set forth in Paragraph 8(a), the Commission may determine existing buffer strip vegetation to be unacceptable if:

i) It contains undesirable plant species including but not limited to common buckthorn, reed canary grass, or species on the Minnesota State Noxious Weeds List; or

ii) It has topography that tends to channelize the flow of runoff; or

iii) For some other reason it is unlikely to retain nutrients and sediment.

iv) Where buffer strips are not vegetated or have been cultivated or otherwise disturbed within 5 years of the project review application, such areas shall be replanted and maintained with native vegetation. The buffer strip plantings must be identified on the project review application. Acceptable buffer strip design and planting methods are detailed in the reference document "Restoring and Managing Native Wetland and Upland Vegetation" (Jacobson 2006, prepared for BWSR and MnDOT).

c) Buffer strip vegetation shall be established and maintained in accordance with the requirements found in this Paragraph. During the first two full growing seasons, the owner must replant any buffer strip vegetation that does not survive. The owner shall be responsible for reseeding and/or replanting if the buffer strip changes at any time through human intervention or activities. At a minimum the buffer strip must be maintained as a "no mow" area.

9. ENCROACHMENT.

a) Buffer strips must be kept free of all materials, equipment and structures, including fences and play equipment. Buffer strips must not be grazed, cropped, logged or mown except as approved by the Commission. The topography of the buffer strips shall not be altered by any means, including paving, plowing, cutting, dredging, filling, mining, or dumping.

b) Variances.

i) Only variances meeting the standards and criteria set forth in Rule K shall be granted.

ii) Variances shall not be granted that would circumvent the intent and purposes of this Rule.

RULE J. FEES

1. POLICY. The Commission finds that it is in the public interest to require applicants to pay the cost of administering and reviewing project review applications, and inspecting approved activities to assure compliance with these Rules, rather than using the Commission's annual administrative levy for such purposes. The Commission shall by resolution establish a schedule of fees that may be amended from time to time to reflect the cost of providing each service.

2. APPLICATION. Each application for the issuance, transfer or renewal of a project review recommendation under these Rules shall be accompanied by an application fee to defray the cost of processing the application.

3. REVIEW. A project review applicant under these Rules shall pay a fee for the cost of the review and analysis of the proposed activity, including services of engineering, legal, and

other consultants. The review fee shall be payable upon the submission of the project review application.

4. **WETLAND MITIGATION PLAN**. A project review applicant under these rules shall pay a fee for the cost of the review and analysis of a proposed activity involving a wetland mitigation plan in a municipality where the Commission is the LGU. The fee is to cover the costs of engineering, legal, and other consultants, and shall be payable upon the submission of the project review application. Should the cost of said wetland mitigation plan review exceed the review fee, the application shall deposit such additional sums as are needed to pay such costs. Failure to pay such costs is grounds to deny the application or suspend review.

5. **WETLAND MITIGATION PLAN MONITORING**. A project review applicant under these rules in a municipality where the Commission is the LGU shall deposit an escrow to cover the cost of Commission monitoring and annual monitoring plan review for the five-year period. If the escrow amount is insufficient to cover the costs the Commission may require additional funds from the applicant.

6. **WETLAND MITIGATION SECURITY DEPOSIT**. A project review applicant under these rules in a municipality where the Commission is the LGU shall provide a security to assure that the replacement plan is followed. The amount of the security shall be calculated on a case-by-case basis based on the estimated cost of construction, follow up and contingency. The security may also include an amount determined by the Commission to be sufficient to protect the public in the event the replacement plan does not succeed.

7. **DEPOSITS**. The Commission will maintain an accounting for all deposits made under this Rule. No interest will be paid to applicants for funds held in deposit.

RULE K. VARIANCES

1. **WHEN AUTHORIZED**. The Commission may grant variances from the literal provisions of these Rules. A variance shall only be granted when in harmony with the general purpose and intent of the Rules in cases where strict enforcement of the Rules will cause practical difficulties or particular hardship, and when the terms of the variance are consistent with the Commission's water resources management plan and Minnesota Statutes, chapter 103D.

2. **HARDSHIP**. "Hardship" as used in connection with the granting of a variance means the land in question cannot be put to a reasonable use if used under the conditions allowed by these Rules; the plight of the applicant is due to circumstances unique to the land and not created by the applicant; and the variance, if granted, will not adversely affect the essential character of the locality and other adjacent land. Economic considerations alone shall not constitute a hardship if a reasonable use for the land exists under the terms of these Rules. Conditions may be imposed in the granting of a variance to insure

compliance and to protect adjacent land and the public health and general welfare of the Commission.

3. **PROCEDURE**. An application for a variance shall describe the practical difficulty or particular hardship claimed as the basis for the variance. The application shall be accompanied with such surveys, plans, data and other information as may be required by the Commission to consider the application.

4. **VIOLATION**. A violation of any condition imposed in the granting of a variance shall be a violation of these Rules and shall automatically terminate the variance.

RULE L. ENFORCEMENT

1. **ADMINISTRATION**. These Rules shall be administered by the Commission. The Commission shall consider applications required under these Rules and determine whether such applications should be approved, approved with conditions, or denied. Such determination shall be communicated to the member city in which the project lies and to the applicant.

2. **IMPLEMENTATION BY MEMBER CITIES**. It shall be the duty of each city to enforce and implement such determinations by the Commission under the various permitting processes and regulations of the city. Each city shall make such amendments to its official controls, regulations, and permitting processes as are necessary to provide it with the authority to enforce and implement the determinations of the Commission.

3. **FAILURE BY CITY TO IMPLEMENT**. Upon a determination by the Commission that a city has not enforced or implemented a decision of the Commission in the administration of these Rules, the Commission shall notify the city of such determination and direct that appropriate action be taken by the city. If the city does not take such action, the Commission may take such legal steps as are available to it to effect such enforcement or implementation.

RULE M. AMENDMENT OF THESE RULES

1. **AMENDMENT.** These rules may be amended from time to time by the Commission. Proposed amendments shall be reviewed by the member cities prior to adoption unless the Commission determines that said amendment is of a minor or technical nature. Minor or technical amendments include recodifying or streamlining the rules, clarifying policies, or other actions that do not adversely affect a member city or impact the Commission's or member cities' ability to meet their water management plan goals.

2. **PROCEDURE.** Proposed major amendments to these rules shall be first considered by the Commission and then forwarded to the member cities for a 45-day comment period. Following that comment period, the Commission shall consider the proposed amendment and the comments received for approval. All amendments shall be made by resolution.

ELM CREEK WATERSHED MANAGEMENT COMMISSION
RULES APPENDIX A
WET POND DESIGN STANDARDS

Permanent Pool Depth	Average 4', maximum 10'
Permanent Pond Surface Area	Greater of 2% of watershed's impervious area and 1% of the watershed
Permanent Pool Length to Width Ratio	3:1 or greater with an irregularly shaped shoreline
Side Slopes	10:1 for 10-foot bench centered on the normal water elevation and between 3:1 and 20:1 elsewhere
Side Slope Stabilization	Native seed with mix 33-261 (MnDOT 310), 34-271 (BWSR W2) or equivalent between NWL and HWL, provide 10' buffer where possible with mix 35-221 (MnDOT 330 (dry)) or mix 35-241 (MnDOT 350 (mesic))
Floatable Removal	Skimming device discharging at no greater than 0.5 fps during the 2-year event or a submerged outlet with a minimum 0.5 feet from the normal water level to the crown of the outlet pipe
Sediment Accumulation Area	Provide maintenance pads to remove sediment deltas at inlets
Permanent Pool Volume	A 4-foot mean depth and equal to 2.5-inch rain over the watershed
Source	Protecting Water Quality in Urban Areas (MPCA 2000)

SUMMARY

Elm Creek Watershed Management Commission
Management Rules and Standards*

	Standard	Purpose	Applicability
Project Reviews Required	A Stormwater Management Plan consistent with all applicable management rules and standards* must be reviewed and approved prior to commencement of land disturbing activities.	To control excessive rates and volumes of runoff; manage subwatershed discharge rates and flood storage volumes; improve water quality; protect water resources; and promote natural infiltration of runoff.	All development or redevelopment projects of the following types: • Projects disturbing more than one acre of land • Projects within the 100-year floodplain • Projects adjacent to or within a lake, wetland, or watercourse • Any land disturbing activity requested by a member city to be reviewed regardless of project size • Linear projects creating more than one acre of new impervious surface
Rate Control	Peak runoff rates may not exceed existing rates for the 2-year, 10-year, and 100-year critical storm event; or the capacity of downstream conveyance facilities; or contribute to flooding	To control excessive rates and volumes of runoff; manage subwatershed discharge rates and flood storage volumes	All projects disturbing more than one acre of land. Redevelopment projects disturbing less than 50 percent of the site must meet the requirement only for the disturbed area.
Volume Manage-ment	1.1 inch of impervious surface runoff must be abstracted on site within 48 hours	To control excessive rates and volumes of runoff; manage discharge rates and flood storage volumes; protect stream channels from erosion; and promote natural infiltration of runoff.	All projects disturbing more than one acre of land. Redevelopment projects disturbing less than 50 percent of the site must meet the requirement only for the disturbed area.
Erosion and Sediment Control	Erosion control plan using Best Management Practices (BMPs) and consistent with the NPDES General Construction Permit is required	To control erosion and sediment so as to protect conveyance systems and water quality	All projects requiring a project review
Floodplain Alteration	Compensating storage is required to mitigate floodplain fill	To prevent and control flooding damage	All development or redevelopment projects within the 100-year floodplain regardless of project size
Water Quality	No net increase in total phosphorus and total suspended sediment annual load	To protect water quality	All projects disturbing more than one acre of land. Redevelopment projects disturbing less than 50 percent of the site must meet the requirement only for the disturbed area.
Buffer Strips	Vegetated buffer strips average 50 foot, minimum 25 foot wide adjacent to Elm, Diamond, Rush, and North Fork Rush Creeks; average 25 foot, minimum 10 foot wide adjacent to lakes, wetlands and other watercourses	To protect water quality; reduce erosion and sedimentation; reduce pollutants from runoff and debris; and provide habitat	All projects requiring a project review that contain or abut a wetland or watercourse
Wetland	Wetlands may not be drained, filled, excavated, or otherwise altered without an approved wetland replacement plan from the local government unit (LGU) with jurisdiction	To preserve and protect wetlands for their water quality, stormwater storage, habitat, aesthetic, and other attributes	All land disturbing activity impacting a wetland as defined by the Wetland Conservation Act (WCA)

*Important Note: Approved TMDL Implementation Plans may have additional site-specific requirements.

July 2015

Appendix G
CIP Project Descriptions

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Elm Creek WMC Third Generation Watershed Management Plan
Capital Improvement Projects Descriptions

Projects proposed for the Capital Improvement Program (CIP) are described below and shown on the Implementation Plan and Capital Improvement Program in the Plan. It is the intent of the Commission to finance these projects using its most current Cost Share Policy. Additional funding options are set forth in the Joint Powers Agreement.

Special Studies

Both by itself and also in partnership with member cities the Commission will undertake special studies to target BMP implementation and to perform feasibility analyses to develop grant applications. These special studies will be solicited and identified each year through the budget/CIP review process. Some examples of these are:

Stream Segment Prioritization. The Commission will periodically conduct stream surveys to better define stream restoration needs and to guide future improvement projects. General needs include:

- The Elm Creek Channel Study identified several locations where streambank stabilization is needed or channel modification should be considered to prevent future erosion.
- The Elm Creek TMDL and Stressor Identification Study identified additional stream enhancements that should be considered to improve habitat, increase stream reaeration, and improve water quality.
- Field assessments and aerial photo interpretation suggests that a fair amount of improvement could be achieved simply through selective tree thinning, minor bank grading and reseeding to open the canopy and encourage the growth of stabilizing herbaceous vegetation and woody understory.

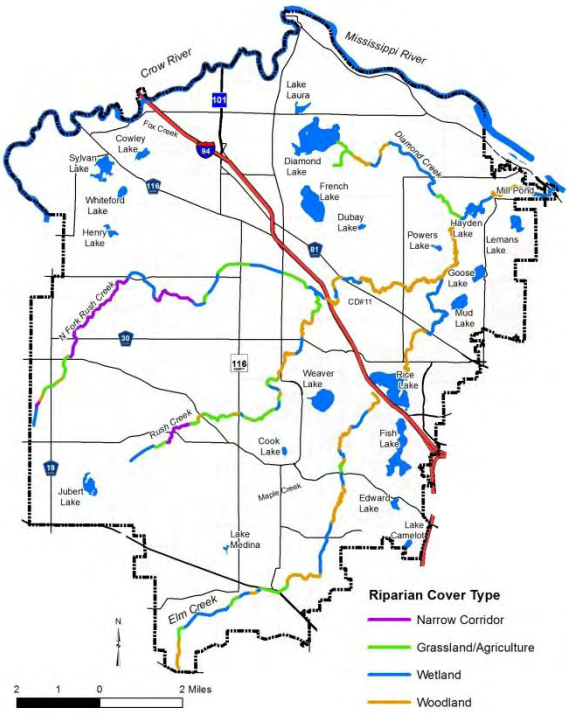

Figure 1. Stream riparian cover type.

The Commission's technical staff and consultant staff will walk priority areas on both the four major streams and key tributaries to identify segments that could benefit from tree thinning. Grant applications for crew work days will be developed and submitted to the Minnesota Conservation Corps where hand labor would be sufficient to improve the banks. Other segments will be classified based on the type of and extent of work to be completed, e.g., tree thinning and live staking on bends; extent and need for boulder toe; need for grade controls. Priority areas include those with known erosion problems; publicly-owned lands; and areas upstream of monitoring stations recording elevated TSS and TP concentrations.

TMDL Implementation. The Elm Creek Watershed TMDL implementation actions include a number of strategies that would require additional, more detailed study to identify specific BMPs and their costs and benefits. The Commission will share 50% of the cost of feasibility studies and subwatershed assessments.

- A high-infiltration potential assessment study to identify and prioritize infiltration projects to supplement stream baseflow.
- Vegetation management plans for curly-leaf pondweed in Rice, Diamond, Cowley, Sylvan, and Henry Lakes.
- Feasibility studies for internal load reduction projects in Rice, Diamond, Goose, Cowley, Sylvan, and Henry Lakes.
- Completing subwatershed assessments in priority areas to identify load and volume reduction BMPs. Tools such as the modeling performed for the Elm Creek watershed TMDL will be used, in consultation with member cities, to prioritize subwatersheds for review.

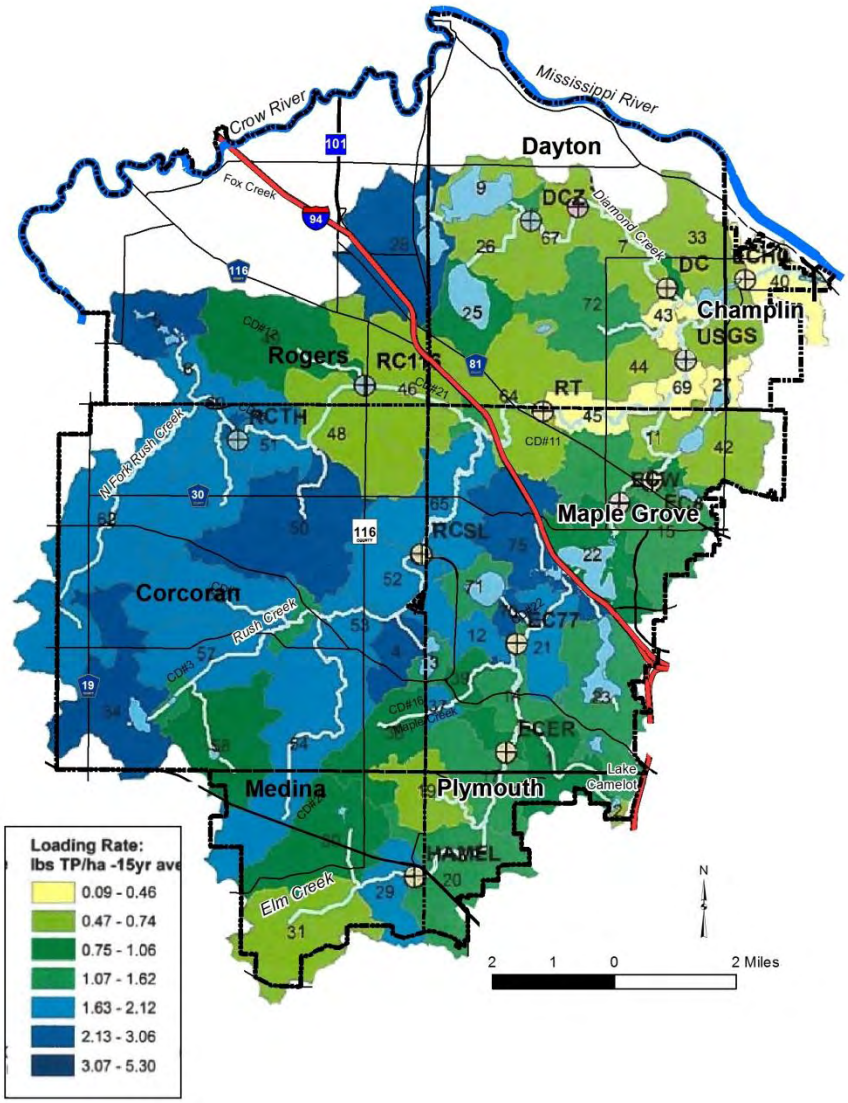

Figure 2. Modeled TP loading rate by subwatershed.

High Priority Stream Restoration Projects

The 2007 Elm Creek Channel Study identified a number of locations on Elm, Rush, North Fork Rush, and Diamond Creeks experiencing streambank erosion and mass wasting. This erosion not only threatens the structural integrity of the creek channels, but also contributes to in-stream and downstream water quality issues, including impairments to the biologic communities. The Commission annually will be undertaking subwatershed assessments in high-loading potential areas of the watershed, and those assessments may identify additional priority projects.

The Commission and member cities will continue to assess conditions on the streams in the watershed, and will undertake period stabilization and restoration projects, both on priority reaches identified in the Channel Study and WRAPS and any new priority reaches. Potential projects include, but are not limited to:

Elm Creek Stabilization, Plymouth. Undertake 5,000 linear foot stream stabilization project within Elm Creek Reach E. Increase channel area, lower hydraulic shear stress. Selectively thin trees and remove invasive species. Plant understory and herbaceous buffer. Stabilize streambanks. Add in-stream habitat features.

Fox Creek Streambank Stabilization, Rogers. Provide stabilization and protection along several reaches of streambank at Edison Court, Creekview Drive, and I-94/Hyacinth. Enhance/ expand adjacent wetland, reduce sediment transport and provide habitat enhancement and wooded upland protection.

Fox Creek South Pointe Streambank Stabilization, Rogers. Provide stabilization and protection along 600 feet of streambank tributary to Fox Creek at its headwaters, reducing sediment transport and providing habitat enhancement and wooded upland protection.

Mississippi Point Park Riverbank Repair, Champlin. Repair and stabilize 500 feet of Mississippi River streambank damaged by recent high waters.

Elm Creek Dam. The Elm Creek Dam project will replace the dam and spillway, stabilize streambanks, and provide an emergency Elm Creek bypass. It will reduce flood hazards, remove 60 acres from floodplains, improve water quality, provide stabilization for Elm Creek and improve stream/dam access.

Tree Thinning and Bank Stabilization Project. The Commission will periodically undertake small projects to selectively thin trees on segments of the four primary streams and tributary streambanks, regrading the banks as necessary, and seeding to establish stabilizing native vegetation.

Other High Priority Stream Restoration Projects. Additional stream restoration projects addressing water quality or biotic impairments on Elm, Diamond, Rush, and North Fork Rush Creeks or their tributaries may be identified though the stream segment prioritization process or be submitted by member cities for consideration. Some projects already identified include:

- *Elm Creek Reach K, Maple Grove.* Undertake 600 linear foot bank stabilization and erosion control project within Elm Creek Reach K. Increase channel area and lower hydraulic shear stress. Increase x-sectional area and meander width, plant disturbed areas with native floodplain forest vegetation to prevent erosion and increase habitat value.
- *Rush Creek Reach M, Maple Grove.* Undertake 1,000 linear foot bank stabilization and erosion control project within Rush Creek Reach M. Widen stream along existing alignment, plant native vegetation to prevent erosion.
- *Elm Creek Reach O, Elm Creek Park.* Undertake 1,100 linear foot bank stabilization and erosion control project within Elm Creek Reach O. Construct new channel alignment within floodplain, improve habitat in stream corridor.
- *Elm Creek Reach R, Elm Creek Park.* Undertake 2,000 linear foot bank stabilization and erosion control project within Elm Creek Reach R. Remove fallen trees to increase channel capacity and reduce bank scour. Reduce channel bank side slopes at existing toe locations, stabilize with riprap and native floodplain forest vegetation to prevent erosion and increase habitat value.
- *Elm Creek Channelization and Stream Restoration, Champlin.* 3,000 feet from 0.5 mile upstream of Cartway Road to Hayden Lake including bank stabilization and channelization, riprap to protect toe of stream bank and native vegetation.
- *Rush Creek, Maple Grove.* Stabilize and restore approximately 11,000 feet of Rush Creek east of I-94 and west of Fernbrook Lane, significantly reducing potential for bank erosion and sediment transport to Elm Creek. Restore native vegetation to provide habitat for wildlife, creating natural area for city demonstration.
- *Rush Creek, Maple Grove.* Stabilize and restore approx. 4,500 feet of Rush Creek north of 101 Avenue, significantly reducing potential for bank erosion and sediment transportation to Elm Creek. Restore native vegetation to provide habitat for wildlife.

High Priority Wetland Improvements

Wetlands provide numerous functions and ecological services, including upland and aquatic habitat, flood storage and attenuation, and groundwater recharge. Key wetland restoration projects have been identified for potential implementation in 2015-2024.

DNR #27-0437 in Maple Grove, Corcoran. Develop channel protection volume storage, flood storage and associated water quality improvements within wetland complex at Maple Grove/Corcoran boundary by providing extended detention within the storage basin.

Stone's Throw Wetland Restoration, Corcoran, Rogers. Acquire easements and restore 135 acre wetland adjacent to County Ditch #6.

Other High Priority Wetland Projects. Additional projects may be identified through ongoing management efforts.

Lake TMDL Implementation

Reducing lake internal loading is an essential component of achieving lake water quality standards. This may include options such as chemical treatment with alum, rough fish management aquatic and vegetation management.

Mill Pond Fishery and Habitat Restoration. To improve water quality, eliminate rough fish, restore the native aquatic plant community, and re-establish a healthy fish population that is beneficial to improved biotic integrity in Mill Pond and in Elm Creek, Champlin proposes to undertake the Mill Pond Fishery and Habitat Restoration Project. This project includes removing up to four feet of accumulated phosphorus-rich sediment and creating a deeper refuge for fish and other organisms during times of low dissolved oxygen in Elm Creek.

Other High Priority Lake Internal Load Projects. The Elm Creek TMDL identified Rice, Diamond, Goose, Cowley, Sylvan, and Henry Lakes as in need of substantial internal load reductions through actions such as aquatic vegetation management, rough fish control, and chemical treatment of lake sediments. As noted under Special Studies, the Commission will cost-share in feasibility studies and vegetation management plans that would then lead to internal load improvement projects. Priority would be given to lakes with public access.

Urban BMPs

Within urbanized areas, nutrient and sediment load reductions may require modifying existing infrastructure or adding BMPs where possible. As noted under Special Studies, the Commission will partner with the cities and Hennepin County to undertake subwatershed assessments in urbanized areas to identify these BMP opportunities, and then to share in the cost of installation. Some retrofits have already been identified.

Stonebridge, Maple Grove. Retrofit street stormsewers with hydrodynamic separators and SAFL baffles in existing storm sewer circuits where construction of ponds is not feasible, reducing TP loading by 50-60%, TSS loading by 75-90% to Rice Lake and Elm Creek.

Other High Priority Urban BMP Projects. The subwatershed studies may identify additional projects installing or modifying BMPs in developed areas to address water quality impairments in the watershed.

Livestock Exclusion, Stream and Channel Buffer, and Stabilized Access

There are numerous locations in the Elm Creek watershed where livestock (cattle, horses, etc.) graze adjacent to streams and channels, and have free access to the stream for water. This can result in broken-down streambanks and denuded pastures and paddocks. Sediment and animal waste is conveyed directly into the stream every time it rains, and the physical destruction of the banks and the lack of a rooted buffer lead to erosion and sediment accumulation in the stream.

Livestock Exclusion, Buffer, and Stabilized Access. The Commission will use the TMDL findings and local knowledge and work with partners at Extension, NRCS, and HCES to identify priority locations to provide technical and cost-share assistance to owners willing to install exclusionary fencing, resort stream buffers, and either provide stabilized access to the stream for water or an alternate water source for livestock.

Agricultural BMPs Cost Share

Agricultural fields are a significant source of sediment and nutrient loading to impaired waters. Modeling being conducted for the TMDL identified areas at highest risk, based on soil type, slope, and other factors, for erosion and sediment transport.

Ag BMP Technical Assistance and Cost Share. Using the TMDL modeling to help identify priority areas for implementation, the Commission will work with local co-ops, Extension, NRCS, and HCES to provide technical and cost-share assistance to agricultural operators to implement such priority BMPs as:

- Cover crops
- Grassed waterways
- Targeted fertilizer application
- Closed intakes
- Buffers

Hydrologic & Hydraulic Modeling

The existing Flood Insurance models for streams in the watershed are based on the critical 10-day snowmelt event. Commission rules requiring rate control have been in place since the models were developed, and were subsequently amended to require management of the Channel Protection Volume. As a part of this Plan the Commission has adopted volume management requirements intended to limit the creation of new volumes of runoff.

Hydrologic and Hydraulic Modeling. The Commission has identified a few key locations where additional hydraulic and hydraulic modeling may help improve the existing hydraulic model of Elm Creek, and may undertake this work as necessary and as desired.

Next Generation Watershed Management Plan

This Third Generation Plan presents goals, policies, and actions to be undertaken 2015-2024. While there will likely be amendments to this Third Generation Plan over that period, state statute does require that the management plan be updated in full at least every ten years.

Next Generation Watershed Management Plan. In approximately 2022 the Commission will begin planning for its Next Generation Watershed Management Plan, with the expectation that it will be complete and approved prior to this Plan's expiration in 2024.

October 2016 (Volume 11, Issue 4): Iron Enhanced Sand Filtration for Agricultural Tile Drainage

University of Minnesota
Driven to Discover℠
Stormwater Assessment and Maintenance
UPDATES

Iron Enhanced Sand Filtration for Agricultural Tile Drainage

Contributed by Peter T. Weiss, Professor, Department of Civil Engineering, Valparaiso University; Andy Erickson, Research Fellow; and John S. Gulliver, Professor, St. Anthony Falls Laboratory and the Department of Civil, Environmental, and Geo-Engineering, University of Minnesota .

In Collaboration with the Wright County Soil and Water Conservation District.

Funded by the Minnesota Pollution Control Agency.

Introduction

Phosphorus is typically the limiting nutrient for plant growth in temperate freshwater systems (Schindler 1977). Thus, the addition of phosphorus to surface waters can exacerbate algae blooms and eutrophication. In fact, the USEPA lists almost 3000 surface water impairments due to phosphates or phosphorus (USEPA 2016). In order to meet Total Maximum Daily Load (TMDL) plans that seek to reduce phosphorus concentrations in these impaired waters, phosphorus loadings to the water bodies must be reduced. A reduction of phosphorus in agricultural runoff could help achieve TMDL goals.

Stuntebeck et al. (2011) found that 51% of the phosphorus in agricultural runoff was dissolved. This value is similar to typical urban stormwater fractions, which have been found to be approximately 43% (Kayhanian et al. 2007). Erickson et al. (2007), however, showed that dissolved fractions of over 90% are not uncommon. With TMDL plans typically targeting from a 60 to 80% reduction in phosphorus loads, the dissolved fraction, at least in part, must be reduced if TMDL goals are to be achieved.

A technology that has been documented (Erickson et al. 2007, 2012) to have the ability to remove a significant portion of the dissolved phosphorus fraction is iron enhanced sand filtration (IESF). IESF uses iron shavings, at 5-7% by weight, mixed with typical concrete sand (e.g., ASTM C 33). When the iron rusts and becomes oxidized its positive charge has the ability to retain negatively charged phosphate ions through surface adsorption. With much of the dissolved phosphorus fraction in the form of phosphate, IESF has been shown to have the ability to retain 80% or more of influent dissolved phosphorus loads (Erickson et al. 2007, 2012). This technology, however, has only been verified in the lab (Erickson et al. 2007) and in one field application in an urban (i.e., non-agricultural setting) (Erickson et al. 2012, 2015). Not only may field performance vary from that observed in a laboratory setting, but performance may also vary due to differences in the source of, and thereby the constituents in, the runoff (i.e., urban vs. agricultural). Thus, the performance of an IESF in an agricultural setting is not known. In order to help fill this knowledge void, a field demonstration/monitoring project of an IESF that receives agricultural runoff is underway. The project objective is to verify and/or determine the ability of IESF to reduce dissolved phosphorus loads in agricultural runoff.

Project Location and Sand Filter Specifications

An IESF measuring 50 feet by 20 feet was installed near Martha Lake and Charlotte Lake in Wright County, Minnesota (Figure 1). The sand filter receives runoff from approximately 19 acres of farm land used for crops and livestock. These lakes have naturally low levels of phosphorus (35 µg/L total P) but receive runoff from agricultural drain tiles through ditches and conveyances. Phosphorus concentrations

in the agricultural runoff, as determined by taking periodic grab samples, have ranged from 73 - 460 µg/L total P and 31 - 242 µg/L dissolved P.

Figure 1. Site photo of Iron Enhanced Sand Filter for Treating Agricultural Drainage.

The cross-section of the IESF consists of, from top to bottom, 12 inches of ASTM C33 construction sand with 5% iron shavings by weight, 6 inches of coarse gravel containing 4-inch diameter perforated PVC underdrains (Figure 2). Flow monitoring equipment was installed on the downstream end of the filter in order to measure effluent flow rates (influent flow rates are assumed to be equal to effluent values). ISCO automatic samplers were installed to take influent and effluent samples on a flow-weighted basis. Atmospheric data, including rainfall as measured by a tipping bucket rain gauge and air temperature, are also recorded.

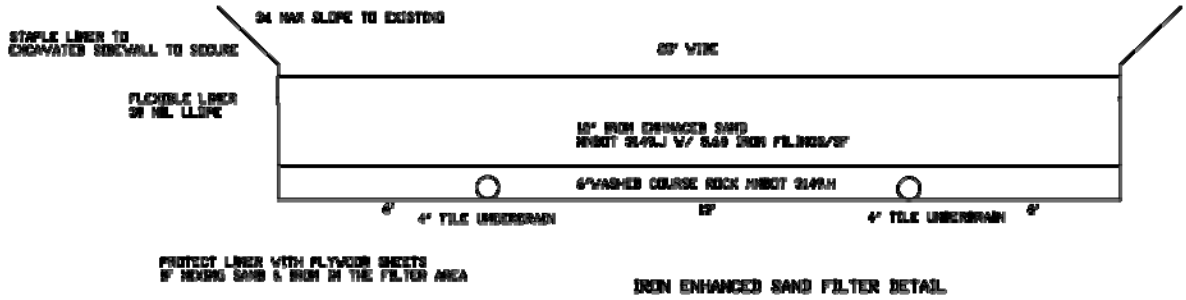

Figure 2. Cross-section of Iron Enhanced Sand Filter.

Results

In 2015 a total of seven rainfall-runoff events were monitored and an additional seven events have been monitored in 2016. The date, total rainfall depth, total runoff volume filtered, and the event mean concentration (EMC) of soluble reactive phosphorus (i.e., phosphate) of the influent and effluent for each event are given in Table 1. Also shown in Table 1 are the percent reduction in EMC, phosphate mass

loads in and out, the percent mass load reductions for each event, and yearly and overall totals where relevant.

*Table 1: Monitoring results from 2015 & 2016. Samples measured below detection limits (10 µg/L, indicated by *) are reported at half the detection limit (5 µg/L), and removal is calculated using half the detection limit.*

Rainfall Start	Rainfall Depth (in)	Filtered Volume (10^6 L)	Volume Percent Exceedance	Phosphate EMC In (µg/L)	Phosphate EMC Out (µg/L)	EMC Reduction	Phosphate Mass In (g)	Phosphate Mass Out (g)	Phosphate Mass Removal
7/18/15	1.87	0.476	17%	241	40	83%	115	19	83%
7/24/15	0.78	0.082	58%	45	5*	89%	3.7	0.4	89%
7/28/15	0.73	0.103	42%	61	12	81%	6.3	1.2	81%
10/8/15	0.70	0.031	100%	52	14	73%	1.6	0.4	73%
10/23/15	0.32	0.096	50%	54	5*	91%	5.2	0.5	91%
10/27/15	1.85	0.784	0%	180	79	56%	141	62	56%
11/11/15	3.00	0.699	8%	146	72	51%	102	50	51%
2015 Totals	**9.25**	**2.269**					**374.3**	**133.7**	**64.3%**
5/23/16	1.93	0.385	25%	25	5*	80%	10	1.9	80%
6/3/16	0.36	0.062	75%	114	5*	96%	7.1	0.3	96%
6/12/16	0.74	0.040	92%	100	5*	95%	4.0	0.2	95%
6/17/16	0.16	0.068	67%	78	5*	94%	5.3	0.3	94%
7/5/16	0.37	0.210	33%	29	10	66%	6.1	2.0	66%
7/10/16	0.63	0.045	83%	80	16	80%	3.6	0.7	80%
2016 Totals	**4.19**	**0.810**					**35.9**	**5.5**	**84.6%**
Grand Totals	**13.44**	**3.080**					**410.2**	**139.2**	**66.1%**

In 2015, seven rainfall events totaled 9.25 inches of rain and generated over 2.2 million liters of filtered runoff. Influent EMC values ranged from 45 to 241 µg/L. Percent reductions in EMC ranged from 51% to 91% and, because there was no infiltration into the existing soil and inflow equaled outflow, the percent reductions in mass load for each event are identical to EMC reductions. Overall, the filter received 374.3 grams of phosphate in 2015 in the influent and discharged 133.7 g of phosphate in the effluent for an overall reduction in the phosphate load of 64%.

In 2016, rainfall depth totaled 4.19 inches for the six events monitored to date and this generated 0.8 million liters of filtered runoff. Influent EMC values ranged from below detection (reported as 5* µg/L) to 114 µg/L and percent EMC reductions ranged from 66% to 96%. The filter received 35.9 g of phosphate in the influent and discharged 5.5 g of phosphate in the effluent. This amounts to a 85% reduction in the phosphate mass load.

The rainfall, runoff volume, and phosphate concentrations for 2016 were about 50% less than those in 2015, and the influent and effluent mass in 2016 were about 90 - 96% less than in 2015. For 2015 and 2016 combined, the total mass load of phosphate entering the filter (410.2 g) divided by the total influent volume (3.08×10^6 L) gives an overall EMC of 133 µg/L for the influent. Similarly, the overall effluent EMC is 45.2 µg/L, which corresponds to an overall mass load reduction of 66% for 2015-2016 monitored events. Filter performance has not decreased over the monitoring period (2015 to 2016). In fact, the

percent mass load reduction has increased from 64% in 2015 to approximately 85% in 2016, though less volume, concentration, and mass have been treated in 2016 compared to 2015. It is possible that filter performance is a function of runoff volume or influent concentration.

To investigate if filter performance is a function of runoff volume, results were plotted as a function of runoff volume percent exceedance in Figure 3. This plot shows runoff volume and phosphate mass loads in and out, as a function of runoff volume percent exceedance. All of the 13 monitored events are plotted in Figure 3, results corresponding to the largest runoff volume event (0.784×10^6L) are plotted at zero percent exceedance because this events runoff volume was never exceeded. Results corresponding to the second largest runoff event (0.699×10^6 L) are plotted at 8% exceedance because this runoff volume was only exceeded by 1 of the 12 other events, or 8% of the time. The results corresponding to the remaining 11 events are plotted in a similar manner.

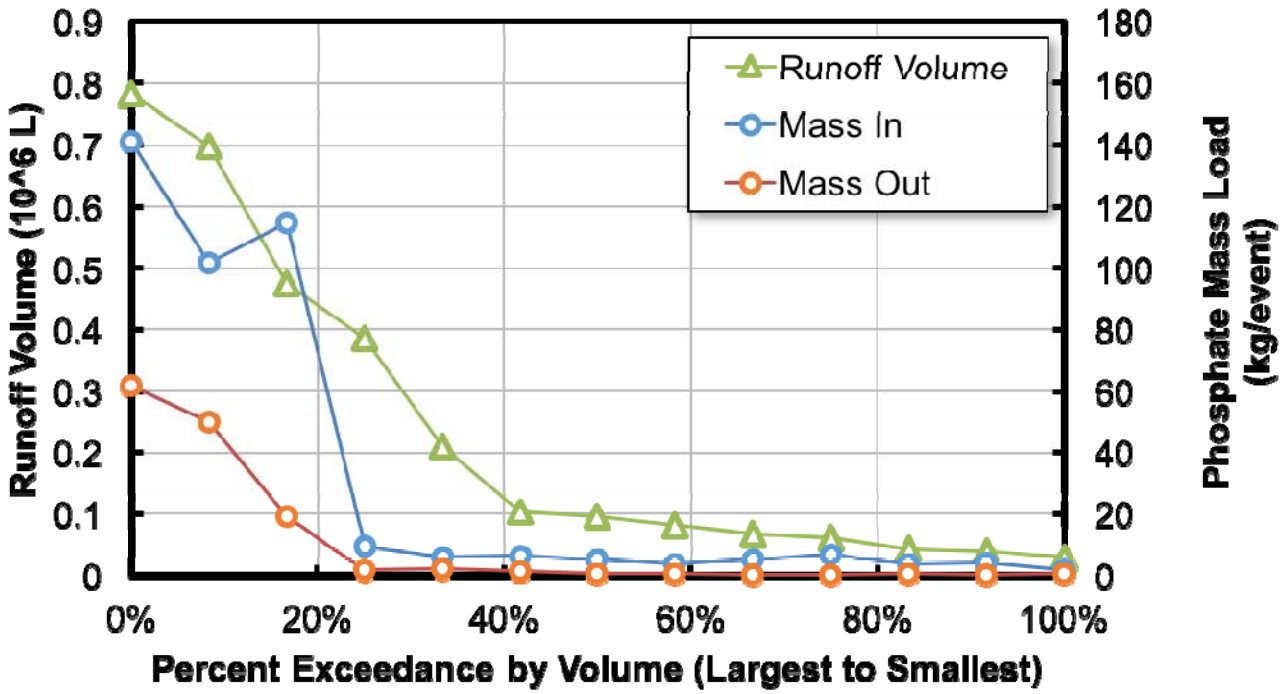

Figure 3. Runoff volume percent exceedance plot showing Event Phosphate Mass In and Out.

As shown in Figure 3, the runoff volume for the four largest events contributes most of the runoff, but the phosphate event mass load contributed by the three largest events (10/27/15, 11/11/15, 7/18/15) is substantially more than the other 10 events. This suggests that treatment of the largest events could have substantial impact on the overall average annual performance. Similar results were observed for Iron Enhanced Pond Perimeter Trenches.

Figure 4 shows the percent removal based on phosphate mass, and that most events achieved a phosphate removal of 80% or more. The smallest event (0.031×10^6 L) achieved 73% phosphate removal; one medium-sized event (0.210×10^6 L) achieved 66% removal; and the two largest events (0.784×10^6 L and 0.699×10^6 L) achieved 56% and 51% removal, respectively. Because the largest runoff events have higher mass loads than smaller runoff events they have a greater impact on the overall phosphate mass load reduction. Together, the two largest events produced 59% of the total influent mass load (243 g of 410 g) and the three largest events produced over 87% of the total influent mass load (358 g of 410 g). Thus, the overall phosphate mass load reduction was 66% even though half of the events achieved over 80% reduction.

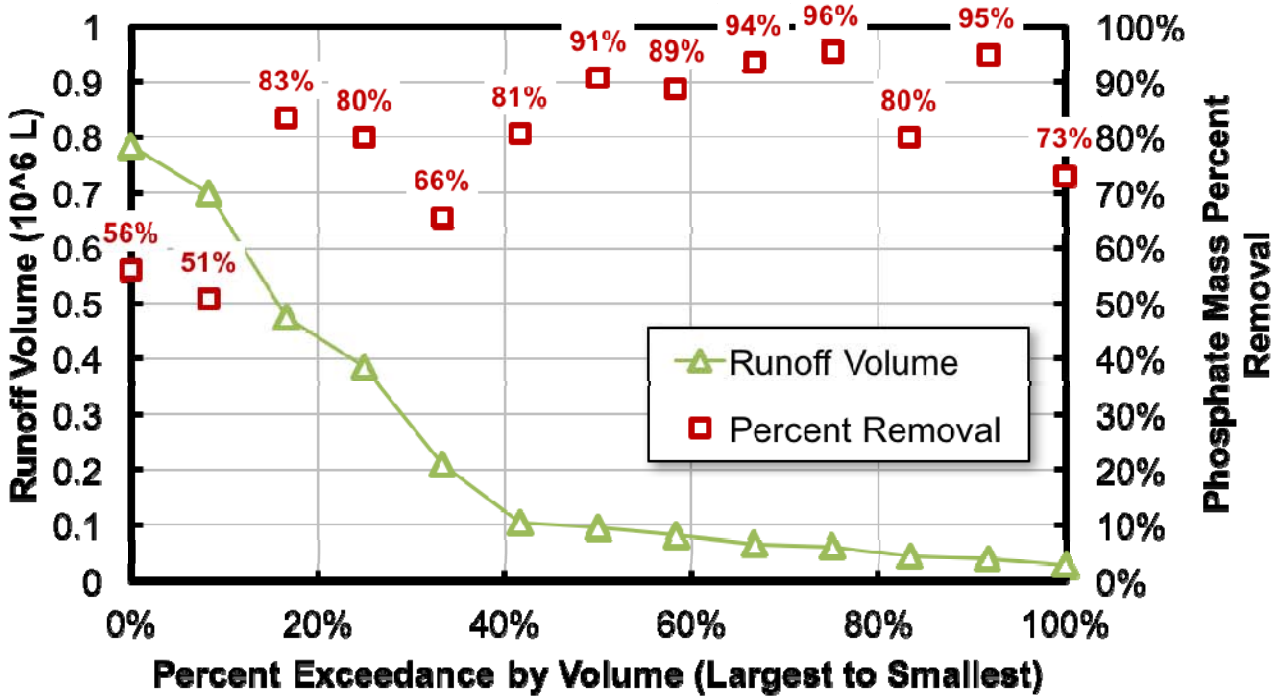

Figure 4. Runoff Volume and Phosphate Mass Percent Removal by Percent Exceedance of Volume.

Summary

As a field demonstration project to verify the ability of iron enhanced sand filtration to reduce dissolved phosphorus loads in agricultural runoff, a surface IESF was installed in Wright County, Minnesota. Thirteen rainfall/runoff events over 2015 and 2016 have been monitored to date. The events have had a total influent phosphate mass load of 410.2 g with the effluent mass load of 139.2 g, which corresponds to a 66% reduction in mass load between influent and effluent.

More than half of the events reduced the phosphate mass load by over 80% and two other events reduced the load by 66% and 73%. These events account for approximately 41% of the total influent load throughout both years. The remaining 59% of the influent load was contributed by the two largest events, which reduced the phosphate load by 56% and 51%, respectively. This explains why the overall load reduction (66%) is less than 80%, though for most events it can be expected that 80% of the phosphate will be captured by the IESF.

Acknowledgements

The authors thank the Wright County Soil and Water Conservation District for their tireless effort while partnering on this project.

Item 9b

Judie Anderson

From: West Metro Water Alliance [West_Metro_Water_Alliance@service.govdelivery.com]
Sent: Tuesday, October 04, 2016 2:18 PM
To: judie@jass.biz
Subject: Water Links Fall 2016

FALL 2016

ABOUT WATER LINKS

Water Links provides monthly updates from the West Metro Water Alliance (WMWA). Water Links features news, events, project updates and tips related to water quality issues.

IN THIS ISSUE

ABOUT WMWA

WMWA is a working group of agencies with a common interest in water quality and stormwater management. The group collaborates on various projects related to education and outreach on water quality issues.

WMWA partners include:

Bassett Creek watershed

Elm Creek watershed

Shingle Creek & West Mississippi River watersheds

Hennepin County

Rake up your leaves

5 bags of unraked leaves creates 1,000 pounds of algae in the lakes

Fall is a magical time of transformation as mornings turn crisp and the brilliant leaves flutter down to find their way to the…street? In natural landscapes, leaves blanket the forest floor and eventually become rich soil. But as we have interrupted the natural cycle with our homes and other "people spaces," much of the land is covered by impervious surfaces like streets, parking lots and roofs. And instead of water and nutrients making their way in to the soil, storm drains provide an expedient and direct route for pollutants - in this case leaves - on streets to flow into our waters.

How could leaves be considered a pollutant? After all, they are natural! Although leaves have valuable nutrients that can be turned into rich compost and be reused by plants, these nutrients are not natural to lakes and create excess algae. One pound of phosphorous contained in organic matter such as leaves creates about five hundred pounds of algae. Raking up leaves and grass clippings is critical to keeping our lakes swimmable and fishable for us to enjoy.

Although cities sweep the streets, cities can't possibly time it perfectly to capture all of the leaves. The help of local residents is important. Some citizens have started "Community Clean Up" events, days where residents get together to rake and bag leaves off the street. There are free toolkits available for hosting such events through the Freshwater Society. Visit http://freshwater.org/community-clean-ups-for-water-quality/ to get started with a small chore that can make a big impact.

This fall, residents are encouraged to do their parts and rake up and compost leaves. Jumping in them beforehand is encouraged—followed by a nice cup of cider. Since most land in Minnesota (about 78%) is privately owned, the way individuals manage their own resources makes all the difference on our collective public resources.

Photo credit: Dawn Pape

Minnesota's new buffer initiative

What's the big deal about buffers? A buffer is vegetated land adjacent to a stream, river, lake or wetland and they can do a lot of good! Buffers help slow the flow of water across the land and they filter out phosphorous, nitrogen, and sediment - all pollutants

Three Rivers Park District

Freshwater Society

Several cities

SIGN UP

Please forward this email to interested individuals and encourage them to sign up.

Sign up!

CONTACT US

Email WMWA.

that degrade the quality of our lakes and streams. Buffers also help stabilize lake shores and streambanks against erosion, which also improves water quality and protects important shoreland habitats.

For these reasons, the State of Minnesota recently began a new “Buffer Initiative” that will soon require public waters in the state - lakes, rivers and streams - to be surrounded by vegetated buffers 50-feet wide (on average) and public ditches to have 16.5-foot wide buffers. While buffers of native plants are best, any vegetation (including turf grass) is allowed in this new rule. Buffers will need to be installed on public waters by November 2017 and on public drainage systems by November 2018. In all, the new initiative will result in about 110,000 acres of buffers along Minnesota waterways.

The Minnesota Department of Natural Resources recently released buffer maps that show which waters are subject to the new requirements. Landowners can use these maps to determine if buffers are needed on their property. Most of the new buffers will be established in rural areas rather than within cities. And, the new rules will not impact lakeshore residents who have beaches, docks or landscaping - although those properties must comply with existing DNR, county and watershed district rules.

The Hennepin County Environment and Energy Department will be contacting landowners who may be affected by this new law in the fall of 2016. Learn more about the buffer initiative.

Hennepin County field day highlights soil health and water quality

Winter rye provide low-cost, high quality feed and allows the farmers to plant three crops in two years.

On a warm day in August, the Patnode Family Dairy Farm in Corcoran was the center of attention. The farm hosted an event highlighting the results of their Minnesota Department of Agriculture Sustainable Agriculture Demonstration Grant project, “Three-Crops in Two Years for Farm Profit, Soil Health & Water Quality: Winter Rye after Corn Silage Managed for Forage”. This informal learning session gathered together farmers and scientists to consider soil quality, pollution prevention, and enhanced farm productivity.

The event was sponsored by the MN Dept. of Agriculture, UM Extension-Hennepin County, the Sustainable Farming Association of MN, and AG Resource Consulting, Inc. of Albany, MN. Lunch was provided by the Corcoran Locker.

This well-run family dairy farm in the Elm Creek Watershed includes 80 cows and 400 acres and is adding a new free stall for more capacity and a manure storage structure. Thirty attendees, including a majority of local farmers, learned about the successes and challenges of using cover crops for improved productivity, water holding capacity, and the benefits of keeping soil and nutrients on the field where they belong.

Daryl, Lori and Andrew Patnode described their experiences growing, harvesting and feeding winter rye on their dairy farm and reported that they were pleased with the results, both the quality of the feed they produced, and how the system fit into their overall operation. They said the winter rye provided a good seedbed for this year's soybean crop as well.

As a cover crop the winter rye protected the soil during the fall, winter, and spring by keeping living roots in the soil and providing soil cover. As silage, the rye produced a low-cost quality feed early in the spring. And, soil erosion and polluted runoff was minimal.

"Soil Health and the Successes and Challenges of Cover Crops" was presented by Glen Borgerding CCA, and James Schroepfer, B.S. Agronomy, AG Resource Consulting, Inc. They emphasized the agronomic potential of keeping the soil covered and keeping living roots in the soil. Advances in our understanding of soil biology is opening up a whole new chapter in our management of agriculture soils in ways that can reduce the need to apply nutirents, improve productivity, and greatly improve infiltration and water holding capacity –the opposite of runoff!

Jason Walker form the Sustainable Farming Association of MN described their many programs aimed at soil quality and how they are making a real impact across the state and nation. Jason shared the five soil health principles: keep the soil covered; minimize soil disturbance; increase crop diversity; keep living roots in the soil; and, integrate livestock. Alatheia Stenvik, MN Dept. of Ag. (MDA), highlighted the Sustainable Ag. Demonstration Grant program for farmers to try out new and innovative practices. See the "Greenbook" of this year's and previous projects.

Tracking the carp: Twin Lake project underway

Have you ever watched a large carp stir up the bottom of a lake or river? As they root around for aquatic plants to eat, they degrade water quality - especially in shallow lakes. Their activity can make the water turbid and releases phosphorus and other nutrients into the water, causing algae blooms and a cascade of other impacts. The Shingle Creek Watershed Management Commission recently received a$100,000 grant to study and manage the carp population in the three basins of Twin Lake - Upper, Middle, and Lower - and downstream in Ryan Lake in Brooklyn Center, Crystal, Robbinsdale, and Minneapolis. A large carp population is known to reside in these lakes and all four lakes were listed by the State as Impaired Waters for excess nutrients, although two have since been "delisted" based on improved water quality. Managing the carp population is an important component of improving and protecting water quality in the lake system.

In late September 2016, up to 45 carp in the lake chain will be implanted with tiny radio transmitters. This will enable biologists to follow how they move around the lake system, and where they congregate. Mobile antennas will be used periodically to determine locations of the tagged fish, and a fixed antenna on land will track whether the fish are actually traveling out of the lake system. Once their overwintering locations are found, commercial fishermen can harvest the fish and bring the population down to a manageable level.

The carp will be tracked through winter 2017-2018, and the potential fish harvest will take place in early 2018, before spawning season. Stay tuned to find out how many pounds of carp they harvest! See project updates.

Events

Aquatic Invaders Summit

October 5 – 6, River's Edge Convention Center, St. Cloud MN
Learn more

Water Resources Conference

October 18 – 19, St. Paul RiverCentre
Learn more

Mississippi River Forum Workshop

Friday October 14, 2016 from 8:30 a.m. to 12:30 p.m at the Science Museum of Minnesota, Saint Paul.

Topics will include:

- Getting to Clean Water: How Do the Economics of Cropping Systems Measure Up?
- Ecosystem Services: Putting People and Land into Water Management Water: Right or Commodity?

Learn more. To RSVP, and for more information, contact Lark Weller at 651-293-8442 or lark_weller@nps.gov.

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