elm creek
Watershed Management Commission

ADMINISTRATIVE OFFICE
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www.elmcreekwatershed.org

March 2, 2022

Members
Technical Advisory Committee
Elm Creek Watershed Management
Commission Hennepin County, MN

Dear Members:

A meeting of the Technical Advisory Committee of the Elm Creek Watershed Management Commission will be held on **Wednesday, March 9, 2022, at 9:00 a.m.** This will be a virtual meeting.

The initial 2022-2023 WBIF Convene Meeting will take place during the TAC meeting, at 10:45.

To join the meeting, click https://zoom.us/j/990970201 or go to www.zoom.us and click **Join A Meeting**. The meeting ID is **990-970-201**. The password is **water.**

If your computer is not equipped with audio capability, you need to dial into one of these numbers:

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+1 301 715 8592 US

Meeting ID: 990 970 201. Passcode: 579973

The meeting is open to the public via the instructions above.

Thank you.

Judie A. Anderson
Administrator
JAA:tim
Encls:

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AGENDA
Technical Advisory Committee
March 9, 2022 | 9:30 a.m.

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Meeting ID: 990 970 201. Passcode: 579973

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1. Call to Order.
   a. Approve agenda.*
   b. Approve Minutes of February 9, 2022, meeting.*
2. Updated Low Floor Rules.*
3. Updated Impervious Rules.*
4. Preliminary 2022 CIPs.*
   a. Table 4.5.*
5. RFPs - Revisions to HUC 8 Model.
   a. Barr.*
   b. Stantec.*
6. Other Business.

7. WBIF Convene Meeting – 10:45 a.m.
   a. Process.*
   b. Guidance.*

8. Next TAC meeting _____.
9. Adjourn meeting

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*in meeting packet
**available at meeting

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Technical Advisory Committee Meeting
Minutes
February 9, 2022

I. A virtual meeting of the **Technical Advisory Committee (TAC)** of the Elm Creek Watershed Management Commission was convened at 9:33 a.m., Wednesday, February 9, 2022.

In attendance: Heather Nelson, Champlin; Kevin Mattson, Corcoran; Nico Cantarero, Stantec, Dayton; Derek Asche, Maple Grove; Matt Danzl, Hakanson-Anderson, Medina; Ben Scharenbroich, Plymouth; Ross Mullen, Ed Matthiesen, and Diane Spector, Stantec; James Kujawa, Surface Water Solutions; Rebecca Carlson, Resilience Resources; Kurt Guentzel and Kevin Ellis, Hennepin County Dept. of Environment and Energy (HCEE); Brian Vlach, Three Rivers Park District; and Amy Juntunen and Judie Anderson, JASS.

Not represented: Rogers.

Also in attendance: Ken Guenthner, Corcoran; Nathan Campeau, Joe Waln, and Heather Lau, Barr Engineering, and Jeff Weiss, Minnesota Department of Natural Resources (MNDNR).

II. Motion by Scharenbroich, second by Cantarero to approve the **agenda.*** *Motion carried unanimously.*

III. Motion by Scharenbroich, second by Cantarero to approve the **minutes*** of the January 12, 2022, meeting. *Motion carried unanimously.*

IV. Third Party Review of Preliminary HUC-8 Model.

A. Stantec February 2, 2022, update.* The MNDNR partnered with the Federal Emergency Management Agency (FEMA) to update the base flood elevation across the watershed for a future Flood Insurance Study (FIS). Member cities of the Elm Creek Watershed Management Commission (Commission) noted significant differences between the flood elevations in the 2016 FIS compared to the preliminary Elm Creek Floodplain Modeling and Mapping HUC-8 study (Preliminary HUC-8 Study) completed by Barr Engineering.

In some locations, the Preliminary HUC-8 results show a base flood ("100-year" or 1%-annual exceedance-probability event) that is up to 7' or 8' higher than the reported 2016 FIS elevations. Based on historic flooding reports and historic knowledge in the watershed, these results are outside of expected flooding conditions, even considering climate change impacts (more rain in a shorter amount of time). The base flood elevation published in the FIS sets the floodplain inundation extents and is particularly important as there are local, state, and federal regulations governing development. For example, existing single-family homes with a federally backed mortgage (approximately 95% of all mortgages) are required to buy subsidized flood insurance that may cost between a few hundred to tens of thousands of dollars per year. The floodplain also substantially increases costs for new construction due to the increased cost associated with bringing in fill (i.e., raising ground level) to reduce flood risk, which leaves the area undeveloped.

The purpose of this update is to provide a work scope to make revisions to the Preliminary HUC-8 based on Stantec's Third-Party Review, which identified four reasons the Preliminary HUC-8 base flood elevations were so much larger than the 2016 FIS. In summary, the recommendations from the Third-Party Review were:

1. Recommendations for the *hydrologic* model: Include floodplain storage, especially in the upper watershed, to account for off-channel floodplain storage on the landscape.

2. Recommendations for the *hydraulic* model:

a. Revise the hydraulic model with the best available data collected by the member cities and provided in the Third-Party Review. *Benefit: Model will use all surveyed structures and as-built drawings previously provided to the Commission, resulting in improved model accuracy.*

b. Modify reaches (streams/watercourses) that are modeled as broken up segments and not as a continuous reach. *Benefit: This will provide more accurate flood elevations.*

Update: On January 20, 2022, Derek Asche, chair of the TAC, and Ross Mullen, representing the Commission, met with Jeff Weiss of the MNDNR Floodplain Group to present the Third-Party Review. The MNDNR acknowledged the existing hydrologic and hydraulic model problems and that the MNDNR has made similar such revisions in the other Twin Cities HUC-8 watersheds; however, the MNDNR stated that they have neither time nor financial resources available to complete the recommended revisions as the number of revisions exceeds those of other watersheds and they are under no contractual obligation to make such changes. The MNDNR said all such revisions to the hydrologic and hydraulic models (and thus the floodplain maps) must be made by the Commission.

The following discusses Stantec's approach to build on the diagnostic work completed for the Third-Party Review and to make the recommended revisions to the model. *(Numbering corresponds to that used in Stantec's document.)*

1.0 Hydrologic Model (HEC-HMS) Updates. Budget: $7,700

a. Replace the Muskingham-Cunge shortened simplified trapezoidal bank-width cross sections with reservoir routing, to account for the full storage and attenuation of the floodplain for up to 55 watersheds. *Benefit: Provide a better estimate of peak streamflows for the regulatory flood events.*

b. Rerun the calibration events included in "*Elm Creek Narrative and QAQC Documentation*" (Barr Engineering Co., 2021) to verify that the model calibration is still valid. The goal is to preserve or improve the calibration as indicated by an improved Nash-Sutcliffe Efficiency Index (a commonly used statistical measurement indicating "goodness of fit").

2.0 Hydraulic Model (HEC-RAS) Updates. Budget: $4,700

a. Update the hydraulic model with the updated flows from the hydrologic model (HEC-HMS) as described in the preceding section for the 10%, 2%, 1%, 0.2%-annual-exceedance-events. *Benefit: Provide a better estimate of peak water surface elevations for the regulatory flood events.*

b. Update 52 bridges, culverts, weirs, and dams based on construction drawings, survey, and as-built data as shown in the Third-Party Review. (Stantec was not able to locate better data for an additional 27 structures).

c. Add the Elm Creek Dam (Mill Pond Dam) to the model based on City of Champlin as-builts.

d. Update the model to correct the stream alignments at:

1) *County Ditch 16* east of Brockton Lane (CR 101). The modeled stream alignment is through a series of stormwater ponds to the east of the intersection of Vagabond Lane and south of Bass Lake Road. The modeled alignment of County Ditch 16 will be corrected to show the watercourse is piped beneath Vagabond Lane to the north.

2) *Unnamed Tributary* to Elm Creek (HEC-RAS Reach *ElmCreek_BR4*) just southeast of the intersection of Hackamore Road (CR 47) and Brockton Lane (CR 101) in Plymouth. The modeled stream alignment appears to show a temporary construction alignment of the creek. The alignment will be updated to follow the permanent alignment of the watercourse.

Benefit: Model will use all surveyed structures and as-built drawings previously provided to the Commission, resulting in improved model accuracy.

e. As directed by the MNDNR, either recombine model reaches that were split at stream confluences in the Preliminary HUC-8 model or update the boundary conditions of the existing severed reaches. It is unclear why the modeled reaches were separated; however, the severed reaches have resulted in disparate base flood elevations from one stream to the next. *Benefit: Provide: ????*

f. Run the updated the hydraulic model (per items 1 through 4 above) with the updated flows from the hydrologic model (HEC-HMS) as described in the preceding section for the 10%, 2%, 1%, 0.2%-annual-exceedance-events. *Benefit: Provide a better estimate of peak water surface elevations for the regulatory flood events.*

3.0 Memorandum of Updates. Budget: $2,300 Stantec will prepare a memorandum describing the updates to the hydrologic and hydraulic models. The memorandum will discuss the revised model results for the calibration events in the "*Elm Creek Narrative and QAQC Documentation*" (Barr Engineering Co., 2021). The memorandum will be a documentation of changes that were made by Stantec and will be an addendum to the previously submitted materials to the MN DNR. Stantec will follow the same protocol and standards defined by FEMA.

4. Deliverables. Stantec will provide the following deliverables:

a. Updated hydrologic (HEC-HMS) model in version 4.3 (same as used for the Preliminary HUC-8 analysis)

b. Updated hydraulic (HEC-RAS) model in version 5.07 (same as used for the Preliminary HUC-8 analysis)

c. Memorandum describing the model updates.

5. Assumptions:

a. Our understanding is based on a working version (not final version) of the HEC-HMS model provided by the MNDNR to Stantec on January 24, 2022

b. Based on our discussion with Jeff Weiss on January 20, 2022, Stantec will not produce mapping products for the MNDNR, such as depth grids, inundation shapefiles, cross-sections, or stream centerlines as the MNDNR does not require these deliverables.

c. Stantec will not analyze or determine the floodway extents.

d. No additional model modifications will be made based on MNDNR review comments.

6. Schedule. The MNDNR has indicated that any rework must be completed by March 31, 2022. The MNDNR is partnered with the University of Minnesota-Duluth to create mapping products, which is contracted to begin in May 2022 and be delivered to FEMA by September 2022.

B. Barr Engineering February 2, 2022, Additional Services Outline.* In January 2022, Barr learned of hydrologic modeling concerns expressed by another consultant in a third-party review (Stantec's

December 22, 2021, correspondence to ECWMC member cities) and through comments from the MNDNR. Following notification of these concerns, Barr performed an internal review using senior technical staff not involved in the original project. Based on this review, they concluded that some adjustments to the hydrologic modeling were warranted. Barr staff were also notified that additional data not provided to Barr as part of the original modeling effort might better inform the hydraulic modeling. The work Barr completed under the original contract incorporated the best data available at the time. Given this information, Barr recommends that additional work be performed, as outlined hereafter. *(Numbering corresponds to that used in Barr's document.)*

Barr recommends the following tasks and has provided corresponding estimated budget ranges to complete the FEMA floodplain hydrologic and hydraulic modeling. A range of budget estimates are presented because Barr has not obtained all of the MNDNR comments or had a chance to provide the MNDNR with the results of our internal review. Barr will provide detailed budgets if desired by the Commission. Barr's understanding is that the MNDNR will be performing all floodmapping services at the conclusion of hydraulic modeling, so this scope does not include any floodmapping tasks.

1a. Barr proposes to correct the **hydrologic modeling** deficiencies identified by MNDNR and Barr's post-project internal review. Their internal review identified areas where the hydrologic modeling approach should be changed to account for flow attenuation from storage. Barr will perform this work at no cost to the Commission or the MNDNR. The scope of the updates will be developed based on further discussion with the MNDNR and will include one round of review with the Commission and MNDNR. Estimated Cost: $0

1b. Stantec's December 22, 2021, Third-Party Review Correspondence Comments. Barr will address the comments identified in the referenced correspondence consistent with MNDNR comments and our internal review. Recognizing that there can be multiple appropriate hydrologic modeling methods used in this watershed, Barr does not believe additional changes are necessary to the hydrologic modeling methodology. If, after further discussion, the Commission would like to change the methodology as Stantec has suggested, Barr could make those changes. Changing the hydrologic modeling approach would require a recalibration of the model to the stream gage. This second hydrologic update includes one round of review with the Commission and MNDNR. Estimated Cost: $10,000–$25,000

2. Most of the significant **hydraulic modeling** updates stem from newly available hydraulic structure data. Barr will update the hydraulic models with any new flows from Tasks 1 and 2 and with new hydraulic structure data. The Stantec memo also recommends updating boundary conditions, a relatively minor task (up to 2 hours). Barr will perform this work at no charge if further discussion with the MNDNR indicates this change is desired. The overall hydraulic update includes one round of review with the Commission and MNDNR. Estimated Cost: $5,000–$15,000

3. Proposed Schedule. Barr's understanding is that the schedule for completing this work is not known. Barr will work with the Commission and MNDNR to meet the Hennepin County floodplain mapping project schedule.

C. TAC Discussion.

Corcoran: We have been doing LOMRs for anyone near the floodplain.

Plymouth and Corcoran: Current is not reasonable model.

Maple Grove: Agree, needs to be more aligned with what we see.

Dayton: Agree, [this mode] puts city staffs in tough position.

Champlin and Medina: Agree.

Mullen: 7-8 foot is in Medina headwaters, huge wetland complex upstream, storage was excluded from the analysis, trying to tie hydraulics and hydrology together.

Wahl: fixes will include the Medina wetland complex

Campeau: internal audit showed attenuation issue, agree best structural information should be included

Maple Grove: When did Barr become aware of 7-8 foot disparity?

Campeau: a week ago.

Unknown: This was discussed at length summer-fall 2020

Maple Grove: Commission may not feel they got that communication.

Kujawa: Does Atlas 14 precipitation affect these flows?

Waln: Ten-day 24-hour storm.

Mullen: As you go downstream, disparities are smaller.

Vlach: Remind individuals that TRPD and the Commission are cooperatively monitoring so we have quite a bit of monitoring data that could be used.

Unknown: Can cities use model to provide specific information to, say, property owners? Flood risk. How can they figure out what elevations make sense?

Kujawa: Nice to have comparison of 100-year before and now.

Mullen: Can do some visuals.

Corcoran: Is March 31 deadline realistic?

Weiss: Could accept later than that.

Maple Grove: Can we go to April 30?

Weiss: Yes.

Maple Grove: Could be mid-May?

Weiss: FIS developed based on existing development, not fully developed.

Unknown: Additional calibration points add more complexity, look at where TRPD models.

Plymouth: why was TRPD data not used:

Barr: not aware of data.

Waln: There was additional data we were not aware of at the time.

Campeau: May not be old enough.

Guentzel: Why such a range of costs?

Campeau: Only had two days to come up with budget. We don't have all the comments. After reading, not much difference in hydrology costs. Agreement with DNR on what appropriate hydrology should be used. On hydraulic side, don't know how many structures will need to be added.

Dayton: Can be some dedicated outreach to city staffs.

Campeau: After Task 1 would have hydrologic model ready for DNR. Not a lot of difference. Biggest difference is the methodology.

Mullen: Task 1 and Task 1a and both Task 2s correlate.

Campeau: Task 1b would probably go away.

Corcoran: Are the end products comparable?

Maple Grove: Looking for a table of the crossings.

Plymouth: Visual components work for me, too.

Champlin: Is it possible to add an additional layer?

Weiss: We generally layer the existing and the proposed.

Medina: Do we need to make a recommendation today?

Weiss: will be more watersheds in the end.

Guenthner: We have apples to apples comparison and what the deliverables are.

Unknown: March approve proposal, work in in May. Comments from cities in June. Commission approve in July. Outputs – figures, tables, GIS, SHAPE files, story map. Interactive mapping takes more time. Cities have sit-down for personalized presentations, model calibration , stakeholder meetings, extra locations.

Maple Grove: Stakeholder meetings between May and July. RFP out this week. Along with Weiss' memo. Back by March 2 for packet. Discuss and recommend March 9.

Weiss: Process is playing out well.

V. Cost Share Policy.*

The Cost Share Policy calls out the Commission's maximum annual share of the cost of a capital project to be up to $250,000 and its maximum annual ad valorem tax levy to be $500,000. Due to the rising cost of projects, it is anticipated future projects will exceed those limits.

Motion by Scharenbroich, second by Nelson to eliminate the annual cost of a capital project, set the maximum annual ad valorem levy at $750,000, retain the 25% of project cost to be borne by the Commission, and recommend these revisions to the Commission. *Motion carried unanimously.*

Members are reminded to review the current CIP and to make any adjustments, revisions, and additions in anticipation of discussing the Capital Improvement Program at the March meeting. Staff will send a reminder of this request and an Exhibit A with which to add projects to the spreadsheet.

VI. Operations and Maintenance Agreements.*

Often development projects are approved contingent upon receipt of an Operations and Maintenance (or other) agreement. This agreement is usually between the city and the project owner and requires approval by the Commission's technical staff. In some cases, this agreement cannot be generated until final plat occurs, sometime years into the future.

Since the City in which the project resides is ultimately responsible for having such an agreement in place to document the future operations and maintenance of the stormwater pond/device/structure, Staff were concerned that the language in the Commission's Rules is inadequate for this purpose. If such language were to be included as a condition for final approval of a project, it would remind cities that this is their responsibility, and Commission staff would not have to undertake the lengthy and costly process of ascertaining that the agreements are in place.

At the January meeting, Staff presented a possible remedy for this process. Members expressed concerns that the proposed language may not adequately address this issue and requested Staff to go back to the Commission's attorney with their concerns.

**included in meeting packet*

In the February meeting packet, Staff's memo has been updated to reflect Commission attorney Joel Jamnik's response. Jamnik indicated that Rules B.6 and B.7 of the Commission's procedural requirements do not affect his earlier recommendation.

Motion by Cantarero, second by Scharenbroich to revise the approving language to read: "Conditions of approval for project reviews and agreements implementing those conditions that bind future owners of the project shall be recorded to provide notice to future owners of the conditions of approval and the future owners' continuing operation and maintenance obligations." Motion carried unanimously. This revision is effective upon approval by the Commission at its March 9, 2022, meeting.

In checking with Steve Christopher, BWSR Board Conservationist, he indicated that the "changes recommended to the Elm Creek Watershed Management Commission in the February 2, 2022 memo from you to the Elm Creek TAC Members fall under Minnesota Rule 8410.0140 Plan Amendments Subp. 1a. Changes not requiring an amendment. Specifically, the changes meet [Section] F. adjustments to how an organization will carry out program activities within its discretion. There are no proposed changes to the existing goals, priorities or outcomes and this will aid the Commission in achieving its stated objectives within the Watershed Management Plan."

VII. 2022 Work Plan.

Included in the meeting packet was a copy of the **proposed 2022 Work Plan.*** Members were requested to review it and to contact the administrative office with proposed updates/revisions. They were also encouraged to review the final PRAP report, which was available at the January regular meeting, and incorporate responses to the Board of Water and Soil Resources' (BWSR's) recommendations in their updates. A final draft of the 2022 Work Plan will be presented for approval at the March TAC and regular meetings.

VIII. Watershed Based Implementation Funding (WBIF).

The Board of Water and Soil Resources (BWSR) biennially appropriates funding for a program called Watershed-Based Implementation Funding (WBIF). The WBIF funding is allocated to targeted watersheds to be distributed according to guidelines agreed upon by the eligible entities in the allocation area ("the Partnership"). The BWSR Board approved allocations for fiscal year 2022, including $297,774 to the Elm Creek allocation area which will become available July 1, 2022.

The BWSR Funding Policy for the program specifies that each Partnership will include one decision-making representative from each watershed district and/or watershed management organization, soil and water conservation district, county with a current groundwater plan, and up to two decision-making representatives from municipalities within the allocation area. For the Elm Creek allocation area, that would include the Elm Creek WMC, Hennepin County in its capacity as the county SWCD, and up to two cities. Other parties may participate in discussions regarding the use of the funding, but only the decision-making representatives may make the final recommendation to BWSR. The city and watershed representatives may be TAC members or Commissioners.

Staff recommends that at their meetings today the TAC and Commission discuss which two persons the cities would like to represent them at the first official convene meeting to be held at the March 9, 2022, meeting, and who should represent the watershed. Hennepin County will also be asked to designate a representative, and BWSR will be formally represented as well. At that meeting the group will begin discussing options for the use of the funds.

Staff further recommends that the TAC and Commission start thinking about their priorities and objectives for the funding. Activities eligible for funding span a very wide range of options, but all must be

**included in meeting packet*

focused on prioritized and targeted cost-effective actions with *measurable water quality results*. Funding is not limited to capital projects; anything in the Third Generation Plan's Implementation Plan may be eligible as long as its end goal is the protection and improvement of water quality. As a reminder, the Implementation Plan included four broad areas: 1) Regulation and Project Reviews; 2) Monitoring; 3) Education and Outreach; and 4) TMDL/WRAPS Implementation. This latter category encompasses a) Load reduction through land use change; b) Targeted load reduction through subwatershed assessments; c) Agricultural outreach; and d) Capital projects in the plan or a subsequently amended CIP.

Nelson and Cantarero volunteered to represent the cities. Guentzel and/or Ellis will represent Hennepin County. A representative from the Commission will be chosen at the regular meeting.

IX. Other Business.

A. Included in the meeting packet was an update from Jim Herbert, Barr Engineering, announcing a new wiki page in the Minnesota Stormwater Manual dedicated to guidance on crediting proprietary **manufactured treatment devices** (MTDs).

B. Topics for future TAC meetings.

1. Review RFP responses – Floodplain Mapping.
2. Follow-up - PRAP subcommittee meeting.
3. Watershed-wide TMDL 5-year review.
4. Follow-up - Convene meeting, FY22-23 WBIF program.
5. Consider projects for 2022 Stormwater, Wastewater and Community Resilience Planning Grants.
6. Consider projects/programs as line items in 2023 Operating Budget (by April 2022).
7. Review Project Review Fee Schedule.
8. Others?

X. There being no further business, the meeting was adjourned at 11:27 a.m.

Respectfully submitted,

Judie A. Anderson
Recording Secretary
JAA:tim

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**included in meeting packet*

To: Elm Creek Watershed Management Commissioners and Member Cities

From: Ross Mullen, PE, CFM and
Jim Kujawa

Date: February 18, 2022

Subject: Proposed rules revisions regarding low floor/freeboard

INTRODUCTION AND PURPOSE

Rule D.3.b.i.7 of the 2015 Elm Creek Watershed Management Commission Third Generation Plan states, "*The low floor shall be at minimum two feet above the critical event 100-year elevation and a minimum one foot above the emergency overflow elevation of nearby waterbodies and stormwater ponds".*

The ambiguity in Rule D.3.b.i.7 has prompted some questions on the part of technical staff, member community, and members of the Technical Advisory Committee (TAC), such as:

- *What was the policy goal for the rule?*
  - *Limit surface water flooding?*
  - *Limit groundwater-induced flooding, including:*
    - *seepage through foundation walls*
    - *structure failures at foundation walls caused by hydrostatic pressure?*
    - *structural failure caused by buoyancy forces on footings?*
  - *Cascade failure from a combination of the above (e.g. a power outage occurs simultaneous with a flood and sump pump without battery backup is unable to pump groundwater away from the foundation).*
- *Under the low floor rule, what constitutes a "stormwater pond or waterbody"? Are localized depressions used to convey stormwater runoff to catch basins included?*
- *What constitutes "nearby"? Are structures not immediately adjacent to the floodplain that have proposed lowest floors beneath the floodplain elevation subject to the rules? How far away must structures be placed to be exempt from these rules?*

The Commission's technical staff and TAC met to discuss rules revisions for the low floor rules based on the risk to structures at the June and December 2021 TAC meetings. The Commission's technical staff and TAC have also reviewed freeboard rules required by state agencies, member cities, and adjacent watersheds as listed in Table 1. Freeboard is the technical term applied to the vertical height between the 100 Year event peak flood stage and the lowest regulatory height that a structure must be built to. Minnehaha Creek Watershed District is the only jurisdiction that uses the low opening as the regulatory height instead of the low floor (used by all other entities reviewed in Table 1).

Table 1 Freeboard Policies by ECWMC Technical Staff and the Technical Advisory Committee

State Agencies	Cities		Watersheds
Minnesota Department of Natural Resources	Elm Creek WMC Member Cities	Champlin	Coon Creek Watershed District
		Corcoran	
		Dayton	Minnehaha Creek Watershed District
		Maple Grove	
		Medina	Shingle Creek and West Mississippi WMCs
		Plymouth	
		Rogers	

The Commission's technical staff and TAC have determined that transition from the existing rules to a three-tiered approach based on the unique flood risk posed to structures based on the flooding source without over complication of the ECWMC's rules.

The Commission's technical staff and TAC recommend the tiered approach to recognize the differences in flood risk from large waterbodies that may have flood stages that last weeks or months from those of small stormwater ponds and waterbodies where the flood stages last hours or days. The flood risk, especially that caused by groundwater sources, is significantly lower to structures surrounding these small stormwater ponds and waterbodies.

Exhibit A shows a diagram of the proposed freeboard requirements.

TIMELINE

This rule shall go into effect as soon as Commissioner's approve the revisions and a Minor Plan Amendment is approved by the Minnesota Board of Soil and Water.

REVISIONS

1. Revise Rule A to include the definition of “Low Opening”.

    a. “*Low Opening. The low opening is the lowest elevation of an enclosed area, such as a basement, that allows surface water to into the enclosed area. Examples of low openings, include but are not limited to doors and windows. Foundation wall cracks, drainage seepage through drain tile, and sewer backup elevations are not low openings.”*

2. Revise Rule D.3.b.i.7

    a. Existing: “*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.”*

    b. Proposed: *“Structures shall be elevated according to the following criteria based on the flooding source.*

        i. *Structures that are within the closed basin of naturally landlocked waterbodies and outside of the effective Federal Emergency Management Agency floodplain as shown on the Flood Insurance Rate Map and outside of the Commission’s floodplain shall meet the following criteria:*

            1. *The low floor must be at minimum one foot above the normal water level and*

            2. *The low floor must be at least two feet above the back-to-back 100-year 24-hour flood elevation.*

        ii. *Structures within the proposed Federal Emergency Management Agency and/or within the Commission’s floodplain (excluding FEMA Zone A areas) shall meet the following criteria:*

            1. *The Low Floor must be at minimum two feet above the 100-year flood elevation and at least one foot above the emergency overflow*

        iii. *Structures that are within the closed basin of naturally landlocked waterbodies and the Federal Emergency Management Agency and/or Commission’s floodplain shall have a low floor elevation at whichever elevation highest elevation calculated from the following:*

            1. *The low floor must be at minimum one foot above the normal water level and*

            2. *The low floor must be at least two feet above the back-to-back 100-year 24-hour flood elevation.*

            3. *The low floor must be at minimum two feet above the 100-year flood elevation.*

        iv. *Structures near the maximum inundation extents caused during the high-water level of nearby stormwater ponds and/or waterbodies that are outside of a naturally landlocked waterbody basin, Federal Emergency Management Agency floodplain, and the Commission’s floodplain shall meet the following criteria:*

a. *The Low Floor must be at minimum one foot above the normal water level of hydraulically connected waterbodies and*

b. *The Low Opening must be at least two feet above the 100-year flood elevation and*

c. *The Low Opening should be at least one foot above the emergency overflow and*

d. *Hydrogeological analyses demonstrating a structure is outside of the lateral transmissivity zone of groundwater flow mounding caused by the 100-year event on hydraulically connected waterbodies and based on the duration of the flood hydrograph in those hydraulically connected waterbodies, to the satisfaction of the Commission's engineer, may be used to exempt structures from the above rules.*

e. *Structures located greater than 200-feet away from the high-water level inundation of hydraulically connected waterbodies are exempt from the above rules.*

f. *The emergency overflow should be an overland flow section, where possible, but piped outlets with appropriate conveyance capacity that are designed to limit clogging may be used as determined by the Commission's Engineer*

v. *Structures adjacent to localized depressions use to route stormwater to waterbodies and stormwater ponds are exempt from these requirements.*

3. Revise Rule F.3.b

a. Existing: "*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.*"

b. Proposed: *"Structures shall be elevated to reduce flood risk as specified in Rule D.3.b.i.7."*

Exhibit A: Flow Chart of Proposed Changes to Low Floor/ Freeboard Rules

Developed by Jim Kujawa and Ross Mullen
February 18, 2021

Start

Basin type:

Naturally Landlocked Waterbody
(basin is 1 acre or larger with no natural outlet below the 100-year flood elevation as determined by the 100-year, 10-day runoff event)

Designed detention basin, BMP, river, lake, pond, stormwater pond, or wetland with outlet?

Floodplain Type

Not within FEMA or ECWMC jurisdictional floodplains

Simulate 100-year, critical duration event

Site is within either or both the:
A. FEMA Jurisdictional Floodplain: https://fema.maps.arcgis.com/apps/webappviewer/index.html?id=29f87515702d4845a906419b287e2049
B. ECWMC Jurisdictional Floodplain: http://www.elmcreekwatershed.org/uploads/5/8/3/0/58303031/ec_flood_study.pdf

End

A. The Low Floor must be at minimum one foot above the normal water level and
B. The **Low Floor** must be at least two feet above the back-to-back, 100-year, 24-hour flood elevation

Rule applies to all parcels near the maximum inundation extents during the 100-year event:
A. **The Low Floor** must be at minimum one foot above the normal water level of hydraulically connected waterbodies, and
B. The **Low Opening** must be at least two feet above the 100-year flood elevation, and
C. The **Low Opening** should be at least one foot above the **emergency overflo**w, and
D. Hydrogeological analyses demonstrating a structure is outside of the lateral transmissivity zone of groundwater flow mounding caused by the 100-year event on hydraulically connected waterbodies based on the duration of the flood hydrograph in those hydraulically connected waterbodies, to the satisfaction of the Commission's engineer, may be used to exempt structures from the above rules, and
E. Structures **located greater than 200-feet away** from the high-water level inundation of hydraulically connected waterbodies are exempt from the above rules, and
F. The **emergency overflow** should be an overland flow section, where possible, but piped outlets with appropriate conveyance capacity that are designed to limit clogging may be used as determined by the Commission's Engineer

The **Low Floor** must be at minimum two feet above the 100-year flood elevation and at least one foot above the emergency overflow

To: Elm Creek Watershed Management Commissioners, Technical Advisory Committee, and Member Cities

From: Ross Mullen, PE, CFM

Date: February 18, 2022

Subject: Minor rules revisions to align Elm Creek Watershed Management Commission rules with the latest Municipal Separate Storm Sewer System (MS4) permit

INTRODUCTION AND PURPOSE

In 2021, the Minnesota Pollution Control Agency (MPCA) issued a new a Municipal Separate Storm Sewer System (MS4) Phase II general permit to Minnesota cities. An individual MS4 Phase II permit requires a city to develop and implement a stormwater pollution prevention program to reduce the discharge of pollutants from their storm sewer system. All member communities in the Elm Creek Watershed Management Commission are MS4 Phase II permit holders.

The revised MS4 Phase II permit requires:

- For non-linear projects, treatment of the amount of 1.0-inches of runoff from new and fully reconstructed impervious surfaces.
- For linear projects, treatment of A) 1.0-inches of runoff from the new impervious surface or B) 0.50-inches of runoff from new and fully reconstructed impervious surfaces, whichever is greater.

The 2015 Third Generation Elm Creek Watershed Management Commission Plan rules require applicants to provide treatment in the amount of 1.1-inches of runoff from the net, new impervious areas for projects with construction disturbance of more than one acre.

The revisions to the MS4 Phase II permit create inconsistencies between the 2015 Third Generation Elm Creek Watershed Management Commission Plan rules and the rules of its member cities as required by the newest MS4 Phase II permit. We propose to revise the Commission's rules to align with the MS4 Phase II permit requirements. These proposed revisions will have the greatest impact to redevelopment, including public works projects (i.e. road projects) and will have negligible impact to new construction projects on greenfield sites. It is important to the Commission's member cities that its rules be aligned with their MS4 Phase II permit requirements to be at least as stringent as its member cities and to create consistency in the project review process.

TIMELINE

The MPCA updated MS4 discharge permits to the Commission's member cities in October and November 2021. The member cities have one year to come into compliance with the new MS4 Phase II permit requirements. Project reviews submitted to the Commission after November 30, 2022, shall be required to follow the revised requirements. This rule shall go into effect as soon as a member city fully implements its new MS4 Phase II permit and a Minor Plan Amendment is approved by the Minnesota Board of Soil and Water, no later than November 30, 2022.

REVISIONS TO THE THIRD GENERATION PLAN

1. Revise Rule A to include the definition of fully reconstructed impervious surfaces:

    a. "*Fully Reconstructed Impervious Surfaces. Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects, and other pavement rehabilitation projects that do not expose the underlying soils beneath the structure, pavement, or activity are not considered fully reconstructed. Maintenance activities such as catch basin repair/replacement, utility repair/replacement, pipe repair/replacement, lighting, and pedestrian ramp improvements are not considered fully reconstructed"*

2. Revise Rule A to include the definition of linear projects:

    a. *"Linear project". Linear projects are projects with construction of new or fully reconstructed roads, trails, sidewalks, or rail lines that are not part of a common plan of development or sale."*

3. Revise Rule D.2.b

    a. Existing: "*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."*

    b. Proposed: "*Linear projects that create one acre or more of new or fully reconstructed impervious surfaces must meet all Commission requirements for 1.1-inches of runoff from the new impervious surface or 0.55-inches from the combination of new and fully reconstructed impervious surfaces, whichever is greater."*

    c. *Linear projects that create one acre or more of new or fully reconstructed impervious surfaces must meet all Commission requirements for 1.1-inches of runoff from the new impervious surface or 0.55-inches from the combination of new and fully reconstructed impervious surfaces, whichever is greater. When this volume cannot be treated within the existing right-of-way, a reasonable attempt to obtain additional right-of-way, easement, or other permission to treat the stormwater during the project planning process must be made. Volume reduction practices must be considered first. Volume reduction practices are not required if the practices cannot be provided cost effectively. If additional right-of-way, easements, or other permission cannot be obtained, owners of construction activity must maximize the treatment of the water quality volume.*

4. Revise Rule D.3.c

    a. Existing: *"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."*

    b. Proposed: *"For non-linear projects, stormwater runoff volume must be infiltrated/abstracted onsite in the amount equivalent to one point one inch (1.1") of runoff generated from new and fully reconstructed impervious surfaces."*

Stantec

Memo

To: Elm Creek TAC

From: Diane Spector
Judie Anderson

Date: March 2, 2022

Subject: 2022 Potential CIP Minor Plan Amendment

Recommended TAC Action	Review the CIP proposals for 2022, and make a recommendation to the Commission on which should proceed to further consideration and a Minor Plan Amendment where necessary.

The following are potential CIP projects for the 2022 CIP. Two of the projects, the City Cost Share and Partnership Cost Share programs, were approved by the Commission in August 2021. Other projects on the potential CIP were previously added to the CIP for 2022 or were rescheduled to 2022. One new project, the South Fork Rush Creek Restoration project, is new and was submitted by Maple Grove for consideration. Those three projects would have to be added to the CIP via Minor Plan Amendment to be further considered. That MPA is scheduled to be initiated at the April meeting and finalized at the May meeting so that a maximum 2022 levy can be conveyed to Hennepin County by June 1.

This is presented for review and comment. If all projects proceeded as proposed the Commission would exceed the voluntary levy cap of $500,000 as stated in the Plan or as revised to $750,000 as recently discussed.

1. Do these projects as presented meet the criteria for CIP projects? Staff suggests that the Fox Creek South Pointe Restoration project be considered for funding via the City Cost Share program for smaller projects.
2. Are the cities all prepared to immediately move to construction or can one or more projects be postponed to the 2023 levy?
3. If the proposed levy still would exceed the voluntary annual cap, is the TAC willing to recommend to the Commission that the limit be exceeded in this case?
4. If not, then score and rank the projects established criteria to determine which highest priority projects should proceed to funding from the CIP.

Table 1. Potential 2022 CIP and levy.

Project	City	Commission Share	Levy
Ranchview Wetland Restoration	Maple Grove	$250,000	$265,125
Fox Creek, South Pointe Restoration	Rogers	22,500	23,861
Downtown Pond Expansion & Reuse	Rogers	101,500	107,641
Lowell Pond Raingarden	Champlin	100,000	106,500
Tower Drive West Stormwater Improvement	Medina	67,813	71,916
S Fork Rush Creek Stream Restoration* ◊	Maple Grove	270,834	287,219
City Cost Share*		100,000	106,500
Partnership Cost Share*		50,000	53,250
TOTAL		962,647	1,022,012

*New, to be added to CIP. ◊ See note in project description below

Project Descriptions

Ranchview Wetland Restoration. Restoration of hydrology and plant community of a 55 acre wetland located between 101st and 105th Streets and west of Ranchview Lane in Maple Grove. The project is intended to restore much of the lost function of the wetland including: flood and stormwater attenuation; vegetative diversity and integrity; wildlife, amphibian and invertebrate habitat; aesthetic, recreational and educational values; and a groundwater recharge area. Enhanced storage will help alleviate some of the downstream flooding and stream bank erosion that is currently occurring in Rush Creek and Elm Creek.

Fox Creek, South Pointe Restoration. This project will provide stabilization and protection along 600 feet of stream bank tributary to Fox Creek at its headwaters. The segment of Fox Creek between Pointe Circle and Erickson Park currently experiences erosion and stream bank failure from periodic high flow velocities. This project will provide stabilization for the stream banks and reduce sediment transport along Fox Creek and ultimately the Crow River. (Sediment Load Reduction: 12 - 24 tons/year, Phosphorus Load Reduction 12 - 24 lbs/year)

Downtown Pond Expansion & Reuse. Major water quality improvements are anticipated with this project for TP and TSS reductions. The pond expansion will also feature a stormwater reuse for the irrigation of nearby parks. The additional storage area will reduce flooding within the Downtown Rogers Area.

Lowell Pond Raingarden. Rain garden and other BMPs for areas tributary to Mill Pond/Elm Creek (directly upstream, adjacent to Elm Creek). Project will reduce sedimentation and total P going into he Mill Pond. Project will help improve conditions for aquatic species habitat including sensitive species such as Blanding's turtles.

Tower Drive West Stormwater Improvement. Install a filtration basin and accessory storm sewer for 5.4 acre drainage area (50% impervious) near 820-830 Tower Drive. The improvement would treat approximately 5.4 acres (50% impervious) which currently discharges untreated to Elm Creek. Estimated reduction of 1720 lb TSS and 3 lbs TP.

S Fork Rush Creek Stream Restoration. Stream restoration and floodplain re-establishment from 101st Avenue North, north to the confluence with the North Fork of Rush Creek. Approximately 7,200 linear feet. Estimated phosphorus reduction of 423.56 lbs per year, improved riparian environment, improved floodplain connectivity, improved recreation and access to the creek, improved education. ◊ Note: the 2022 proposed amount of $270,834 is 1/3 the total requested Commission share of $812,500.

City Cost Share. Funding for a program to share 50% in the cost of city projects up to $50,000.

Partnership Cost Share. Funding for a program to share up to 100% in the cost of voluntary projects on private property up to $50,000

Table 4.5. Elm Creek Third Generation Plan Capital Improvement Program

	Levy Proj #	Description	Location	Est Total Project Cost	2027	2026	2025	2024	2023	2022 Est Cost	2022 Levy Amount	2021 Est Cost	2021 Levy Amount	2020 Est Cost	2020 Levy Amount	2019 Est Cost	2019 Levy Amount	2018 Est Cost	2017 Est Cost	2016 Est Cost	2015 Est Cost	2014 Est Cost	Description	Line
1	2014-01	Tower Drive Improvements	Medina	$3,437,300																		68,750	Tower Drive Improvements	1
2	2014-02	Elm Creek Dam at Mill Pond	Champlin	350,000																		62,500	Elm Creek Dam at Mill Pond	2
3		TMDL implementation special study PLACEHOLDER	Watershed	$225,000.00																			TMDL implementation special study	3
4		Stream segment prioritization PLACEHOLDER	Watershed	$20,000.00																			Stream segment prioritization	4
5	2015-01	Elm Cr Reach E	Plymouth	$1,086,000.00																	250,000		Elm Cr Reach E	5
6	2016-01	CIP-2016-RO-01 Fox Cr, Creekview	Rogers	$321,250.00												0		0	0	80,312	0		CIP-2016-RO-01 Fox Cr, Creekview	6
7	2016-02	Mississippi Point Park Riverbank Repair	Champlin	$300,000.00												0		0	0	75,000	0		Mississippi Point Park Riverbank Repair	7
8	2016-03	Elm Creek Dam	Champlin	$7,001,220.00												0		0	0	187,500	0		Elm Creek Dam	8
9		Tree Thinning and Bank Stabilization Project PLACEHOLDER	Watershed	$50,000.00												~~50,000~~		~~50,000~~	~~50,000~~		0		Tree Thinning and Bank Stabilization Project	9
10	2017-01	Fox Cr, Hyacinth	Rogers	$450,000.00												0		0 ~~,000~~ 112,500		0	0		Fox Cr, Hyacinth	10
11		Fox Cr, South Pointe, Rogers MOVED TO 2021	Rogers	$90,000.00						22,500	23,861					~~22,500~~		0	~~22,500~~	0	0		Fox Cr, South Pointe, Rogers MOVED TO 2021	11
12		Other High Priority Stream Project PLACEHOLDER	Watershed	$500,000.00												~~125,000~~		~~125,000~~	0	0	0		Other High Priority Stream Project	12
13	2016-04 2018-01 2019-01	CIP-2016-MG-02 Rush Creek Main	MG	$1,650,000.00								~~25,000~~				25,000	26,513	75,000	~~75,000~~	75,000			CIP-2016-MG-02 Rush Creek Main	13
14		CIP-2016-MG-03 Rush Creek South	MG	~~$675,000.00~~														~~168,750~~					CIP-2016-MG-03 Rush Creek South	14
15	2018-02	CIP-2017-PL-01 EC Stream Restoration Reach D	Plymouth	$850,000.00														212,500					CIP-2017-PL-01 EC Stream Restoration Reach D	15
16		~~DNR #27-0437~~	MG	~~$75,000.00~~											4	0		0	0	0	0		DNR #27-0437	16
17		~~Stone's Throw Wetland~~	~~Corcoran~~													~~112,500~~		~~112,500~~	~~112,500~~	0	0		Stone's Throw Wetland	17
18		Other High Priority Wetland Projects PLACEHOLDER	Watershed	$100,000.00												0		0	0	0	0		Other High Priority Wetland Projects	18
19	2019-02	CIP-2016-MG-01 Ranchview W'land Restora MOVED TO 2019	MG	2,500,000.00						250,000	265,125					~~125,000~~		~~250,000~~	~~250,000~~				CIP-2016-MG-01 Ranchview Wetland Restoration N	19
20	2017-03	Mill Pond Fishery and Habitat Restoration	Champlin	$5,000,000.00												0		0	250,000	0	0		Mill Pond Fishery and Habitat Restoration	20
21		Other Priority Lake Internal Load Projects PLACEHOLDER	Watershed	$100,000.00												0		0	0	0	0		Other Priority Lake Internal Load Projects	21
22	2016-05	CIP-2016-MG-04 Fish Lake Alum Treatment-Phase 1	MG	$300,000.00																75,000			CIP-2016-MG-04 Fish Lake Alum Treatment-Phase 1	22
23		~~Stonebridge~~	~~MG~~	~~$200,000.00~~												~~0~~		~~0~~	~~50,000~~		~~0~~		~~Stonebridge~~	23
24	2017-04	Rain Garden at Independence Avenue	Champlin	$300,000.00												0		0	75,000		0		Rain Garden at Independence Avenue	24
25		CIP-2016-CH-01 Mill Pond Rain Gardens	Champlin	$400,000.00								~~100,000~~				~~100,000~~		~~100,000~~		0	0		CIP-2016-CH-01 Mill Pond Rain Gardens	25
26		Other Priority Urban BMP Projects PLACEHOLDER	Watershed	$200,000.00												0		0	0	0	0		Other Priority Urban BMP Projects	26
27	2020-01	Livestock Exclus, Buffer & Stabilized Access new 2020	Watershed	$50,000.00										50,000	53,025	0		50,000	0	0	0		Livestock Exclus, Buffer & Stabilized Access new 20	27
28	2020-02	Agricultural BMPs Cost Share new 2020	Watershed	$50,000.00										50,000	53,025	~~50,000~~ 20,000		50,000			0		Agricultural BMPs Cost Share new 2020	28
29		~~CIP-2016-RO-04~~ CIP-2017-RO-1 ~~Ag BMPs~~ Cowley-Sylvan Connections BMPs	Rogers	$300,000.00														75,000					~~CIP-2016-RO-04~~ CIP-2017-RO-1 ~~Ag BMPs~~ Cowley-S	29
30		CIP-2016-RO-03 Downtown Pond Exp & Reuse	Rogers	$406,000.00						101,500	107,641							101,500					CIP-2016-RO-03 Downtown Pond Exp & Reuse	30
31	2019-04	Hickory Dr Stormwater Improvement COST ADJUSTED 2019	Medina	$307,920.00												~~56250~~ 76,823	81,471						Hickory Drive Stormwater Improvement COST ADJU	31
32		SE Corcoran Wetland Restoration	Corcoran	$400,000.00												~~100,000~~							SE Corcoran Wetland Restoration	32
33	2019-05	Downtown Regional Stormwater Pond NEEDS FEAS STUDY	Corcoran	$105,910.00												~~10,000~~ 26,477	28,079						Downtown Regional Stormwater Pond REQUIRES F	33
34	2018-03	Elm Creek Stream Restoration Phase III	Champlin	$400,000.00														100,000					Elm Creek Stream Restoration Phase III	34
35	2018-04	Downs Road Trail Raingarden	Champlin	$300,000.00														75,000					Downs Road Trail Raingarden	35
36	2019-06	Elm Creek Stream Restoration Phase IV	Champlin	$600,000.00												150,000	159,075						Elm Creek Stream Restoration Phase IV	36
37		Lowell Pond Raingarden	Champlin	$400,000.00						100,000	106,500					~~100,000~~							Lowell Pond Raingarden	37
38		Rush Creek Headwaters SWA BMP Implementation	Rogers	$200,000.00																			Rush Creek Headwaters SWA BMP Implementation	38
39		Hydrologic & Hydraulic Modeling	Watershed	$25,000.00												0		25,000	0	0	0		Hydrologic & Hydraulic Modeling	39
40		Brockton Lane Water Quality improvements NEW 2019	Plymouth	$150,000.00				37,500	moved to 2024	~~37,500~~		~~37,500~~	moved to 2022			0							Brockton Lane Water Quality improvements NEW	40
41		Mill Pond Easement REMOVED 2019	Champlin	$64,000.00												~~16,000~~							Mill Pond Easement NEW, REMOVED 2019	41
42		The Meadows Playfield NEW 2019	Plymouth	$5,300,000.00				250,000	moved to 2024	~~250,000~~													The Meadows Playfield NEW 2019	42
43	2020-03	Enhanced Street Sweeper NEW 2019	Plymouth	$350,000.00										75,000	31,512								Enhanced Street Sweeper NEW 2019	43
44		Fourth Generation Plan	Commission	$70,000												0		0	0	0	0		Fourth Generation Plan	44
45	2021-01	Elm Road Area/Everest Lane Stream Restora NEW 2020	MG	$500,000								125,000	132,563										Elm Road Area Stream Restoration NEW 2020	45
46		Corcoran City Hall Parking Lot NEW 2020/RESCHEDULED 20	Corcoran	$40,000				10,000		~~10,000~~	~~10,605~~	~~10,000~~	moved to 2023										Corcoran City Hall Parking Lot NEW 2020. RESCHE	46
47	2021-02	EC Stream Restora Ph V Hayden Lk Outfall NEW 2020	Champlin	~~000,000 610900~~								150000.00	159,075										EC Stream Restoration Ph ~~IV~~ V Hayden Lake Outfall NEW	47
48		CSAH 12/Dayton River Road Ravine Stabilization	Dayton	$382,000				95,500																48
49		Tower Drive West Stormwater Improvement	Medina	$271,250						67,813	71,916			moved to 2022, Complete feasibility study, consider using iron-enhanced filtration, improvements to impervious areas.										
50		~~Grass Lake wetland monitoring~~	~~Dayton~~	~~$16,000~~						~~4,000~~		not considered to be a CIP by TAC												
		South Fork Rush Creek Stream Restoration	M Grove	$3,250,000				270,833	270,833	270,834	287,219													
51	New 2022	Update City-wide Stormwater Model	Champlin	$50,000				12,500																
52	New 2022	Reconstruct Bridge at Cartway and Elm Creek	Champlin	$950,000				237,500																49
53	Place holders for 2023 CIP	Lemans Lake Water Quality Improvements	Champlin	$100,000		25,000																		
54	Place holders for 2023 CIP	Goose Lake road Area Infiltraiton Improvements TMDL	Champlin	$200,000		50,000																		
55	Place holders for 2023 CIP	Mill Pond BMPs Water Quality Project Area	Champlin	$200,000		50,000																		
56		City Cost Share			100,000	100,000	100,000	100,000	100,000	100,000	106,500													56
57		Partnership Cost Share			50,000	50,000	50,000	50,000	50,000	50,000	53,250													57
58																								58
59		**TOTAL STUDIES**		245,000																			**TOTAL STUDIES**	59
60		**TOTAL CIPS**		36,899,600	100,000	125,000		1,383,333	526,333	962,647		275,000		175,000		278,300		764,000	437,500	492,812	250,000	131,250	**TOTAL CIPS**	60
61		**LEVY AMOUNT**									1,022,012		291,638		137,562		$ 295,138	462,500	$ 437,500	$ 492,812	$ 250,000	131,250	**LEVY AMOUNT**	61
62		**ACCUMULATED LEVY AMOUNT**									3,520,412		2,498,400		2,206,762		2,069,200	1,774,062	1,311,562	$ 874,062	$ 381,250	131,250	**ACCUMULATED LEVY AMOUNT**	62
		Projects awarded Henn. County ad valorem funding are highlighted in yellow.		40,873,850						Formula = Comm share x 1.05% for admin and other costs x 1.01% for levy shortfalls														

resourceful. naturally.
engineering and environmental consultants

BARR

March 2, 2022

Judie Anderson, Watershed Administrator
Elm Creek Watershed Management Commission
3235 Fernbrook Lane
Plymouth, Minnesota 55447

Re: Request for Proposal (RPF) Revisions to HUC-8 Model

Dear Ms. Anderson:

Barr is pleased to offer this proposal to provide additional FEMA floodplain modeling and mapping services for the Elm Creek Watershed Management Commission (ECWMC).

Background

In early 2020, ECWMC hired Barr to support a FEMA remapping effort in Hennepin County, led by the MNDNR entitled Elm Creek Floodplain Modeling and Mapping HUC-8 study (HUC-8 Study). As part of this work, Barr agreed to complete hydrologic modeling, hydraulic modeling, and floodplain mapping tasks for Elm Creek and several tributaries.

Over the next year, working closely with MNDNR staff, Barr completed the scope of work and received approval from the MNDNR.

In October 2020, the MNDNR and Interagency Hydrology Review Committee (IAHRC) approved the HUC-8 Study hydrologic modeling. In February 2021, Barr provided the initial hydraulic model to the MNDNR. Barr provided the initial mapping to the MNDNR in March 2021. After incorporating the MNDNR's comments, Barr provided the final model and mapping submittal to the MNDNR in April 2021. The MNDNR delayed the community review meeting for the deliverables and obtained an extension for the project from FEMA.

Cities of the ECWMC and the MNDNR noticed differences between the flood elevations in the current 2016 FIS when compared to the HUC-8 Study. In May 2021, another consultant was hired by the ECWMC to conduct a third-party review to understand these differences. The third-party review was completed in December 2021 and shared at the January 12, 2022, TAC meeting (Attachment B). Following notification of these concerns in January 2022, Barr performed an internal review by senior technical staff not involved in the original project. During the February 9, 2022, TAC meeting, a discussion between Stantec, Barr, ECMWC, and the MNDNR resulted in the issuance of an RFP to make revisions to the HUC-8 model.

Project Understanding and Scope of Work

On February 18, 2022, Barr received an RFP by the ECWMC requesting a scope of work to make revisions to the HUC-8 model provided by the MNDNR to the Commission on January 24, 2022. The RFP was a result of a third-party review of the HUC-8 model, which identified several potential reasons the HUC-8 base flood elevations were different than the 2016 FIS. A follow-up email from the ECWMC on February 22, 2022, resulted in a revision to the RFP for the exclusion of the 10% and 2% annual exceedance events comparison maps because FEMA does not publish those results in map format.

In response to the RFP, Barr proposes the following scope of work to complete the services.

Task 1. Hydrologic Revisions

Task 1a. Hydrologic Model Updates

Hydrologic modeling deficiencies were identified by the MNDNR and Barr's post-project internal review. Our internal review identified areas where the hydrologic modeling approach should be changed to account for flow attenuation from storage.

Barr will update the HEC-HMS model to better account for surface storage and flow attenuation within the watershed. We will do this by replacing the Muskingham-Cunge shortened simplified trapezoidal bank-width cross sections with reservoir routing for up to 55 subwatersheds, as identified in yellow on Figure 1 of the third-party review (Attachment B). Up to an additional 15 subwatersheds will be revised or subdivided to account for flow restriction locations identified in the hydraulics modeling. The subwatershed revisions will be important for model calibration using the reservoir routing method.

Included in this task is internal QA/QC of the revised hydrologic model.

We recognize that these adjustments are necessary to correct the hydrologic modeling we performed in 2020. We will perform this work at no cost to the ECWMC or the MNDNR.

Task 1b. Model Calibration

The HUC-8 Study involved calibrating the hydrologic model to one (1) USGS stream gage on Elm Creek near Champlin (5287890). Barr calibrated the model to two (2) rainfall events using Next Generation Weather Radar (NEXRAD) data and two (2) snowmelt events using National Weather Service snow-water-equivalent gridded data. The USGS gage on Elm Creek is downstream of the confluence with Rush Creek and upstream of Hayden Lake.

Barr will re-calibrate the hydrologic model to the following additional flow monitoring locations shown on Figure 1 of the RFP (Attachment A):

- Elm Creek at Elm Road – ECER – 14 years of data – continuous flow of Elm Creek leaving the City of Plymouth and entering into City of Maple Grove
- Rush Creek at Territorial – RT – 10 years of data – continuous flow of Rush Creek at Territorial Road

This task involves first reviewing the additional monitoring data to ensure sufficient information is provided for model calibration. Barr will calibrate the model at all three (3) monitoring locations to the September 2016 rainfall event and the two snowmelt events from the HUC-8 Study. Barr will validate the model with the June 2003 rainfall event from the HUC-8 Study to the RT site and the USGS gage. This task will not involve processing additional NEXRAD data or validating the model to an event not included in the HUC-8 Study. In some cases, the calibration process may require the inclusion of Muskingham-Cunge eight-point cross-section routing between subwatershed reservoirs where additional flow attenuation is necessary to calibrate the model.

Barr will also compare the re-calibrated model flows to the effective FIS flows for the 10%, 2%, 1% and 0.2% annual exceedance events. Included in this task is internal QA/QC of calibration updates to the hydrologic model.

Barr will then submit the effective FIS flow comparison tables, model calibration results in the form of graphs and tables, and hydrologic models to ECWMC and the MNDNR for review and approval. Barr will incorporate one round of revisions into the model.

Barr assumes that IAHRC comments on the draft updated hydrology will not change peak flows by more than 5%. This assumption allows the hydraulic modeling updates to proceed without waiting for IAHRC approval of the hydrology. Should the IAHRC comments result in changes to peak flows by more than 5%, revisions to the schedule may be necessary. For example, significant changes to flows would necessitate a reevaluation of overbank flows and reach lengths.

Deliverables for Task 1 include:

- Draft effective FIS flow comparison tables
- Draft model calibration results in the form of graphs and tables
- Draft model internal QA/QC documentation
- Draft hydrologic models for the calibration events and the 10%, 2%, 1% and 0.2% annual exceedance events
- Final IAHRC-approved hydrologic models for the calibration events and the 10%, 2%, 1% and 0.2% annual exceedance events
- Responses to IAHRC comments on the draft hydrology submittal (if applicable)
- Final effective FIS flow comparison tables
- Final model calibration results in the form of graphs and tables
- Final model internal QA/QC documentation

Task 2. Hydraulic Revisions

Task 2a. Revise Model with Updated Flows

Barr will revise the hydraulic model with the updated flows from the draft hydrologic model for the 10%, 2%, 1% and 0.2% annual exceedance events. Flows will be updated with the final hydrologic model after receiving approval from the IAHRC.

Task 2b. Update Model Structure Data

Barr will incorporate additional hydraulic structures into the HEC-RAS model developed for the original HUC-8 Study. Barr will update up to 52 hydraulic structures (bridges, culverts, weirs, and dams) as listed in Table 3 of the third-party review (Attachment B). Barr assumes structure data will be pulled directly from Table 3 of the third-party review. Reviewing construction drawings, survey, and as-built data is not included in the scope and would only be necessary if additional structure information not included in Table 3 is required.

This task assumes all updated structure data will be provided to Barr electronically in the form of construction drawings, survey, and as-built data. In all cases where the updated hydraulic structure data appears reasonable for the crossing, Barr will assume that the third-party compilation of structure data is correct.

Task 2c. Update Elm Creek Dam

Barr will add the Elm Creek Dam (Mill Pond Dam) to the model based on City of Champlin as-builts.

Task 2d. Revise Stream Alignments

Barr will revise stream alignments at the following locations:

- County Ditch 16 east of Brockton Lane (County Road 101). This watercourse will be revised to show it to be piped beneath Vagabond Lane to the north.
- Unnamed Tributary to Elm Creek (HEC-RAS Reach ElmCreek_BR4) just southeast of the intersection of Hackamore Road (County Road 47) and Brockton Lane (County Road 101) in Plymouth. The model will be revised to show the permanent alignment of the watercourse.

Task 2e. Revise Model Reaches (Optional)

If necessary, and with direction from the MNDNR, Barr will recombine model reaches that were split at stream confluences or update boundary conditions of the existing severed reaches.

Task 2f. Calibrate Hydraulic Model (Optional)

Barr will attempt to calibrate the hydraulic model to high water levels observed at the three monitoring locations (ECER, RT, and USGS gage 5287890) and calibration events used for the hydrologic calibration. The hydraulic calibration will involve adjusting Manning's n values, weir coefficients, and ineffective flow areas to match water surface elevations and rating curves for the calibration events. Hydraulic model calibration will require additional time not provided in the current schedule. If this optional task is approved, Barr will provide a revised project schedule.

Task 2g. Rerun Updated Hydraulic Model

Barr will rerun the updated hydraulic model with the updated flows from the hydrologic model for the 10%, 2%, 1% and 0.2% annual exceedance events. Included in this task is internal QA/QC of the hydraulic model and the incorporation of one (1) round of review comments from the ECWMC, MNDNR, and stakeholders as a result of the Task 3 stakeholder meeting.

The workflow for this task is as follows:

- Barr will rerun the draft updated hydraulic model and develop 1% annual chance exceedance event inundation mapping using the RAS Mapper tool within HEC-RAS.
- Barr will conduct internal QA/QC of the draft updated hydraulic model. Internal QA/QC will include:
    - Review of revised model inputs and configuration outlined in Tasks 2a through 2f
    - Review of creek profiles for the 10%, 2%, 1% and 0.2% annual exceedance events
    - Review of 1% annual exceedance event preliminary floodplain mapping
    - Comparison of FIS flows to the updated model flows at various locations throughout the watershed
- Barr will provide the draft hydrologic model (awaiting IAHRC approval) and draft hydraulic model and memorandum to the Commission by April 22, 2022.
- Stakeholders will provide comments to Barr within two (2) weeks of receipt of the draft submittal. This will allow Barr to prepare responses to be discussed during the May 11, 2022, stakeholder meeting.
- Barr will update the hydraulic model to include ECWMC, MNDNR, and stakeholder comments. Peak flows will be updated to include the IAHRC-approved hydrologic model results.
- Barr will rerun the final updated hydraulic model and develop 1% annual chance exceedance event inundation mapping using the RAS Mapper tool within HEC-RAS.
- Barr will conduct internal QA/QC of the final hydraulic model. Internal QA/QC will include:

- Review of revised hydraulic model inputs as a result of incorporating stakeholder comments
- Review of creek profiles for the 10%, 2%, 1% and 0.2% annual exceedance events
- Review of 1% annual exceedance event floodplain mapping

Deliverables for Task 2 include:

- Updated draft hydraulic models for the 10%, 2%, 1% and 0.2% annual exceedance events
- (Optional) Draft model calibration results in the form of graphs and tables
- Draft model internal QA/QC documentation
- Responses to stakeholder comments on draft submittal
- Final hydraulic models for the 10%, 2%, 1% and 0.2% annual exceedance events

Task 3. Meetings

Barr will attend the ECWMC TAC meeting on May 11, 2022 to discuss ECWMC and MNDNR comments on the draft deliverables. During this meeting, Barr will receive any additional feedback to help refine the model. Barr's scope proposes to receive one (1) round of review comments from the ECWMC, MNDNR, and stakeholders prior to this meeting to provide opportunity to address comments during the stakeholder meeting.

Stakeholder comments on the draft submittal will be incorporated into the final hydrologic and hydraulic models.

Task 4. Memorandum of Revisions

Task 4a. Memorandum of Revisions

Barr will develop a memorandum of revisions describing updates to both the hydrologic and hydraulic models including a discussion on the revised model results for the calibration events. Documentation of internal QA/QC and responses to stakeholder comments will be included with the memorandum and final model submittal.

Task 4b. Flow Comparison Tables

Included in the memorandum will be a table documenting current 2016 FIS flood elevations and draft HUC-8 flood elevations for the 10%, 2%, 1% and 0.2% annual exceedance events at each road crossing.

Task 4c. Floodplain Maps

Figures in pdf format documenting current 2016 FIS flood elevations and draft HUC-8 flood elevations for the 1% and 0.2% annual exceedance events for the floodway, floodplain, and cross-sections at a scale of 1:10,000 will be provided for the following creeks:

- Elm Creek
- Diamond Creek
- North Fork Rush Creek
- South Fork Rush Creek

Draft spatial mapping will be developed using the RAS Mapper function within HEC-RAS. Post-processing cleanup will not be conducted for the draft submittal.

Final spatial mapping files will also be developed using the RAS Mapper functions within HEC-RAS. RAS Mapper spatial mapping will be coarse but generally representative of the floodplain extents. Post-processing cleanup of the spatial mapping using ArcGIS software is not included in this scope.

Deliverables for Task 4 include:

- Draft Memorandum of Revisions, including:
    - Updates to the hydrologic and hydraulic models,
    - Internal QA/QC documentation,
    - Draft effective FIS flow comparison tables, and
    - Draft spatial maps in pdf format for the 1% and 0.2% annual exceedance events for the floodway, floodplain, and cross-sections
- Final Memorandum of Revisions, including:
    - Updates to the hydrologic and hydraulic models,
    - Internal QA/QC documentation,
    - Responses to stakeholder comments on draft submittal
    - Effective FIS flow comparison tables, and
    - Spatial maps in pdf format for the 1% and 0.2% annual exceedance events for the floodway, floodplain, and cross-sections

Barr's Team

Key technical staff that will be working on this project are:

- Nathan Campeau, PE – Nathan will serve as the project's principal, providing overall guidance and handling contractual issues. Nathan has led and contributed to several FEMA countywide floodplain studies throughout Minnesota.
- Heather Lau, PE – Heather will serve as the overall project manager and primary point of contact between Barr, the member cities and the DNR. Heather served as the project manager for the HUC-8 Study for the ECWMC in 2020. Heather has experience developing and revising multiple HEC-RAS flood models, including the HEC-RAS model developed for the ECWMC HUC-8 Study. She will be the technical lead on the HEC-RAS modeling revisions.
- Joe Waln, PE, CFM – Joe is a Certified Floodplain Manager (CFM) and will perform QA/QC for the project in accordance with the scope. Joe has worked on several FEMA mapping projects and has been helping the City of Rochester develop Atlas 14 based floodplain maps so they can regulate development to a higher standard than the effective FEMA maps.
- Anthony Vecchi, Water Resources Engineer – Anthony will lead the HEC-HMS model revisions and calibration. He has completed multiple projects using HEC-HMS to determine design flows and conducted the HEC-HMS modeling for the HUC-8 Study.
- Brandon Barnes, PE – Brandon led the effort to model and map floodplains for the Ramsey-Washington Metro Watershed District (RWMWD). Brandon performed the internal, post-project audit on the modeling and is familiar with ECWMC's hydrologic and hydraulic models. He will be a technical resource for the model revisions and calibration.
- Josh Vosejpka, GIS Specialist – Josh will lead the GIS work to develop the pdf floodplain maps.

Budget

The total proposed budget and the estimated hours and budget for each task is summarized in the following table:

Task	Description	Hours	Cost
1a	Hydrologic Model Updates	0	$0
1b	Model Calibration	38	$5,140
	Subtotal Task 1	**38**	**$5,140**
2a	Revise Model with Updated Flows	8	$1,040
2b	Update Model Structure Data	14	$1,960
2c	Update Elm Creek Dam	4	$520
2d	Revise Stream Alignments	6	$860
2e	Revise Model Reaches (Optional Task)	6	$860
2f	Calibrate Hydraulic Model (Optional Task)	28	$3,940
2g	Rerun Updated Hydraulic Model (Draft, Final, and Internal QAQC)	38	$5,150
	Subtotal Task 2	**70**	**$9,530**
	Subtotal Task 2 (with Optional Tasks)	**104**	**$14,330**
3a	Meetings	22	$3,190
	Subtotal Task 3	**22**	**$3,190**
4a	Memorandum of Revisions	26	$3,910
4b	Flow Comparison Tables	4	$520
4c	Floodplain Maps	30	$3,650
	Subtotal Task 4	**60**	**$8,080**
	Grand Total	**190**	**$25,940**
	Grand Total (with Optional Tasks)	**224**	**$30,740**

Schedule

The anticipated schedule for completing the scope of work described above is summarized in the table below. Meeting this schedule will depend in part on the ability of stakeholders to complete review in a timely manner. This schedule also assumes that IAHRC comments on the draft updated hydrology will not change peak flows by more than 5%. This assumption allows the hydraulic modeling updates to proceed without waiting for IAHRC approval of the hydrology. Should the IAHRC comments result in changes to peak flows by more than 5% or reviews not completed according to the proposed schedule, revisions to the overall schedule may be necessary.

Task	Milestone Schedule	Date
1	Notice to Proceed	March 10, 2022
1	Hydrology submitted to IAHRC	March 30, 2022
1	Hydrology reviewed by IAHRC	April 27, 2022
2	Draft deliverables to ECWMC and MNDNR for review	April 22, 2022
2	ECWMC and MNDNR review comments due to Barr	May 6, 2022
3	Stakeholder Meeting to discuss comments	May 11, 2022
4	Final deliverables submitted to ECWMC and MNDNR	June 24, 2022

Barr acknowledges that:

- all work projects may not be distributed or disseminated in any form without written permission from the ECQMC; and
- the ECWMC reserves the right to enter into an agreement with a consultant for any or all of Tasks 1-4.

Thank you for providing this opportunity to complete this important project for the ECWMC. If you have any questions or require further information, please contact me (612-710-8140, ncampeau@barr.com). We look forward to continuing to serve the watershed.

Sincerely,

Nathan Campeau, PE
Vice President, Principal in Charge

Heather Lau, PE
Project Manager

Attachments

Attachment A – ECWMC Request for Proposal (RFP) Revisions to HUC-8 Model received February 18, 2022

Attachment B – Third Party Review of the Preliminary HUC-8 Model of the Elm Creek Watershed by Stantec

REQUEST FOR PROPOSAL (RFP)
REVISIONS TO HUC-8 MODEL
ELM CREEK WATERSHED MANAGEMENT COMMISSION

Introduction

The Minnesota Department of Natural Resources (MNDNR) is partnering with the Federal Emergency Management Agency to update the base flood elevation across the watershed for a future Flood Insurance Study (FIS). The base flood elevation published in current and any future FIS sets the floodplain inundation extents and is particularly important as there are local, state, and federal regulations governing work or other such impacts within the floodplain. Reasonable accuracy is paramount with floodplain modeling as homeowners may be required to buy flood insurance, construction costs can increase for work in the floodplain, and local, regional, and state agencies rely on the base flood elevation for planning efforts.

On March 11, 2020 the ECWMC accepted a consultant proposal to provide FEMA floodplain modeling and mapping for the Elm Creek Watershed. On October 13, 2020, the MNDNR inter-agency review accepted the modeling methodology and results, however, cities of the Elm Creek Watershed Management Commission (ECWMC) noted significant differences between the flood elevations in the current 2016 FIS when compared to the Elm Creek Floodplain Modeling and Mapping HUC-8 study (HUC-8 Study). Subsequently, in May 2021 the ECWMC authorized a "third-party" review of the HUC-8 study to understand unreasonable outputs of the HUC-8 model.

The purpose of this RFP is to request a scope of work to make revisions to the HUC-8 model provided by the MN DNR to the Commission on January 24, 2022 based on the Third-Party Review, which identified several reasons the HUC-8 base flood elevations were significantly different than the 2016 FIS.

Tasks

1. Hydrologic Revisions
    a. Replace the Muskingham-Cunge shortened simplified trapezoidal bank-width cross sections with reservoir routing, to account for full storage and attenuation of the floodplain for up to 55 watersheds (identified in yellow on Figure 1 of the Third-Party Review)
    b. Add Three Rivers Park District monitoring sites "ECER" & "RT" as additional calibration sites in the upper watershed (see Figure 1). Revise and rerun calibration to verify model is valid.
2. Hydraulic Revisions
    a. Revise hydraulic model with updated flows from the hydrologic model for the 10%, 2%, 1% and 0.2% annual exceedance events.
    b. Update 52 bridges, culverts, weirs, and dams based on construction drawings, survey, and as-built data shown in Table 3 of the Third-Party Review.
    c. Add the Elm Creek Dam (Mill Pond Dam) to the model based on City of Champlin as-builts.
    d. Revise stream alignments at:
        i. County Ditch 16 east of Brockton Lane (County Road 101). This watercourse should be shown to be piped beneath Vagabond Lane to the north.
        ii. Unnamed Tributary to Elm Creek (HEC-RAS Reach ElmCreek_BR4) just southeast of the intersection of Hackamore Road (County Road 47) and Brockton Lane (County Road 101) in Plymouth. The model should show the permanent alignment of the watercourse.
    e. If necessary and with direction from the MN DNR, recombine model reaches that were split at stream confluences or update boundary conditions of the existing severed reaches.

f. Run the updated hydraulic model with updated flows from the hydrologic model for the 10%, 2%, 1% and 0.2% annual exceedance events.

3. Meetings
    a. Stakeholder Meeting - provide for one stakeholder meeting to update member communities on the revised model outcomes and receive any additional feedback to help refine the model.
4. Memorandum of Revisions
    a. Provide a memorandum of revisions describing updates to both the hydrologic and hydraulic models including a discussion on the revised model results for the calibration events.
    b. Provide a table documenting current 2016 FIS flood elevations and draft HUC-8 flood elevations for the 10%, 2%, 1% and 0.2% annual exceedance events at each road crossing.
    c. Provide figures in pdf format documenting current 2016 FIS flood elevations and draft HUC-8 flood elevations for the 10%, 2%, 1% and 0.2% annual exceedance events for the floodway, floodplain and cross sections at a scale of 1:10,000 for:
        i. Elm Creek
        ii. Diamond Creek
        iii. North Fork Rush Creek
        iv. South Fork Rush Creek

Timeline

1. Preliminary draft of Tasks 1, 2 & 4 are due to the Commission no later than April 22, 2022
2. Stakeholder Meeting shall be May 11, 2022 during regularly scheduled Elm Creek Technical Advisory Committee meeting.
3. Final draft of Tasks 1, 2, & 4 are due no later than June 24, 2022

Deliverables

1. Revised hydrologic (HEC-HMS) model in version 4.3
2. Revised hydraulic (HEC-RAS) model in version 5.07
3. Memorandum of Revisions

Communications and Contact Information

1. All communications on this RFP shall be directed to Judie Anderson, Administrator, Elm Creek Watershed Management Commission at judie@jass.biz

Submission Requirements

1. Scope shall be submitted electronically to the Elm Creek Watershed Management Commission, c/o Judie Anderson, JASS at judie@jass.biz
2. Scope is due no later than March 2, 2022 at 4:30pm.
3. Minimum information required in scope:
    a. A narrative of project understanding
    b. Itemized costs for each Task 1-4
    c. Information on the Project Team
    d. Acknowledgment that all work projects may not be distributed or disseminated in any form without written permission from the Elm Creek Watershed Management Commission.
    e. Acknowledgement the Commission reserves the right to enter into an agreement with a consultant for any or all of Tasks 1-4.

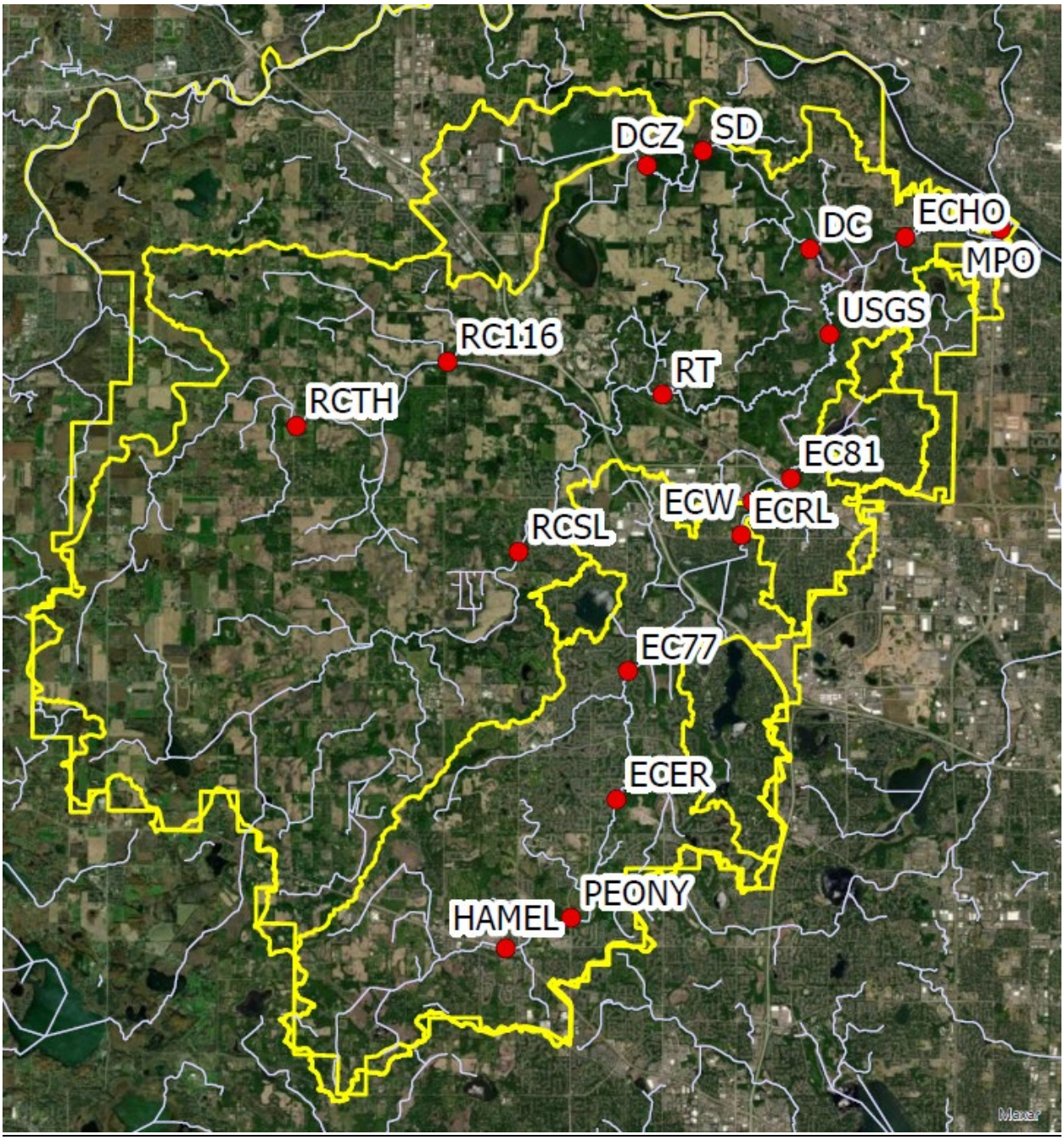
Assumptions

1. HUC-8 model provided to successful consultant shall be the same as was provided to the Commission on January 24, 2022 by the MN DNR.

Attachments

1. Third Party Review of the Preliminary HUC-8 Model of the Elm Creek Watershed by Stantec dated January 22, 2021

Figure 1: Three Rivers Park District Monitoring Sites



To: Minnesota Department of Natural Resources

From: ECWMC Technical Staff

cc: Ross Mullen, PE, CFM

Date: January 22, 2021

Subject: Third Party Review of the Preliminary HUC-8 Model of the Elm Creek Watershed

INTRODUCTION AND PURPOSE

Member cities of the Elm Creek Watershed Management Commission (ECWMC) have noted significant differences between the flood elevations in their community hydrologic and hydraulic (e.g., XPSMWM) models and the 2016 Federal Emergency Management Agency (FEMA) Hennepin County Flood Insurance Study (FIS) verses those included in the preliminary Elm Creek Floodplain Modeling and Mapping HUC-8 study (Preliminary HUC-8 Study). In some instances, especially in the upper watershed, the Preliminary HUC-8 model simulates a base flood elevation (100-year or 1%-annual-exceedance-probability event) that is seven (7) to eight (8) feet higher than the 2016 FIS.

The hydrologic and hydraulic analyses used to create the 2016 FIS were created, with modifications submitted as FEMA Letters of Map Revision, are dated:

- Champlin 1975-1977
- Corcoran: 1980-1981
- Dayton: 1976-1977
- Maple Grove:1976-1977
- Medina:1978-1980
- Plymouth: 1977-1982
- Rogers: 1990-1993.

Significant development has occurred in these member cities of the Elm Creek Watershed Management Commission since the publication of the above studies, using the results of those studies to limit flood risk in the watershed (e.g., land use planning and requiring structures to be elevated). Such significant increases in the base flood elevation will place numerous structures in the regulatory floodplain and are cause for concern as the communities continue to develop using best practices to reduce flood risk.

The MNDNR provided ECWMC technical staff the Preliminary HUC-8 hydrologic and hydraulic models to review and the memorandum documenting the methodology used to create the hydrologic and hydraulic models, "*Elm Creek Narrative and QAQC Documentation*" (Barr Engineering Co., 2021). ECWMC technical staff also reviewed the web-based interactive map published by the MNDNR titled "*Elm Creek Watershed District Draft Flood Risk Review Map"*.

HYDROLOGY

A hydrologic analysis (e.g., model) calculates the water cycle process that occur, including infiltration, evaporation, transpiration (plant absorption), and runoff. Hydrologic analyses are then used to estimate the peak streamflow in a watercourse, which can be used for planning and infrastructure design.

Peak Streamflow Review

A comparison of the peak streamflow rates between the 2016 FIS and Preliminary HUC-8 is included in Table 1. The percent changes are symbolized with arrow markers indicating a greater than 10% increase, within 10% (approximately unchanged), and a 10% or greater decrease in peak streamflow. A general discussion of the peak streamflow rates is discussed below.

- **Elm Creek:** At the upper end of Elm Creek, near the Medina-Plymouth city limits, the Preliminary HUC-8 model peak discharge rates are approximately 43-72% higher than the 2016 FIS. Farther downstream, the peak discharge rates in the Preliminary HUC-8 model vary between 3-36% lower than the 2016 FIS. Because it is the policy of the ECWMC to require all culvert and bridge crossings to show no-rise for the base flood event, the floodplain for the downstream portions is expected to be lower than that shown in the 2016 FIS due to the decrease in estimated peak discharge.

- **North Fork Rush Creek:** The peak discharge rates in the Preliminary HUC-8 model on North Fork Rush Creek are approximately 20-35% lower than the 2016 FIS. Because it is the policy of the ECWMC to require all culvert and bridge crossings to show no-rise for the base flood event, the floodplain is expected to be lower for the entirety of North Fork Rush Creek than that shown in the 2016 FIS due to the decrease in estimated peak discharge.

- **Rush Creek:** Upstream of County Road 116 on Rush Creek, peak discharge rates published in the Preliminary HUC-8 model are generally lower the 2016 FIS by 15-61%. The estimated discharge at the outlet of Jupert Lake during the 10-year increases by 22%; however, the absolute amount is only 11-cfs. Downstream the Preliminary HUC-8 model peak discharge rates are approximately 31-40% higher than the 2016 FIS.

Based on several conversations ECMWC technical staff have had with MNDNR floodplain group staff, we understand that the 2016 FIS model of Elm Creek reflects republished 1970's and 1980's analyses discussed in the *Introduction and Purpose* Section. It is also our understanding that those analyses were based on fully developed planned use in the watershed, as expected in the 1970's and 1980's using Technical Paper 40 hydrology (statistically derived design storm depths based on the period of record from late 1800's to 1961).

The fully developed planned use of the 2016 FIS (1970's and 1980's analyses) hydrologic models was expected to generate extremely conservative peak streamflows. The increase in peak streamflows is surprising because of the land use assumption in combination with the policy of the ECWMC that new and re-development of more than 1-acre must not increase the site peak runoff rates for the 2-, 10-, and 100-year events. While design rainfall depths have increased as published in Atlas 14 Volume 8 (reflecting statistically derived design storm depths based on the late 1800's to 2013), the land use assumptions used in the 2016 FIS in combination with the Commission's policy limiting rate control from developed site, should limit the increases in peak streamflow rates.

Hydrologic Model Review

The Preliminary HUC-8 hydrologic model uses the Muskingham-Cunge hydrologic routing method across the entirety of the watershed. The Muskingham-Cunge hydrologic routing method simulates the channel as a simplified trapezoidal cross section and routes a hydrograph through a watercourse (reach). The simplified trapezoidal cross section used throughout the model reflects the apparent channel width (i.e., distance between the banks). All modeled storage is accounted for using these shortened simplified trapezoidal cross sections except the most upstream watershed within a reach and at major named lakes (i.e., Rice Lake, Mud Lake, and Fish Lake) are modeled as *Reservoirs.*

This hydrologic routing method may be appropriate for the downstream channelized reaches of Elm Creek, Rush Creek, and North Fork Rush Creek or for modeling low flows; however, the upper watershed consists of series of large ponds, wetlands, and lakes connected by ephemeral streams, culverts, and bridges with appreciable flood storage outside of the channel banks. In these locations there is significant flood storage outside of the channel that is not included using the Muskingham-Cunge routing method with a shortened simplified trapezoidal cross section. Instead, the HEC-HMS model simulates a channel that is analogous to an incised channel without floodplain connectivity, which produces large peak flood flows with a faster time of concentration. In some cases, the Preliminary HUC-8 model simulates a several thousand-foot-wide floodplain as a channel with a width of ten to twenty feet. For example, Lake Medina is simulated as 10-foot-wide trapezoidal channel when the apparent floodplain width approaches 2,400-feet.

Table 2 highlights a few locations where the modeled approach is significantly undercounting for a significant flood storage volume as it only simulates on-channel storage for most of the watershed. The locations identified in Table 2 are not meant to be exclusive and are provided for illustrative purposes only. An annotated figure showing the locations where the Preliminary HUC-8 uses only channel storage or does not reflect any modeled storage is included as Figure 1.

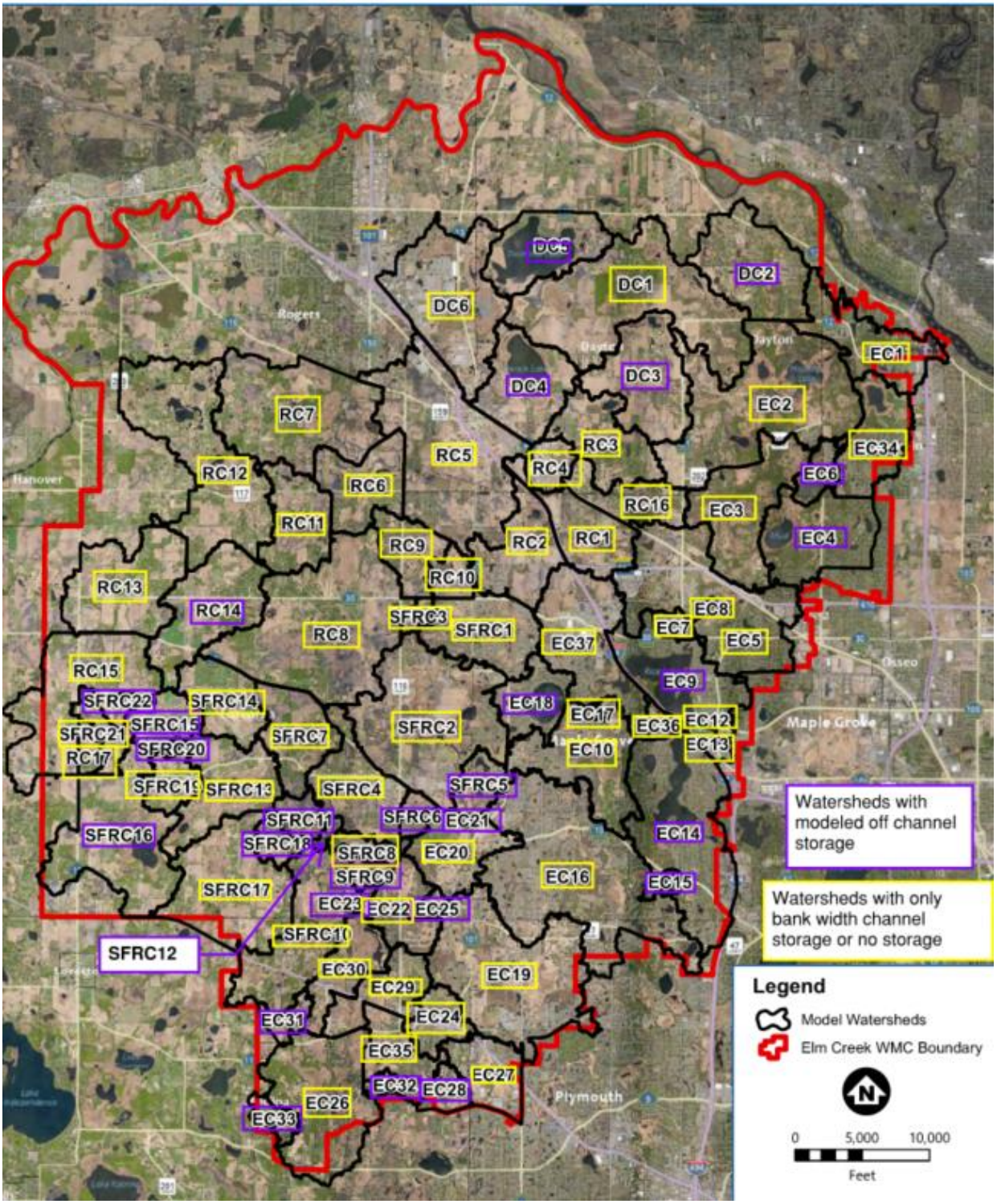
Table 1 Difference in Peak Streamflow between the 2016 FIS and the Preliminary HUC-8 at Key Locations

Location	10% Annual Chance Exceedance Probability			2% Annual Chance Exceedance Probability			1% Annual Chance Exceedance Probability			0.2% Annual Chance Exceedance Probability		
	Preliminary HUC-8	2016 Effective	Difference (%)	Preliminary HUC-8	2016 Effective	% Difference	Preliminary HUC-8	2016 Effective	% Difference	Preliminary HUC-8	2016 Effective	% Difference
Elm Creek												
Conf. with Mississippi River	1,099	1,380	-20%	1,700	2,300	-26%	1,999	2,780	-28%	2,790	4,350	-36%
Elm Creek Above Rush Creek	429	450	-5%	666	690	-3%	783	860	-9%	1086	1345	-19%
Elm Creek Medina-Plymouth Limits	201	185	9%	329	230	43%	394	245	61%	568	330	72%
North Fork Rush Creek												
N. Fork Rush Creek Cain Road	219	340	-36%	333	485	-31%	391	530	-26%	542	700	-23%
N. Fork Rush Creek Trail Haven Road	193	280	-31%	295	435	-32%	347	495	-30%	482	700	-31%
Rush Creek												
Rush Creek Conf. with Elm Creek	1,010	770	31%	1,575	1,170	35%	1,857	1,330	40%	2,587	2,000	29%
Rush Creek Downstream of Co. Rd 116	185	285	-35%	285	420	-32%	336	470	-29%	465	680	-32%
Rush Creek at Jubert Lake Outlet	34	40	-15%	61	50	22%	76	150	-49%	118	300	-61%

Table 2 Non-exclusive List of Locations where the Muskingham-Cunge Shortened Simplified Trapezoidal Cross Sections Significantly Undercount Floodplain Storage

Elm Creek HEC-HMS Model Feature Name	Common Name	Location Description	City	Preliminary HUC-8			Apparent Floodplain Width (feet) as Measured in Aerial Imagery
				Simplified Shape	Bottom Width (feet)	Side Slopes (H:1V)	
EC30R	Lake Medina	Medina North of Highway 55	Medina	Trapezoid	10	2	300-2,400
EC26R & EC26R22	Elm Creek Pond	Elm Creek Headwaters & Elm Creek floodplain upstream of Hamel Road	Medina	Trapezoid	10	2	50-1,500 (with significant offline storage)
EC19R & EC19R2	Elm Creek Greenway	Elm Creek floodplain downstream (east) of Peonly Lane	Plymouth	Trapezoid	20	2	200-2,700
EC16R	Elm Creek floodplain	Elm Creek floodplain in Nottingham Park	Maple Grove	Trapezoid	30	2	500-2,000
EC22R	County Ditch 16	Upstream (west) of Brockton Lane	Corcoran	Trapezoid	0	2	100-2,000
EC2R & EC3R	Elm Creek Park Reserve	---	Maple Grove/Dayton	Trapezoid	40	2	500-1,000
DC1R & DC1R2	Diamond Creek	Diamond Creek Downstream of French and Diamond Lakes to the Confluence with Elm Creek	Dayton	Trapezoid	20	2	150-2,000
RC1R & EC3R2	Rush Creek	Rush Creek between County Road 81 and its confluence with Elm Creek	Dayton	Trapezoid	40	2	25-600
RC5R	North Fork Rush Creek	North Fork Rush Creek downstream of Fletcher Lane	Dayton & Corcoran	Trapezoid	30	2	2100
RC13R, RC12R2, RC12R, RC11R, RC8	North Fork Rush Creek	North Fork Rush Creek between County Road 10 and Fletcher Lane	Corcoran	Trapezoid	10-25	2	100-3,800
SFRC1R	Rush Creek	Rush Creek between Brockton Lane and 97th Avenue	Maple Grove	Trapezoid	20	2	100-2,000
SFRC1R2	Rush Creek	Rush Creek between County Road 10 and Schutte Road	Corcoran	Trapezoid	20 - 30	2	300-6,500
SFRC14	County Ditch 7	Upstream of Trail Haven Road	Corcoran	Trapezoid	15	2	50-2,000
RSRC13R3, SFRC13R2, RSRC13R	County Ditch 3 (Rush Creek downstream of Jupert Lake)	Between Jupert Lake and Kalk Road	Corcoran	Trapezoid	15 - 20	2	40-2,000

Figure 1 Annotated Subwatershed Figure Reflecting Subwatersheds with No Modeled Storage or Only On-Channel Storage



HYDRAULICS

The Minnesota Department of Natural Resources (MNDNR) proposed to complete extensive surveys of all hydraulic structures (bridges, culverts, and weirs) within the effective (FEMA mapped) floodplain as part of the Twin Cities HUC-8 pass-through FEMA grant; however, the MNDNR was unable to complete these surveys with limited budgets.

Approximately 80 hydraulic structures, representing approximately half of the total hydraulic structures in the Elm Creek Preliminary HUC-8 model, were simulated based on assumptions made from review of aerial imagery as shown in Table 3 of the *Elm Creek Narrative and QAQC Documentation (Barr Engineering Co., 2021).*

To ensure that the Preliminary HUC-8 Study reflects the best available data, ECWMC technical staff reviewed:

1. Publicly available data sources, such as the Minnesota Department of Transportation's (MNDOT) *BridgeInfo3* map, which was developed by MNDOT to assist local Staite Aid agencies, to complete bridge and culvert inspections. This application includes bridge and culvert dimensions for many county roads.
2. The cities of Corcoran, Champlin, Plymouth, and Maple Grove provided ECWMC technical staff data for this review, including existing hydrologic and hydraulic models, construction plans, as-builts, and survey information.
3. Technical staff consulted with the city of Medina, who provided ECWMC technical staff references to FEMA Letters of Map Revision based on survey and as-builts.
4. The cities of Dayton and Rogers did not provide updated data to ECWMC technical staff and indicated the proposed base flood elevations shown in the Preliminary HUC-8 model were not concerning to their communities.
    a. Note that Stantec staff reviewed the city of Dayton's utility network as part of this review, which was provided to Stantec as part of other project work.

The review is summarized in Table 3. Based on a conversation with MNDNR staff in December 2021 we understand that concurrent to this review, the MNDNR has completed a thorough review of the road overflows in the hydraulic model, so this review focuses on the culverts and bridge openings.

MAPPING

We understand that as part of the mapping process, the MNDNR staff are completing a review of the inundation maps that includes processes such as removing mapped islands within the base floodplain extents where the LiDAR data erroneously reflects that reflect vegetation (e.g., cattails) in large wetland complexes.

Exhibit A includes example figures from the *Elm Creek Watershed District Draft Flood Risk Review Map* showing the Preliminary HUC-8 floodplain and locations where Elm Creek technical staff identified mapping irregularities that may be caused by the hydrologic or hydraulic issues identified above. These locations should be reviewed closely in both the modeling and mapping. At some streamflow confluences, the base flood elevation differs by up to several feet. The MNDNR should review these locations to ensure that appropriate boundary conditions were chosen for the model.

RECOMMENDATIONS

Following the above review, we recommend the MNDNR make the following revisions to the Preliminary HUC-8 models:

1. We recommend the MNDNR update the hydrologic HEC-HMS model with an alternative modeling approach, such as *Reservoir Routing*, in the upper watershed to account for all the off-channel flood storage on the landscape.

2. We recommend the MNDNR update the hydraulic HEC-RAS model with the best available information for each of the hydraulic structures in the model.

3. We recommend the MNDNR review the boundary conditions for each of the stream sections as the mapped base flood elevations differ at stream confluences.

4. We recommend the MNDNR remap the floodplain after the above changes are made to the hydrologic and hydraulic models.

Table 3

			Preliminary HUC-8 HEC-RAS Model									Data Review				
Municipality	Name	FEMA ZONE	River	Reach	HEC-RAS XS	HEC-RAS XS Structure Size and Shape	Bridge Opening Area (sq ft)	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source	Structure Size and Shape	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source
Dayton	Zanzibar Lane	A	DiamondCreek	DiamondCreek	25012	Bridge	173	896.0	896.2	906.6	Assumed from aerial imagery	No Additional Information Available				
Dayton	Diamond Lake Road	A	DiamondCreek	DiamondCreek	16591	4' Circular		882.4	882.5	897.8	Assumed from aerial imagery	No Additional Information Available				
Dayton	Diamond Lake Road	A	DiamondCreek	DiamondCreek	13849	4' Circular		877.0	876.9	882.4	Assumed from aerial imagery	No Additional Information Available				
Dayton	129th Aven N	A	DiamondCreek	DiamondCreek	7018	4' Circular		866.8	866.1	872.8	Assumed from aerial imagery	No Additional Information Available				
Dayton	Trail Crossing	A	DiamondCreek	DiamondCreek	721	1' Circular		854.4	854.3	856.8	Assumed from aerial imagery	No Additional Information Available				
Medina	Prairie Drive	A	Elm Creek	ElmCreek	130575	3' Circular		995.2	993.7	1003.5	Assumed from aerial imagery	No Additional Information Available				
Medina	Hwy 55	A	Elm Creek	ElmCreek	129606	4' Circular		987.4	986.5	996.3	Assumed from aerial imagery	No Additional Information Available				
Medina	Arrowhead Drive	A	Elm Creek	ElmCreek	129406	4' Circular		986.4	985.1	994.8	Assumed from aerial imagery	No Additional Information Available				
Medina	Meander Road	A	Elm Creek	ElmCreek	128820	2' Circular		983.7	982.2	985.0	Assumed from aerial imagery	No Additional Information Available				
Medina	Shorewood Trail	A	Elm Creek	ElmCreek	123228	Double 5' Circular		979.5	978.9	989.0	Assumed from aerial imagery	No Additional Information Available				
Medina	Meander Road	A	Elm Creek	ElmCreek	122340	6' Circular		976.6	976.0	985.9	Assumed from aerial imagery	No Additional Information Available				
Medina	Hwy 55	AE	Elm Creek	ElmCreek	120239	3.5' Circular		972.4	972.4	983.1	Effective Model MapleGrv-7 Bridge #19 and assumed from aerial imagery	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	CP RR	AE	Elm Creek	ElmCreek	120115	4' Circular		972.4	972.4	983.3	Effective Model MapleGrv-7 Bridge #18 and assumed from aerial imagery	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	Hamel Road	AE	Elm Creek	ElmCreek	118483	5' x 6.5' Box		973.9	973.9	987.7	DNR 2020 Survey - ELM_101	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	Private Road	AE	Elm Creek	ElmCreek	116126	3' Circular		970.4	970.4	975.2	Effective Model MapleGrv-7 Bridge #16	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	Elm Creek Drive	AE	Elm Creek	ElmCreek	114930	3.5' Circular		968.7	967.5	975.4	DNR 2020 Survey - ELM_394	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	Hamel Road	AE	Elm Creek	ElmCreek	114599	5' x 7' Box		967.0	967.3	976.2	DNR 2020 Survey - ELM 390	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	CP RR	AE	Elm Creek	ElmCreek	113790	5.5' Circular		965.4	965.1	982.9	Effective Model MapleGrv-7	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	Private Road	AE	Elm Creek	ElmCreek	113604	5' Circular		963.6	963.6	970.6	Medina Plan Sheet	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	Private Road	AE	Elm Creek	ElmCreek	112622	4.5' Circular		960.8	960.8	973.7	Medina Plan Sheet	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Medina	Co. Rd. 101	AE	Elm Creek	ElmCreek	111746	6' x 7.5' Box		958.6	958.0	972.1	DNR 2020 Survey - ELM_391	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Plymouth	Hwy 55	AE	Elm Creek	ElmCreek	110895	8' x 10' Box		956.3	956.3	973.3	DNR 2020 Survey - Elm_07	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Plymouth	Peony Lane	A	Elm Creek	ElmCreek	101787	Bridge	34	930.0	930.0	938.6	Effective Model MapleGrv-7 Bridge #8	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Plymouth	Co. Rd. 47	A	Elm Creek	ElmCreek	94969	Double Box	228	914.0	914.0	924.2	Effective Model MapleGrv-1 Bridge #7. Side slopes from aerial imagery.	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Elm Road	AE	Elm Creek	ElmCreek	90404	Double 8' x 8' Box		912.7	912.5	923.5	DNR 2020 Survey - ELM_381	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Private Road	AE	Elm Creek	ElmCreek	86376	Bridge	198	906.6	904.6	916.4	DNR 2020 Survey - ELM_15	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Bass Lake Road	AE	Elm Creek	ElmCreek	82661	Double 10' x 10' Box		902.4	902.0	931.8	DNR 2020 Survey - ELM_393	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Trail Crossing	AE	Elm Creek	ElmCreek	78645	Bridge	761	899.0	898.8	914.1	EN0_(S_ELM_CREEK_TRAIL_BRIDGE)_P0 .PDF	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Nottingham Parkway	AE	Elm Creek	ElmCreek	74483	Bridge	534	896.1	895.4	917.8	DNR 2020 Survey - ELM_400 MapleGrv-7 Bridge #3	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Trail Crossing	AE	Elm Creek	ElmCreek	74162	Bridge	365	895.0	894.0	906.3	DNR 2020 Survey - Elm_62	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Weaver Lake Rd	AE	Elm Creek	ElmCreek	68167	Double 8' x 10' Ellipse		889.0	888.7	903.3	DNR 2020 Survey - ELM_385 Maple Grv-7 Bridge #2	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				

Table 3

			Preliminary HUC-8 HEC-RAS Model									Data Review				
Municipality	Name	FEMA ZONE	River	Reach	HEC-RAS XS	HEC-RAS XS Structure Size and Shape	Bridge Opening Area (sq ft)	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source	Structure Size and Shape	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source
Maple Grove	Trail Crossing	AE	Elm Creek	ElmCreek	66093	Bridge	468	886.6	886.5	897.5	Effective Model Maple Grv-7 Bridge #1	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	I-94	AE	Elm Creek	ElmCreek	63269	Bridge	1119	886.4	884.8	908.0	DNR 2020 Survey - Elm_63	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	93rd Ave N	AE	Elm Creek	ElmCreek	55968	Bridge	1170	884.5	884.6	906.4	DNR 2020 Survey - ELM_380	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Rice Lake Dam	AE	Elm Creek	ElmCreek	53103	60ft wide spillway Dam		N/A	N/A	N/A	DNR 2020 Survey	60 ft wide spillway at 891.0'				As-Built
Maple Grove	Trail Crossing	AE	Elm Creek	ElmCreek	52158	Bridge	2100	877.3	877.5	884.3	DNR 2020 Survey - Elm_64	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Regional Trail	AE	Elm Creek	ElmCreek	49922	Bridge	7083	873.0	872.7	908.5	Assumed from aerial imagery	80' Span Length				MNDOT-BridgeInfo3 App. ID R1024
Maple Grove	BNSF RR	AE	Elm Creek	ElmCreek	49134	Bridge	210	871.3	871.3	886.5	DNR 2020 Survey - ELM_66	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Co. Rd. 81	AE	Elm Creek	ElmCreek	49010	Bridge	436	872.0	872.7	886.6	DNR 2020 Survey - ELM_382	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Hwy 610	AE	Elm Creek	ElmCreek	48906	Bridge	376	872.5	872.4	885.0	Assumed from upstream bridge configuration	No Additional Information Available				
Maple Grove	Hwy 610	AE	Elm Creek	ElmCreek	48820	Bridge	403	873.2	872.2	884.8	Assumed from upstream bridge configuration	No Additional Information Available				
Maple Grove	Co. Rd. 81	AE	Elm Creek	ElmCreek	48703	Bridge	441	871.9	872.4	885.3	DNR 2020 Survey - ELM_389	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Private Road	AE	Elm Creek	ElmCreek	48346	Bridge	163	869.1	869.0	881.4	DNR 2020 Survey - ELM_69	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Trail Crossing	AE	Elm Creek	ElmCreek	46341	Bridge	1731	868.6	868.6	881.0	DNR 2020 Survey - ELM_70	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Trail Crossing	AE	Elm Creek	ElmCreek	42894	Bridge	145	866.1	866.1	875.5	DNR 2020 Survey - ELM_71	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Dayton	Private Road	AE	Elm Creek	ElmCreek	33604	Bridge	1279	855.3	855.3	868.4	Champlin effective model Bridge 5	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Dayton	Elm Creek Road	AE	Elm Creek	ElmCreek	25578	Bridge	236	851.6	853.0	862.6	DNR 2020 Survey - ELM_397 Dayton-2 Bridge #1	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Champlin	French Lake Road	AE	Elm Creek	ElmCreek	9161	Bridge	3348	846.4	847.3	865.2	LOMR Case 13-05-8011R	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Champlin	Cartway Road	AE	Elm Creek	ElmCreek	4072	15' x 24' CMP Arch		839.0	839.0	856.2	DNR 2020 Survey - ELM_396 LOMR Case 13-05-8011R	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Champlin	US Hwy 169	AE	Elm Creek	ElmCreek	1044	Bridge	517	838.5	838.5	856.2	LOMR Case 13-05-8011R	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Champlin	Osseo Road	AE	Elm Creek	ElmCreek	650	Dam		N/A	N/A	N/A	Dam is Not Modeled	Dam- see as-builts	N/A	N/A	N/A	Record Plans
Medina	Medina Road	A	Elm Creek	ElmCreek_BR1	4766	3' Circular		981.5	981.4	986.3	Assumed from aerial imagery	No Additional Information Available				
Medina	Blackfoot Trail	A	Elm Creek	ElmCreek_BR2	4121	3' Circular		977.5	977.1	980.6	Assumed from aerial imagery	No Additional Information Available				
Medina	Private Road	AE	Elm Creek	ElmCreek_BR2	215	3' Circular		973.9	973.6	976.7	Assumed from aerial imagery	No Additional Information Available				
Plymouth	Hwy 55	AE	Elm Creek	ElmCreek_BR3	939	4' Circular		965.8	965.5	974.7	Assumed from aerial imagery	No Additional Information Available				
Plymouth	CP RR	AE	Elm Creek	ElmCreek_BR3	741	4' Circular		966.2	963.4	992.8	Assumed from aerial imagery	3' (Material Not Listed)	Not Listed	962.9		Record Plans
Plymouth	Trojan Trail/ Wayzata High	A	Elm Creek	ElmCreek_BR3	226	6' Circular		960.5	955.4	975.2	Assumed from aerial imagery	5' RCP	962.15	957.05		Record Plans
Corcoran	Private Road	A	Elm Creek	ElmCreek_BR4	11620	2' Circular		980.4	979.9	987.1	Assumed from aerial imagery	No Additional Information Available				
Corcoran/ Medina	Hackamore Road	A	Elm Creek	ElmCreek_BR4	10363	3' Circular		971.7	970.6	977.6	Assumed from aerial imagery	2' Circular RCP	970.96	970.11	977.48	City of Corcoran Survey 2021
Corcoran/ Medina	Hackamore Road	A	Elm Creek	ElmCreek_BR4	9555	3' Circular		964.6	964.0	974.1	Assumed from aerial imagery	2' Circular RCP	964.05	963.37	973.76	City of Corcoran Survey 2021
Maple Grove/ Corcoran	Brockton Ln	A	Elm Creek	ElmCreek_BR4	9394	3' Circular		964.0	961.4	974.4	Assumed from aerial imagery	OCS draining to Pond to the SE	956.00	Not Listed		Record Plans
Maple Grove/ Plymouth	Hackamore Road	A	Elm Creek	ElmCreek_BR4	8966	3' Circular		959.6	958.3	965.7	Assumed from aerial imagery	3' RCP	Not Listd	Not Listed		Record Plans
Plymouth	Troy Ln	A	Elm Creek	ElmCreek_BR4	4858	Double 3' x 6' Box		940.7	938.3	944.4	Assumed from aerial imagery	Double 3' x 6' Box Culvert	940.37	939.79		Record Drawing
Plymouth	58th Circle	A	Elm Creek	ElmCreek_BR4	3392	Double 5' Circular		934.9	934.1	942.5	Assumed from aerial imagery	Twin 54x88" Arch Pipes	934.45	933.61		City of Plymouth GIS

Table 3

			Preliminary HUC-8 HEC-RAS Model									Data Review				
Municipality	Name	FEMA ZONE	River	Reach	HEC-RAS XS	HEC-RAS XS Structure Size and Shape	Bridge Opening Area (sq ft)	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source	Structure Size and Shape	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source
Plymouth	Peony Ln	AE	Elm Creek	ElmCreek_BR4	1891	6' x 6' Box		926.0	927.3	938.1	Assumed from aerial imagery	6' x 5' Box Culvert	926.96	925.69		Record Drawing
Maple Grove/ Corcoran	Co. Rd. 101	A	Elm Creek	ElmCreek_BR5	11191	4' Circular		958.9	957.9	968.1	Assumed from aerial imagery	4.5' Circular CSP	957.84	957.84		Construction Drawings
Maple Grove	Private Road	A	Elm Creek	ElmCreek_BR5	10648	7' Circular		957.2	957.2	972.0	Assumed from aerial imagery	5' Circular RCP	957.7	957.4		Record Drawing
Maple Grove	Vagabond Court	A	Elm Creek	ElmCreek_BR5	9049	6' Circular		955.5	955.5	967.4	Assumed from aerial imagery	5' Diameter RCP . The routing of this is under the Vagabond Court not through the pond	954.93	954.67		Construction Drawings
Maple Grove	Co. Rd. 10	A	Elm Creek	ElmCreek_BR5	8529	5' Circular		960.0	956.0	966.3	Assumed from aerial imagery	Does not exist, the creek is not routed in this direction.	N/A	N/A		Maple Grove GIS
Maple Grove	Private Road	A	Elm Creek	ElmCreek_BR5	8223	5' Circular		953.4	951.6	966.8	Assumed from aerial imagery	6' Circular RCP	951.83	950.48		Construction Drawings
Maple Grove	Trail Crossing	A	Elm Creek	ElmCreek_BR5	6707	5' Circular		941.5	941.1	947.2	Assumed from aerial imagery	1.25' RCP beneath recreational trail	Not Listd	Not Listed		Maple Grove GIS
Maple Grove	74th Ave N	A	Elm Creek	ElmCreek_BR5	5192	6' Circular		929.6	927.4	942.0	Assumed from aerial imagery	10x6' Precast Concrete Box	929.41	927.93		Construction Drawings
Maple Grove	Lawndale Ln	A	Elm Creek	ElmCreek_BR5	3072	6' Circular		919.6	918.1	927.4	Assumed from aerial imagery	10x6' Precast Concrete Box	Approx 917.5	Approx 917.5		As-Built
Maple Grove	Inland Ln	A	Elm Creek	ElmCreek_BR5	2092	6' Circular		911.6	911.4	920.9	Assumed from aerial imagery	10' x 6' Box Culvert	909.64	909.01	Approx. 921.5'	As-Built
Maple Grove	Private Road	A	Elm Creek	ElmCreek_BR5	1422	10' x 4' Box		908.9	908.8	913.1	Assumed from aerial imagery	No Additional Information Available				
Corcoran	Co. Rd. 116	A	NFRushCreek	NFRushCreek_BR1	5112	5' Circular		914.7	914.7	920.8	Assumed from aerial imagery	3' Circular CMP	913.04	912.96	921.15	City of Corcoran Survey 2021
Rogers	Trail Haven Lane	AE	NFRushCreek	NFRushCreek_BR2	17732	3' Circular		935.5	935.4	940.9	Assumed from aerial imagery	No Additional Information Available				
Rogers	Tucker Road	AE	NFRushCreek	NFRushCreek_BR2	16178	4' Circular		934.4	934.3	940.0	Assumed from aerial imagery	No Additional Information Available				
Rogers	Tilton Trail	AE	NFRushCreek	NFRushCreek_BR2	9928	Double 6' Circular		925.0	925.0	933.3	Assumed from aerial imagery	No Additional Information Available				
Rogers	Private Road	AE	NFRushCreek	NFRushCreek_BR2	4022	4' Circular		922.1	922.1	928.6	Assumed from aerial imagery	No Additional Information Available				
Rogers	Private Road	AE	NFRushCreek	NFRushCreek_BR2	3658	4' Circular		921.9	921.8	926.4	Assumed from aerial imagery	No Additional Information Available				
Rogers	Valley Drive	AE	NFRushCreek	NFRushCreek_BR2	3558	5' Circular		921.5	920.8	932.8	Assumed from aerial imagery	No Additional Information Available				
Rogers	Private Road	AE	NFRushCreek	NFRushCreek_BR2	3017	3' Circular		920.2	919.7	923.5	Assumed from aerial imagery	No Additional Information Available				
Corcoran	Co. Rd. 50	AE	NFRushCreek	NorthFrkRushCrk	73093	2.5' Circular		1001.9	1001.2	1009.0	Assumed from aerial imagery	2.5' Circular CMP	1000.53	1000.18	1009.29	City of Corcoran Survey 2021
Corcoran	Strehler Road	AE	NFRushCreek	NorthFrkRushCrk	67362	2.5' Circular		996.3	996.1	1003.1	DNR 2020 Survey - ELM_473	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Co. Rd. 19	AE	NFRushCreek	NorthFrkRushCrk	64849	5' x 5' Box		992.2	992.2	1007.7	Effective Model Corcoran-2 Bridge #9 and aerial imagery	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Private Road	AE	NFRushCreek	NorthFrkRushCrk	60629	5' Circular		986.1	986.1	991.0	DNR 2020 Survey - ELM_55	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Co Rd. 10	AE	NFRushCreek	NorthFrkRushCrk	60324	10' x 5' Box		985.5	985.5	994.3	Effective Corcoran-2. Bridge #7	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Private Road	AE	NFRushCreek	NorthFrkRushCrk	59917	5' Circular		984.0	984.0	991.3	DNR Survey 2020 - ELM_92	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Co. Rd. 30	AE	NFRushCreek	NorthFrkRushCrk	55164	7' x 7' Box		968.6	968.3	979.6	DNR 2020 Survey - ELM_476	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Rush Creek Blvd	AE	NFRushCreek	NorthFrkRushCrk	53017	4' Circular		962.7	962.5	970.7	DNR 2020 Survey - ELM_477	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Sundance Road	AE	NFRushCreek	NorthFrkRushCrk	49447	4' Circular		955.4	955.4	962.0	DNR 2020 Survey - ELM_93	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Oakdale Drive	AE	NFRushCreek	NorthFrkRushCrk	41884	5' Circular		938.8	938.3	946.0	DNR 2020 Survey - ELM_468	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Bechtold Rd.	AE	NFRushCreek	NorthFrkRushCrk	38901	6' x 8' Box		932.0	931.9	940.5	DNR 2020 Survey - ELM_469	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran/ Rogers	Co. Rd 117	AE	NFRushCreek	NorthFrkRushCrk	35228	6' x 8' Box		921.9	921.5	934.4	DNR 2020 Survey - ELM_570	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Co. Rd 117	AE	NFRushCreek	NorthFrkRushCrk	31427	6.5' x 8' Ellipse		918.8	918.7	930.0	DNR 2020 Survey - ELM_571	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Trail Haven Road	AE	NFRushCreek	NorthFrkRushCrk	27701	84" x 132" Arch		918.4	917.9	927.6	DNR 2020 Survey - ELM_474	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Cain Road	AE	NFRushCreek	NorthFrkRushCrk	19638	7' x 10.5' Box		905.6	905.1	914.9	DNR 2020 Survey - ELM_475	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Private Road	AE	NFRushCreek	NorthFrkRushCrk	18133	Double 4' Circular		907.4	907.4	912.7	DNR 2020 Survey - ELM_94	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran/ Rogers	109th Ave N	AE	NFRushCreek	NorthFrkRushCrk	14546	8' Circular		902.6	902.5	913.0	DNR 2020 Survey - ELM_471	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Rogers	Fletcher Lane	A	NFRushCreek	NorthFrkRushCrk	10707	15' x 6' Box		905.1	905.1	915.0	Assumed from aerial imagery	8x14' Precast Concrete Box				MNDOT- BridgeInfo3. App ID 27J52
Dayton/ Rogers	Brockton Lane	A	NFRushCreek	NorthFrkRushCrk	5258	Bridge	189	903.8	903.9	910.7	Assumed from aerial imagery	41.7' Span Bridge (207sq ft conveance)				MNDOT- BridgeInfo3. App ID 27B87

Table 3

			Preliminary HUC-8 HEC-RAS Model									Data Review				
Municipality	Name	FEMA ZONE	River	Reach	HEC-RAS XS	HEC-RAS XS Structure Size and Shape	Bridge Opening Area (sq ft)	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source	Structure Size and Shape	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source
Corcoran	Rolling Hills Rd	AE	RushCreek	RushCreek	101719	4.5' x 7' Box		962.0	961.7	967.8	DNR 2020 Survey - ELM_401	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Kalk Road	AE	RushCreek	RushCreek	94540	4.5' Circular		958.1	957.7	966.0	DNR 2020 Survey - ELM_402	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Co. Rd. 50	AE	RushCreek	RushCreek	91926	6' x 10' Box		954.6	954.9	966.1	DNR 2020 Survey - ELM_403	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Co. Rd. 10	AE	RushCreek	RushCreek	84354	102' x 88' Arch	66	939.0	939.0	949.7	DNR 2020 Survey - ELM_405	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Co. Rd. 116	AE	RushCreek	RushCreek	77126	88" Circular		930.9	930.7	938.2	DNR 2020 Survey - ELM_406	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Schutte Road	AE	RushCreek	RushCreek	66735	Bridge	83	926.5	926.0	933.3	DNR 2020 Survey - Elm_409	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Corcoran	Shannon Lane	AE	RushCreek	RushCreek	64465	7' x 10' Box		926.2	925.8	938.1	DNR 2020 Survey - ELM_407	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove/ Corcoran	Brockton Lane	AE	RushCreek	RushCreek	63595	7.17' x 14' Box		926.2	925.9	935.6	DNR 2020 Survey - ELM_410	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Co. Rd. 30	AE	RushCreek	RushCreek	54230	Double 8' x 8' Box		918.9	919.0	933.4	DNR 2020 Survey - ELM_408	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	101st Ave N	AE	RushCreek	RushCreek	46409	Double 7' x 7.5' Box		910.8	910.6	924.1	DNR 2020 Survey - ELM_404	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	I-94	AE	RushCreek	RushCreek	36608	Double 10' x 10' Box		900.2	899.7	920.9	Rush River CLOMR Model Bridge #8	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	105th Ave N	AE	RushCreek	RushCreek	36346	Bridge	787	899.2	899.0	919.0	Assumed from aerial imagery	379.3' Span Bridge over I-94 and Rush Creek				MNDOT- BridgeInfo3. App ID 27251
Maple Grove	Private Road	AE	RushCreek	RushCreek	36188	Bridge	276	897.5	897.5	910.9	Rush River CLOMR Model Bridge #7	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	105th Ave N	AE	RushCreek	RushCreek	34065	Double 8' x 10' Box		898.7	898.0	906.8	DNR 2020 Survey - ELM_483	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Dunkirk Ln	AE	RushCreek	RushCreek	31456	Double 8' x 10' Box		899.5	899.3	912.0	DNR 2020 Survey - ELM_48	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	BNSF RR	AE	RushCreek	RushCreek	29989	Bridge	1918	898.3	897.0	924.5	DNR 2020 Survey - ELM_96	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Co. Rd. 81	AE	RushCreek	RushCreek	29857	Triple 10' x 10' Box		898.4	898.4	920.5	DNR 2020 Survey - ELM_27	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Territorial Road	AE	RushCreek	RushCreek	25437	Bridge	731	895.2	894.7	912.0	DNR 2020 Survey - ELM_480 Dayton-1 Bridge #2	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Fernbrook Ln	AE	RushCreek	RushCreek	12903	Double 10' x 10' Box		876.2	876.1	890.2	DNR 2020 Survey - ELM_482 Dayton-1 Bridge #1	Preliminary HUC-8 Model Data Source Meets FEMA Data Capture Requirements (data check not completed)				
Maple Grove	Trail Crossing	AE	RushCreek	RushCreek	12657	Bridge	229	874.7	874.3	886.7	Assumed from aerial imagery	No Additional Information Available				
Corcoran	Horseshoe Trail	A	RushCreek	RushCreek_BR1	13676	3' Circular		974.3	973.1	975.1	Assumed from aerial imagery	Size Unspecified, CMP	972.63	972.62		City of Corcoran Survey 2021
Corcoran	Willow Drive	A	RushCreek	RushCreek_BR1	8595	3' Circular		966.4	966.7	973.2	Assumed from aerial imagery	2.5' Circular PVC	965.65	965.24		City of Corcoran Survey 2021
Corcoran	Horseshoe Trail	A	RushCreek	RushCreek_BR1	6626	2' Circular		965.5	965.4	966.9	Assumed from aerial imagery	1.25' Circular PVC	965.64	965.05		City of Corcoran Survey 2021
Corcoran	Private Road	A	RushCreek	RushCreek_BR1	4157	1.5' Circular		965.1	965.0	967.0	Assumed from aerial imagery	Two, 2.5' Circular RCP's	963.74, 963.46	963.37, 963.42	967.9	City of Corcoran Survey 2021
Corcoran	Homestead Trail	A	RushCreek	RushCreek_BR1	2142	4' x 3' Box		963.9	963.7	968.2	Assumed from aerial imagery	4.5' Circular CIP	963.63	963.56		City of Corcoran Survey 2021
Corcoran	Co. Rd. 50	A	RushCreek	RushCreek_BR2	4251	5' Circular		980.2	974.7	987.7	Assumed from aerial imagery	2' Circular CPP	986.89	986.46	993.79	City of Corcoran Survey 2021
Corcoran	Rolling HIlls Road	A	RushCreek	RushCreek_BR2	3066	4' Circular		964.2	964.2	966.4	Assumed from aerial imagery	2' Circular RCP	963.01	962.66	967.31	City of Corcoran Survey 2021
Corcoran	Private Road	A	RushCreek	RushCreek_BR2	1717	4' Circular		961.6	961.5	968.3	Assumed from aerial imagery	5' Circular CRP	961.35	961.05		City of Corcoran Survey 2021
Corcoran	Trail Haven Road	A	RushCreek	RushCreek_BR3	5809	6' Circular		969.3	970.5	979.9	Assumed from aerial imagery	24" Circular CMP	969.68	967.98	980.43	City of Corcoran Survey 2021
Corcoran	Settlers Road	A	RushCreek	RushCreek_BR4	9019	2' Circular		975.4	974.0	981.0	Assumed from aerial imagery	1.5' Circular PVC	974.21	973.83	981.59	City of Corcoran Survey 2021
Corcoran	Private Road	A	RushCreek	RushCreek_BR4	8256	2' Circular		973.1	972.9	978.7	Assumed from aerial imagery	3.5' Circular PVC	972.24	971.51	977.55	City of Corcoran Survey 2021
Corcoran	Larkin Road	A	RushCreek	RushCreek_BR4	6938	3' Circular		970.3	970.3	984.1	Assumed from aerial imagery	3.5' Circular RCP	969.83	968.56	984.49	City of Corcoran Survey 2021

Table 3

			Preliminary HUC-8 HEC-RAS Model									Data Review				
Municipality	Name	FEMA ZONE	River	Reach	HEC-RAS XS	HEC-RAS XS Structure Size and Shape	Bridge Opening Area (sq ft)	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source	Structure Size and Shape	U/S Invert (feet)	D/S Invert (feet)	Road Overflow (feet)	Structure Data Source
Corcoran	Private Road	A	RushCreek	RushCreek_BR4	4999	1.5' Circular		962.5	961.9	964.4	Assumed from aerial imagery	1.5' Circular PVC	961.86	961.34	964.68	City of Corcoran Survey 2021
Corcoran	Private Road	A	RushCreek	RushCreek_BR4	4523	2' Circular		962.1	962.0	964.7	Assumed from aerial imagery	2' Cicrular CMP	959.23	959.16	961.5	City of Corcoran Survey 2021
Corcoran	Co. Rd. 50	A	RushCreek	RushCreek_BR4	1774	5' Circular		946.0	946.0	952.7	Assumed from aerial imagery	4' Circular CMP	944.74	944.49	953.12	City of Corcoran Survey 2021
Medina	Pioneer Trail	A	RushCreek	RushCreek_BR5	32629	3' Circular		989.9	988.2	996.9	Assumed from aerial imagery	No Additional Information Available				
Medina	CP RR	A	RushCreek	RushCreek_BR5	28947	3' Circular		983.1	983.0	991.9	Assumed from aerial imagery	No Additional Information Available				
Medina	Hwy 55	A	RushCreek	RushCreek_BR5	28819	3' Circular		983.7	983.3	992.3	Assumed from aerial imagery	No Additional Information Available				
Medina	Mohawk Drive	A	RushCreek	RushCreek_BR5	27773	3' Circular		982.9	981.6	989.9	Assumed from aerial imagery	No Additional Information Available				
Corcoran	Horseshoe Trail	A	RushCreek	RushCreek_BR5	17557	5' Circular		973.2	973.0	979.7	Assumed from aerial imagery	No Additional Information Available				
Corcoran	Settlers Road	A	RushCreek	RushCreek_BR5	16293	5' Circular		973.7	974.1	981.4	Assumed from aerial imagery	3' Circular PVC	974.39	973.73		City of Corcoran Survey 2021
Corcoran	Private Road	A	RushCreek	RushCreek_BR5	13795	5' Circular		972.1	972.0	978.2	Assumed from aerial imagery	Two, 3' Circular PVC Pipes	974.33, 972.78	972.28, 972.72	978.31	City of Corcoran Survey 2021
Corcoran	Blue Bonnet Drive	A	RushCreek	RushCreek_BR5	12050	2' Circular		968.5	968.5	972.6	Assumed from aerial imagery	4' Circular CMP	968.55	967.52	973.45	City of Corcoran Survey 2021
Corcoran	Abilene Lane	A	RushCreek	RushCreek_BR5	9192	5' Circular		961.0	961.0	967.0	Assumed from aerial imagery	2.25' Circular PVC	961.74	961.55	967.48	City of Corcoran Survey 2021
Corcoran	Buckskin Trail	A	RushCreek	RushCreek_BR5	8494	5' Circular		959.8	959.7	966.1	Assumed from aerial imagery	3' Circular PVC	960.39, 960.45	960.07, 960.34	966.6	City of Corcoran Survey 2021
Corcoran	Larkin Road	A	RushCreek	RushCreek_BR5	8110	5' Circular		959.6	959.3	966.4	Assumed from aerial imagery	5' Circular CMP	959.25	958.72		City of Corcoran Survey 2021
Corcoran	Co. Rd. 50	A	RushCreek	RushCreek_BR5	5079	6' Circular		951.9	950.0	959.8	Assumed from aerial imagery	5' Circular CMP	951.58	950.26	960.11	City of Corcoran Survey 2021
Corcoran	Private Road	A	RushCreek	RushCreek_BR5	3967	3.5' Circular		948.2	947.9	953.6	Assumed from aerial imagery	5' Circular CPP	947.81	947.53	954.16	City of Corcoran Survey 2021
Corcoran	Co. Rd. 10	A	RushCreek	RushCreek_BR5	654	Bridge	101	938.4	938.6	947.8	Assumed from aerial imagery	10x6' Precast Concrete Box	938.98	938.79	947.98	City of Corcoran Survey 2021 & MNDOT- BridgeInfo3. App ID 90462
Dayton	Co. Rd. 81	A	RushCreek	RushCreek_BR6	2369	3.5' Circular		923.9	923.8	934.3	Assumed from aerial imagery	No Additional Information Available				
Dayton	BNSF RR	A	RushCreek	RushCreek_BR6	2214	3.5' Circular		923.8	921.9	931.7	Assumed from aerial imagery	No Additional Information Available				
Dayton	Holly Ln	A	RushCreek	RushCreek_BR6	1787	3' Circular		918.0	913.3	919.7	Assumed from aerial imagery	3' Culvert	917.75	911.65		Dayton Municiapl GIS
Dayton	Holly Ln	AE	RushCreek	RushCreek_BR6	768	3' Circular		909.6	907.5	914.4	Assumed from aerial imagery	3' Circular RCP	908.72	907.49		Dayton Municiapl GIS
Dayton	Territorial Road	A	RushCreek	RushCreek_BR7	355	6' Circular		898.1	898.0	911.2	Assumed from aerial imagery	2' Circular RCP	908.18	907.78		Dayton Municiapl GIS

EXHIBIT A

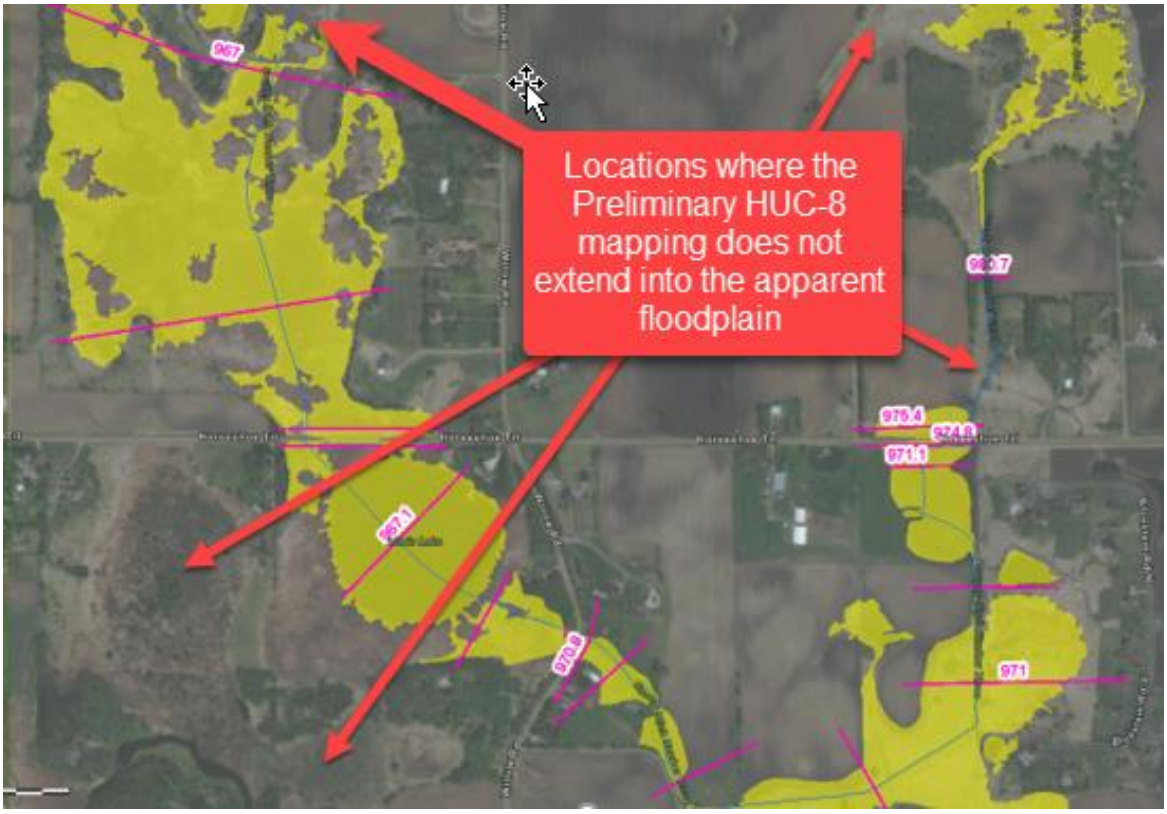


Figure 2 City of Corcoran just east of Jupert Lake and north of municipal boundary with city of Medina. Note how the Preliminary HUC-8 model floodplain does not extend into the apparent floodplain (wetlands) shown in the aerial imagery. (HEC-RAS Reach RushCreek_BR1)

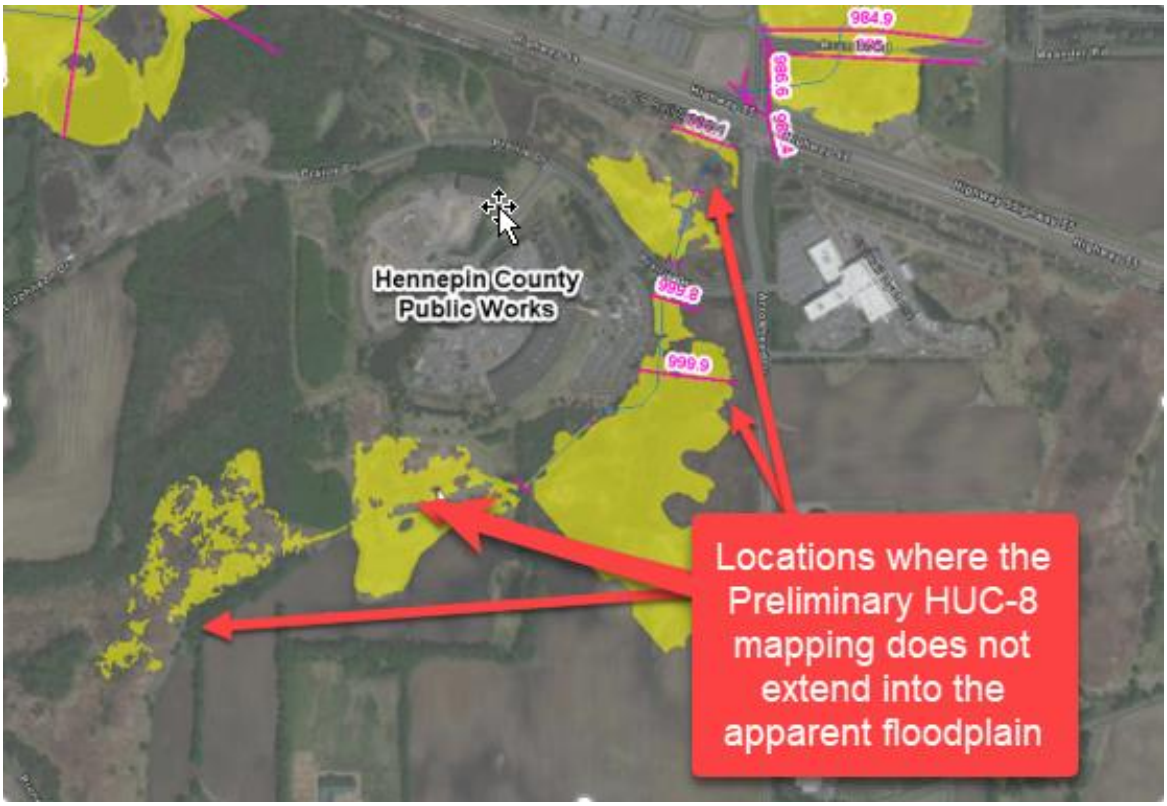


Figure 3 City of Medina near the Hennepin County Public Works facility. Note how the Preliminary HUC-8 model floodplain does not extend into the apparent floodplain (wetlands) shown in the aerial imagery. (HEC-RAS Reach ElmCreek)

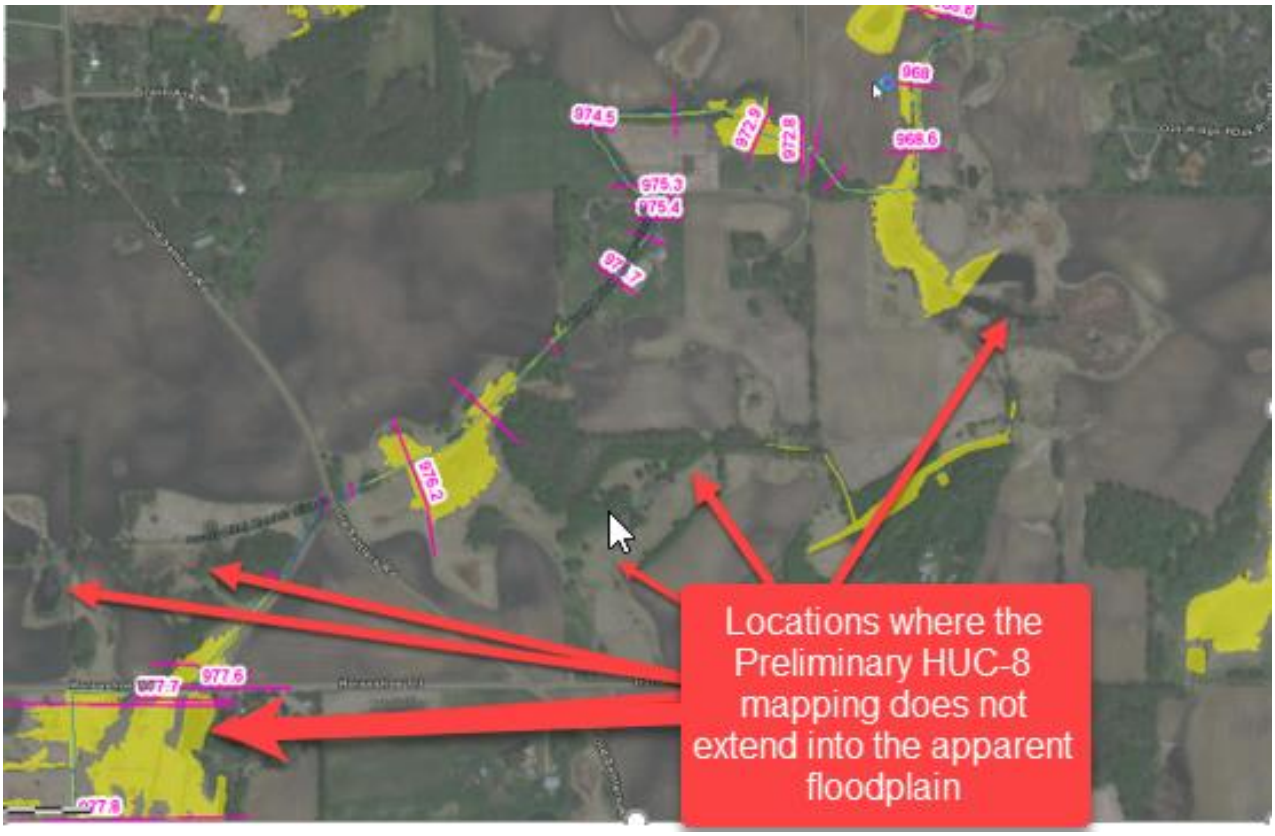


Figure 4 Rush Creek in Corcoran near Old Settlers Road (HEC-RAS Reach RushCreek_BR5)

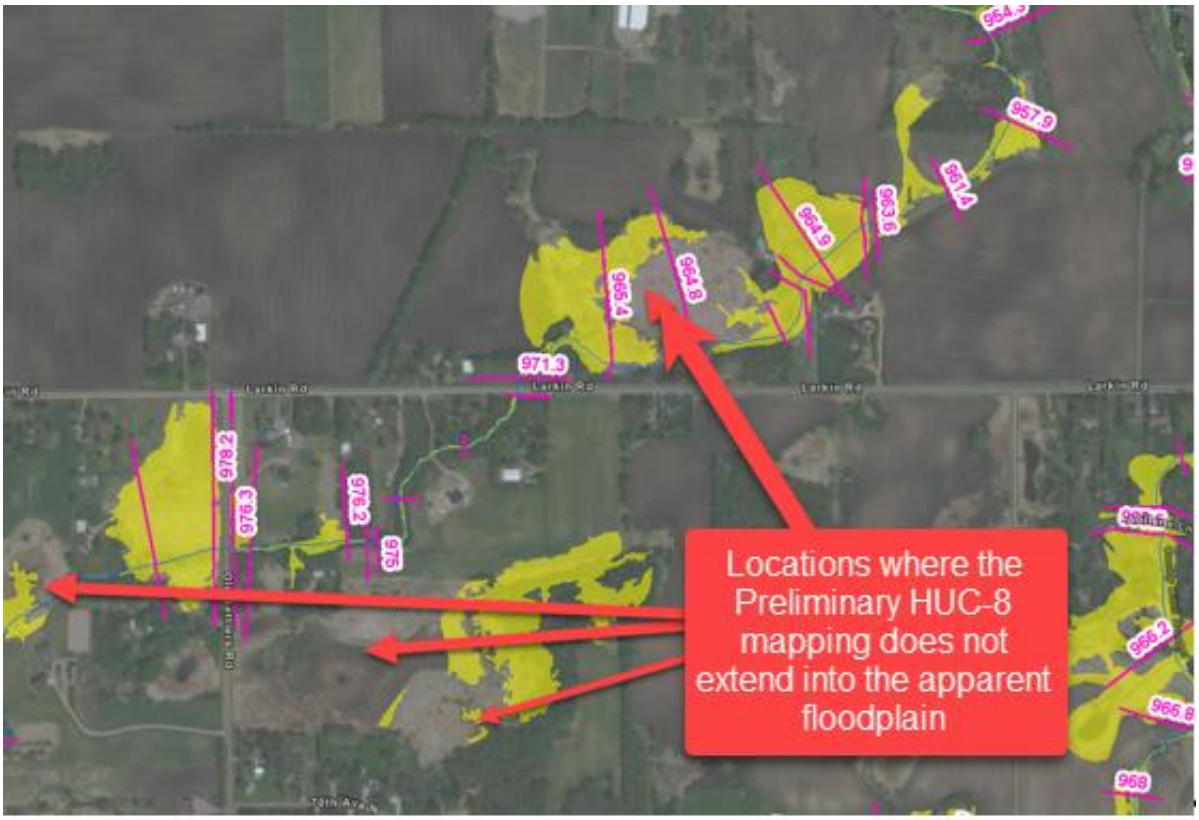


Figure 5 Elm Creek Tributary in Corcoran (HEC-RAS Reach ElmCreek_BR5)

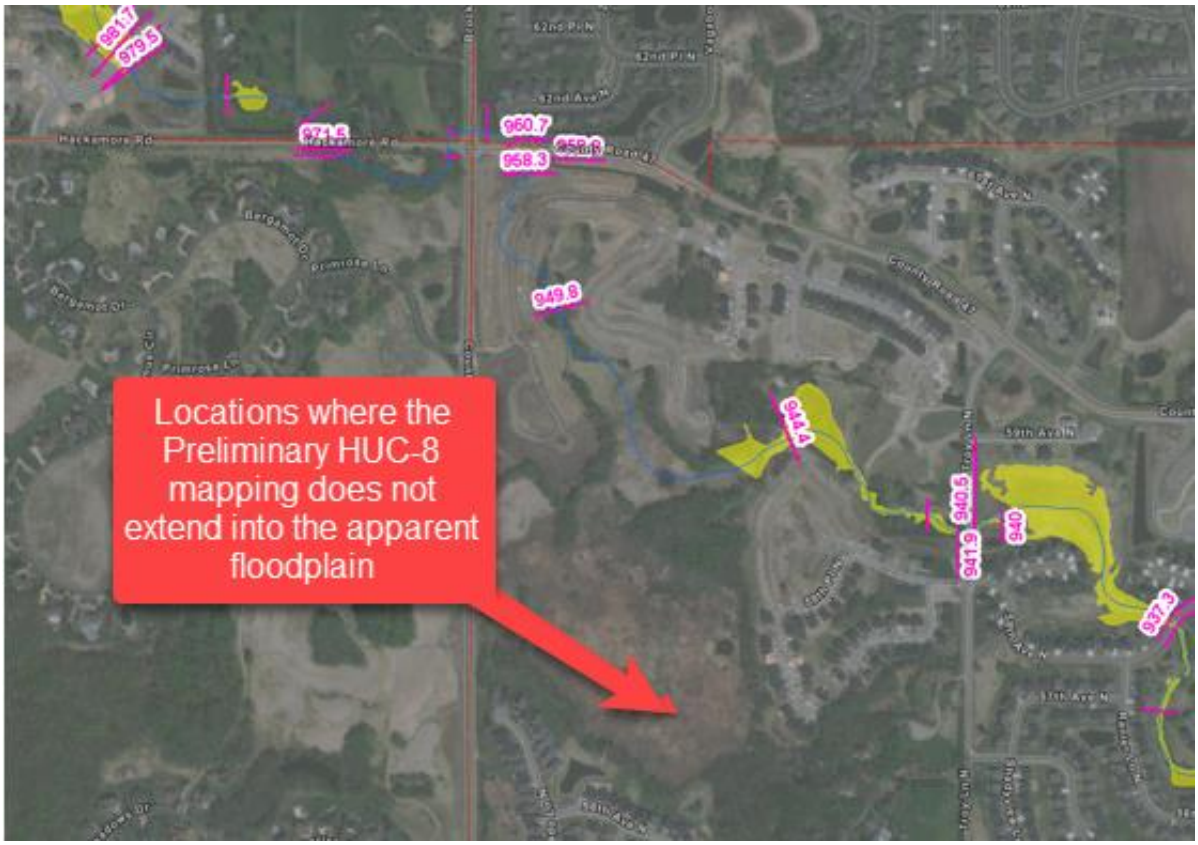


Figure 6 Tributary (HEC-RAS ElmCreek_BR4) tributary from near the Corcoran-Medina-Plymouth-Maple Grove Municipal Boundary. Also note that mapping is not provided between the 979.5 and 944.4-feet base flood elevation.

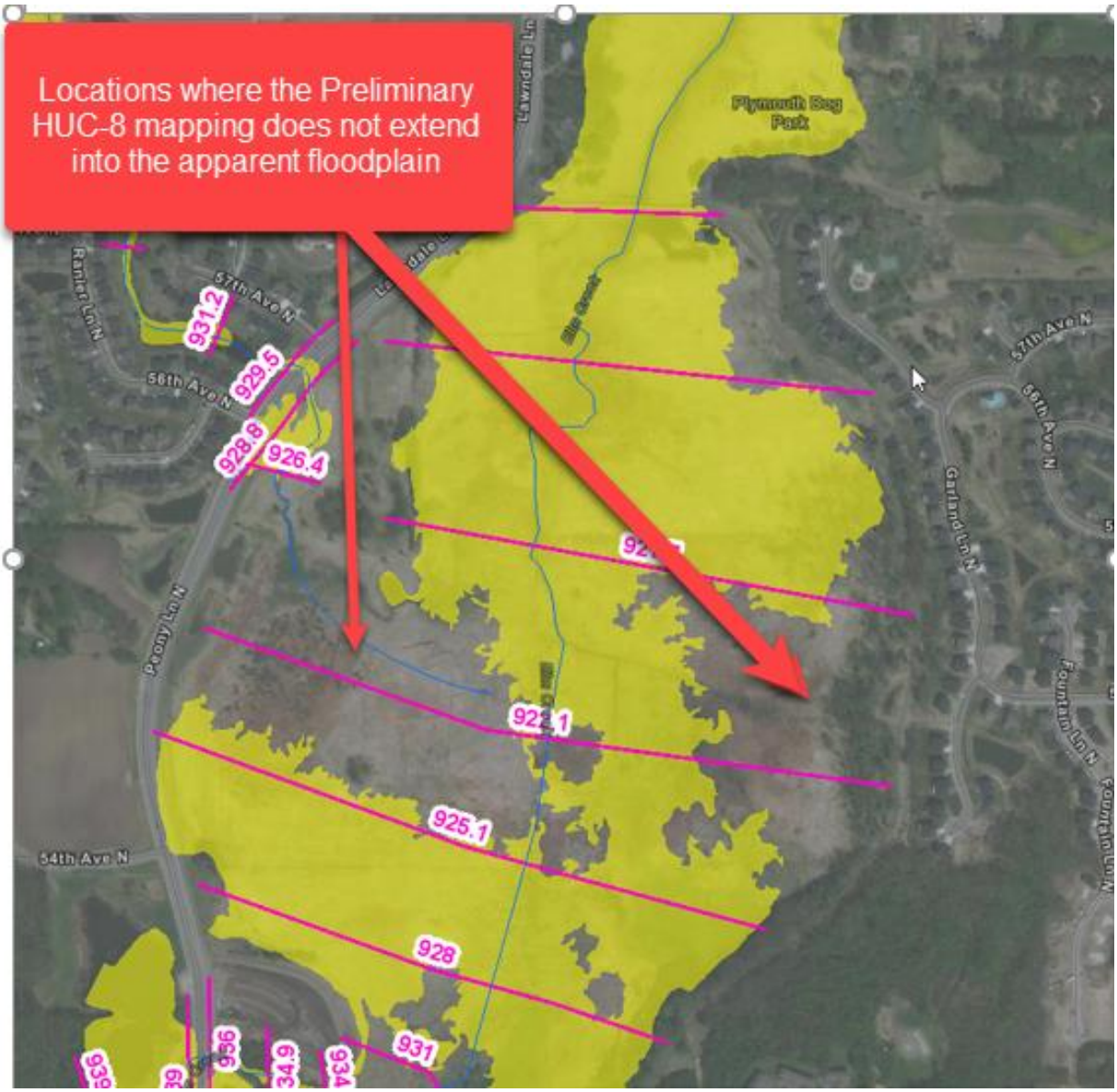


Figure 7 Elm Creek Greenway in Plymouth just east of Peony Lane. Also note that the tributary base flood elevations differ from the adjacent reach and that the cross sections do not extend across the apparent wetlands/floodplains (HEC-RAS Reaches ElmCreek and ElmCreek_BF4)

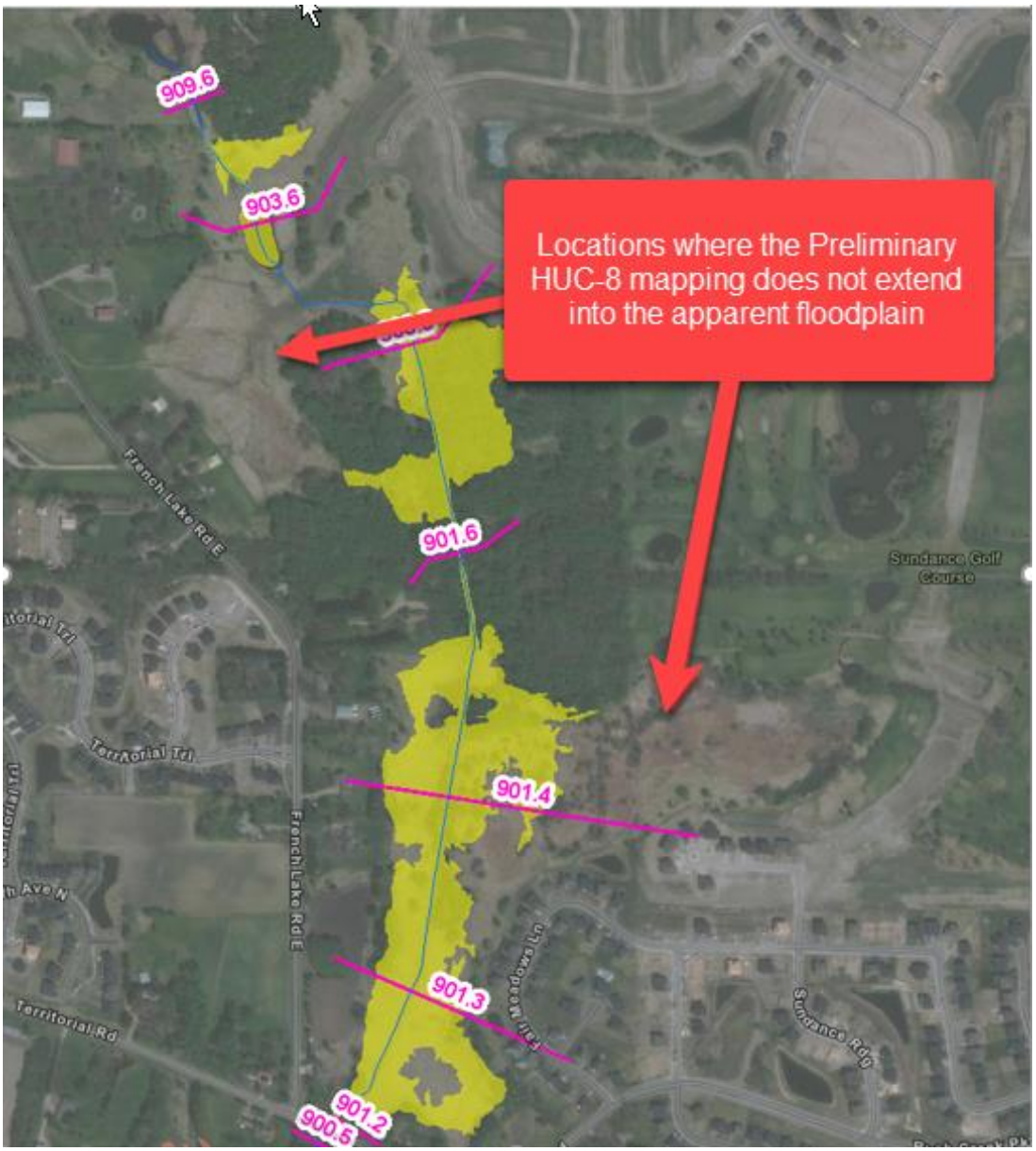


Figure 8 Rush Creek Tributary in Dayton near French Lake Road E (HEC-RAS Reach RushCreek_BR7). Also note the significant decrease in base flood elevation at the upstream end of the reach.

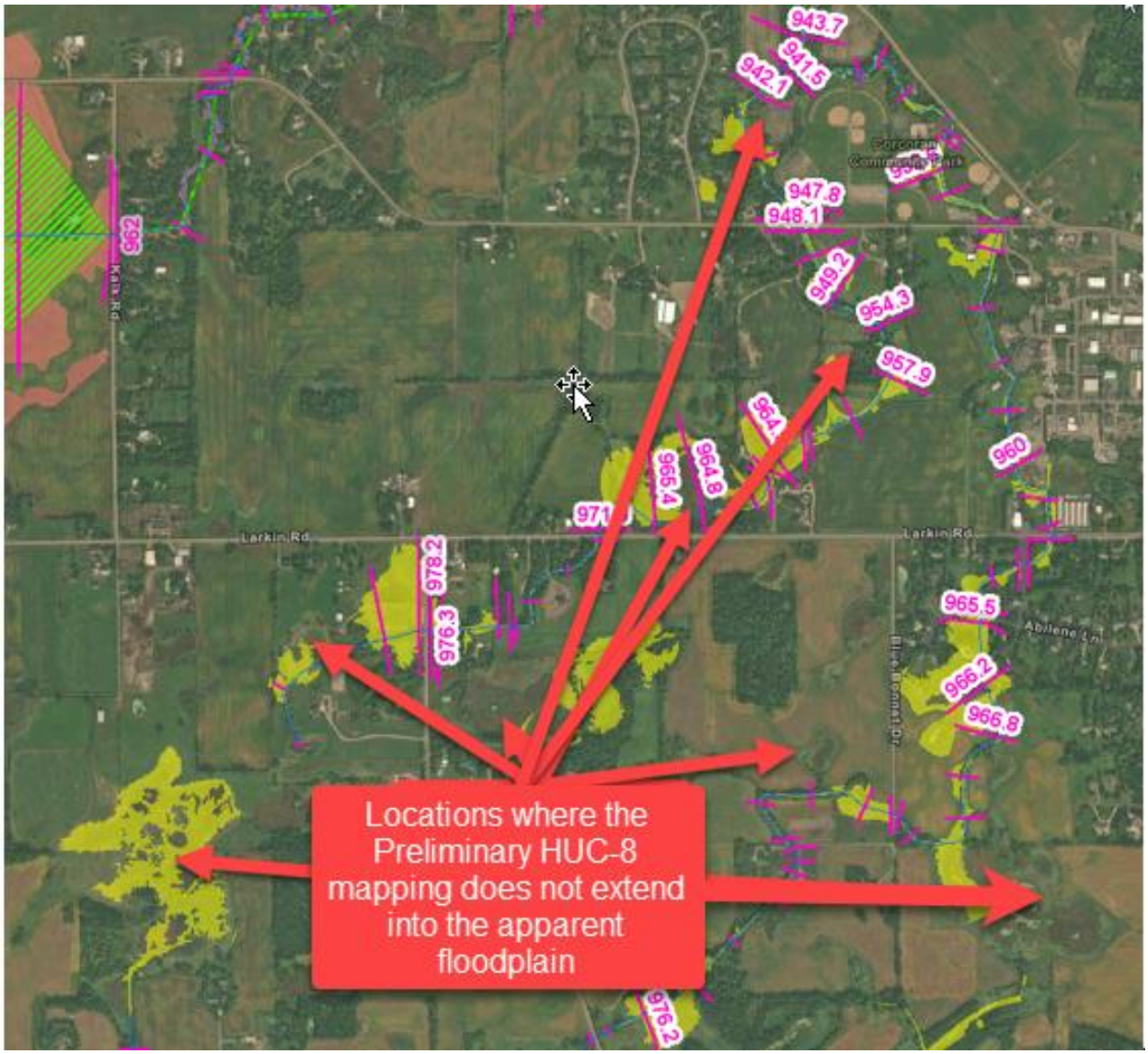


Figure 9 Rush Creek in Dayton near French Lake Road E (HEC-RAS Reach RushCreek, RushCreek_BR4, and RushCreek_BR5).

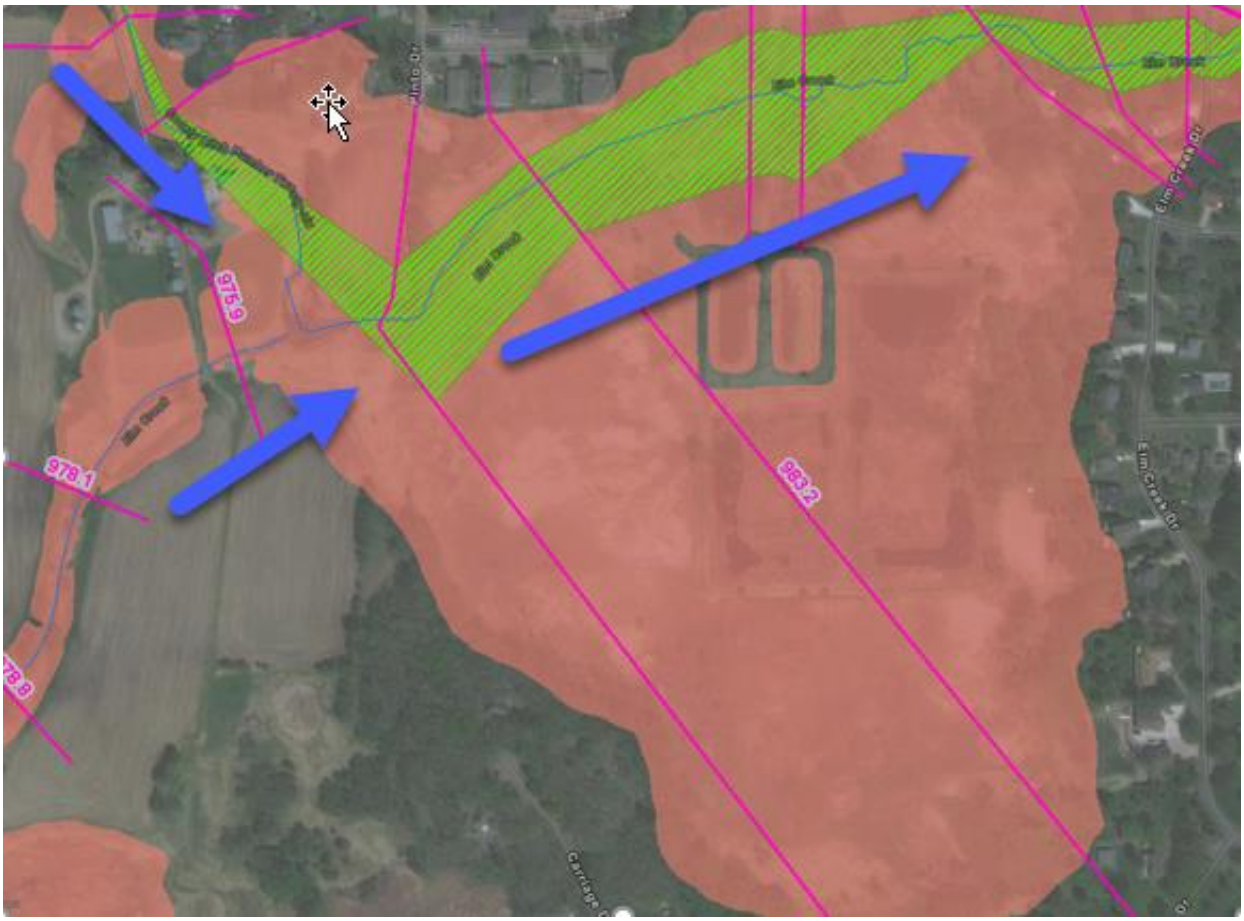


Figure 10 Just upstream of the crossing of Elm Creek's crossing with Hamel Road in Medina (HEC-RAS Reaches ElmCreek and ElmCreek_BR2), note the adversely increasing base flood elevation in the direction of flow (975.9' to 983.2') as well as the inconsistencies in the mapped floodway.

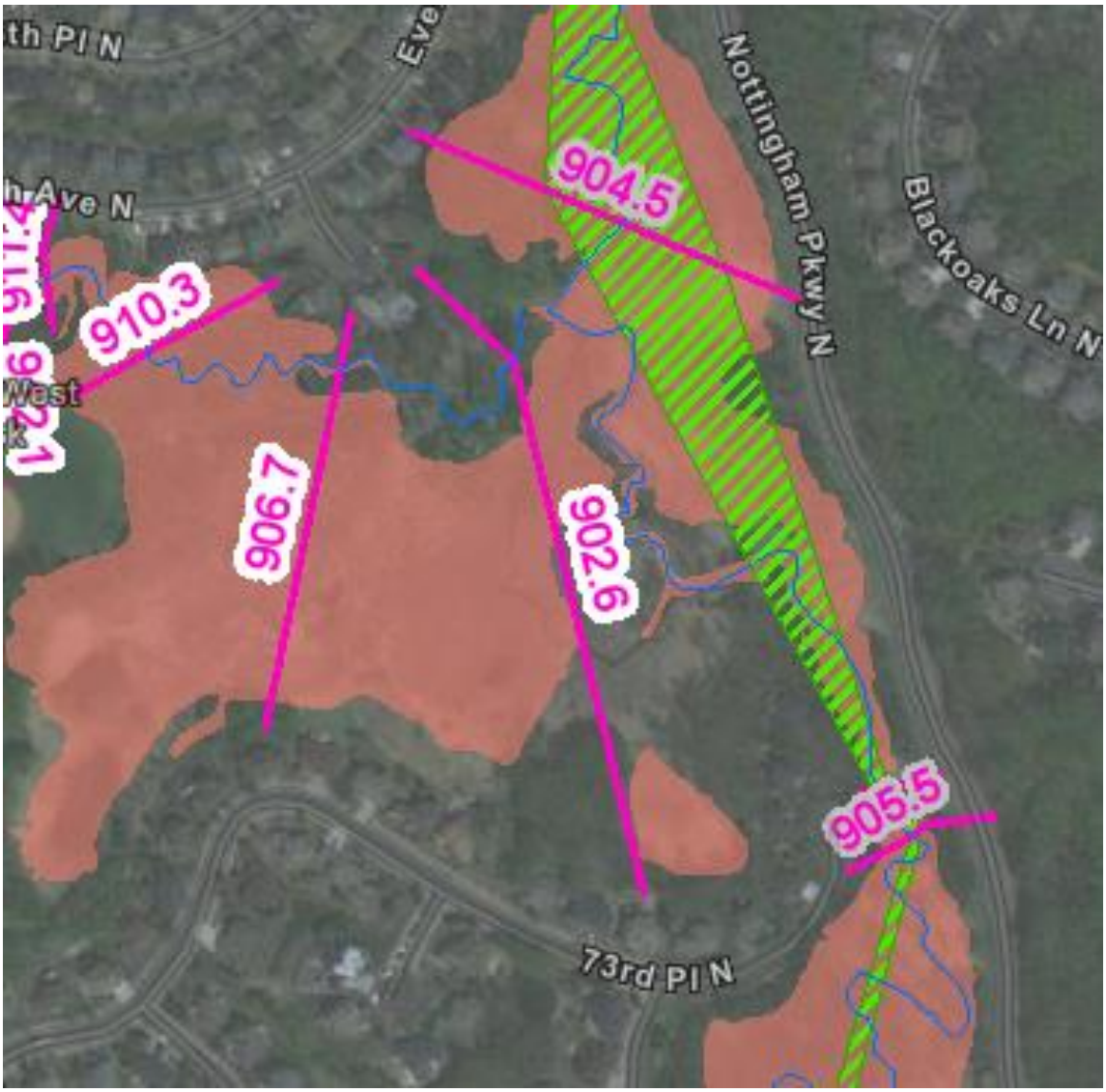


Figure 11 Note the difference in base flood elevations of the confluence of HEC-RAS Reaches ElmCreek and ElmCreek_BR5 between 73rd Place North and Nottingham Parkway N in Maple Grove as well as the inconsistencies in the mapped floodway.

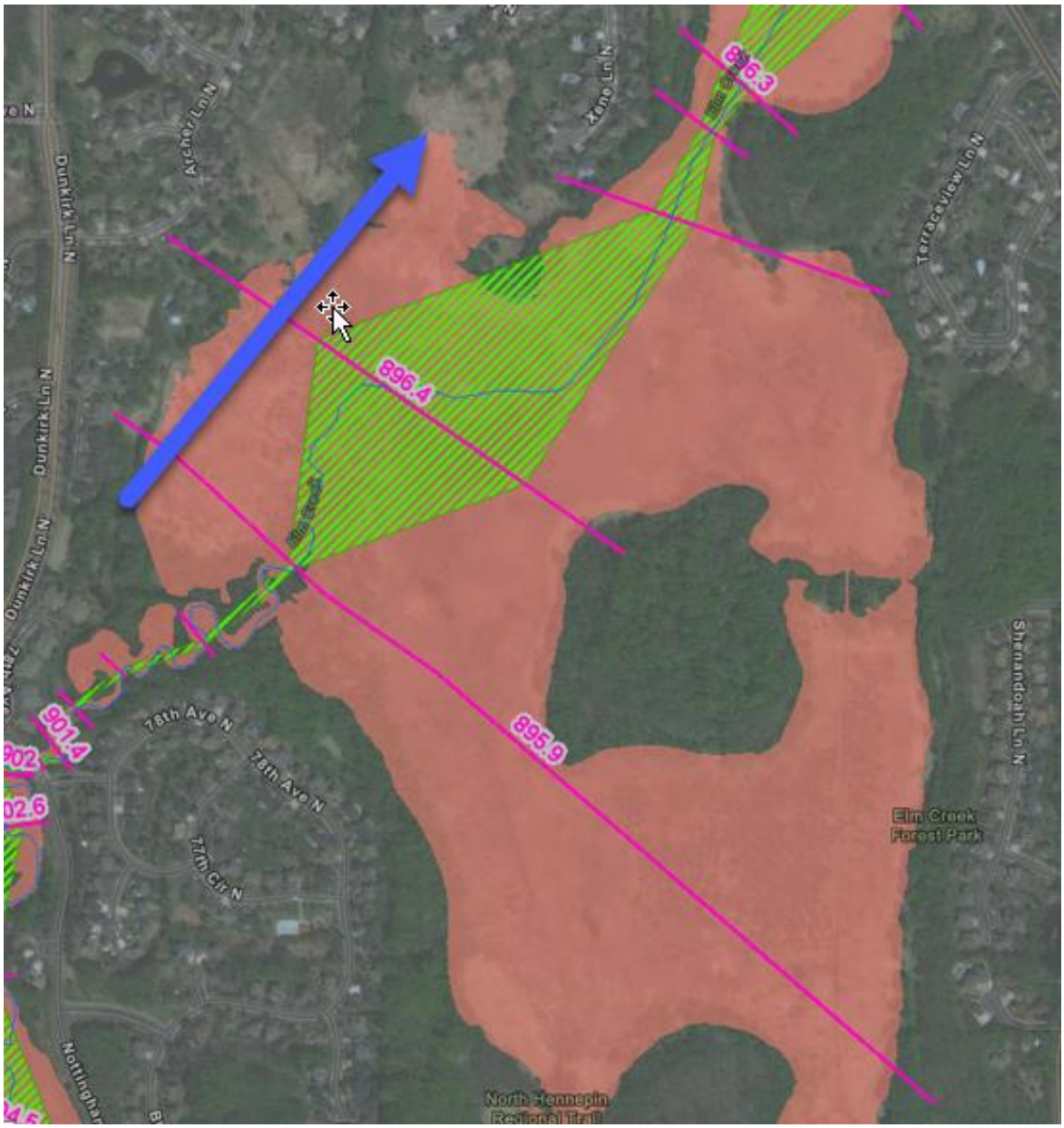


Figure 12 Elm Creek between Nottingham Parkway North and Weaver Lake Road. Note how the simulated floodplain elevation increases with the direction of flow.

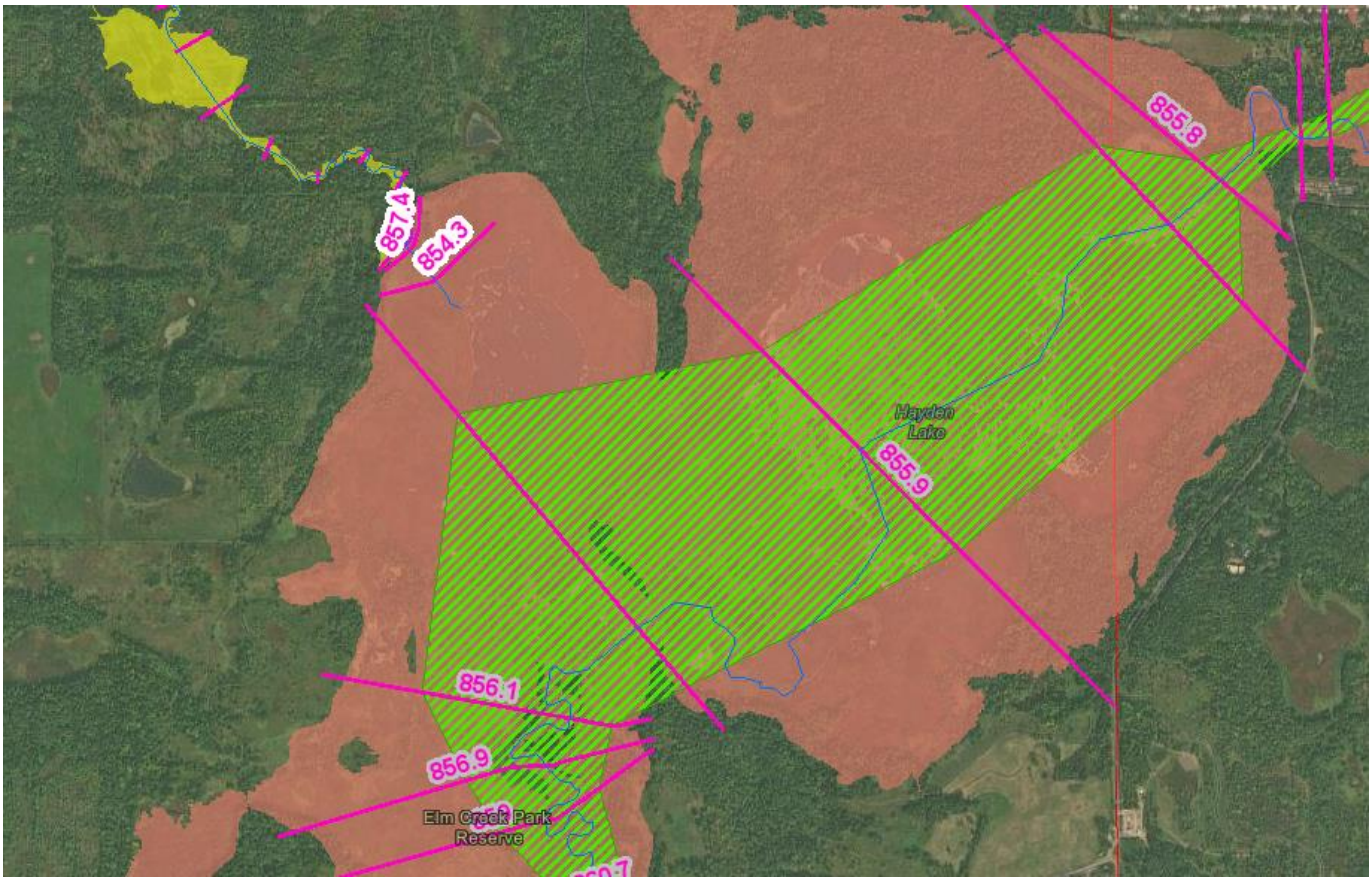


Figure 13 Note the difference in base flood elevations at the confluence of Rush Creek and Elm Creek.

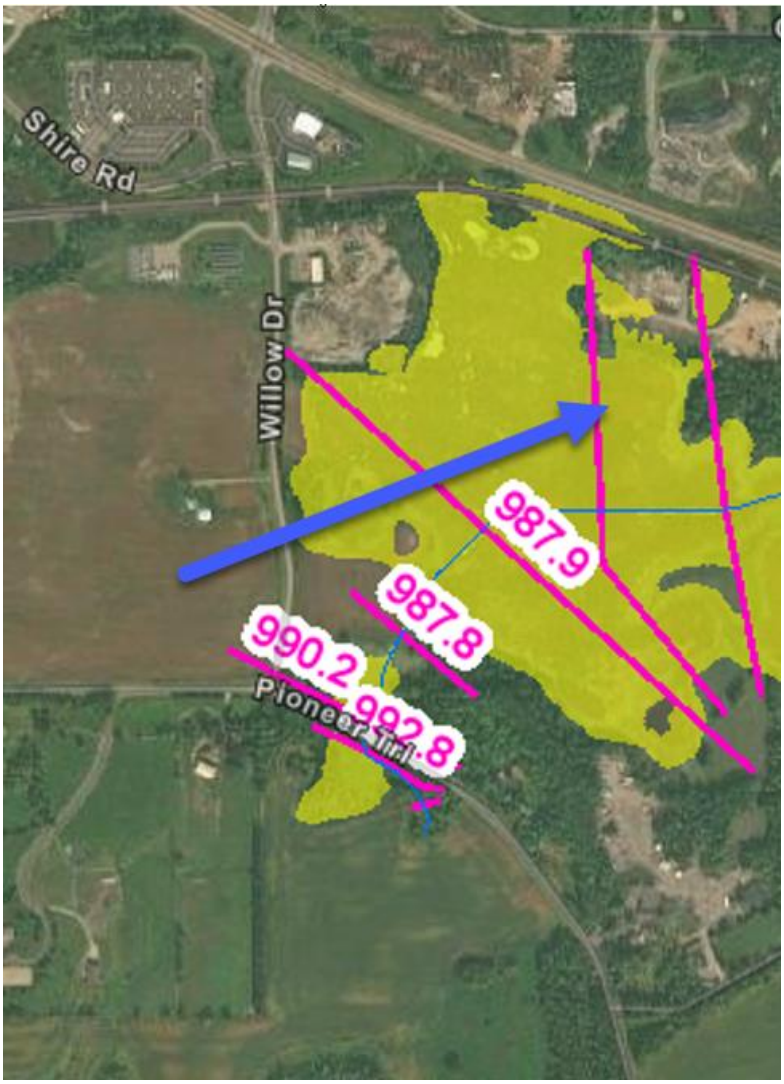


Figure 14 HEC-RAS Reach RushCreek_BR5 in Medina. Note how the simulated floodplain elevation increases with the direction of flow.

Figure 15 HEC-RAS RushCreek_BR5 just north of the Hennepin County Public Works building in. Note portions of the channel are unmapped and the apparent floodplain (upstream of base flood elevation 980.7) is unmapped.

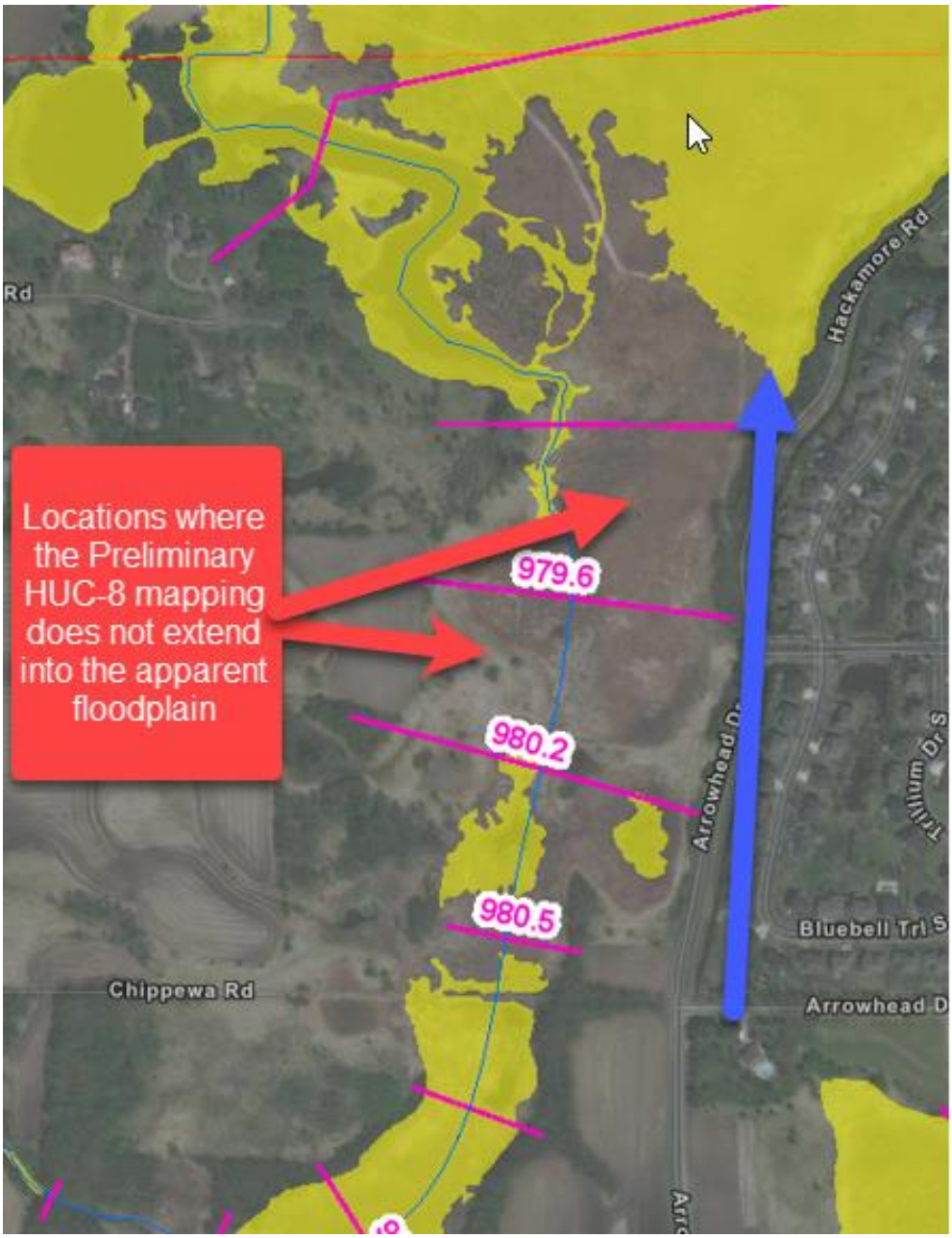


Figure 16 HEC-RAS Reach RushCreek_BR5 near the Medina-Corcoran municipal boundary.

Figure 17 HEC-RAS Reach RushCreek_BR5 in Corcoran near its crossing with Horseshoe Trail and Old Settlers Road. B

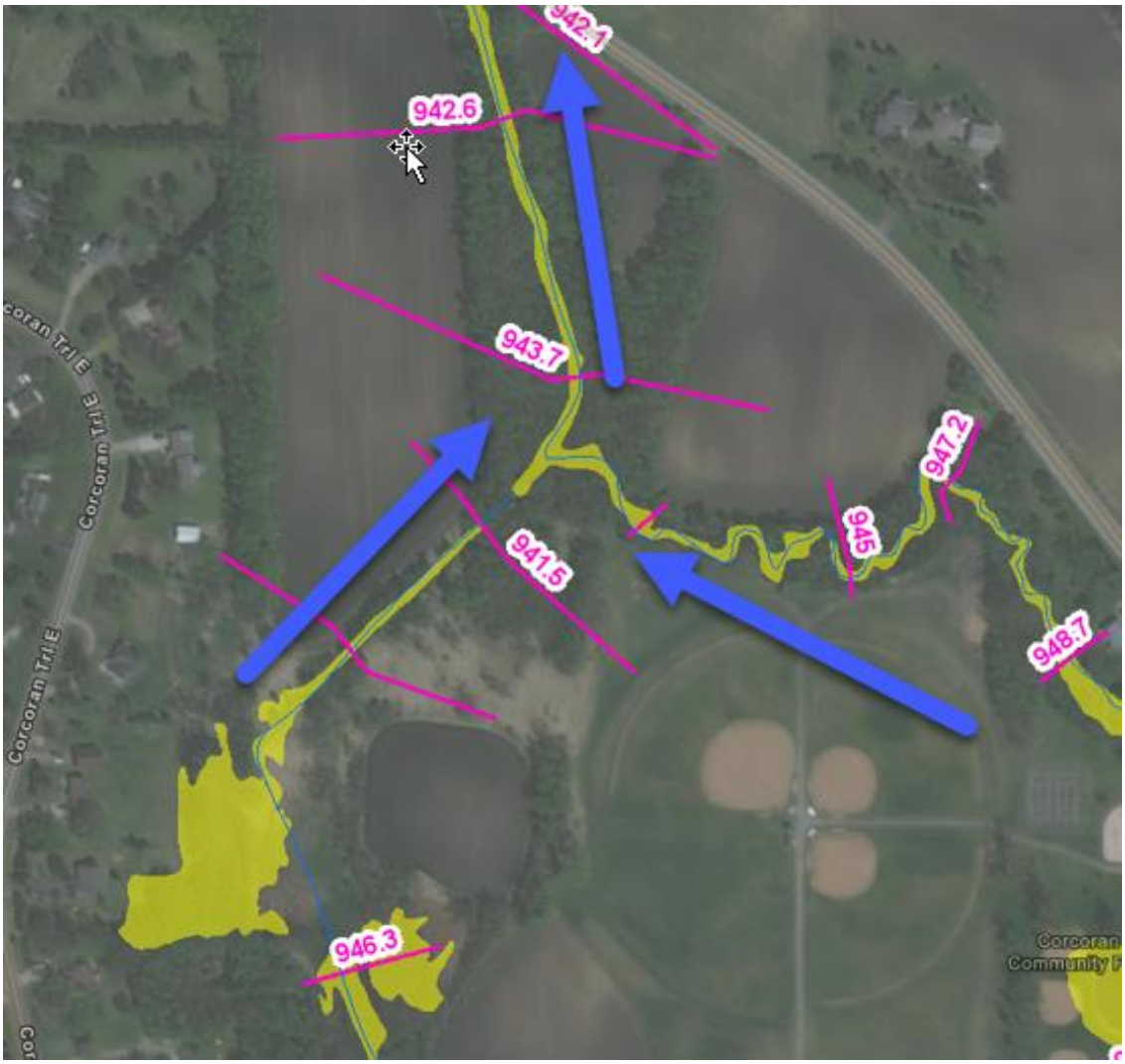


Figure 18 HEC-RAS Reach RushCreek_ BR5 in Corcoran near its confluence with HEC-RAS Reach RushCreek_ BR4. Note the difference in base flood elevations at the confluence of Rush Creek and Elm Creek.

Figure 19 Rush Creek (HEC-RAS Reach RushCreek) over Scott Lake and just downstream of Lake Jupert. Note how the base flood elevation increases in the direction of flow.

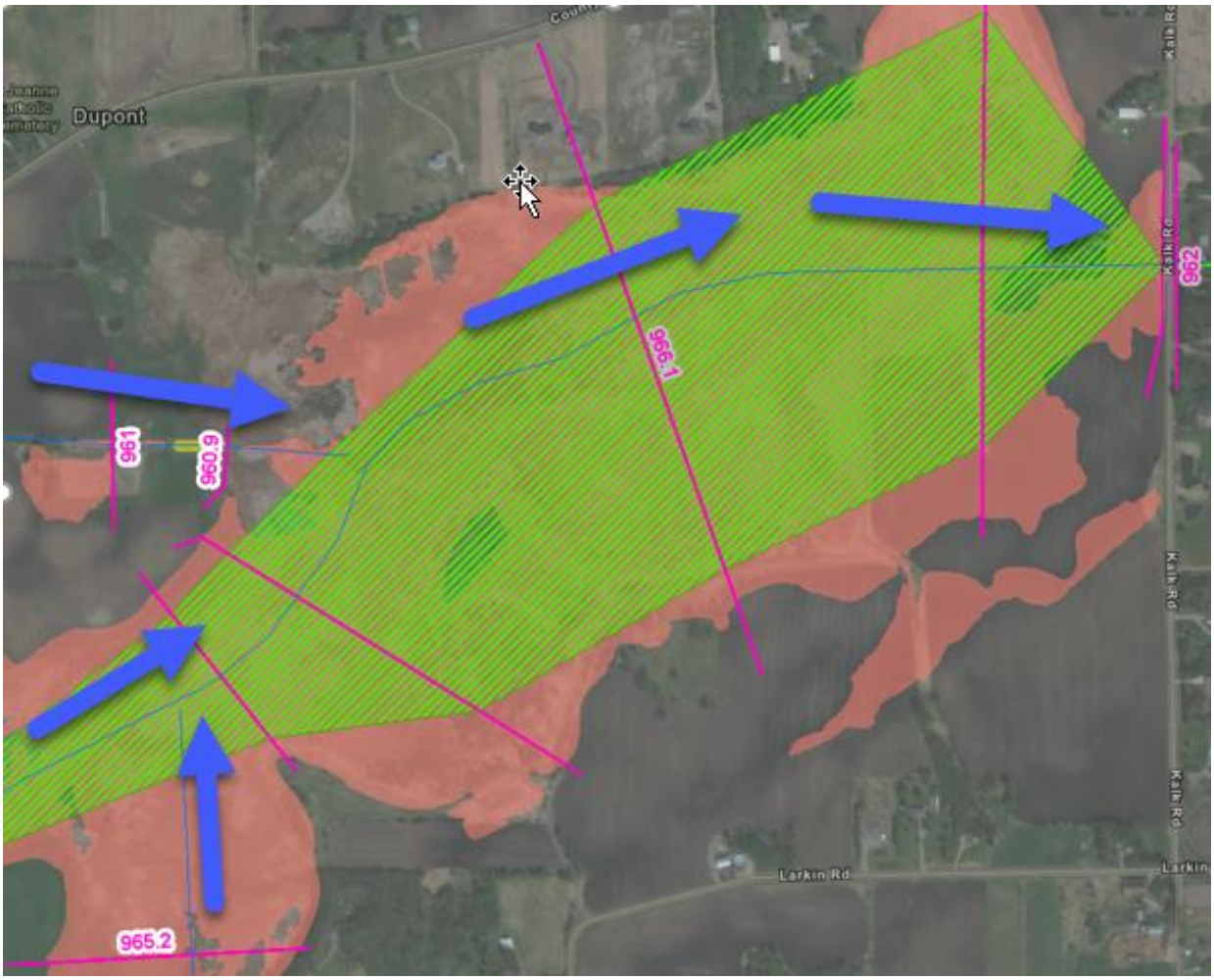


Figure 20 County Ditch #3 (HEC-RAS Reaches RushCreek, RushCreek_BR1, and RushCreek_BR2). Note how the base flood elevation increases in the direction of flow as well as the inconsistencies in the mapped floodway.

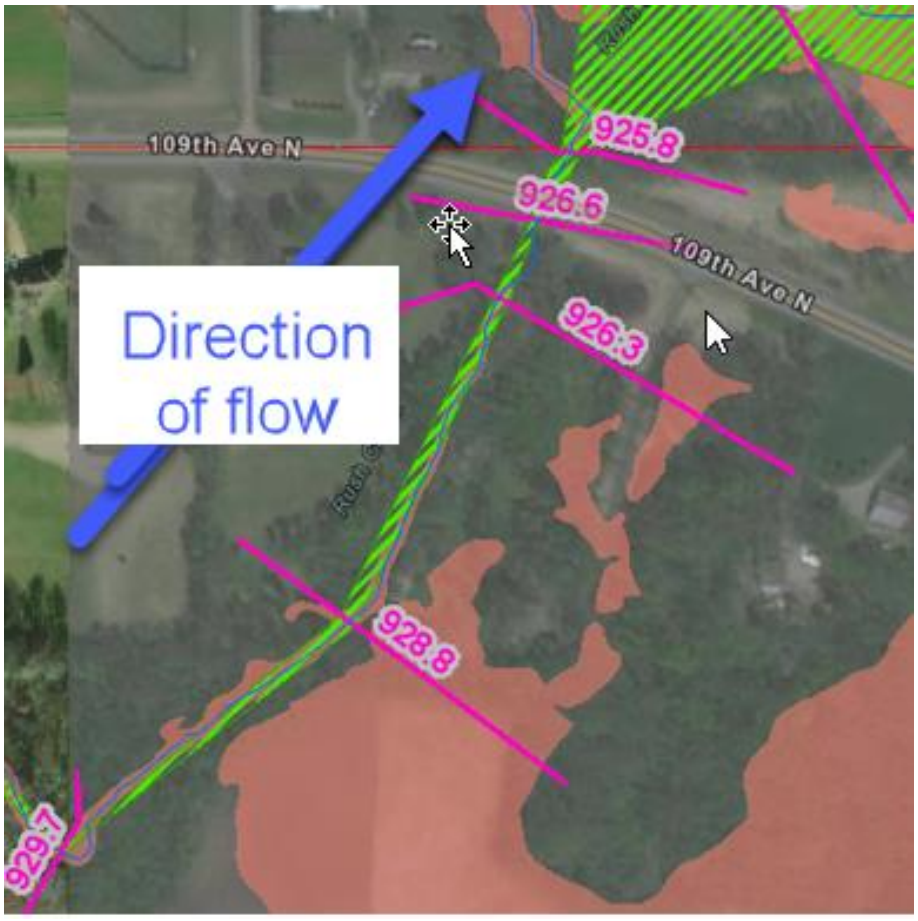


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Figure 21 North Fork Rush Creek in Corcoran near 109th Avenue North (HEC-RAS Reach NorthFrkRushCrk). Note the adversely increasing base flood elevation in the downstream direction

Figure 22 Rush Creek near the Confluence with North Fork Rush Creek in Maple Grove, note the adversely increasing base flood elevation

To: Elm Creek Watershed Management Commission Commissioners and Technical Advisory Committee

From: Ross Mullen, PE, CFM
Erik Megow, PE

Date: March 2, 2022

Subject: Response to Request for Proposal (FRPM) for Revisions to HUC-8 Model

Recommended Commission Action	Approve Work Scope to Make Revisions to the HUC-8 Study model and associated work products

INTRODUCTION

The Minnesota Department of Natural Resources (MNDNR) is partnering with the Federal Emergency Management Agency to update the base flood elevation across the watershed for a future Flood Insurance Study (FIS). Member cities of the Elm Creek Watershed Management Commission (ECWMC) have noted significant differences between the flood elevations in the 2016 FIS and the preliminary Elm Creek Floodplain Modeling and Mapping HUC-8 Study (HUC-8 Study).

In some locations, the HUC-8 results show a base flood ("100-year" or 1%-annual-exceedance-probability) elevation that is up to 8' higher than the reported 2016 FIS elevations. Based on historic flooding reports and historic knowledge in the watershed, these results are outside of expected flooding conditions.

The base flood elevation published in the FIS sets the floodplain inundation extents and is particularly important as there are local, state, and federal regulations governing development. For example, existing single-family homes with a federally backed mortgage (approximately 95% of all mortgages) are required to buy subsidized flood insurance that may cost between a few hundred to tens of thousands of dollars per year. The floodplain also substantially increases costs for new construction due to the increased cost associated with bringing in fill (i.e. raising ground level) to reduce flood risk.

The purpose of this memorandum is to provide a work scope to revise the HUC-8 Study based on the Third-Party Review (Stantec, January 2022).

SCOPE

The subsequent sections discuss Stantec's approach to build on the diagnostic work completed for the Third-Party Review and to make the recommended revisions to the model.

1.0 HYDROLOGIC MODEL (HEC-HMS) UPDATES

Stantec proposes the following steps to provide better estimates of peak streamflows.

1. Replace the Muskingham-Cunge shortened simplified trapezoidal bank-width cross sections to account for the full storage and attenuation of the floodplain for up to 55 watersheds (identified in yellow on Figure 1 of the Third-Party Review).

2. Verify that watershed areas are consistent with GIS and hydrologic connections between watersheds and reach segments are correct in the model. Stantec will use the GIS formatted watersheds included in the copy of the HUC-8 Study HEC-HMS model received January 24, 2022 for this data verification.

3. Recalibrate the Hydrologic (HEC-HMS) model
   1) The model will be recalibrated based on the same calibration events included in "*Elm Creek Narrative and QAQC Documentation*" (Barr Engineering Co., 2021).
   2) The recalibrated model will be assessed at the Three Rivers Park District flow monitoring gages *ECER (Elm Creek at Elm Road* near the Plymouth-Maple Grove municipal border) and *RT* (Rush Creek at Territorial Road) and the gage co-operated with the U.S. Geological Survey on Elm Creek in Elm Creek Park Preserve.
   3) The calibration events for consideration are:
      i. June 23 – July 5, 2003 (rainfall) Note flow monitoring data for the Three Rivers Park District Rush Creek at Road is unavailable for this time (data was first collected at the RT site in 2009). Stantec will exclude this gage from the calibration. If the Commission wants to use four calibration events with available gage data for each event, Stantec can do so in a separate scope of work. The other monitoring stations include monitoring data.
      ii. March 6 – April 3, 2010 (snowmelt)
      iii. March 18 – March 28, 2011 (snowmelt)
      iv. September 22 – October 1, 2016 (rainfall)

   4) The MNDNR has expressed concern with the Curve Number used in the model and stated that the Curve Numbers are inconsistent with the Hydrologic Soil Groups present in the watershed; therefore, Stantec will first look to modify the Curve Numbers as part of calibration.

DELIVERABLES

Stantec will provide the following deliverables as part of Task 1:

- Updated hydrologic (HEC-HMS) model in version 4.3 (same as used for the HUC-8 Study analysis).

2.0 HYDRAULIC MODEL (HEC-RAS) UPDATES

Stantec proposes the following steps to provide better estimates of peak water surface elevations.

1. Update the hydraulic model with the updated flows from the hydrologic model (HEC-HMS) as described in the preceding section for the 10%, 2%, 1%, 0.2%-annual-exceedance-events.

2. Update 52 bridges, culverts, weirs, and dams based on construction drawings, survey, and as-built data as shown in Table 3 of the Third-Party Review. (Stantec was not able to locate better data for an additional 27 structures).

3. Add the Elm Creek Dam (Mill Pond Dam) to the model based on City of Champlin as-builts.

4. Update the model to correct the stream alignments at:
   1) *County Ditch 16* east of Brockton Lane (County Road 101). The modeled stream alignment is through a series of stormwater ponds to the east of the intersection of Vagabond Lane and south of Bass Lake Road. The modeled alignment of County Ditch 16 will be corrected to show the watercourse is piped beneath Vagabond Lane to the north.
   2) *Unnamed Tributary* to Elm Creek (HEC-RAS Reach *ElmCreek_BR4*) just southeast of the intersection of Hackamore Road (County Road 47) and Brockton Lane (County Road 101) in Plymouth. The modeled stream alignment appears to show a temporary construction alignment of the creek. The alignment will be updated to follow the permanent alignment of the watercourse.

5. As directed by the MNDNR, either recombine model reaches that were split at stream confluences in the HUC-8 Study model or update the boundary conditions of the existing severed reaches. It is unclear why the modeled reaches were separated; however, the severed reaches have resulted in disparate base flood elevations from one stream to the next.

6. Run the updated the hydraulic model (per items 1 through 4 above) with the updated flows from the hydrologic model (HEC-HMS) as described in the preceding section for the 10%, 2%, 1%, 0.2%-annual-exceedance-events.

7. Stantec will also develop a floodway scenario using the revised hydraulic model. Stantec proposes the following methodology to develop a floodway and will be required to work closely with the Elm Creek member communities to understand public right of way and flowage easements.
   1) As a first step, Stantec will assume the floodway is located in the same location as shown in the effective 2016 Flood Insurance Rate Maps. Where the floodway surcharge is less than ½-foot, as required by the state of Minnesota, Stantec will not alter the proposed floodway.
   2) Where the floodway surcharge is between ½ and 1-foot (the federal floodway surcharge standard) Stantec will propose to map the floodway in the same location as the 2016 effective Flood Insurance Rate Maps. It is our understanding the MNDNR has used this approach in other watersheds as it wishes to maintain the existing floodway while recognizing precipitation and development changes.
   3) Where the floodway surcharge exceeds 1-foot Stantec will identify those locations to the member communities for input and provide an understanding of the simulated floodway surcharge (and therefore provide an understanding of where the floodway needs to expand the most). Where possible, the revised floodway will be simulated to stay within the public right of way and/or flowage easements. As much as possible, Stantec will work to exclude existing structures from the revised floodway.

DELIVERABLES

Stantec will provide the following deliverables as part of Task 2:

- Updated hydraulic (HEC-RAS) model in version 5.0.7 (same as used for the HUC-8 Study analysis).
- Floodway Scenario Model Run

3.0 STAKEHOLDER MEETING

Up to two Stantec staff will facilitate a Stakeholder meeting during the May 11, 2022 Elm Creek TAC meeting. We assume this will be a virtual meeting

4.0 MEMORANDUM OF UPDATES

Stantec will prepare the following documentation for the TAC and other interested parties to review the describing the updates to the hydrologic and hydraulic models and the revised results:

1) A memorandum that will discuss the revised model results for the calibration events as well as changes to the parameters required to recalibrate the model. The memorandum will be documentation of changes that were made by Stantec and will be an addendum to the previously submitted materials to the MNDNR.

2) Stantec will prepared a table comparing the effective 2016 FIS flood elevations to the revised HUC-8 model elevations at road crossings, lettered FEMA cross sections, and other pertinent locations across the watershed for the 1% and 0.2% annual exceedance events (per 2/22/2022 addendum). The memorandum discussed as Task 4.1 will include high-level discussion of locations where the proposed flood elevation differs by more than 2-feet.

3) Stantec will also prepare working level inundation maps for the same events at a scale of 1:10,000 for Elm Creek, diamond Creek, North Fork Rush Creek, and South Fork Rush Creek. The HEC-RAS RASMapper routine will be used to automatically generate output and Stantec will review all bridge and culvert crossing, sharp turns in the watercourse, and other common automated mapping output issues to display accurate maps.

DELIVERABLES

Stantec will provide the following deliverables as part of Task 4:

- Memorandum describing the model updates.
- QAQC Documentation (required by MNDNR for HUC-8 Study approval).
- 1:100,000 Scale Maps

ASSUMPTIONS:

- Based on our discussion with Jeff Weiss of the MNDNR Floodplain group on January 20, 2022, Stantec will not produce mapping products for the MNDNR, such as depth grids, inundation shapefiles, cross sections, or stream centerlines as the MNDNR does not require these deliverables.
- Stantec will not analyze or determine the floodway extents.
- **Based on our conversation with Derek Asche, Chair of the ECWMC Technical Advisory Committee (TAC), on February 16, 2022, Stantec will not make additional model**

modifications based on MNDNR review comments as documented in the MNDNR's February 14, 2022 memorandum except as documented in the RFP for Revisions to HUC-8 Model

- For example, Stantec will not subdivide watersheds with multiple stream segments (Additional Review Comment #5).

SCHEDULE

Stantec will complete Tasks 1, 2, and 4 no later than April 22, 2022 and provide the results to Judie Anderson for distribution to the ECWMC TAC and other interested parties.

Stantec will present the initial findings of Tasks 1, 2, and 4 at a Stakeholder Meeting (Task 3) on May 11, 2022 during the regularly scheduled Elm Creek TAC meeting. Stantec will document comments from member Cities and make revisions to model inputs, unless additional hydraulic analysis outside of this scope is required and provide final work products no later than June 24, 2022. The schedule outlined above assumes an authorization to start date, no later than March 10, 2022 and also assumes that Stantec will be completing all Tasks outlined within the Scope (Sections 1 – 4, above).

PROJECT TEAM

- **Erik Megow, PE** has over twelve years of experience as a consulting engineer. His primary expertise is stormwater best management practice design, regulatory review, hydraulic and hydrology modeling, stream restoration and stabilization design, floodplain analysis, stormwater management, and surface water mixing zone modeling. Erik has experience and is proficient using XP-SWMM, PC-SWMM, EPA-SWMM, HydroCAD, HEC-RAS, HY8, CORMIX, P8, MIDS, Qual2k, ArcMap (GIS), & ArcGIS Pro.

- **Jason Schneider, PE, CFM** has over 15 years of experience as a Project Manager and Professional Engineer. He's experienced in managing survey, hydrology, hydraulic and floodplain mapping, flood risk infrastructure, flood risk analysis and risk communication. As part of the STARR joint venture Jason currently serves as the Region Support Center Lead for FEMA Region VII. In that role he's the primary point of contact for the FEMA, and provides technical support on standards and guidance.

- **Kiley Gafner, EIT** has two years of experience and primarily works on renewable energy, water resource management/stormwater management, and brownfield redevelopment projects. She recently has worked on several hydrologic and hydraulic studies for solar farms as the lead HEC-RAS modeler.

ACKNOWLEDGEMENTS

We acknowledge and accept that all work products for the above scope may not be distributed or disseminated in any form without written permission from the Elm Creek Watershed Management Commission.

We also acknowledge and accept that the Commission reserves the right to enter into an agreement with a consultant for any or all of Tasks 1-4.

BUDGET

Stantec's budget for the proposed work is shown in the table below.

Task		Total
1.0 Hydrologic Model (HEC-HMS) Updates	**All Subtasks**	**$15,250**
2.0 Hydraulic Model (HEC-RAS) Updates	Subtasks 1-6	$5,875
	Subtask 7[a]	$20,125[a]
	Subtotal for Task 2.0	**$26,000**
3.0 Stakeholder Meeting	**All Subtasks**	**$1,875**
4.0 Memorandum of Revisions	Subtask 1	$2,000
	Subtask 2	$11,750
	Subtask 3	$9,000
	Subtotal for Task 4.0	**$22,750**
Total		**$65,875**

[a] The MNDNR has agreed to do this for other Twin Cities HUC-8 Studies free of charge. Per 2/22/2022 correspondence with JASS, the TAC requests to see this analysis as part of the RFP revisions.

Stantec

Memo

To: Elm Creek WMO Commissioners
Elm Creek TAC

From: Diane Spector

Date: March 2, 2022

Subject: Watershed-Based Implementation Funding
Convene Process

Recommended Commission Action	Complete process steps 1-3 below, and discuss options for step 4.

This Convene meeting is intended to kick off the Watershed-Based implementation Funding (WBIF) allocation process for the Elm Creek Watershed Allocation Area. The Board of Water and Soil Resources (BWSR) approved allocations for fiscal year 2022 to the Elm Creek allocation area is **$297,774,** which will become available July 1, 2022. Funding must be focused on prioritized and targeted cost-effective actions with *measurable water quality results* that were identified in the implementation section of a state approved and locally adopted comprehensive watershed management plan. BWSR published a Convene Process Guidance document (attached) that the Partnership will be using to develop funding options and make decisions and recommendations to BWSR for funding.

At their February 10, 2022 meetings, the TAC selected Heather Nelson from Champlin and Nico Cantarero from Dayton to represent the cities in the Partnership and the Commission selected Doug Baines from Dayton as the Elm Creek Watershed representative. Hennepin County designated Kris Guentzel to represent it as the county and SWCD.

BWSR-Recommended Convene Meeting Process:

1. Choose a facilitator.
2. Choose a decision-making process. (For example, consensus, parliamentary (Robert's Rules)).
3. Decide how to select activities for funding. Note that partnerships may also want to choose funding targets for different categories (e.g., projects, studies, education).
4. Partnerships may select activities by:
    - Developing a list of potential activities from eligible plans,
    - Dividing funding among eligible entities in an equitable manner,
    - Selecting a few priority waterbodies (lake, streams) and/or groundwater areas to prioritize activities,
    - Using agreed upon criteria to select activities, or
    - Using a process approved by the BWSR Central Region Manager.
5. Select the highest priority, targeted, measurable, and eligible activities to be submitted to BWSR as a budget request.
6. Confirm which entity will serve as grantee and/or fiscal agent for each selected activity and decide on the source of the 10% required match.

Potential Funding Activities

Funding is not limited to capital projects; anything in the Third Generation Plan's Implementation Plan may be eligible as long as its end goal is the protection and improvement of water quality. As a reminder, the Implementation Plan included four broad areas, including:

- Regulation and Project Reviews
- Monitoring
- Education and Outreach
- TMDL/WRAPS Implementation
    - Load reduction through land use change
    - Targeted load reduction through subwatershed assessments
    - Agricultural outreach
    - Capital projects in the plan or a subsequently amended CIP

The Implementation Plan/CIP in the 3rd Generation Plan also includes generalized Special Projects that may be considered for funding through WBIF. Some examples of these include:

- Stream inspections to identify maintenance and restoration needs.
- 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.
- Agricultural BMPs cost share.
- Generic stream restoration, wetland restoration, lake internal load, and urban BMP projects yet to be defined.

Discussion

The Partnership may choose to award the funds to one high-priority project or make numerous awards for varying objectives – for example dividing up the funds into an allocation for ag cost share, a lake internal load feasibility study, a priority subwatershed assessment, targeted resident outreach, and one or more projects. Or, you may decide to focus on one or two priority lakes and undertake a suite of activities focused on making a measurable improvement in water quality. As set forth in steps 3 and 4 above:

1. Discuss preference for funding:
    a. Limit to one or two activities or fund several activities.
    b. Focus on one or two specific resources (one or two lakes; a stream)
    c. Fund an existing CIP project or projects.
    d. Solicit new ideas.
    e. Other
2. Discuss and generate specific options for funding.
    a. Solicit new projects or ideas for funding.

Next Steps

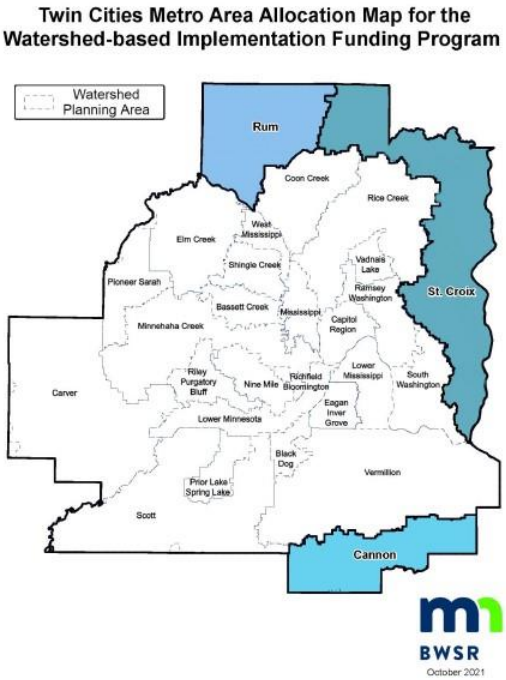
Depending on what is accomplished at the initial Convene meeting, the next steps at the next meeting(s) would be 1) to solidify the list of potential activities for funding, 2) determine how the Partnership will select activities for funding; 3) select the highest priority activities for funding.

11/19/21

Metro Area Watershed-Based Implementation Funding (WBIF) Program FY22-23 Convene Process Guidance

The purpose of WBIF is to supplement existing funding to accelerate clean water activities (practices, projects, and programs) toward advancing Minnesota's water resources goals through prioritized and targeted cost-effective actions with measurable water quality results.

In the seven-county Metropolitan Area (Metro), only activities identified in the *implementation section* of a state approved and locally adopted comprehensive watershed management plan developed under Minnesota statutes §103B.101, Subd. 14 or §103B.801, watershed management plan required under §103B.231, county groundwater plan authorized under §103B.255, or a Metro soil and water conservation district enhanced plan as described in the "*Metro SWCD Enhanced Comprehensive Plan Options Guidance Document*" (https://bwsr.state.mn.us/watershed-based-implementation-funding-program) and authorized under §103C.331 are eligible to be funded. Activities must also have a primary benefit towards water quality.



For purposes of this document, the group of participants in each watershed allocation area (see map) will be called a partnership (e.g., Rice Creek partnership or Rum partnership) and meetings will be referred to as convene meetings.

Convene Meeting Process

The convene meeting process allows the partnership to jointly coordinate on the development of a WBIF budget request for submittal to BWSR that is prioritized, targeted and measurable. Each partnership will include one decision-making representative (participant) from each watershed district and/or watershed management organization, soil and water conservation district, county with a current groundwater plan, and up to two decision-making representatives from municipalities within the allocation area.

Prior to the initial meeting, individual organizations must select one decision-making representative to the partnership. Municipalities in each allocation area must coordinate prior to the start of the convene process to self-select up to two decision-making representatives. Municipal representatives are expected to communicate with other municipalities on the solicitation and selection of projects and

activities during the process. The partnership can then either select a local government entity (or entities) to coordinate and facilitate the convene meeting(s) or request assistance from BWSR by contacting the Board Conservationist (BC). The BWSR BC and Clean Water Specialist (CWS) must be invited to convene meetings. Meeting notes that document the general discussion, decisions, and attendees will be taken by the facilitating entity and shared with the partnership soon after each meeting and be made available upon request.

Each partnership must meet at a minimum of one time prior to submitting a budget request. Ideally, partnerships will develop a shared understanding of proposed activities during the convene meeting process. In order to improve the efficiency of the convene meeting process, BWSR recommends the following meeting objectives.

Recommended Convene Meeting Objectives:

1. Choose a decision-making process.
2. Decide how to select activities for funding. Note that partnerships may also want to choose funding targets for different categories (e.g., projects, studies, education).
   Partnerships may select activities by:
   - Developing a list of potential activities from eligible plans,
   - Dividing funding among eligible entities in an equitable manner,
   - Selecting a few priority waterbodies (lake, streams) and/or groundwater areas to prioritize activities,
   - Using agreed upon criteria to select activities, or
   - Using a process approved by the BWSR Central Region Manager.
3. Select the highest priority, targeted, measurable, and eligible activities to be submitted to BWSR as a budget request (see submittal process below).
4. Confirm which entity will serve as grantee and/or fiscal agent for each selected activity and decide on the source of the 10% required match.

Eligibility

To better understand the eligibility of proposed activities, BWSR recommends that you first refer to the FY22-23 WBIF Policy at https://bwsr.state.mn.us/grant-program-policies. If there are questions regarding eligibility, it is recommended that the BWSR BC be consulted as early as possible.

The partnership must send the BWSR BC a list of partnership-approved activities prior to submittal of an eLINK budget request when there will be multiple grantees per watershed allocation area to ensure funds are not being overextended. This list should include the project title and description, water resource(s), proposed measurable outcome(s), grant funds requested, plan reference(s), entity requesting funding (grantee), and fiscal agent (if different from grantee).

Even if your partnership will not have multiple grantees, it is still recommended that partnerships provide the BWSR BC this same list of project details prior to completion of a budget request in eLINK in order to accelerate the eligibility screening process. This step could reduce the need for additional meetings or the number of times an eLINK budget request is completed.

A template can be provided if requested. For plan references, please provide the title(s) to the eligible water management plan(s), page number where these are found in the *implementation section* of the

eligible plan(s), and weblink to the referenced plan(s).

Submittal of the Budget Request

Once the activities have been agreed upon by the partnership, each grantee will then be responsible for submitting an eLINK (https://bwsr.state.mn.us/elink) budget request to BWSR. BWSR may deny the budget request for reasons such as activities are ineligible according to the WBIF Policy, activities are not identified in the implementation section of an eligible plan, requested amount is inaccurate, the request is incomplete, etc. Please save the budget request information outside of eLINK as this information is not retained in eLINK if a budget request is denied and a new budget request would need to be submitted.

Once the eLINK budget request is approved by BWSR, each grantee will be responsible for completing an eLINK work plan, which needs to be approved by BWSR **no later than March 30, 2023**. Note that if a work plan cannot be approved by this date, BWSR will reallocate these funds through the WBIF Program. Therefore, we highly recommend that eLINK budget requests are submitted no later than November 30, 2022 and the eLINK work plan is submitted by December 30, 2022. The work plan must be approved by BWSR prior to funds being distributed.

Guidance on the eLINK budget request and work plan can be found at https://bwsr.state.mn.us/grant-profile-watershed-based-implementation-funding under "Resources".

Timeline (hard deadlines are in bold font)

- BWSR holds informational meeting(s) (Jan. – Feb. 2022)
- Organizations select decision-making representatives for convene meetings (Jan. – March 2022)
- Partnerships select meeting coordinator/facilitator (Spring 2022)
- 1-2 convene meetings held (Spring 2022)
- Funding available (**July 1, 2022**)
- Send list of partnership-approved activities to BWSR – this is required for areas with multiple grantees and recommended for other areas (prior to the submittal of the eLINK budget request)
- Submit eLINK budget requests (July 2022 – Nov. 2022)
- eLINK Work Plan submittal deadline (Aug. 2022 – Dec. 2022)
- eLINK Work Plan approval deadline (**March 30, 2023**). Note that if a work plan cannot be approved by this date, BWSR will reallocate these funds through the WBIF Program.
- Grant expiration date (**Dec. 31, 2025**)

Additional Information

- Please see the WBIF Policy, Allocation Table, FAQs and other guidance documents on our website at https://bwsr.state.mn.us/watershed-based-implementation-funding-program.
- More information about the terms "prioritize, target, and measure" can be found at https://bwsr.state.mn.us/sites/default/files/2021-11/WP_1W1P_guidebook.pdf.
- Partnerships should consider the high-level priorities of the Nonpoint Priority Funding Plan (https://bwsr.state.mn.us/reports).