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

May 11, 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**, **May 18**, **2022**, **at 9:30 a.m.** This will be a virtual meeting.

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:

+1 929 205 6099 US (New York) +1 312 626 6799 US (Chicago) +1 669 900 6833 US (San Jose) +1 346 248 7799 US (Houston) +1 253 215 8782 US +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 May 18, 2022 | 9:30 a.m.

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Meeting ID: 990 970 201. Passcode: 579973

1. Call to Order. Approve agenda.* a. Approve Minutes of April 13, 2022, meeting.* b. 2. HUC 8 Model. Draft 5-10-2022.* a. Cover email Draft 5_10_2022.* b. c. Draft 5-12-2022.* 3. Other Business. Next TAC meeting – _____ 4. 5. Adjournment. Z:\Elm Creek\TAC\2022\May 18, 2022 agenda .docx

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

Technical Advisory Committee Meeting Minutes - April 13, 2022

I. A virtual meeting of the **Technical Advisory Committee (TAC)** of the Elm Creek Watershed Management Commission was convened at 10:01 a.m., Wednesday, April 13, 2022.

In attendance: Heather Nelson, Champlin; Nico Cantarero, Stantec, Dayton; Derek Asche, Maple Grove; Matt Danzl, Hakanson-Anderson, Medina; Ben Scharenbroich, Plymouth; Andrew Simmons, Rogers; Diane Spector and Erik Megow, Stantec; James Kujawa, Surface Water Solutions; Rebecca Carlson, Resilience Resources; Kris 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: Corcoran.

Also in attendance: Ken Guenthner, Corcoran; Doug Baines, Dayton; Jeff Weiss, Minnesota Department of Natural Resources (MNDNR); and RSB.

- **II.** Motion by Scharenbroich, second by Danzl to approve the **revised agenda.*** *Motion carried unanimously.*
- **III.** Motion by Scharenbroich, second by Danzl to approve the **minutes*** of the March 9, 2022, meeting. *Motion carried unanimously.*

[Simmons arrived 10:03 a.m.]

IV. HUC 8 Watershed Floodplain Modeling and Mapping Project.

A. Background.

Asche's April 11, 2022, memo* to the Commission recapped the history of this project, which spans 49 months. In his memo, Asche states:

[At the request of the DNR, on April 7, 2022, a Teams Meeting was held] to discuss the responses/comments provided by the DNR regarding the Third Party Review. (Present at that meeting were Derek Asche, Erik Megow, Jeff Weiss, and Judie Anderson.) Jeff Weiss reiterated that Comment "5", subdivision of watersheds in the MNDNR Response to the Third Party Review should be included in the Commission's work to revise the model as the DNR expects this to only take one-half day. After discussion with Ross Mullen, Stantec, at the time the DNR comments were initially submitted, this comment was not included in the RFP out of concern for cost. In fact, the comment refers to 9 example watersheds recommended for subdivision as examples but is open ended and is not necessarily limited to 9. In addition, the DNR made a similar request of Barr regarding subdivision of watersheds. According to Barr's calculations they spent 95 hours and \$9,500 on this similar request. The DNR subsequently funded \$5,000 of the requested \$9,500 for this work. While

April 13, 2022, TAC Meeting Minutes Page 2

likely not apples to apples, there was enough cause for concern to leave sub-division of watersheds out of the RFP. Also of note, all TAC requests for the RFP could not be included, again, out of concern for cost.

DNR's letter dated April 11, 2022,* in response to Asche's memo, was included in the TAC's supplemental meeting packet. Asche continued, "The Commission is trying to get a model that works for the member communities. The DNR is already satisfied with the product submitted by Barr Engineering. The Commission has met its obligation. The subdivision process could be never-ending. That effort should have been done before." Asche stated that his recommendation is that we have to stop at some point.

B. Discussion.

Weiss: I don't have to review anything if [what is being done by Stantec] is not replacing the DNR/Barr model. The Commission has to decide if the Stantec model is replacing the DNR/Barr model.

Guenthner: Are you comfortable with the [Barr] data so we are not undertaking excessive costs?

Asche: In Maple Grove I would not use data from the DNR/Barr model.

The Flood Risk Review meeting is still to come. Had we known the problems we would have addressed them.

The stakeholder meeting as part of Stantec's work is intended [to be held] in May, when cities can comment on how they see the model in their communities.

Third party review – these nine [subdivisions] are being addressed differently, left [out] due to concern for cost.

Vlach: If subdivided, would you be changing calibration points?

Megow: No.

Asche noted that the DNR has already accepted a model without the requested subdivisions.

Asche: Let's stay the course. If we find problems we address them. Or describe how flows are split up. Recommend to the Commission that we continue with the RFP and address any problems as they arise and be flexible in the timeline to complete the review.

The members agreed by consensus.

Other documents related to this item included in the meeting packet: RFP,* DNR February 14, 2022 memo,* January 22, 2022, Third Party Review,* Consider Third Party Review,* and Barr December 7, 2021 memo.*

V. Revisions to Commission Rules.*

A. Background. In 2021, the Minnesota Pollution Control Agency (MPCA) issued a new 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 systems. All member communities in the Elm Creek Watershed Management Commission are MS4 Phase II permit holders.

The revised MS4 Phase II permit requires:

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- **1.** For non-linear projects, treatment of the amount of 1.0-inches of runoff from new and fully reconstructed impervious surfaces.
- **2.** 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 Commission's Third Generation Plan rules and the rules of its member cities as required by the newest MS4 Phase II permit. Staff 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 so as to be at least as stringent as those of its member cities and to create consistency in the project review process.

B. 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 Water and Soil Resources, no later than November 30, 2022.

C. Proposed Revisions.

- 1. Revise Rule A to include the definition of 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: *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.

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."

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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. 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 from the new impervious surface or 0.55-inches from the combination of new and fully reconstructed impervious surfaces, whichever is greater."

D. Minor Plan Amendment to Revise Rules.*

The proposed amendment would revise Appendix C of the Third Generation Plan, Rules and Standards, to (1) make the rules consistent with the most recent Minnesota General Stormwater Permit and (2) clarify the Commission's standards regarding the required freeboard between the high-water elevation of a constructed or natural water and the low floor or opening of a proposed adjacent structure.

Motion by Scharenbroich, second by Danzl to approve the rules as revised, (revising what was proposed "one point one inch (1.1") of runoff from the new impervious surface or 0.55-inches from the combination of new and fully reconstructed impervious surfaces, whichever is greater" to read: "one point one inch of runoff from the sum of new and fully reconstructed impervious surfaces.") and recommend to the Commission that it proceed with a Minor Plan Amendment and set May 11, 2022, as the date of the public meeting at which the proposed revised rules will be discussed. Motion carried unanimously. If approved, the revised Rules would go into effect June 1, 2022, for the revisions to the low floor rules (Rule D.3.b.i.7 and Rule F.3.b) and November 30, 2022, for the linear project rules (Rule D.2.b and Rule D.3.c)

A copy of the proposed notice* was included in the meeting packet.

VI. 2022 CIP Minor Plan Amendment.*

A. The Third Generation Watershed Management Plan and Capital Improvement Program (CIP) is proposed for a Minor Plan Amendment (MPA). The members reviewed the proposed revisions at its March meeting and agreed to revise the Plan to add three new projects to the Capital Improvement Program (CIP):

CHAMPLIN - CORCORAN - DAYTON - MAPLE GROVE - MEDINA - PLYMOUTH - ROGERS

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- **1.** Line 50: Maple Grove South Fork Rush Creek Steam Restoration project, \$406,252 each in 2022 and 2023.
- **2.** Line 57: City Cost Share Program, a new project to the CIP to share in the cost of small Best Management Practices (BMPs) on city projects, in accordance with the Commission's Cost Share Policy, approved in August 2021, \$100,000 annually.
- **3.** Line 58: Partnership Cost Chare Program, a new project to the CIP to share in the cost of voluntary load-reduction BMPs on private property, in accordance with the Commission's Cost Share Policy, also approved in August 2021, \$50,000 annually.
- **B.** Some smaller projects (under \$100,000) have been submitted to the CIP by the cities, as well as one since the March meeting from Three Rivers Park District for the proposed Oxbow Trail-Rush Creek Channel Stabilization that is likely to be under \$100,000. It is recommended that those projects be handled administratively through the city cost share program rather than as small (<\$50,000) line items on the CIP.
- **C.** Ongoing discussions regarding the Watershed Based Implementation Funding (WBIF) may result in additional projects being added to the CIP, and the TAC may need to suggest a revision to the proposed Minor Plan Amendment. One option would be simply to allocate some of the WBIF grant funding to the city Cost Share program to accommodate the several small projects that are currently being contemplated. That would not require a Plan Amendment.
- **D.** Motion by Scharenbroich, second by Cantarero to recommend to the Commission that it proceed with the Minor Plan Amendment and set May 11, 2022, as the date of the public meeting at which the revisions to the CIP will be discussed. *Motion carried unanimously.* A copy of the proposed notice* was included in the meeting packet. Public meetings are noticed twice, at least seven and 14 days prior to the meeting, in the Commission's official newspaper, the *Osseo-Maple Grove Press.*

VII. 2022-2023 Watershed-Based Implementation Funding (WBIF) Convene Meeting.

Due to time constraints, this meeting will be rescheduled to a separate time later in the month.

VIII. The next Technical Advisory Committee meeting will be rescheduled to a time NOT prior to the regular meeting.

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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To: Elm Creek Watershed Management Commission Commissioners and Technical

Advisory Committee

From: Erik Megow, PE

Lori Schrader Danielle Johnson Kiley Gafner

Date: May 10, 2022

Subject: Revisions to the Elm Creek Watershed HUC-8 Model - DRAFT

1.0 INTRODUCTION AND PURPOSE

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 summarize the work completed to revise and update the HUC-8 Study based on the findings of the Third-Party Review (Stantec, January 2022) through the Tasks outlined in Stantec's Response to Request for Proposal for Revisions to HUC-8 Model (March 2022). The following sections provide an overview of the revisions made to the hydrologic (HEC-HMS) and hydraulic (HEC-RAS) models, along with a discussion of the calibration analysis.

2.0 HYDROLOGIC MODEL (HEC-HMS) UPDATES AND HYDROLOGIC CALIBRATION

Stantec updated the HEC-HMS (US Army Corps of Engineers Hydrologic Engineering Center – Hydrologic Modeling System) model (received from the DNR January 24, 2022) to provide better estimates of peak streamflows for input into the hydraulic (HEC-RAS) model. After the updates were completed, the model was assessed through the same calibration methodology, and for the same calibration events, that were included in "Elm Creek Narrative and QAQC Documentation" (Barr Engineering Co., 2021).



2.1 HEC-HMS Updates

Three major updates were made to the HEC-HMS model to improve hydrology and estimate new streamflows:

- 1. The model was updated from HEC-HMS Version 4.3 to Version 4.7, the latest version.
- 2. Natural storage and cross-sections were updated to replace areas where a Muskingham-Cunge shortened simplified trapezoidal bank-width cross section was modeled.
- 3. Watershed areas and hydrologic connections between the watersheds and reach segments were updated and a methodology was produced to input the calculated flows into the HEC-RAS Model.

The following sections provide an overview of these updates, while Appendices A and B provide additional details.

2.1.1 HEC-HMS Version Update

The original HEC-HMS model was transitioned from Version 4.3 to Version 4.7 for storage, cross-section, and routing updates. Using Version 4.7 made it possible to easily integrate the required updates, but this update required defining an Index Method (Celerity). According to the HEC-HMS User's Manual, the Index Method (Celerity) is used in conjunction with the physical properties of the channel to discretize the routing reach in both space and time. A celerity, or reference flow, equal to 5 ft/s was assumed uniformly across the model as recommended by the HEC-HMS User's Manual. Assuming a celerity of 5 ft/s, no negligible change in the 100-year flows was seen between the runs in Version 4.3 and 4.7.

2.1.2 Natural Storage and Sub-basin Cross-section Updates

The 55 sub-basins highlighted in the Third-Party Review (Stantec, January 2022) were examined to determine whether storage or updated cross-section definitions would be beneficial to updating flow calculations. Storage considerations included depressions in the Digital Elevation Model (DEM), imagery, and how/if the storage could then be accounted for in the HMS routing. Storage was calculated by first creating polygons around the depression areas seen in imagery and LiDAR. These polygons were then used along with the DEM to create storage capacity curves (elevation-area). The calculated curves were then applied to an existing or added associated reservoir. Added reservoirs were assumed to have outlets estimated by measuring culvert or bridge openings and inlet and outlet elevations. Rise was calculated using engineering judgement based on the size of the structure to subtract 2.5-4 feet from the differential of the structure deck and inlet elevations.

Cross-section updates were made by pulling terrain data for the whole cross section in HEC-RAS and then filtering them to 8 point cross sections. The left and right Manning's coefficient settings were applied by reviewing common overbank channel along the reach.

Overall, 47 sub-basins were updated by adding natural storage areas or updating storage reservoir curves within 37 sub-basin and updating cross-section within the other 10 sub-basins. A summary of the updates is included as Appendix A.

With the added natural storages and updated cross-sections, junctions were added as needed to properly join and route flows within the model. For example, if more than one component (i.e. reach, basin, reservoir, etc.) were joining together and we deemed a potential need to collect flows in that location, a junction was added. Junction components do not contribute to the program calculations. They served a



dual purpose of more accurately modeling the routing of the watershed and making it easier to import flows into HEC-RAS.

2.1.3 Watershed Area and Hydrologic Routing Updates

The subbasin (watershed) areas were calculated in GIS and compared to the drainage areas represented in the HMS model. Eight subbasins had areas that differed by greater than 2 % and were updated. These basins were DC1, DC4, DC5, EC11, EC12, EC17, and EC8.

Every attempt was made to mimic the methodology used previously to route flows from the HMS results to the HEC-RAS cross-sections. The routing method used in the January 24, 2022 HEC-HMS Model, was not replicable and had inconsistencies on where the flows were applied. Without further sub-delineations, Stantec was required to compute ratios for some reaches based on the percentage of drainage area and reach length routed within each sub-basin. A spreadsheet was used to calculate the routed flows and an example (for the 100-year flows) of the methodology used is shown in Appendix B.

2.2 Hydrologic Model Calibration Analysis

Following the HEC-HMS updates outlined in Section 2.1, the model was assessed through the same calibration methodology, and for the same calibration events, that were included in "*Elm Creek Narrative and QAQC Documentation*" (Barr Engineering Co., 2021).

The updated model was evaluated using the historical flow record at the gage co-operated with the U.S. Geological Survey (USGS) on Elm Creek in Elm Creek Park Preserve, and two Three Rivers Park District-operated flow monitoring gages:

- ECER (Elm Creek at Elm Road near the Plymouth-Maple Grove municipal border), and
- RT (Rush Creek at Territorial Road).

The precipitation events that were used to assess the calibration of the updated model are:

- June 23 July 5, 2003 (rainfall)
 - Data for RT was not available before 2006.
- September 22 October 1, 2016 (rainfall)
- March 6 April 3, 2010 (snowmelt)
 - Data for RT and ECER was not available for winter months
- March 18 March 28, 2011 (snowmelt)
 - Data for RT and ECER was not available for winter months

As outlined in "Elm Creek Narrative and QAQC Documentation" (Barr Engineering Co., 2021), the calibration targets for the June 2003 and September 2016 rainfall events were to achieve a Nash-Sutcliffe Efficiency (NSE) index of 0.6, which is a measure of model fit compared to observed data. With an NSE of 0.6, a model is deemed satisfactorily accurate and with an index >0.75, the model is considered excellent. Figures 1 through 7 show the calibrated HEC-HMS Model results compared to the data from the three stations, when available. A summary of the calibration results is as follows:

- For Figures 1, 2, and 5 the calculated NSE Index was > 0.8 showing that our updated HEC-HMS model matched these storm events very well.
- For Figure 3, we did not have enough data points to calculate an NSE Index, but the modeled peak flow (159 cfs) was within 12.5% of the observed flow (181.5 cfs).



- For the September 16 RT comparison (Figure 4), the HEC-HMS modeled flows were higher than the observed, but after further conversation with Brian Vlach at Three Rivers Park District, it was determined that the rating curve at this location was not accurate for high flows (56.7 cfs, or water levels above 3.13 ft).
- For the snowmelt events, shown in Figures 6 and 7, where the orange line is the model-predicted
 results and the blue dots are the actual observed flows, the modeled (HMS) peak flows continue
 to occur close to the measured peak flow for both events, so no further lag time adjustments were
 made.

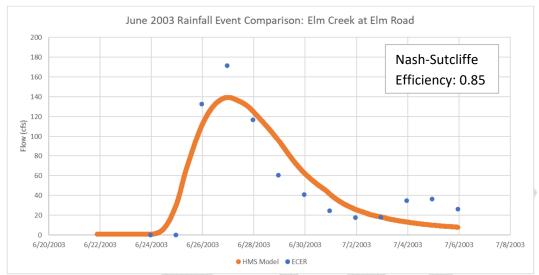


Figure 1. June 2003 rainfall event comparison at ECER.

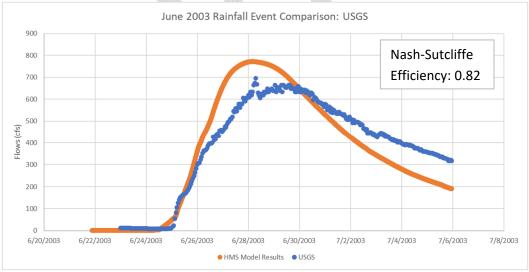


Figure 2. June 2003 rainfall event comparison at USGS.



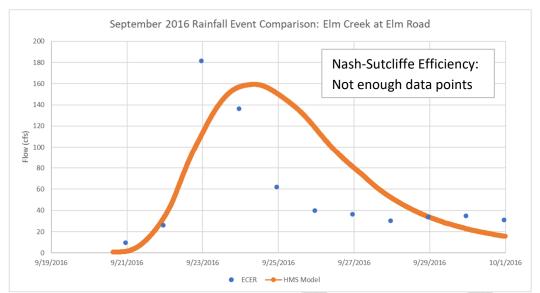


Figure 3. June 2016 rainfall event comparison at ECER.

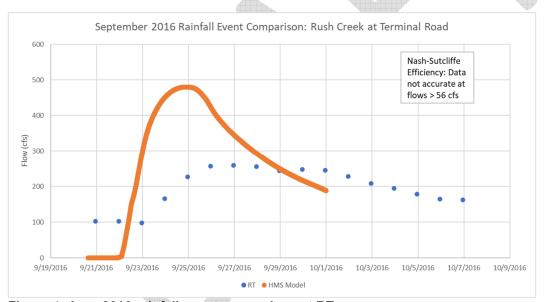


Figure 4. June 2016 rainfall event comparison at RT.



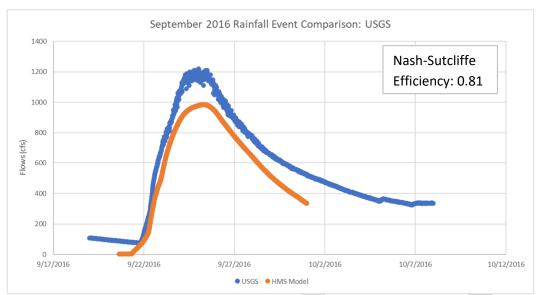


Figure 5. June 2016 rainfall event comparison at USGS.

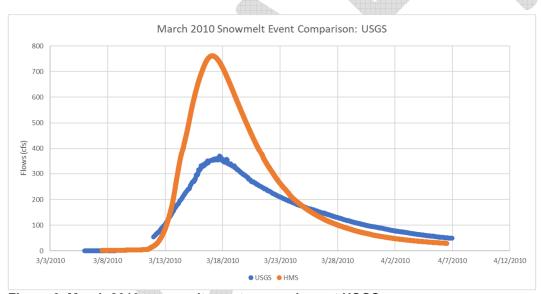


Figure 6. March 2010 snowmelt event comparison at USGS.



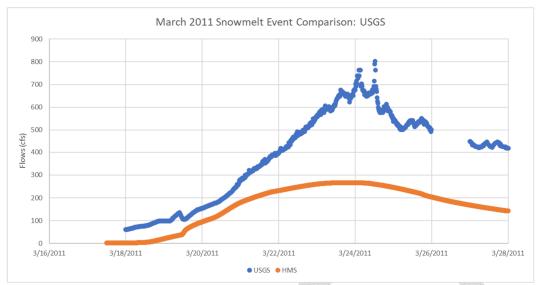


Figure 7. March 2011 snowmelt event comparison at USGS.

Based on the acceptable NSE Indexes (> 0.75) shown in Figures 1, 2, and 5 and the accurate timing of the peak flows shown in Figures 6 and 7, no further changes were made to curve numbers or lag times of the HEC-HMS Model. After calibration, flows for the 10%, 2%, 1%, and 0.2% rain events were calculated in the HEC-HMS model and inported into the HEC-RAS model to calculate elevations and hydraulics for the floodplain mapping task.

3.0 HYDRAULIC MODEL (HEC-RAS) UPDATES

Stantec updated hydraulic connections and downstream boundary conditions within the HEC-RAS model to calculate better estimates of peak water surface elevations. Three groups of updates were made to the HEC-RAS Model:

- Hydraulic crossings (bridges, culverts, weirs, and dams),
- Stream alignments, and
- Downstream boundary conditions.

The following sections provide an overview of these updates, while Appendix C provides additional details.

3.1 Hydraulic Crossing Updates

Fifty-three (53) hydraulic crossings, including Elm Creek Dam, were updated in the HEC-RAS model based on construction drawings, surveys, photos, and as-built information. These 53 structures were highlighted in the Third-Party Review (Stantec, January 2022). The updates included upstream/downstream inverts, road overflow elevation, pipe size, pipe material, and ground elevation (based on LiDAR). The details and any assumptions for these updates are listed in Appendix C



3.2 Stream Alignment Updates

Two major stream alignments were updated in the HEC-RAS Model, as follows:

1) County Ditch 16 east of Brockton Lane (County Road 101).

The alignment of County Ditch 16 was updated to match the record plans from Maple Grove. The ditch is routed through a series of storm sewer pipes beneath Vagabond Lane N and Bass Lake Road. The outlet is on the north side of Bass Lake Road where the ditch line then continues north. The storm sewer was modeled as a culvert without any bends for simplicity. The upstream invert elevation is where the ditch enters the storm sewer, and the downstream invert is where it leaves the storm sewer.

 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 appeared to show a temporary construction alignment of the creek. The alignment was updated to follow the permanent alignment of the watercourse, per record drawings from the City of Plymouth. The watercourse is routed through a culvert crossing County Road 47, and then through a storm sewer pipe, modeled as a culvert, under a new residential development. The storm sewer outlets to a wetland where the watercourse realigns with the natural flow path of the stream.

3.3 Downstream Boundary Condition Updates

As directed by the MNDNR, the downstream boundary conditions were modeled using a 'normal depth' in HEC-RAS. Each of the normal depth boundary conditions were reviewed and the upstream/downstream slopes were changed when necessary. In addition, the most downstream cross section of each tributary and the nearest downstream cross section of the main stem were reviewed to confirm that the tributary cross section had a lower water surface elevation than the main stem cross section. By verifying each tributary had a lower water surface elevation than the main stem, an appropriate tie-in could be made. The elevations along each flooding source could be evaluated independently and the water surface elevation at the confluences would be dictated by the main flooding source elevations.

4.0 RESULTS AND FLOODPLAIN MAPPING

After the hydrologic (HEC-HMS) and hydraulic (HEC-RAS) models were updated, the updated flows for the 10%, 2%, 1%, 0.2%-annual-exceedance-events were exported from the hydrologic model (HEC-HMS) and imported into the HEC-RAS Model. Results from the 1% and 0.2%-annual-exceedance-events are shown in Appendix D, along with a comparison to the effective 2016 FIS flood elevations at road crossings, lettered FEMA cross sections, and other pertinent locations across the watershed.

In addition to the updated models and results, floodplain inundation maps were created 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 was used to automatically generate output and create maps. The maps were then reviewed to correct any issues the initial mapping had at bridge and culvert crossing, sharp turns in the watercourse, and other common automated mapping output issues to display accurate maps. During the mapping iterations, updates needed to be made to the HEC-RAS model. The inundation maps are shown in Appendix E. Appendix F provides a summary of the HEC-RAS model updates that were required for mapping.

APPENDIX A

HEC-HMS Sub-basin Updates

| HMS Basin | Changes made |
|-----------|--|
| DC1 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC1 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC3 | Updated Cross Sections with 8 Point |
| EC5 | Storage Added and updated Cross Section with 8 Point |
| EC7 | Updated Cross Sections with 8 Point |
| EC8 | Storage Curves Updated |
| EC10 | Storage Added, 3 reaches removed to model storage |
| EC11 | Storage Curves Updated |
| EC12 | Storage Curves Updated |
| EC13 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC16 | Updated Cross Sections with 8 Point |
| EC17 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC19 | Updated Cross Sections with 8 Point |
| EC20 | Storage Curves Updated |
| EC22 | Storage Curves Updated |
| EC24 | Updated Cross Sections with 8 Point |
| EC26 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC27 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC29 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC30 | Storage Curves Updated |
| EC34 | Storage Curves Updated |
| RC1 | Updated Cross Sections with 8 Point |
| RC2 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC4 | Storage Curves Updated |
| RC5 | Updated Cross Sections with 8 Point |
| RC6 | Updated Cross Sections with 8 Point |
| RC7 | Storage Curves Updated |
| RC8 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC9 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC10 | Storage Curves Updated |
| RC11 | Updated Cross Sections with 8 Point |
| RC12 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC13 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC15 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC1 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC2 | Storage Added, 1 reach removed to model storage |
| SFRC3 | Storage Curves Updated |
| SFRC4 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC7 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC8 | Storage Curves Updated |
| SFRC10 | Storage Curves Updated |
| SFRC13 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC14 | Storage Curves Updated |
| SFRC17 | Storage Curves Updated |
| SFRC19 | Storage Curves Updated |
| SFRC21 | Storage Added, Outlet assumed from imagery and LiDAR |

APPENDIX B

Hydrologic Routing Example

| | | | | | | | Original Subasin | Subasin Component for | Original Subbasin | Subbasin Flow | Original Reach | Reach Component for | | Reach Flow | HMS | Adjusted |
|-----------------------|-------------|------------------|-------------|-----------|-----------|-----------------|------------------|-----------------------|-------------------|---------------|----------------|---------------------|-----------------|--------------|--------|----------|
| IEC-RAS Cross-section | Location ID | StreamName | HMSElement | OrigBasin | OrigReach | HMS_Comm | Area | Ratio | Discharge | Contribution | Length | Ratio Orig | inal Reach Flow | Contribution | Flows | Flows |
| | RCBR7_01 | RushCreek_BR7 | RC3P | | | | | | | | | | | | 49.5 | 49.5 |
| | RCBR6_01 | RushCreek_BR6 | RC4P | | | | | | | | | | | | 30.5 | 30.5 |
| | RCBR5_03 | RushCreek_BR5 | SFRC10P | | | | | | | | | | | | 33.3 | 33.3 |
| | RCBR5_02 | RushCreek_BR5 | SFRC8P | | | | | | | | | | | | 49.8 | 49.8 |
| 1471 | RCBR5_01 | RushCreek_BR5 | SFRC4P | | | | | | | | | | | | 142.5 | 142.5 |
| 10876 | RCBR4_01 | RushCreek_BR4 | SFRC11P | | | | | | | | | | | | 19.3 | 19.3 |
| 10604 | RCBR3_02 | RushCreek_BR3 | SFRC15P | | | | | | | | | | | | 26.2 | 26.2 |
| | RCBR3_01 | RushCreek_BR3 | SFRC14P | | | | | | | | | | | | 62.5 | 62.5 |
| | RCBR2_01 | RushCreek_BR2 | SFRC19P | | | | | | | | | | | | 25 | 25 |
| | RCBR1_01 | RushCreek_BR1 | SFRC17P | | | | | | | | | | | | 50.5 | 50.5 |
| 105486 | | RushCreek | Jubert Lake | | | | | | | | | | | | 76.5 | 76.5 |
| 99522 | RC_08 | RushCreek | JSFRC13_1 | SFRC13 | | plus SR | 1.525122 | 0.437085 | 65.1 | 18.65702121 | | | | | 124.2 | 142.9 |
| | RC_07 | RushCreek | SFRC7P | | | | | | | | | | | | 184.2 | 184.2 |
| | RC_06 | RushCreek | JSFRC4_1 | | | | | | | | | | | | 265.8 | 265.8 |
| 77175 | RC_05 | RushCreek | SFRC2P | | | | | | | | | | | | 357 | 357 |
| 62766 | RC_04 | RushCreek | SFRC1P | | | | | | | | | | | | 396.1 | 396.1 |
| 53717 | RC_03 | RushCreek | RC2P | | | | | | | | | | | | 878 | 878 |
| 37740 | RC_02 | RushCreek | JRC1_2 | | | | | | | | | | | | 914.3 | 914.3 |
| 12615 | RC_01 | RushCreek | EC3R2 | EC3 | | plus SR | 1.904015 | 0.451326 | 69.8 | 16.54532911 | | | | | 986.9 | 1003.4 |
| 17919 | NFRCBR2_01 | NFRushCreek_BR2 | RC7P | | | | | | | | | | | | 33.8 | 33.8 |
| 8127 | NFRCBR_01 | NFRushCreek_BR1 | RC9P | | | | | | | | | | | | 49.9 | 49.9 |
| 73290 | NFRC_07 | NorthForkRushCrk | RC15P | | | | | | | | | | | | 43 | 43 |
| 60120 | NFRC_06 | NorthForkRushCrk | RC13P | | | | | | | | | | | | 91.9 | 91.9 |
| 41705 | NFRC_05 | NorthForkRushCrk | RC12P | | | | | | | | | | | | 117 | 117 |
| 30100 | NFRC_04 | NorthForkRushCrk | RC12R | | | | | | | | | | | | 157.1 | 157.1 |
| 24861 | NFRC_03 | NorthForkRushCrk | JRC8 | | | | | | | | | | | | 311.5 | 311.5 |
| 18282 | NFRC 02 | NorthForkRushCrk | JRC5 | | | | | | | | | | | | 359 | 359 |
| 11411 | NFRC_01 | NorthForkRushCrk | JRC5_2 | | RC5R | minus RR | | | | | 10414.20174 | 1315.207985 | 458.3 | 57.87863868 | 458.3 | 400.4 |
| 16051 | ECBR5_01 | ElmCreek_BR5 | EC22P | | | | | | | | | | | | 113.6 | 113.6 |
| 12125 | ECBR4_02 | ElmCreek_BR4 | EC19R3 | | | | | | | | | | | | 5.6 | 5.6 |
| 6036 | ECBR4_01 | ElmCreek_BR4 | EC19R3 | EC19 | | plus SR | 3.436849 | 1.116634 | 122.5 | 39.80031273 | | | | | 5.6 | 45.4 |
| 1766 | ECBR3_01 | ElmCreek_BR3 | EC27P | | | | | | | | | | | | 34.9 | 34.9 |
| 13614 | ECBR2_02 | ElmCreek_BR2 | EC26R2 | EC26 | | Assumed = split | 2.430516 | 1.215258 | 344.3 | 172.15 | | | | | 17.7 | 189.9 |
| 4652 | ECBR2_01 | ElmCreek_BR2 | JEC26 | | | | | | | | | | | | 344.3 | 344.3 |
| 10253 | ECBR1_01 | ElmCreek_BR1 | SR26 | EC26 | | Assumed = split | 2.430516 | 1.215258 | 344.3 | 172.15 | | | | | 0 | 172.2 |
| 132106 | EC_09 | ElmCreek | EC30P | | | | | | | | | | | | 38.1 | 38.1 |
| 122487 | EC_08 | ElmCreek | EC29P | | | | | | | | | | | | 72.1 | 72.1 |
| 117239 | | ElmCreek | JEC26_1 | | | | | | | | | | | | 235.3 | 235.3 |
| 93233 | EC_06 | ElmCreek | JEC16 | | | | | | | | | | | | 488.4 | 488.4 |
| 71366 | EC_05 | ElmCreek | EC10P | | | | | | | | | | | | 527.3 | 527.3 |
| 63137 | EC_04 | ElmCreek | Rice Lake | | | | | | | | | | | | 688.6 | 688.6 |
| 54439 | EC_03 | ElmCreek | JEC5 | | | | | | | | | | | | 749.4 | 749.4 |
| 34765 | EC_02 | ElmCreek | JEC3_2 | | | | | | | | | | | | 1779.6 | 1779.6 |
| 9268 | EC_01 | ElmCreek | EC1P | | | | | | | | | | | | 1950 | 1950 |
| 33492 | DC_02 | DiamondCreek | French Lake | | | | | | | | | | | | 17.3 | 17.3 |
| 25449 | DC 01 | DiamondCreek | JDC1 | DC1 | | plus SR | 3.854982 | 1.122419 | 89.5 | 26.05887667 | | | | | 46.4 | 72.5 |

APPENDIX C

Hydraulic Crossing Updates

| | | | | I | | Preliminary | HUC-8 HEC | C-RAS N | /lodel | ı | 1 | | I | Data Rev | iew and Stanted | Updates | |
|--------------------------|-------------------------------|--------------|----------------------------|------------------------------------|---------------|---|-----------------------------------|-------------------------|-------------------------|----------------------------|--|---|----------------------------|-------------------|----------------------|--|--|
| 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 | Internal Review |
| 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 | ENO_(RICE_Lake_DAM)_D0 |
| 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 | |
| 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 | 1684-74 Elm Creek Dam Roadway - RECORD PLAN.pdf |
| 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 | STS1888.pdf |
| 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 | STS1887.pdf |
| Corcoran/ Medina | Hackamore Road | Α | 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 | Ok- Consistent |
| 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 | Ok- Consistent |
| 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 | STS1972 and STS19733.pdf has limited info |
| 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 | STS1972.pdf top right comer |
| 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 | STS1901.pdf |
| 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 | N/A |
| 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 | STS1846.pdf, STS1855.pdf |
| 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 | ENA_20_07_17-A0.pdf (construction drawing) PD |
| 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 ENA_20_17-11_A0.pdf, sheet 14 |
| 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 | ENA_20_01-17_A0.pdf (see PDF page 100 and 10 |
| Maple Grove | Co. Rd. 10 | А | 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 | 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 | ENA_20_12-15_A0.pdf |
| Maple Grove | Trail Crossing | Α | 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 | ENA_20_07-10_A0 |
| 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 | MNDOT-BridgeInfo3 App. ID 97986 and ENA_19 |
| 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 | ENA_19_97-42_A0.pdf |
| Corcoran | Co. Rd. 116 Co. Rd. 50 | A AE | NFRushCreek NFRushCreek | NFRushCreek_BR1 NorthFrkRushCrk | 5112 73093 | 5' Circular 2.5' Circular | | 914.7 1001.9 | 914.7 1001.2 | 920.8 1009.0 | Assumed from aerial imagery Assumed from aerial imagery | 3' Circular CMP 2.5' Circular CMP | 913.04 1000.53 | 912.96 1000.18 | 921.15 1009.29 | City of Corcoran Survey 2021 City of Corcoran Survey 2021 | |
| Rogers | Fletcher Lane | A | NFRushCreek | NorthFrkRushCrk | 10707 | 15' x 6' Box | | 905.1 | 905.1 | 915.0 | Assumed from aerial imagery | 8x | 14' 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' Sp | an Bridge (207sq ft conve | ance) | | MNDOT- BridgeInfo3. App ID 27B87 | |
| Maple Grove | 105th Ave N | AE | RushCreek | RushCreek | 36346 | Bridge | 787 | 899.2 | 899.0 | 919.0 | Assumed from aerial imagery | 379.3' Spar | n Bridge over I-94 and Ru | sh Creek | | MNDOT- BridgeInfo3. App ID 27251 | |
| 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 | This seems off but matches the survey |
| 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 Private Road | A | RushCreek RushCreek | RushCreek_BR4 | 6938 | 3' Circular | | 970.3 | 970.3 | 984.1 | Assumed from aerial imagery Assumed from aerial imagery | 3.5' Circular RCP | 969.83 961.86 | 968.56 | 984.49 | City of Corcoran Survey 2021 | |
| Corcoran | Private Road | A | RushCreek | RushCreek BR4 | 4523 | 2' Circular | | 962.1 | 962.0 | 964.4 | 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 | |
| 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 | |

| | | | | | | Preliminary | HUC-8 HF | -RAS N | Indel | | | | | Data Revi | iew and Stantec | Undates | |
|--------------|-------------------|--------------|-----------|---------------|------------|---|-----------------------------------|-------------------------|-------------------------|----------------------------|-----------------------------|----------------------------|-------------------|----------------|----------------------|---|-----------------|
| 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) | | Road Overflow (feet) | Structure Data Source | Internal Review |
| Corcoran | Blue Bonnet Drive | Α | 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 | А | 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 | А | 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 | А | RushCreek | RushCreek_BR5 | 654 | Bridge | 101 | 938.4 | 938.6 | 947.8 | Assumed from aerial imagery | 10x6' Precast Concrete Box | 938.98 | 938.79 | | City of Corcoran Survey 2021 & MNDOT- BridgeInfo3. App ID 90462 | |
| Dayton | Holly Ln | А | 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 Municiapi 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 | |

APPENDIX D

2016 FIS Comparison Tables

| | | 1% AEP Com | parison of ECWMC 2016 | FIS Flood Profiles to | Stantec HUC-8 Revised | Model Results - | Flood Elevations and Pe | ak Discharges | | |
|----------------------|----------------|--|--|------------------------------------|-------------------------------|-----------------|-------------------------------|--------------------|---------------------------------------|--|
| | | | | | ECWMC FIS Floor | l Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | Change in Flood Elec and Flow Rate | |
| | | | | | 100-yr | | 100-yr | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation Flow Ra (feet) | te (CFS) Notes |
| lm Creek | 1767 | U.S. Route 169 (US) | * (Data not applicable) | | 851.5 | 2,780 | | 1950 | | (830) At conflucence with Mississippi |
| Im Creek | 2505 4251 | U.S. Route 169 (US), US of A U.S. Route 169 (US), US of B | * (Data not applicable) * (Data not applicable) | | 851.7 851.7 | | 853.67 853.66 | | 2.0 2.0 | |
| lm Creek Im Creek | 4251 4604 | | | | 851.7 851.8 | | 853.66 853.71 | | | |
| | | Cartway Road (DS) | | | | | 857.04 | | | |
| Im Creek Im Creek | 4750 5731 | Cartway Road (US) US of confluence with Elm Creek. DS of | 0.85 | | 856.3 856.4 | | 857.58 | | | |
| III Greek | 3731 | Fernbrook Lane | 0.50 | | 030.4 | | 037.30 | 1330 | | |
| Im Creek | 6876 | DS of Fernbrook Lane, US of F | 1.20 | 3 | 856.6 | | 857.68 | 1950 | 1.1 | |
| Im Creek | 7643 | DS of Fernbrook Lane, US of G | 1.40 | | 856.7 | | 857.78 | | | |
| lm Creek | 8448 | Fernbrook Lane (County and State Aide Highway 121) | 1.56 | | 856.7 | | 857.78 | 1950 | 1.1 | |
| Im Creek | 8719 | US of Fernbrook Lane | 1.62 . | | 856.7 | | 857.79 | 1950 | 1.1 | |
| Im Creek | 9684 | US of Fernbrook Lane, US of J | 1.76 | < | 857.4 | | 858 | | 0.6 | |
| Im Creek | 9883 | US of Fernbrook Lane, US of K | 2.19 | | 857.5 | | 858.01 | | | |
| Elm Creek | 10985 | US of Fernbrook Lane, US of L | 2.30 | | 857.8 | | 858.03 | | | |
| lm Creek | 11340 | US of Fernbrook Lane, US of M | 2.34 | | 857.8 | | 858.04 | | | |
| Im Creek | 19957 | DS of Elm Creek Road, DS of P | 3.98 | | 858.3 | | 858.31 | | | |
| Im Creek | 22253 | DS of Elm Creek Road, DS of Q | 4.34 | | 858.3 | | 858.69 | | | |
| Im Creek | 24546 | Elm Creek Road (DS), DS of R | 4.62 | | 858.5 | | 859.89 | | | |
| Im Creek Im Creek | 25060 25541 | DS of Elm Creek Road, DS of S Elm Creek Road (DS) | 4.71 4.80 | | 860.5 861.4 | | 860.47 861.03 | | | |
| Im Creek | 26148 | Elm Creek Road (US) | 4.80 | | 861.4 861.8 | | 861.03 861.24 | | | |
| Im Creek | 26220 | DS of Pineview Lane, US of Elm Creek | 4.95 | | 863.1 | | 861.78 | | | |
| ilm Creek | 28303 | Road, DS of V DS of Pineview Lane, US of Elm Creek | 5.21 | | 863.1 | | 862.86 | | | |
| Im Creek | 29590 | Road, DS of W DS of Pineview Lane, US of Elm Creek | 5.21 | | 864.2 | | 863.73 | | | |
| Im Creek | 32034 | Road, DS of Y DS of Pine View Lane | 5.75 | | 865.8 | | 865.04 | | | |
| Im Creek | 32439 | DS of Pineview Lane, US of Elm Creek | 5.84 | | 866.3 | | 865.35 | | | |
| .iiii Creek | 32433 | Road, DS of Z | 3.04 | | 000.3 | | 005.55 | 1775.0 | -0.5 | |
| Im Creek | 33241 | DS of Pineview Lane, US of Elm Creek Road, DS of AA | 5.99 | 2 | 867.8 | | 866.18 | 1779.6 | -1.6 | |
| Creek | 34180 | Pine View Lane (DS) | 6.10 . | | 869.2 | | 866.82 | 1779.6 | -2.4 | |
| Im Creek | 34246 | Pine View Lane (US) | 6.14 | AB | 869.3 | | 866.99 | 1779.6 | -2.3 | |
| Elm Creek | 34783 | DS of Confluence of Bush Creek, US of Pine View Lane | 6.21 | AC | 869.3 | | 867.09 | 1779.6 | -2.2 | |
| Elm Creek | 35380 | Confluence of Bush Creek (DS) | 6.31 | AD | 869.4 | 945 | 867.29 | 1779.6 | -2.1 | 835 FIS location: Above junction of Rush Creek, just inside corporate limits of City of Dayton. Looked Cross sections on Arcmap and this aligns with the described location. |
| Elm Creek | 36616 | DS of Pine View Lake, DS of AI | 6.63 | AE | 869.6 | | 868 | 749.4 | -1.6 | |
| Im Creek | 37254 | Pine View Lake (DS), downstream of AG | 6.77 | A.F | 869.6 | | 868.16 | 749.4 | -1.4 | |
| Im Creek | 39639 | Pine View Lake (DS) | 7.36 | | 870.1 | | 868.99 | | | |
| Im Creek | 41126 | DS of Pine View Lake, DS of AI | 7.70 | | 870.9 | | 870.18 | | | |
| Im Creek | 42433 | DS of Pine View Lake, DS of AJ | 7.99 | | 871.3 | | 870.88 | | | |
| Im Creek | 43181 | Pine View Lake (DS) | 8.20 | | 871.6 | | 871.36 | | | |
| Im Creek | 43585 | Pine View Lake (US) | 8.37 | | 873.8 | | 872.06 | | | |
| Im Creek | 44250 | DS of Territorial Road, US of Pine View Lake, DS of AM | 8.46 | | 874.2 | | 873.36 | | | |
| Im Creek | 46044 | DS of Territorial Road, US of Pine View Lake, DS of AN | 8.75 | | 874.6 | | 874.9 | | | |
| Im Creek | 47970 | Territorial Road (DS) | 9.20 | | 875.2 | | 876.03 | | | |
| Im Creek | 48986 | Minnesota Trunk Highway 52 (DS) | 9.44 | | 876.2 | | 878.34 | | | |
| Im Creek | 49361 | Minnesota Trunk Highway 52 (US), DS of Railroad | 9.52 | | 877.1 | | 878.61 | | | |
| Im Creek | 49968 | US of Railroad that is US of Minnesota Trunk Highway 152 | 9.63 . | | 879.8 | | 879.05 | | | |
| Im Creek | 50514 | US of Railroad, DS of Rice Lake Dam, DS o AS | f 9.72 | AK | 880.0 | | 879.6 | 749.4 | -0.4 | |

| | | | | | | . = | | | Change in | Flood Elevations | |
|------------------------|-----------------|---|--|------------------------------------|-------------------------------|-----------------|-------------------------------|--------------------|------------------------------|------------------|--|
| | | | | | ECWMC FIS Floor | d Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | | Flow Rates | |
| | | | | | 100-yr | | 100-yr | | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Im Creek | 51433 | Rice Lake Dam (DS) | 9.91 | | 881.8 | | 880.01 | | | | |
| Im Creek Im Creek | 52499 53197 | DS of Rice Lake Dam, DS of AU Rice Lake Dam (DS) | 10.12 a | | 882.9 884.1 | | 880.99 882.26 | 749.4 749.4 | | | |
| ilil Pond (Elm Creek) | 53796 | | | AV | 893.9 | | 893.89 | 749.4 | 0.0 | | FIS Location: 10.33 mi above Mill Pond Spillway. Looked on Arcmap and this cross section is on El Creek but near Mill pond and Rice Lake. The cros section on FIS prille is 10.35 mi above the Mill Pond Spillway. I think all the Mill Pond cross sectins are actually part of Elm Creek and then would in turn have a creek distance. The missing Cross sections in the Mill Pond main stem. |
| Aill Pond (Elm Creek) | 65333 | | | AW | 893.9 | | | | | | FIS Location: 12.52 mi above Mill Pond Spillway. Looked on Arcmap and this cross section is on El Creek but near Mill pond and Rice Lake. The cros section on FIS prfile is 12.52 mi above the Mill Pond Spillway |
| Aill Pond (Elm Creek) | 65946 | | | AX | 894.1 | | 894.18 | 527.3 | | | |
| Im Creek Im Creek | 66592 66781 | West Rice Lake Road West Rice Lake Road (US) | 12.76 a | | 894.6 895.3 | | 894.24 894.26 | | | | |
| ilm Creek | 67119 | DS of Weaver Lake Road, US of West Rice Lake Road | 12.84 | | 895.6 | | 894.39 | | | | |
| lm Creek | 68058 | DS of Weaver Lake Road, US of West Rice Lake Road | 13.05 | 3B | 897.3 | | 894.61 | | | 7 | |
| Im Creek | 68853 | Weaver Lake Road | 13.17 | | 898.4 | | 895.98 | 527.3 | | | |
| Im Creek | 69167 | Weaver Lake Road (US) | 13.25 | | 898.4 | | 896.09 | 527.3 | | | |
| Im Creek Im Creek | 69875 70093 | US of Weaver Lake Road, DS of BF US of Weaver Lake Road, DS of BG | 13.37 13.44 | | 898.4 898.4 | | 896.11 896.14 | | | | |
| Im Creek | 70462 | US of Weaver Lake Road, DS of BH | 13.48 | | 898.5 | | 896.22 | | | | |
| Im Creek | 71981 | Weaver Lake Road (US) | 13.77 | | 898.5 | | 896.27 | 527.3 | | | |
| lm Creek | 73933 | DS of Farm Driveway | 14.10 | ВІ | 898.5 | 690 | 898.19 | 488.4 | -0.3 | 3 (202 | FIS Location: 14.08 miles above Mill pond spillwa |
| Im Creek | 74436 | DS of Farm Driveway, DS of BK | 14.30 | | 901.5 | | 898.84 | 488.4 | | | |
| Im Creek | 74718 | Dunkirk Lane | 14.41 | | 903.7 | | 899.28 | | | | |
| ilm Creek ilm Creek | 74971 75680 | Dunkirk Lane (US) US of Dunkirk Lane, DS of Bass Lake Road, DS of BN | 14.44 14.55 | | 903.9 905.1 | | 901.23 902.39 | | | | |
| lm Creek | 76495 | US of Dunkirk Lane, DS of Bass Lake Road, DS of BO | 14.72 | | 906.0 | | 903.78 | | | 2 | |
| Im Creek | 77331 | DS of Bass Lake Road, US Dunkirk Lane, DS of BP | 14.86 | | 906.2 | | 904.97 | | | | |
| Ilm Creek | 79194 80843 | DS of Bass Lake Road, US Dunkirk Lane, DS of BQ DS of Bass Lake Road, US Dunkirk Lane, DS | 15.18 | | 906.4 | | 906.08 | | | | |
| | | of BR | | | | | | | | | |
| lm Creek | 82336 | DS of Bass Lake Road | 15.75 | | 909.8 | | 908.7 | 488.4 | | | |
| ilm Creek ilm Creek | 82996 83398 | Bass Lake Road DS of Elm Road, US of Bass Lake Road, DS of BU | 15.90 15.95 | | 910.4 910.7 | | 909.19 909.48 | | | | |
| ilm Creek | 83890 | DS of Elm Road, US of Bass Lake Road, DS of BV | 16.05 | BU | 910.9 | | 909.83 | 488.4 | -1.3 | 1 | |
| lm Creek | 84476 | DS of Elm Road, US of Bass Lake Road, DS of BW | 16.16 | BV | 911.0 | | 909.88 | 488.4 | -1.3 | 1 | |
| Ilm Creek | 85470 | DS of Elm Road, US of Bass Lake Road, DS of BX | 16.35 | | 911.0 | | 910.12 | | | 9 | |
| Im Creek Ilm Creek | 86861 88288 | DS of Elm Road, US of Bass Lake Road DS of Elm Road, US of Bass Lake Road, DS | 16.52 16.74 | | 911.0 915.4 | | 911.35 914.44 | | | |) On FIS the creek distance for the 100-yr peak flow |
| lm Creek | 88898 | of BZ DS of Elm Road, US of Bass Lake Road, DS of CA | 16.82 | 3Z | 916.7 | | 915.3 | 488.4 | -1.4 | 1 | rate is 16.73, used this peak flow rate |
| Im Creek | 90652 | Elm Road (DS) | 17.04 | CA | 918.9 | | 918.09 | 488.4 | -0.8 | 3 | |
| Im Creek | #N/A | Elm Road (US) | 17.11 | | 920.6 | | #N/A | #N/A | #N/A | | |
| Im Creek | 91739 | US of Elm Road, US of CB | 17.24 | | 921.0 | | 919.96 | | | | |
| Im Creek | 92290 | US of Elm Road, US of CC | 17.34 | | 921.6 | | 920.71 | 488.4 | | | |
| Im Creek | 93102 93848 | US of Elm Road, DS of CF US of Elm Road, US of CE | 17.50 | | 922.2 | | 921.2 | | | | |
| Im Creek Im Creek | 93848 111598 | US of Elm Road, US of CE US of State Highway 55, DS of State Highway 101 and CH | 17.63 20.66 | | 922.3 959.6 | | 921.36 960.5 | | | |) FIS Location: At Medina-Plymouth corporate boundary limits. This Cross section is the closest the city boundaries |

| | | 1% AEP Comp | arison of ECWMC 2016 | FIS Flood Profiles to | Stantec HUC-8 Revised I | /lodel Results - I | Flood Elevations and Pe | ak Discharges | | | |
|-----------------|------------|--|--|------------------------------------|-------------------------------|--------------------|-------------------------------|-----------------|------------------------------|-----------------------------|---|
| | | 2///23 | <u></u> | | ECWMC FIS Floor | | ECWMC HUC-8 Revised Mo | | | lood Elevations ow Rates | |
| | | | | | 100-yr | | 100-yr | | 1 | 00-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Elm Creek | 112306 | State Highway 101 (DS) | 20.73 | CH | 962.1 | | 961.57 | 235.3 | | | |
| Elm Creek | 112413 | State Highway 101 (US) | 20.75 | 1 | 963.9 | | 963.66 | 235.3 | -0.2 | | |
| Elm Creek | 113170 | DS of Access Road, US of State Highway 101 | 20.87 | | 966.0 | | 965.78 | 235.3 | | | |
| Elm Creek | 113302 | US and DS of two Access Road, US of State Highway 101 | 20.91 | CK | 972.4 | | 972.4 | 235.3 | 0.0 | | |
| Elm Creek | 113654 | US and DS of two Access Road, US of State Highway 101, US of CK | 20.96 | CL . | 972.5 | | 972.6 | 235.3 | 0.1 | | |
| Elm Creek | 113752 | US of Access Road, DS of Railroad | 21.00 | CM | 972.7 | | 972.62 | 235.3 | -0.1 | | |
| Elm Creek | 114334 | US Access road, DS railroad and Hamel Road | 21.11 | CN | 972.7 | 210 | 972.65 | 235.3 | -0.1 | | FIS Location: Below Soo Line Bridge, near Hamel Road. I think this is the correct cross section location but not positive. Double check |
| Elm Creek | 114472 | Railroad, DS of Hamel Road | 21.14 | 0 | 974.6 | | 975.33 | 235.3 | 0.7 | | |
| Elm Creek | 114953 | DS of Hamel Road, US of Railroad | 21.21 | CP. | 974.6 | 65 | 975.33 | 235.3 | 0.7 | | FIS Location: downstream of Hamel Road, near Pinto Drive. I picked the cross section that is farthest DS of Hamel Road (Creek meanders around it), and is still near Pinto Road. |
| Elm Creek | 115445 | Elm Creek Drive (DS) | 21.29 | 0 | 975.7 | | 976.29 | 235.3 | 0.6 | | |
| Elm Creek | 115587 | Elm Creek Drive (US) | 21.32 | | 976.9 | | 976.36 | 235.3 | | | |
| Elm Creek | 116667 | Sewage Lagoon Road (DS) | 21.50 | | 976.9 | | 976.55 | 235.3 | | | |
| Elm Creek | 116797 | Sewage Lagoon Road (US) | 21.53 | | 977.0 | | 976.67 | 235.3 | | | |
| Elm Creek | 117854 | DS of Confluence of Tributary to Elm Creek | 21.73 | CU | 977.0 | | 976.68 | 235.3 | -0.3 | | |
| Elm Creek | 118767 | DS of Hamel Road, DS of CW | 21.90 | CV | 977.1 | | 976.76 | 72.1 | -0.3 | | |
| Elm Creek | 119019 | DS of Hamel Road | 21.94 | CW | 977.5 | | 977.34 | 72.1 | -0.2 | | |
| Elm Creek | 119205 | US of Hamel Road DS of SOO Line Railroad | 21.97 | CX . | 977.7 | | 977.67 | 72.1 | 0.0 | | |
| Elm Creek | 119439 | US of Hamel Road DS of SOO Line Railroad | 22.02 | CY | 977.9 | | 977.7 | 72.1 | -0.2 | | |
| Elm Creek | 120084 | DS of SOO Line Railroad | 22.15 | Z | 978.0 | | 977.74 | 72.1 | -0.3 | | |

| | | 1% AEP Comparison of E | CWMC FIS Flood Profi | ies to Stantec HUC-8 Re | evised Model Res | uits - Flood Elev | ations arnd F | eak Discharges | | | |
|----------------------|------------|--|---|--------------------------------|----------------------------------|-------------------|-------------------------------------|-------------------------------|------------------------------|--------------------------------|--|
| | | | | | ECWMC FIS I | Flood Profiles | | 8 Revised Model I Profiles | | Flood Elevations Flow Rates | |
| | | | | | 100 |)-yr | | 00-yr | | L00-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| sh Creek | | 61 US of confluence with Elm Creek | 0.26 | | 869.60 | 1,330 | 868.44 | 1003.4 | -1.16 | (327) | |
| sh Creek | | 30 US of confluence with Elm Creek, DS of C | 0.76 | | 869.90 | | 871.25 | 1003.4 | 1.35 | | |
| sh Creek sh Creek | | 41 US of confluence with Elm Creek, DS of D 68 US of confluence with Elm Creek, DS of E | 1.00 1.39 | | 871.60 874.30 | | 872.64 874.79 | 1003.4 1003.4 | 1.04 0.49 | | |
| sh Creek | | 15 US of confluence with Elm Creek, DS of F | 1.52 | | 875.70 | | 875.47 | 1003.4 | -0.23 | | |
| sh Creek | | 84 US of confluence with Elm Creek, DS of G | 1.87 | | 880.00 | | 878.1 | 1003.4 | -1.90 | | |
| sh Creek | 113 | 75 US of confluence with Elm Creek, DS of H | 2.14 | G | 882.60 | | 881.29 | 1003.4 | -1.31 | | |
| sh Creek | | 15 Fernbrook Lane (DS) | 2.36 | | 885.00 | | 882.91 | 1003.4 | -2.09 | | |
| sh Creek | | 77 At Fernbrook Lane | 2.42 | | 886.80 | | 883.92 | 914.3 | -2.88 | | |
| sh Creek | | 40 Fernbrook Lane (US) | 2.60 | | 887.30 | | 885.24 | 914.3 | -2.06 | | |
| sh Creek sh Creek | | 25 US of Fernbrook Lane, DS of L 94 US of Fernbrook Lane, DS of M | 2.68 2.94 | | 887.80 890.10 | | 885.45 886.57 | 914.3 914.3 | -2.35 -3.53 | | |
| in Creek ih Creek | | .52 US of Fernbrook Lane, DS of M | 2.94 3.01 | | 890.10 890.60 | | 886.81 | 914.3 | -3.53 -3.79 | | |
| sh Creek | | 84 US of Fernbrook Lane, DS of O | 3.01 | | 890.80 | | 887.19 | 914.3 | -3.79 | | |
| sh Creek | | 11 US of Fernbrook Lane, DS of P | 3.33 | | 892.90 | | 888.85 | 914.3 | -4.05 | | |
| sh Creek | | 29 US of Fernbrook Lane, DS of Q | 3.43 | ~ | 894.00 | | 889.86 | 914.3 | -4.14 | | |
| sh Creek | 198 | 00 US of Fernbrook Lane, DS of R | 3.64 | | 895.70 | | 893 | 914.3 | -2.70 | | |
| h Creek | 205 | 67 US of Fernbrook Lane, DS of S | 3.75 | | 896.90 | | 893.94 | 914.3 | -2.96 | | |
| sh Creek | | 18 US of Fernbrook Lane, DS of T | 3.89 | | 898.90 | | 894.95 | 914.3 | -3.95 | | |
| sh Creek sh Creek | | 33 Territorial Road (DS) | 4.66 4.70 | | 905.50 905.90 | | 902.91 903.09 | 914.3 914.3 | -2.59 -2.81 | | |
| n Creek h Creek | | 18 At Territorial Road 24 Territorial Road (US) | 4.70 | | 905.90 | | 903.69 | 914.3 | -2.81 -2.47 | | |
| sh Creek | | 58 US of Territorial Road, DS of Minnesota Trunk Highway 152 | 5.00 | | 906.10 | 1,280 | 903.68 | 914.3 | | (366) | Location from FIS: 5 miles above confluence with Elm Creek |
| h Creek | 285 | 41 Minnesota Trunk Highway 152 (DS) | 5.22 | X | 906.20 | | 903.89 | 914.3 | -2.31 | | connactice with zim creek |
| sh Creek | | 02 At Minnesota Trunk Highway 152 | 5.30 | Υ | 906.30 | | 904.05 | 914.3 | -2.25 | | |
| sh Creek | | 64 Minnesota Trunk Highway 152 (US), near Burling and Nor. RR | 5.61 | Z | 907.50 | | 905.66 | 914.3 | -1.84 | | |
| sh Creek | | 18 US of Burling and Nor. RR, DS of Dunkirk Lane | 5.67 | | 907.60 | | 905.78 | 914.3 | -1.82 | | |
| sh Creek | | 34 Dunkirk Lane (DS) | 5.71 | | 907.70 | | 905.78 | 914.3 | -1.92 | | |
| sh Creek sh Creek | | 23 Dunkirk Lane (US) 89 US of Dunkirk Lane, DS of AE | 5.74 5.78 | | 907.80 909.40 | | 905.85 | 914.3 914.3 | -1.95 -3.12 | | |
| sh Creek | | 87 US of Dunkirk Lane, DS of 105th Avenue N, DS of AF | 5.92 | | 909.70 | | 906.28 907.45 | 914.3 | | | |
| sh Creek | 334 | 61 105th Avenue N (DS) | 6.09 | AF | 909.70 | | 907.53 | 914.3 | -2.17 | | |
| sh Creek | | 52 At 105th Avenue N | 6.18 | | 909.70 | | 907.53 | 914.3 | -2.17 | | |
| sh Creek | | 27 105th Avenue N (US) | 6.24 | | 911.70 | | 908.14 | 914.3 | -3.56 | | |
| sh Creek | | '52 US of 105th Avenue N, DS of State Route 92/Interstate 94, DS of AH | 6.35 | | 911.80 | | 908.49 | 914.3 | | | |
| h Creek | | 10 State Route 92/Interstate 94 (DS) | 6.66 | | 911.90 | | 908.88 | 914.3 | -3.02 | | |
| sh Creek sh Creek | | 27 State Route 92/Interstate 94 (US) 20 US of the confluence with North Fork Rush Creek | 6.76 7.52 | | 913.00 913.00 | 680 | 909.25 909.81 | 914.3 914.3 | -3.75 -3.19 | 234 | Location from FIS: 7.52 mi above confluence with Elm Creek |
| sh Creek | 404 | 68 US of the confluence with North Fork Rush Creek, DS of 101st Avenue North, US of AL | 7.85 | AM | 913.00 | | 910.49 | 878 | -2.51 | | |
| sh Creek | 422 | 14 US of the confluence with North Fork Rush Creek, DS of 101st Avenue North, US of AM | 8.05 | AN | 913.00 | | 912.14 | 878 | -0.86 | | |
| h Creek | 438 | 10 101st Avenue North (DS) | 8.28 | AO | 913.20 | | 912.8 | 878 | -0.40 | | |
| h Creek | | 64 101st Avenue North (US) | 8.33 | | 914.50 | | 915.37 | 878 | 0.87 | | |
| sh Creek | 462 | 34 US of 101st Avenue North, DS of 97th Avenue North, US of AP | 8.48 | AQ | 917.60 | | 916.47 | 878 | -1.13 | | |
| h Creek | | 23 US of 101st Avenue North, DS of 97th Avenue North, US of AQ | 8.67 | | 921.30 | | 922.15 | 878 | 0.85 | | |
| h Creek | | 85 US of 101st Avenue North, DS of 97th Avenue North, US of AR | 8.84 | | 922.60 | | 922.84 | 878 | | | |
| sh Creek | | 88 US of 101st Avenue North, DS of 97th Avenue North, US of AS | 9.08 | | 924.50 | | 923.63 | 878 | | | |
| h Creek h Creek | | 11 US of 101st Avenue North, DS of 97th Avenue North, US of AT 17 US of 101st Avenue North, DS of 97th | 9.37 | | 926.60 927.40 | | 926.48 926.88 | 878 878 | -0.12 -0.52 | | |
| on Circlex | 53/ | 1/ US of 101st Avenue North, DS of 9/th | 9.48 | AV | 927.40 | | 926.88 | 8/8 | -0.52 | | |

Avenue North, US of AU

| | | 1% AEP Comparison of | ECWMC FIS Flood Profi | les to Stantec HUC-8 R | evised Model Res | ults - Flood Elev | ations arnd F | eak Discharges | 5 | | |
|--------------------------|------------|--|---|--------------------------------|----------------------------------|-------------------|-------------------------------------|-------------------------------|------------------------------|--------------------------------|--|
| | | | | | ECWMC FIS I | Flood Profiles | | 8 Revised Model I Profiles | | Flood Elevations Flow Rates | |
| | | | | | 100 |)-yr | | 00-yr | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| ush Creek ush Creek | | I 97th Avenue N (DS) B At 97th Avenue N | 9.55 9.59 | | 927.70 928.50 | | 927.07 927.26 | 396.1 396.1 | | | |
| ush Creek | | 3 97th Avenue N (US) | 9.69 | | 928.50 | | 927.37 | 396.1 | | | |
| tush Creek | | US of 97th Avenue N, DS of BA | 9.92 | | 928.50 | | 927.39 | 396.1 | | | |
| tush Creek | 57461 | US of 97th Avenue N, DS of Minnnnesota Highway 10, US of AZ | 10.12 | BA | 928.60 | | 927.46 | 396.1 | -1.14 | | |
| tush Creek | 58182 | 2 US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BA | 10.22 | ВВ | 928.60 | | 927.65 | 396.1 | -0.95 | | |
| Rush Creek | 60047 | 7 US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BB | 10.51 | BC | 929.70 | | 929.12 | 396.1 | -0.58 | | |
| Rush Creek | 60695 | DS of Minnesota Highway 101, US of 97th | 10.64 | BD | 930.30 | | 929.77 | 396.1 | -0.53 | | |
| Rush Creek | 62766 | Avenue North, DS of BE 5 DS of Minnesota Highway 101, US of BD | 10.96 | RF | 932.10 | | 930.9 | 396.1 | -1.20 | | |
| Rush Creek | | State Highway 101 (just DS) | 11.03 | | 932.40 | 570 | 931.18 | 357 | | | FIS Location: At State Highway 101 |
| Rush Creek | | 5 DS of Private Road that is DS of Schute Road | 11.28 | | 934.00 | 370 | 932.19 | 357 | | | 201 |
| Rush Creek | 64580 | O US of Private Road that is DS of Schute Road | 11.36 | ВН | 935.00 | | 932.92 | 357 | -2.08 | | |
| Rush Creek | 65350 | O US of Private Road near State Highway 10, DS of Schute Road, US of BH | 11.42 | ВІ | 935.10 | | 933.27 | 357 | -1.83 | | |
| Rush Creek | 65819 | DS of Schute Road, US of BI | 11.52 | BJ | 935.20 | | 933.38 | 357 | -1.82 | | |
| Rush Creek | | Schute Road (DS) | 11.64 | | 935.20 | | 933.42 | | | | |
| Rush Creek | | S Schute Road (US) | 11.72 | | 935.20 | | 933.73 | 357 | | | |
| Rush Creek | | US of Schute Road, DS of BN | 11.84 | | 935.30 | | 933.78 | 357 | | | |
| Rush Creek Rush Creek | | US of Schute Road, DS of BD | 12.16 12.38 | | 935.40 | | 933.97 934.64 | 357 | | | |
| Rush Creek Rush Creek | | L US of Schute Road, DS of BP 5 US of Schute Road, DS of County Highway | 13.50 | | 935.70 936.10 | | 934.64 | 357 357 | | | |
| Rush Creek | 76731 | 116, DS of BQ L County Highway 116 (DS) | 13.60 | BQ | 936.10 | 470 | 935.63 | 357 | -0.47 | (113) | FIS location: Just downstream of Country Road 116 |
| Rush Creek | 77179 | County Highway 116 (US) | 13.66 | RR | 937.20 | | 938.1 | 357 | 0.90 | | Noau 110 |
| Rush Creek | | 5 US of County Highway 116, DS of County Highway 10, DS of BT | 13.94 | | 937.50 | | 938.35 | 265.8 | | | |
| Rush Creek | 80181 | US of County Highway 116, DS of County Highway 10, DS of BU | 14.12 | ВТ | 937.90 | | 938.39 | 265.8 | 0.49 | | |
| Rush Creek | 81438 | B US of County Highway 116, DS of County Highway 10, DS of BV | 14.44 | BU | 940.70 | | 939.33 | 265.8 | -1.37 | | |
| Rush Creek | 82895 | S US of County Highway 116, DS of County Highway 10, DS of BW | 14.64 | BV | 942.40 | 315 | 941.92 | 265.8 | -0.48 | (49) | FIS location: Just aboved Unnamed Tributary approximately 0.3 miles downstream of County Highway 10. Cross section BV is "0.39 mi downstrea of Highway 10 and downstream of a tril |
| Rush Creek | 84156 | County Highway 10 (DS) | 14.78 | BW | 945.10 | | 944.56 | 265.8 | -0.54 | | |
| Rush Creek | | 3 County Highway 10 (US) | 14.86 | | 945.90 | | 945.17 | 265.8 | | | |
| Rush Creek | | US of County Highway 10, DS of County Highway 50, DS of BZ | 15.06 | ВУ | 946.30 | | 946.27 | 265.8 | | | |
| Rush Creek | 86165 | US of County Highway 10, DS of County Highway 50, DS of CA | 15.14 | BZ | 947.30 | | 946.84 | 265.8 | -0.46 | | |
| Rush Creek | 86434 | US of County Highway 10, DS of County Highway 50, DS of CB | 15.34 | CA | 949.50 | | 947.98 | 265.8 | -1.52 | | |
| tush Creek | 88133 | B US of County Highway 10, DS of County Highway 50, DS of CC | 15.42 | СВ | 951.10 | 230 | 951.04 | 184.2 | -0.06 | (46) | FIS Location: Just above Unnamed Tributary approximately 0.6 miles upstream of County Highway 10. Cross section CB is 0.6 mi upstream of Count Highway 10 |
| Rush Creek | 89836 | US of County Highway 10, DS of County Highway 50, DS of CD | 15.72 | сс | 955.20 | | 954.56 | 184.2 | -0.64 | | |
| Rush Creek | 90820 |) US of County Highway 10, DS of County Highway 50, DS of CE | 15.92 | CD | 957.30 | | 956.32 | 184.2 | -0.98 | | |
| Rush Creek | | 2 County Highway 50 (DS) | 16.02 | | 958.60 | | 958.7 | 184.2 | | | |
| Rush Creek | | 2 County Highway 50 (US) | 16.12 | | 959.20 | | 959.2 | 184.2 | | | |
| Rush Creek | 93097 | 7 US of County Highway 50, DS of Kalk Road, DS of CH | 16.33 | CG | 960.50 | | 960.92 | 184.2 | 0.42 | | |

| | | 1% AEP Comparison of I | ECWMC FIS Flood Profi | les to Stantec HUC-8 Re | evised Model Res | sults - Flood Elev | ations arnd I | Peak Discharges | 5 | | |
|-----------------|---|---|---|--------------------------------|----------------------------------|--------------------|-------------------------------------|--------------------------------|------------------------------|--------------------------------|--|
| | | | | | ECWMC FIS | Flood Profiles | | -8 Revised Model d Profiles | | Flood Elevations Flow Rates | |
| | | | | | 100 | 0-yr | 1 | 00-yr | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Rush Creek | 93948 US of County Highway 50, DS of Kalk Roa DS of CI | | 16.45 | CH | 962.80 | | 961.84 | 184.2 | -0.96 | | |
| Rush Creek | | Kalk Road (DS) | 16.53 | CI | 963.00 | | 962.16 | 184.2 | -0.84 | | |
| Rush Creek | | Kalk Road (US) | 16.57 | | 964.90 | | 966.38 | | | | |
| Rush Creek | 95356 | US of Kalk Road, DS of Rolling Hills Road, US of CJ | 16.73 | CK | 964.90 | | 966.4 | | 1.50 | | |
| Rush Creek | 100957 | DS of Rolling Hills Road, US of CK | 17.76 | CL | 964.90 | | 966.43 | 76.5 | 1.53 | | |
| ush Creek | 101677 | Rolling Hills Road (DS) | 17.86 | CM | 964.90 | | 966.45 | 76.5 | 1.55 | | |
| ush Creek | 101771 | Rolling Hills Road (US) | 17.92 | CN | 965.60 | | 966.58 | 76.5 | 0.98 | | |
| tush Creek | 104294 | US of Rolling Hills Road, DS of CP | 18.36 | CO | 966.20 | | 967.33 | 76.5 | 1.13 | | |
| tush Creek | | US of Rolling Hills Road, DS of CQ | 18.44 | CP | 969.40 | | 968.66 | | | | |
| Rush Creek | | US of Rolling Hills Road, At the "limit of detailed of study" | 18.58 | CQ | 970.60 | 150 | 969.36 | 76.5 | -1.24 | ` ′ | FIS Location: At Jubert Lake outlet. Looked on Arcmap and CQ is at this location |

| | | | | | ECWMC FIS Floo | d Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | _ | levations and Flow ates |
|--|------------|---|---|-----------------------------------|-------------------------------|-----------------|-------------------------------|--------------------|---------------------------|----------------------------|
| | | | | | 100-yr | | 100-yr | | 10 | 0-yr |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Rush Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) |
| lorth Fork Rush Creek | | County Road 117 (US) | 2.66 | | 914.8 | | 912.12 | 359 | | |
| Iorth Fork Rush Creek Iorth Fork Rush Creek | | 109th Avenue North (US) US of 109th Avenue N, DS of Access Road | 2.76 2.98 | | 914.8 914.8 | | 912.27 912.28 | 359 359 | | |
| lorth Fork Rush Creek | | near Cain Road, DS of D US of 109th Avenue N, DS of Access Road near Cain Road, DS of E | 3.26 | D | 914.8 | | 912.29 | 359 | -2.5 | |
| Iorth Fork Rush Creek | | Access Road near Cain Road (DS) | 3.30 | E | 914.8 | | 912.29 | 359 | -2.5 | |
| lorth Fork Rush Creek | 18282 | Access Road near Cain Road (US) | 3.32 | F | 914.8 | | 913.58 | 359 | -1.2 | |
| lorth Fork Rush Creek | 19664 | Cain Road | 3.55 | G | 914.8 | 530 | 913.9 | 311.5 | -0.9 | (21 |
| Iorth Fork Rush Creek | 19750 | Cain Road (US) | 3.58 | Н | 915.0 | | 914.03 | 311.5 | -1.0 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of J | 3.70 | I | 915.0 | | 914.04 | 311.5 | -1.0 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of J | 3.70 | I | 915.0 | | 914.04 | 311.5 | -1.0 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of J | 3.84 | I | 915.0 | | 914.04 | 311.5 | -1.0 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of K | 3.84 | J | 915.4 | | 914.47 | 311.5 | -0.9 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of L | 4.06 | к | 917.7 | | 917.49 | 311.5 | -0.2 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of M | 4.24 | L | 918.4 | | 917.79 | 311.5 | -0.6 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of N | 4.34 | М | 918.7 | | 917.83 | 311.5 | -0.9 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of O | 4.50 | N | 919.9 | | 918.73 | 311.5 | -1.2 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of P | 4.72 | 0 | 921.1 | | 919.4 | 157.1 | -1.7 | |
| lorth Fork Rush Creek | 26892 | US of Cain Road, DS of Trail Haven Road, DS of Q | 4.87 | P | 921.9 | | 920.49 | 157.1 | -1.4 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of R | 4.98 | Q | 923.2 | | 920.99 | 157.1 | -2.2 | |
| Iorth Fork Rush Creek | 27581 | Trail Haven Road (DS) | 4.99 | R | 923.3 | 495 | 921.22 | 157.1 | -2.1 | (33 |
| lorth Fork Rush Creek | 27759 | Trail Haven Road (US) | 5.03 | S | 924.6 | | 921.76 | 157.1 | -2.8 | |
| lorth Fork Rush Creek | | US of Trail Haven Road, DS of County Road 117, US of S | 5.19 | Т | 924.7 | | 921.97 | 157.1 | -2.7 | |
| lorth Fork Rush Creek | | US of Trail Haven Road, DS of County Road 117, US of T | 5.44 | U | 924.7 | | 922.31 | 157.1 | -2.4 | |
| lorth Fork Rush Creek | 31286 | County Road 117/109th Avenue North (DS) | 5.65 | v | 924.7 | | 922.6 | 117 | -2.1 | |
| lorth Fork Rush Creek | | At County Road 117/109th Avenue N | 5.67 | W | 924.7 | | 922.65 | 117 | -2.1 | |
| lorth Fork Rush Creek | 31460 | County Road 117/109th Avenue North (US) | 5.68 | | 924.7 | | 923.06 | 117 | -1.6 | |
| lorth Fork Rush Creek | 31580 | US and DS of County Road 117/109th Avenue N, DS of Z | 5.70 | Υ | 925.8 | | 923.21 | 117 | -2.6 | |
| lorth Fork Rush Creek | 35165 | DS of County Road 117/109th Ave N, DS of AA | 6.47 | Z | 926.6 | | 924.95 | 117 | -1.6 | |
| Jorth Fork Rush Creek | | US of County Road 117/109th Avenue N | 6.50 | AA | 930.0 | | 925.29 | 117 | -4.7 | |
| Jorth Fork Rush Creek | 35391 | US of County Road 117/109th Ave N, DS of AC | 6.52 | | 930.2 | | 925.99 | 117 | | |
| lorth Fork Rush Creek | 35871 | US of County Road 117/109th Ave N, DS of AD | 6.60 | AC | 930.3 | | 928.5 | 117 | -1.8 | |
| lorth Fork Rush Creek | 36391 | US of County Road 117/109th Ave N, DS of AE | 6.70 | AD | 931.1 | | 929.29 | 117 | -1.8 | |
| Iorth Fork Rush Creek | | DS of Access Road, US of AD | 6.99 | AF | 935.6 | | 932.27 | 117 | -3.3 | |
| Jorth Fork Rush Creek | | DS of Bechtold Road, US of Access Road | 7.03 | | 937.1 | | 932.52 | 117 | | |
| Jorth Fork Rush Creek | | DS of Bechtold Road | 7.15 | | 937.6 | | 934.68 | 117 | | |
| Jorth Fork Rush Creek | | US of Bechtold Road | 7.16 | | 937.6 | | 935.05 | 117 | | |
| Jorth Fork Rush Creek | | US of Bechtold Road,DS of AJ | 7.25 | | 940.4 | | 936.07 | 117 | -4.3 | |
| | | | | | | | | | | |

| | | 1% AEP Comparison of ECV | /MC FIS Flood Profiles | to Stantec HUC-8 Rev | ised Model Results - Fic | od Elevations a | rnd Peak Discharges | | | |
|--|----------------------|---|--|--------------------------------|-------------------------------|-----------------|-------------------------------|--------------------|---------------------------|------------------------|
| | | | | | ECWMC FIS Floor | d Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | Change in Flood E | levations and Flovates |
| | | | | | 100-yr | | 100-yr | | 10 | 0-yr |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Rush Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) |
| North Fork Rush Creek | | County Road 30/Oak Bole Drive | 7.67 | | 943.3 | | 941.67 | 117 | | |
| North Fork Rush Creek | | f County Road 30/Oak Bole Drive | 7.72 | | 947.6 | | 943.17 | 91.9 | -4.4 | |
| North Fork Rush Creek | of AN | | 7.96 | | 947.8 | | 945.17 | 91.9 | -2.6 | |
| North Fork Rush Creek | of AC | | 8.07 | | 947.9 | | 946.15 | 91.9 | -1.8 | |
| North Fork Rush Creek | | f Sundance Road, DS of AP | 8.37 | | 951.0 | | 949.96 | 91.9 | -1.0 | |
| North Fork Rush Creek | | f Sundance Road, DS of AQ | 8.53 | | 954.8 | | 951.06 | 91.9 | -3.7 | |
| North Fork Rush Creek | | f Sundance Road, DS of AR | 8.69 | | 957.4 | | 954.88 | 91.9 | | |
| North Fork Rush Creek | | f Sundance Road | 8.86 | | 959.9 | | 957.21 | 91.9 | -2.7 | |
| North Fork Rush Creek | | f Sundance Road | 8.88 | | 963.2 | | 959.11 | 91.9 | | |
| North Fork Rush Creek | | f Sundance Road, US of AS | 8.94 | | 963.3 | | 960.8 | 91.9 | -2.5 | |
| North Fork Rush Creek | | f Sundance Road, US of AT | 9.08 | | 963.5 | | 961 | 91.9 | | |
| North Fork Rush Creek | | f 97th Avenue N, DS of AW | 9.29 | | 965.8 | | 965.42 | 91.9 | -0.4 | |
| North Fork Rush Creek | | f 97th Avenue N, DS of AX | 9.42 | | 968.4 973.4 | | 966.9 | 91.9 | | |
| North Fork Rush Creek | | f 97th Avenue N | 9.75 | | 973.4 977.1 | | 971.08 | 91.9 | -2.3 | |
| North Fork Rush Creek | | f 97th Avenue N | 9.78 | | | | 971.37 | 91.9 | | |
| North Fork Rush Creek | | f 97th Avenue N, US of AY | 9.91 | | 977.5 981.4 | | 974.13 978.91 | 91.9 91.9 | -3.4 -2.5 | |
| North Fork Rush Creek North Fork Rush Creek | | f 97th Avenue N, US of AZ | 10.13 10.32 | | 981.4 | | 982.37 | 91.9 | -2.5 | |
| North Fork Rush Creek | | f 97th Avenue N, DS of BC If Access Road and County Road 10, | 10.52 | | 988.9 | | 988.04 | 91.9 | | |
| North Fork Rush Creek | | f Access Road, DS of BE | 10.55 | RD | 990.9 | | 988.53 | 91.9 | -2.4 | |
| North Fork Rush Creek | | f Access Road near County Road 10, | 10.59 | | 991.1 | | 988.58 | 91.9 | | |
| North Fork Rush Creek | | f County Road 10 | 10.61 | BF | 991.9 | 310 | 988.86 | 91.9 | -3.0 | (2: |
| North Fork Rush Creek | | f County Road 10 | 10.63 | | 992.0 | | 989.36 | 43 | -2.6 | , |
| North Fork Rush Creek | | f County Road 10, DS of Access Road | 10.69 | | 992.0 | | 989.37 | 43 | | |
| North Fork Rush Creek | 60948 US of | f Access Road, DS of BJ | 10.73 | BI | 992.1 | | 989.64 | 43 | -2.5 | |
| North Fork Rush Creek | 61315 US of of BI | f County Road 10 and Access road, US | 10.81 | BJ | 992.2 | | 989.66 | 43 | -2.5 | |
| North Fork Rush Creek | 63385 US of | f County Road 10, US of BJ | 11.20 | BK | 993.5 | | 990.53 | 43 | -3.0 | |
| North Fork Rush Creek | 63749 US of | f County Road 10, US of BK | 11.27 | BL | 994.0 | | 990.79 | 43 | -3.2 | |
| North Fork Rush Creek | 64763 DS of Road | f County Road 19/Crow Hassan Park | 11.45 | BM | 995.0 | | 993.02 | 43 | -2.0 | |
| North Fork Rush Creek | 64955 US of Road | f County Road 19/Crow-Hassan Park | 11.49 | BN | 1001.2 | | 994.07 | 43 | -7.1 | |
| North Fork Rush Creek | 65429 DS of | f Strehler Road, DS of BP | 11.58 | ВО | 1001.2 | | 994.84 | 43 | -6.4 | |
| North Fork Rush Creek | | f Strehler Road, DS of BQ | 11.68 | | 1001.2 | | 994.85 | 43 | | |
| North Fork Rush Creek | 66739 DS of | f Strehler Road, DS of BR | 11.80 | BQ | 1001.2 | | 998.53 | 43 | -2.7 | |
| North Fork Rush Creek | 67226 DS of | f Strehler Road | 11.92 | BR | 1001.9 | 215 | 999.47 | 43 | -2.4 | (1 |
| North Fork Rush Creek | 67429 US of | f Strehler Road | 11.96 | BS | 1004.1 | | 1001.78 | 43 | -2.3 | |
| North Fork Rush Creek | 68345 US of | f Strehler Road, US of BS | 12.12 | BT | 1004.1 | | 1001.84 | 43 | -2.3 | |
| North Fork Rush Creek | 69031 US of | f Strehler Road, US of BT | 12.24 | BU | 1004.1 | | 1001.84 | 43 | -2.3 | |
| North Fork Rush Creek | 69474 US of | f Strehler Road, US of BU | 12.33 | BV | 1004.1 | | 1001.84 | 43 | -2.3 | |
| North Fork Rush Creek | 71089 US of | f Strehler Road, DS of BX | 12.64 | BW | 1004.2 | | 1001.87 | 43 | -2.3 | |
| North Fork Rush Creek | 72186 US of | f Strehler Road, US of BW | 12.85 | BX | 1004.3 | | 1001.91 | 43 | -2.4 | |
| North Fork Rush Creek | 72915 US of | f Strehler Road, US of BX | 12.99 | BY | 1004.3 | | 1001.9 | 43 | -2.4 | |

| SOU-yr Flood Flow Rate (CFS) Notes | WMC HUC-8 Revised Model Flood Profiles Change in Flood Elevations and Flow Rates | | ECWMC HUC-8 Revised Model Flood Profiles | | ECWMC FIS Flood Profiles | | | | | | |
|--|--|-----------------|---|---|--------------------------|---------------------------------|--|--|------------|-----------------|--|
| ste (CFS) Elevation (feet) Flow Rate (CFS) Notes (Feet) 2685.6 | ţ | 00-yr | 500-yr | | 500-yr | | | | | | |
| 2685.6 | 6) Elevation | Flow Rate (CFS) | Elevation (NGVD29 | Flood Elevation (NGVD29 feet) Flow Rate (CFS) | | Lettered Cross Section from FIS | Creek Distance above State Route 12 (miles) | Location | HEC-RAS XS | Main Stem Creek | |
| 2685.6 | | 2685.6 | 854.88 | 4,350 | 854.6 | A | * (Data not applicable) | U.S. Route 169 (US) | 1767 | Creek | |
| 2685.6 | 5.6 0.6 | 2685.6 | 855.16 | | 854.6 | В | * (Data not applicable) | U.S. Route 169 (US), US of A | 2505 | Creek | |
| 2685.6 -0.9 2685.6 -0.2 2685.6 -0.2 2685.6 -0.3 2685.6 -0.5 2685.6 -0.5 2685.6 -0.5 2685.6 -0.8 2423.8 -0.9 2423.8 -0.3 2423.8 -0.3 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -1.6 2423.8 -2.5 2423.8 -2.5 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.7 2423.8 -2.8 2423.8 -2.8 2423.8 -2.9 2423.8 | | | 855.14 | | 854.6 | С | V | U.S. Route 169 (US), US of B | | Creek | |
| 2685.6 -0.2 2685.6 -0.3 2685.6 -0.5 2685.6 -0.5 2685.6 -0.5 2685.6 -0.5 2685.6 -0.8 2423.8 -0.9 2423.8 -0.3 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -1.6 2423.8 -2.2 2423.8 -2.2 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 | | | 855.21 | | 854.8 | D | V | Cartway Road (DS) | | Creek | |
| 2685.6 -0.2 2685.6 -0.3 2685.6 -0.5 2685.6 -0.5 2685.6 -0.5 2685.6 -0.5 2685.6 -0.8 2423.8 -0.9 2423.8 -0.3 2423.8 -0.3 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -1.6 2423.8 -2.5 2423.8 -2.5 2423.8 -2.5 2423.8 -2.6 2423.8 -2.6 2423.8 -2.6 2423.8 -2.7 2423.8 -2.8 2423.8 -2.9 | | | 857.61 | | 858.5 | | 0.85 | Cartway Road (US) | | Creek | |
| 2685.6 -0.3 2685.6 -0.5 2685.6 -0.5 2685.6 -0.5 2685.6 -0.8 2423.8 -0.9 2423.8 -0.3 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -0.8 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 | | | 858.48 | | 858.6 | | 0.98 | US of confluence with Elm Creek. DS of Fernbrook Lane | | Creek | |
| 2685.6 -0.5 2685.6 -0.5 2685.6 -0.5 2685.6 -0.8 2423.8 -0.9 2423.8 -0.5 2423.8 -0.3 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -1.6 2423.8 -2.2 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 2423.8 -2.6 2423.8 -2.7 2423.8 -2.8 2423.8 -2.9 | | | 858.6 | | 858.8 | | 1.20 | DS of Fernbrook Lane, US of F | | Creek | |
| 2685.6 -0.5 2685.6 -0.8 2685.6 -0.8 2423.8 -0.9 2423.8 -0.5 2423.8 -0.5 2423.8 -0.3 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 | | | 858.73 858.74 | | 859.0 859.2 | | 1.40 1.56 | DS of Fernbrook Lane, US of G Fernbrook Lane (County and State Aide | | Creek Creek | |
| 2685.6 -0.5 2685.6 -0.8 2423.8 -0.9 2423.8 -0.8 2423.8 -0.5 2423.8 -0.5 2423.8 -0.5 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -1.6 2423.8 -2.2 2423.8 -2.2 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 | | | | | | | | Highway 121) | | | |
| 2685.6 -0.8 2423.8 -0.9 2423.8 -0.8 2423.8 -0.5 2423.8 -0.5 2423.8 -0.3 2423.8 -0.4 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -0.8 2423.8 -1.6 2423.8 -2.2 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.6 2423.8 -2.7 2423.8 -2.8 2423.8 -2.9 | | | 858.74 | | 859.3 | | 1.62 | US of Fernbrook Lane | | Creek | |
| 2423.8 -0.9 2423.8 -0.8 2423.8 -0.5 2423.8 -0.3 2423.8 -0.5 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.3 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 | | | 859.01 859.02 | | 859.5 859.8 | | 1.76 2.19 | US of Fernbrook Lane, US of J US of Fernbrook Lane, US of K | | Creek Creek | |
| 2423.8 -0.8 2423.8 -0.5 2423.8 -0.3 2423.8 -0.4 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.8 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.2 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 | | | 859.04 | | 859.9 | | 2.30 | US of Fernbrook Lane, US of L | | Creek | |
| 2423.8 -0.5 2423.8 -0.3 2423.8 -0.4 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.7 2423.8 -0.3 2423.8 -0.8 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.2 2423.8 -2.5 2423.8 -2.4 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.4 2423.8 -2.5 | | | 859.03 | | 859.8 | | 2.34 | US of Fernbrook Lane, US of M | | Creek | |
| 2423.8 -0.3 2423.8 -0.4 2423.8 -0.7 2423.8 -0.7 2423.8 -1.1 2423.8 -0.7 2423.8 -0.3 2423.8 -0.8 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.4 2423.8 -2.4 2423.8 -2.4 2423.8 -2.4 2423.8 -2.4 2423.8 -2.4 2423.8 -2.5 | | | 859.35 | | 859.8 | | 3.98 | DS of Elm Creek Road, DS of P | | Creek | |
| 2423.8 | | | 859.61 | | 859.9 | | 4.34 | DS of Elm Creek Road, DS of Q | | Creek | |
| 2423.8 -0.7 2423.8 -0.7 2423.8 -0.3 2423.8 -0.8 2423.8 -1.6 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.6 Cross sections or Arcmap and this with the describe | | | 860.53 | | 860.0 | | 4.62 | Elm Creek Road (DS), DS of R | | Creek | |
| 2423.8 -1.1 2423.8 -0.7 2423.8 -0.3 2423.8 -0.8 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 | | | 860.92 | | 861.3 | | 4.71 | DS of Elm Creek Road, DS of S | | Creek | |
| 2423.8 -0.7 2423.8 -0.8 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.6 Cross sections or Avance of Arcmap and this with the describe | 3.8 -0.7 | 2423.8 | 861.71 | | 862.4 | S | 4.80 | Elm Creek Road (DS) | 25541 | Creek | |
| 2423.8 -0.8 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.6 Cross sections or Arcmap and this with the describe with the describe | | | 861.91 | | 863.0 | | 4.90 | Elm Creek Road (US) | | Creek | |
| 2423.8 -0.8 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 944 FIS location: Abo junction of Rush just inside corpor limits of City of Dayton. Looked a Cross sections on Arcmap and this with the describe | 3.8 -0.7 | 2423.8 | 862.52 | | 863.2 | U | 4.95 | DS of Pineview Lane, US of Elm Creek Road, DS of V | | Creek | |
| 2423.8 -1.5 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 Cross sections or Arcmap and this with the describe | 3.8 -0.3 | 2423.8 | 863.89 | | 864.1 | V | 5.21 | DS of Pineview Lane, US of Elm Creek Road, DS of W | | Creek | |
| 2423.8 -1.6 2423.8 -2.2 2423.8 -2.3 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 944 FIS location: Abo junction of Rush just inside corpor limits of City of Dayton. Looked a Cross sections on Arcmap and this with the describe | 3.8 -0.8 | 2423.8 | 864.67 | | 865.5 | W | 5.39 | DS of Pineview Lane, US of Elm Creek Road, DS of Y | | Creek | |
| 2423.8 -2.2 2423.8 -2.4 2423.8 -2.5 2423.8 -2.5 2423.8 -2.4 944 FIS location: Abo junction of Rush just inside corpol limits of City of Dayton. Looked : Cross sections or Arcmap and this with the describe | | | 866.01 | | 867.5 | | 5.75 | DS of Pine View Lane | | Creek | |
| 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 944 FIS location: Abo junction of Rush just inside corpo limits of City of Dayton. Looked cross sections on Arcmap and this with the describe | | | 866.14 | | 867.8 | | 5.84 | DS of Pineview Lane, US of Elm Creek Road, DS of Z | | Creek | |
| 2423.8 -2.4 2423.8 -2.5 2423.8 -2.4 944 FIS location: Abo junction of Rush just inside corpolimits of City of Dayton. Looked: Cross sections or Arcmap and this with the describe | | | 867.17 | | 869.4 | | 5.99 | DS of Pineview Lane, US of Elm Creek Road, DS of AA | | Creek | |
| 2423.8 -2.5 2423.8 -2.4 944 FIS location: Abo junction of Rush just inside corpo limits of City of Dayton. Looked. Cross sections on Arcmap and this with the describ | | | 867.89 | | 870.2 | | 6.10 | Pine View Lane (DS) | | Creek | |
| 2423.8 -2.4 944 FIS location: Abo junction of Rush just inside corpo limits of City of Dayton. Looked. Cross sections on Arcmap and this with the describ | | | 868.25 | | 870.7 | | 6.14 | Pine View Lane (US) | | Creek | |
| junction of Rush just inside corpo limits of City of Dayton. Looked Cross sections or Arcmap and this with the describe | 3.8 -2.5 | 2423.8 | 868.35 | | 870.9 | AC | e 6.21 | DS of Confluence of Bush Creek, US of Pin View Lane | | Creek | |
| location | -2.4 | 2423.8 | 868.53 | 1,480 | 871.0 | AD | 6.31 | Confluence of Bush Creek (DS) | 35380 | Creek | |
| 1034.6 -1.9 | 4.6 -1.9 | 1034.6 | 869.05 | | 871.0 | AE | 6.63 | DS of Pine View Lake, DS of AI | 36616 | Creek | |
| 1034.6 -1.8 | | | 869.15 | | 871.0 | | 6.77 | Pine View Lake (DS), downstream of AG | | Creek | |
| 1034.6 -1.7 | | | 869.53 | | 871.2 | | 7.36 | Pine View Lake (DS) | | Creek | |
| 1034.6 -1.1 | | | 870.65 | | 871.7 | AH | 7.70 | DS of Pine View Lake, DS of AI | 41126 | Creek | |
| 1034.6 -1.0 | | | 871.28 | | 872.3 | | 7.99 | DS of Pine View Lake, DS of AJ | | Creek | |
| 1034.6 -0.9 | | | 871.74 | | 872.6 | | 8.20 | Pine View Lake (DS) | | Creek | |
| 1034.6 -2.2 1034.6 -2.1 | | | 872.86 874.02 | | 875.0 876.1 | | 8.37 8.46 | Pine View Lake (US) DS of Territorial Road, US of Pine View | | Creek Creek | |

| | Flood Elevations Flow Rates | | -8 Revised Model | ECWMC HUC- | Model Results - Flood Elevations ECWMC FIS Flood Profiles | | | | | | | |
|--|--------------------------------|--|---|---|--|---|---|---|--|--|--|--|
| Notes | | 500-yr | | Flood Profiles 500-yr | | 500 | | | | | | |
| | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Lettered Cross Section from FIS | Creek Distance above State Route 12 (miles) | Location | HEC-RAS XS | Main Stem Creek | |
| | | -1.0 | 1034.6 | 875.27 | | 876.3 | 5 AM | 8.75 | DS of Territorial Road, US of Pine View Lake, DS of AN | 46044 | lm Creek | |
| | | -0.2 | 1034.6 | 876.39 | | 876.6 |) AN | 9.20 |) Territorial Road (DS) | 47970 | lm Creek | |
| | | 2.3 | | 879.32 | | 877.0 | I AO | | Minnesota Trunk Highway 52 (DS) | | m Creek | |
| | | 1.8 | | 879.63 | | 877.9 | | 9.52 | . Minnesota Trunk Highway 52 (US), DS of Railroad | | m Creek | |
| | | -1.7 | | 880.16 | | 881.8 | 3 AQ | | US of Railroad that is US of Minnesota Trunk Highway 152 | | m Creek | |
| | | -1.3 | | 880.7 | | 882.0 | | | US of Railroad, DS of Rice Lake Dam, DS of AS | | lm Creek | |
| | | -1.9 | 1034.6 | 881.07 | | 883.0 | | 9.91 | Rice Lake Dam (DS) | | m Creek | |
| | | -2.4 | | 881.85 | | 884.2 | | 10.12 | DS of Rice Lake Dam, DS of AU | | lm Creek | |
| IS Location: 10.3 | | -4.1 -0.3 | | 883.14 894.49 | | 887.2 894.8 | AV AV | Not listed in FIS | Rice Lake Dam (DS) | 53197 53796 | lm Creek 1ill Pond (Elm Creek) | |
| pillway. Looked of rcromap and this co- cection is on Elm of ut near Mill pond ice Lake. The cro ection on FIS pril 0.35 mi above th Mill Pond Spillway hink all the Mill P ross sectins are ctually part of El reek and then w. In turn have a cree istance. The miss ross sections fro he Elm Creek orrespond to the ross section in th Mill Pond main stu IS Location: 12.5. | (401) | -0.3 | 729.5 | 894.87 | 1,130 | 895.2 | AW | Not listed in FIS | | 65333 | till Pond (Elm Creek) | |
| | | | | | | | | | | | | |
| bove Mill Pond pillway. Looked of curemap and this cection is on Elm (| | | | | | | | | | | | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above the | | -0.5 -0.8 | | 894.91 | | 895.4 | AX . av | Not listed in FIS | | 65946 66507 | | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above the | | -0.8 | 729.5 | 894.99 | | 895.8 | S AY | 12.76 | West Rice Lake Road | 66592 | liill Pond (Elm Creek) im Creek | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | | 729.5 729.5 | | | | S AY B AZ | | | 66592 66781 | | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 | 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 | | 895.8 896.1 897.5 | 6 AY 8 AZ 8 BA 6 BB | 12.76 12.78 12.84 13.09 | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road | 66592 66781 67119 68058 | im Creek im Creek im Creek im Creek | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 | 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 | | 895.8 896.1 897.5 898.6 | S AY S AZ S BB S BB | 12.76 12.78 12.82 13.05 | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road | 66592 66781 67119 68058 | m Creek m Creek m Creek m Creek m Creek | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 -1.1 -2.6 | 729.5 729.5 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 897.27 897.42 | | 895.8 896.1 897.5 898.6 898.4 900.0 | S AY AZ BA BB BB BC BB | 12.76 12.78 12.84 13.01 13.17 13.21 | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road Weaver Lake Road Weaver Lake Road (US) | 66592 66781 67119 68058 68853 69167 | im Creek | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 -1.1 -2.6 -2.6 | 729.5 729.5 729.5 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 897.27 897.42 897.43 | | 895.8 896.1 897.5 898.6 898.4 900.0 900.0 | S AY S AZ S BB S BB S BC S BD BE | 12.76 12.78 12.84 13.09 13.17 13.25 13.37 | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road US Weaver Lake Road US Weaver Lake Road US of Weaver Lake Road | 66592 66781 67119 68058 68853 69167 69875 | im Creek | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 -1.1 -2.6 | 729.5 729.5 729.5 729.5 729.5 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 897.27 897.42 | | 895.8 896.1 897.5 898.6 898.4 900.0 | S AY S AZ B BA S BB S BC S BD S BC S BB | 12.76 12.78 12.84 13.01 13.17 13.21 | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road Weaver Lake Road Weaver Lake Road (US) | 66592 66781 67119 68058 68853 69167 69875 70093 | m Creek | |

| | | 0.2% AEP Comparison of ECWN | IC FIS Flood Profiles to | Stantec HUC-8 Revised | ivioaei Results - | Fiood Elevations | and Peak Di | scnarges | | | |
|------------------------|------------|--|--|------------------------------------|----------------------------------|------------------|----------------------|--------------------------------|---|-----------------|--|
| | | | | | ECWMC FIS I | Flood Profiles | | -8 Revised Model d Profiles | Change in Flood Elevations and Flow Rates | | |
| | | | | | 500-yr | | 500-yr | | 500-yr | | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Elm Creek | 73933 | B DS of Farm Driveway | 14.10 | BI | 900.0 | 1,020 | 898.86 | 672.2 | -1.2 | (348) | FIS Location: 14.08 miles above Mill por spillway |
| Im Creek | 74436 | DS of Farm Driveway, DS of BK | 14.30 | BJ | 902.0 | | 899.56 | 672.2 | -2.4 | | |
| Im Creek | 74718 | 3 Dunkirk Lane | 14.41 | BK | 904.0 | | 899.97 | 672.2 | -4.1 | | |
| Im Creek | 74971 | 1 Dunkirk Lane (US) | 14.44 | BL | 905.1 | | 901.89 | 672.2 | -3.2 | | |
| Im Creek | | US of Dunkirk Lane, DS of Bass Lake Road, DS of BN | 14.55 | | 905.9 | | 903.13 | | | | |
| Elm Creek | | 5 US of Dunkirk Lane, DS of Bass Lake Road, DS of BO | 14.72 | | 906.6 | | 904.13 | | | | |
| Elm Creek | | L DS of Bass Lake Road, US Dunkirk Lane, DS of BP | 14.86 | | 907.2 | | 905.55 | | | | |
| ilm Creek | | 4 DS of Bass Lake Road, US Dunkirk Lane, DS of BQ | 15.18 | | 907.6 | | 906.67 | | | | |
| | | B DS of Bass Lake Road, US Dunkirk Lane, DS of BR | 15.48 | | | | | | | | |
| Elm Creek Elm Creek | | 5 DS of Bass Lake Road 5 Bass Lake Road | 15.75 15.90 | | 910.4 911.3 | | 909.34 909.95 | | -1.0 -1.3 | | |
| Elm Creek | | 3 DS of Elm Road, US of Bass Lake Road, DS of BU | 15.95 | | 911.8 | | 910.3 | | -1.5 | | |
| Elm Creek | 83890 | D DS of Elm Road, US of Bass Lake Road, DS of BV | 16.05 | BU | 911.9 | | 910.75 | 672.2 | -1.1 | | |
| Im Creek | 84476 | DS of Elm Road, US of Bass Lake Road, DS of BW | 16.16 | BV | 912.0 | | 910.79 | 672.2 | -1.2 | | |
| Elm Creek | 85470 | DS of Elm Road, US of Bass Lake Road, DS of BX | 16.35 | BW | 912.0 | | 910.96 | 672.2 | -1.1 | | |
| Im Creek | | L DS of Elm Road, US of Bass Lake Road | 16.52 | | 912.4 | | 911.86 | | -0.5 | | |
| Elm Creek | 88288 | B DS of Elm Road, US of Bass Lake Road, DS of BZ | 16.74 | ВУ | 916.1 | 740 | 915.07 | 672.2 | -1.0 | | On FIS the creek distance for the 100- peak flow rate is 16.73, used this peal flow rate |
| Im Creek | 88898 | B DS of Elm Road, US of Bass Lake Road, DS of CA | 16.82 | BZ | 917.3 | | 915.99 | 672.2 | -1.3 | | |
| Im Creek | | 2 Elm Road (DS) | 17.04 | | 920.1 | | 918.75 | | -1.4 | | |
| Im Creek | #N/A | Elm Road (US) | 17.11 | | 921.0 | | #N/A | #N/A | #N/A | | |
| Im Creek | | US of Elm Road, US of CB | 17.24 | | 921.7 | | 921 | | -0.7 | | |
| Im Creek | | US of Elm Road, US of CC | 17.34 | | 922.3 | | 921.82 | | -0.5 | | |
| Im Creek | | 2 US of Elm Road, DS of CF | 17.50 | | 923.5 | | 922.22 | | -1.3 | | |
| Elm Creek | | 3 US of Elm Road, US of CE | 17.63 | | 922.3 | | 922.42 | | 0.1 | | |
| lm Creek | 111598 | B US of State Highway 55, DS of State Highway 101 and CH | 20.66 | CG | 960.8 | 330 | 962.82 | 460.5 | 2.1 | | FIS Location: At Medina-Plymouth corporate boundary limits. This Cross section is the closes to the city boundari |
| Im Creek | | 5 State Highway 101 (DS) | 20.73 | | 963.9 | | 963.56 | | -0.3 | | |
| Im Creek Im Creek | | 3 State Highway 101 (US) D DS of Access Road, US of State Highway | 20.75 20.87 | | 965.3 966.2 | | 966.76 967.72 | | 1.5 1.5 | | |
| Elm Creek | 113302 | 101 2 US and DS of two Access Road, US of State Highway 101 | 20.91 | CK | 973.1 | | 974.04 | 460.5 | 0.9 | | |
| Im Creek | 113654 | 4 US and DS of two Access Road, US of State Highway 101, US of CK | 20.96 | CL | 973.2 | | 974.57 | 460.5 | 1.4 | | |
| Elm Creek | 113752 | 2 US of Access Road, DS of Railroad | 21.00 | CM | 973.3 | | 974.57 | 460.5 | 1.3 | | |
| ICICEN | 113/52 | 2 03 OI Access Nodu, D3 OI NdIII Od0 | 21.00 | CIVI | 9/3.3 | | 3/4.5/ | 400.5 | 1.3 | | |

| | | 0.2% AEP Comparison of ECWN | 1C FIS Flood Profiles to | Stantec HUC-8 Revised | Model Results - | Flood Elevations | and Peak Di | ischarges | | | |
|---------------------------------|--------|--|--|---------------------------------|----------------------------------|-------------------------|---|-----------------|--|-----------------|--|
| | | | | | | Flood Profiles | ECWMC HUC-8 Revised Model Flood Profiles | | Change in Flood Elevations and Flow Rates | | |
| Main Stem Creek HEC-RAS XS Loca | | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | 0-yr Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Elm Creek | 114334 | US Access road, DS railroad and Hamel Road | 21.11 | CN | 973.4 | 305 | 974.59 | 460.5 | 1.2 | 156 | FIS Location: Below Soo Line Bridge, near Hamel Road. I think this is the correct cross section location but not positive. Double check |
| Elm Creek | 114472 | ! Railroad, DS of Hamel Road | 21.14 | CO | 976.6 | | 983.4 | 460.5 | 6.8 | | |
| Elm Creek | 114953 | l DS of Hamel Road, US of Railroad | 21.21 | СР | 977.4 | 72 | 983.4 | 460.5 | 6.0 | 389 | FIS Location: downstream of Hamel Road, near Pinto Drive. I picked the cross section that is farthest DS of Hamel Road (Creek meanders around it), and is still near Pinto Road. |
| Elm Creek | | Elm Creek Drive (DS) | 21.29 | | 977.8 | | 983.4 | | | | |
| Elm Creek | | ' Elm Creek Drive (US) | 21.32 | | 977.8 | | 983.4 | | | | |
| Elm Creek | | ' Sewage Lagoon Road (DS) | 21.50 | | 977.9 | | 983.41 | | | | |
| Elm Creek Elm Creek | | Sewage Lagoon Road (US) DS of Confluence of Tributary to Elm Creek | 21.53 21.73 | | 977.9 977.8 | | 983.41 983.41 | | | | |
| Elm Creek | 118767 | DS of Hamel Road, DS of CW | 21.90 | CV | 978.0 | | 983.41 | 102 | 5.4 | | |
| Elm Creek | | DS of Hamel Road | 21.94 | | 978.0 | | 983.41 | | | | |
| Elm Creek | 119205 | US of Hamel Road DS of SOO Line Railroad | 21.97 | СХ | 978.2 | | 983.65 | | | | |
| Elm Creek | 119439 | US of Hamel Road DS of SOO Line Railroad | 22.02 | CY | 978.4 | | 983.65 | 102 | 5.3 | | |
| Elm Creek | 120084 | DS of SOO Line Railroad | 22.15 | CZ | 978.5 | | 983.65 | 102 | 5.1 | | |

| | | | | | ECWMC FIS Flood Profiles | | ECWMC HUC-8 Revised Model Flood Profiles | | Change in Flood Elevations and Flow Rates | | | |
|------------------------|------------|---|--|------------------------------------|----------------------------------|-----------------|---|------------------|---|-----------------|--|--|
| | | | | | 100 | -yr | 1 | 00-yr | 100-yr | | | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes | |
| ush Creek | | US of confluence with Elm Creek | 0.26 | | 971.0 | 2,000 | 860.1 | 1345.8 | -110.9 | -654.2 | | |
| sh Creek | | US of confluence with Elm Creek, DS of C | 0.76 | | 971.0 | | 862.3 | 1345.8 | -108.7 | | | |
| ish Creek | | US of confluence with Elm Creek, DS of D | 1.00 | | 872.2 | | 864.3 | 1345.8 | -7.9 | | | |
| ush Creek | | US of confluence with Elm Creek, DS of E | 1.39 | | 875.3 | | 867 | 1345.8 | -8.3 | | | |
| ısh Creek | | US of confluence with Elm Creek, DS of F | 1.52 | | 876.4 | | 868.3 | 1345.8 | | | | |
| ısh Creek | | US of confluence with Elm Creek, DS of G | 1.87 | | 880.7 | | 869 | 1345.8 | | | | |
| ish Creek | | US of confluence with Elm Creek, DS of H | 2.14 | | 884.0 | | 871.1 | 1345.8 | | | | |
| ush Creek | | Fernbrook Lane (DS) | 2.36 | | 886.6 | | 874.3 | 1345.8 | -12.3 | | | |
| ush Creek | | At Fernbrook Lane | 2.42 | | 888.8 | | 875.5 | 1227.5 | | | | |
| ish Creek ish Creek | | Fernbrook Lane (US) US of Fernbrook Lane, DS of L | 2.60 2.68 | | 889.4 889.6 | | 876.7 879 | 1227.5 1227.5 | -12.7 -10.6 | | | |
| ish Creek | | US of Fernbrook Lane, DS of L US of Fernbrook Lane, DS of M | 2.68 | | 889.6 891.2 | | 879 878.7 | 1227.5 | -10.6 | | | |
| ush Creek | | US of Fernbrook Lane, DS of N | 3.01 | | 891.2 | | 880.2 | 1227.5 | -12.5 | | | |
| ish Creek | | US of Fernbrook Lane, DS of O | 3.05 | | 891.8 | | 880.2 | 1227.5 | -11.8 | | | |
| ish Creek | | US of Fernbrook Lane, DS of P | 3.33 | | 893.9 | | 882.88 | 1227.5 | | | | |
| ush Creek | | US of Fernbrook Lane, DS of Q | 3.43 | | 894.8 | | 883.6 | 1227.5 | -11.0 | | | |
| ush Creek | | US of Fernbrook Lane, DS of R | 3.64 | | 896.6 | | 886.9 | 1227.5 | | | | |
| ish Creek | | US of Fernbrook Lane, DS of S | 3.75 | | 897.9 | | 888.51 | 1227.5 | -9.4 | | | |
| ısh Creek | | US of Fernbrook Lane, DS of T | 3.89 | | 900.4 | | 888.7 | 1227.5 | -11.7 | | | |
| ısh Creek | | Territorial Road (DS) | 4.66 | | 907.1 | | 894.7 | 1227.5 | -12.4 | | | |
| ush Creek | | At Territorial Road | 4.70 | | 907.9 | | 895.2 | 1227.5 | | | | |
| ush Creek | | Territorial Road (US) | 4.84 | | 907.9 | | 895.3 | 1227.5 | -12.6 | | | |
| ush Creek | | US of Territorial Road, DS of Minnesota Trunk Highway 152 | 5.00 | w | 907.9 | 1,860 | 894.1 | 1227.5 | -13.8 | -632.5 | Location from FIS: 5 miles above confluence with Elm Cre | |
| ısh Creek | 28541 | Minnesota Trunk Highway 152 (DS) | 5.22 | X | 907.9 | | 895.6 | 1227.5 | -12.3 | | | |
| ush Creek | | At Minnesota Trunk Highway 152 | 5.30 | | 907.9 | | 895.6 | 1227.5 | | | | |
| ush Creek | 30564 | Minnesota Trunk Highway 152 (US), near Burling and Nor. RR | 5.61 | Z | 909.7 | | 898.24 | 1227.5 | -11.5 | | | |
| ush Creek | | US of Burling and Nor. RR, DS of Dunkirk Lane | 5.67 | | 910.0 | | 898.24 | 1227.5 | -11.8 | | | |
| ush Creek | | Dunkirk Lane (DS) | 5.71 | | 910.0 | | 898.14 | 1227.5 | -11.9 | | | |
| ish Creek | | Dunkirk Lane (US) | 5.74 | | 912.6 | | 898.14 | 1227.5 | | | | |
| ush Creek ush Creek | 32287 | US of Dunkirk Lane, DS of AE US of Dunkirk Lane, DS of 105th Avenue N, DS of AF | 5.78 · 5.92 · | | 912.9 912.9 | | 899.7 898.1 | 1227.5 1227.5 | -13.2 -14.8 | | | |
| ush Creek | | 105th Avenue N (DS) | 6.09 | AF | 912.9 | | 897.5 | 1227.5 | -15.4 | | | |
| ush Creek | | At 105th Avenue N | 6.18 | | 912.9 | | 896.2 | 1227.5 | -16.7 | | | |
| ısh Creek | 34127 | 105th Avenue N (US) | 6.24 | AH | 912.9 | | 896.2 | 1227.5 | -16.7 | | | |
| ush Creek | | US of 105th Avenue N, DS of State Route 92/Interstate 94, DS of AH | 6.35 | | 912.9 | | 898.8 | 1227.5 | | | | |
| ush Creek | | State Route 92/Interstate 94 (DS) | 6.66 | | 912.9 | | 899.2 | 1227.5 | | | | |
| ısh Creek | | State Route 92/Interstate 94 (US) | 6.76 | | 913.5 | | 899.5 | 1227.5 | -14.0 | | | |
| ish Creek | | US of the confluence with North Fork Rush Creek | 7.52 | AL | 913.9 | 960 | 901.6 | 1227.5 | -12.3 | 267.5 | Location fro FIS: 7.52 mi above confluence with Elm Cr | |

| | | 0.2% AEP Comparison of ECWMC F | IS Flood Profiles to Sta | ntec HUC-8 Revised M | odel Results - Flo | ood Elevations ar | nd Peak Disc | harges | | | |
|--------------------------|------------|---|--|---------------------------------|----------------------------------|-------------------|---|-----------------|---|-----------------|---|
| | | | | | | Flood Profiles | ECWMC HUC-8 Revised Model Flood Profiles | | Change in Flood Elevations and Flow Rates | | |
| | | | | | 100 |)-yr | | 00-yr | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| lush Creek | 42214 | US of the confluence with North Fork Rush Creek, DS of 101st Avenue North, US of AM | 8.05 | AN | 916.2 | | 904.94 | 1178.8 | -11.2 | | |
| ush Creek | 43810 | 101st Avenue North (DS) | 8.28 | AO | 918.2 | | 906 | 1178.8 | -12.2 | | |
| tush Creek | | 101st Avenue North (US) | 8.33 | AP | 920.2 | | 907.9 | 1178.8 | -12.3 | | |
| ush Creek | 46234 | US of 101st Avenue North, DS of 97th Avenue North, US of AP | 8.48 | AQ | 920.3 | | 910.3 | 1178.8 | -10.0 | | |
| ush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AQ | 8.67 | | 921.9 | | 913.4 | 1178.8 | | | |
| tush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AR | 8.84 | | 923.3 | | 915.1 | | | | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AS | 9.08 | | 925.1 | | 916.8 | | -8.3 | | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AT | 9.37 | | 927.1 | | 918 | | | | |
| Rush Creek Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AU 97th Avenue N (DS) | 9.48 | | 928.2 928.8 | | 918.6 919.1 | 1178.8 521.9 | -9.5 -9.7 | | |
| Rush Creek | | At 97th Avenue N | 9.55 | | 928.8 | | 919.1 | 521.9 | -9.7 -9.6 | | |
| ush Creek | | 97th Avenue N (US) | 9.69 | | 929.0 | | 919.4 | 521.9 | -9.6 | | |
| ush Creek | | US of 97th Avenue N, DS of BA | 9.92 | | 929.1 | | 920.2 | 521.9 | -8.9 | | |
| lush Creek | | US of 97th Avenue N, DS of Minnnnesota Highway 10, US of AZ | 10.12 | | 929.2 | | 920.6 | | | | |
| Rush Creek | 58182 | US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BA | 10.22 | ВВ | 929.2 | | 920.7 | 521.9 | -8.5 | | |
| ush Creek | 60047 | US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BB | 10.51 | BC | 930.0 | | 922.1 | 521.9 | -7.9 | | |
| Rush Creek | 60695 | DS of Minnesota Highway 101, US of 97th Avenue North, DS of BE | 10.64 | BD | 930.6 | | 923 | 521.9 | -7.6 | | |
| Rush Creek | 62766 | DS of Minnesota Highway 101, US of BD | 10.96 | BE | 932.8 | | 925.5 | 521.9 | -7.3 | | |
| Rush Creek | 63179 | State Highway 101 (just DS) | 11.03 | BF | 933.4 | 810 | 925.7 | 464.5 | -7.7 | | FIS Location At State Highway 10: |
| Rush Creek | | DS of Private Road that is DS of Schute Road | 11.28 | | 934.6 | | 925.9 | | | | |
| ush Creek | 64580 | US of Private Road that is DS of Schute Road | 11.36 | | 936.2 | | 926.6 | 464.5 | -9.5 | | |
| ush Creek | | US of Private Road near State Highway 10, DS of Schute Road, US of BH | 11.42 | | 936.3 | | 926.6 | | | | |
| ush Creek | | DS of Schute Road, US of BI | 11.52 | | 936.3 | | 926 | | | | |
| ush Creek | | Schute Road (DS) | 11.64 | | 936.4 | | 926 | | | | |
| ush Creek | | Schute Road (US) | 11.72 | | 936.5 | | 926.54 | 464.5 | | | |
| tush Creek | | US of Schute Road, DS of BN | 11.84 | | 936.6 | | 927.1 | 464.5 | | | |
| ush Creek ush Creek | | US of Schute Road, DS of BO US of Schute Road, DS of BP | 12.16 12.38 | | 936.8 937.0 | | 928.4 928.5 | 464.5 464.5 | | | |
| Rush Creek | | US of Schute Road, DS of County Highway 116, DS of BQ | 13.50 | | 937.1 | | 928.8 | | | | |
| ush Creek | 76731 | County Highway 116 (DS) | 13.60 | BQ | 937.1 | 680 | 929.72 | 464.5 | -7.4 | | FIS location: Just downstream County Road 116 |
| ush Creek | 77175 | County Highway 116 (US) | 13.66 | BR | 939.2 | | 930.5 | 464.5 | -8.7 | | |
| tush Creek | | US of County Highway 116, DS of County Highway 10, DS of BT | 13.94 | | 939.3 | | 931.9 | | | | |
| Rush Creek | 80181 | US of County Highway 116, DS of County Highway 10, DS of BU | 14.12 | ВТ | 939.4 | | 932.3 | 365.5 | -7.1 | | |

| | | .2% AEP Comparison of ECWMC | | | | | | | | | |
|------------------------|------------|--|--|---------------------------------|----------------------------------|-----------------|----------------------|--------------------------------|------------------------------|--------------------------------|---|
| | | | | | ECWMC FIS F | Flood Profiles | | -8 Revised Model d Profiles | | Flood Elevations Flow Rates | |
| | | | | | 100 |)-yr | 10 | 00-yr | 1 | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| sh Creek | | US of County Highway 116, DS of County Highway 10, DS of BV | 14.44 | BU | 941.2 | | 935.8 | 365.5 | -5.4 | | |
| ish Creek | 82895 | US of County Highway 116, DS of County Highway 10, DS of BW | 14.64 | BV | 942.5 | 485 | 938.63 | 365.5 | -3.9 | -119.: | 5 FIS location: Just aboved Unnamed Tributary approximate: 0.3 miles downstream County Highway 10. Cross section BV is ~0.39 m downstream Highway 10 and downstream a trib |
| ish Creek | 84156 | County Highway 10 (DS) | 14.78 | 3 BW | 945.9 | | 939.7 | 365.5 | -6.2 | | a trib |
| ish Creek | | County Highway 10 (US) | 14.86 | S BX | 947.0 | | 939 | 365.5 | -8.0 | | |
| ish Creek | | US of County Highway 10, DS of County Highway 50, DS of BZ | 15.06 | S BY | 947.3 | | 941 | 365.5 | -6.3 | | |
| sh Creek | 86165 | US of County Highway 10, DS of County Highway 50, DS of CA | 15.14 | BZ | 947.6 | | 943.62 | 365.5 | -4.0 | | |
| ish Creek | 86434 | US of County Highway 10, DS of County Highway 50, DS of CB | 15.34 | I CA | 950.5 | | 944.26 | 365.5 | -6.3 | | |
| sh Creek | | US of County Highway 10, DS of County Highway 50, DS of CC | 15.42 | C C B | 952.0 | 375 | 946.8 | 251.1 | -5.2 | -123. | FIS Location: Just above Unnamed Tributary approximatel 0.6 miles upstream of County Highway 10. Cross section CB is 0.6 mi upstream of County Highway 10. |
| sh Creek | | US of County Highway 10, DS of County Highway 50, DS of CD | 15.72 | | 956.1 | | 951.6 | | -4.5 | | J , . |
| ish Creek | | US of County Highway 10, DS of County Highway 50, DS of CE | 15.92 | | 957.9 | | 952.5 | | -5.4 | | |
| sh Creek | | County Highway 50 (DS) | 16.02 | | 960.0 | | 953.9 | 251.1 | -6.1 | | |
| ish Creek | | County Highway 50 (US) | 16.12 | | 960.0 | | 955.7 | 251.1 251.1 | -4.3 -3.4 | | |
| ish Creek | | US of County Highway 50, DS of Kalk Road, DS of CH | 16.33 | | 961.1 | | 957.73 | | | | |
| ish Creek | | US of County Highway 50, DS of Kalk Road, DS of CI | 16.45 | CH | 963.2 | | 958.1 | 251.1 | -5.1 | | |
| ish Creek | | Kalk Road (DS) | 16.53 | S CI | 963.8 | | 958.5 | 251.1 | -5.3 | | |
| ish Creek | | Kalk Road (US) | 16.57 | | 966.1 | | 957.5 | 251.1 | -8.6 | | |
| sh Creek | 95356 | US of Kalk Road, DS of Rolling Hills Road, US of CJ | 16.73 | | 966.1 | | 956.8 | | -9.3 | | |
| ish Creek | 100957 | DS of Rolling Hills Road, US of CK | 17.76 | S CL | 966.3 | | 962 | 117.7 | -4.3 | | |
| | 101677 | Rolling Hills Road (DS) | 17.86 | CM | 966.3 | | 960.5 | 117.7 | -5.8 | | |
| ish Creek ish Creek | | Rolling Hills Road (US) | 17.92 | | 968.0 | | 960.5 | | -7.5 | | |

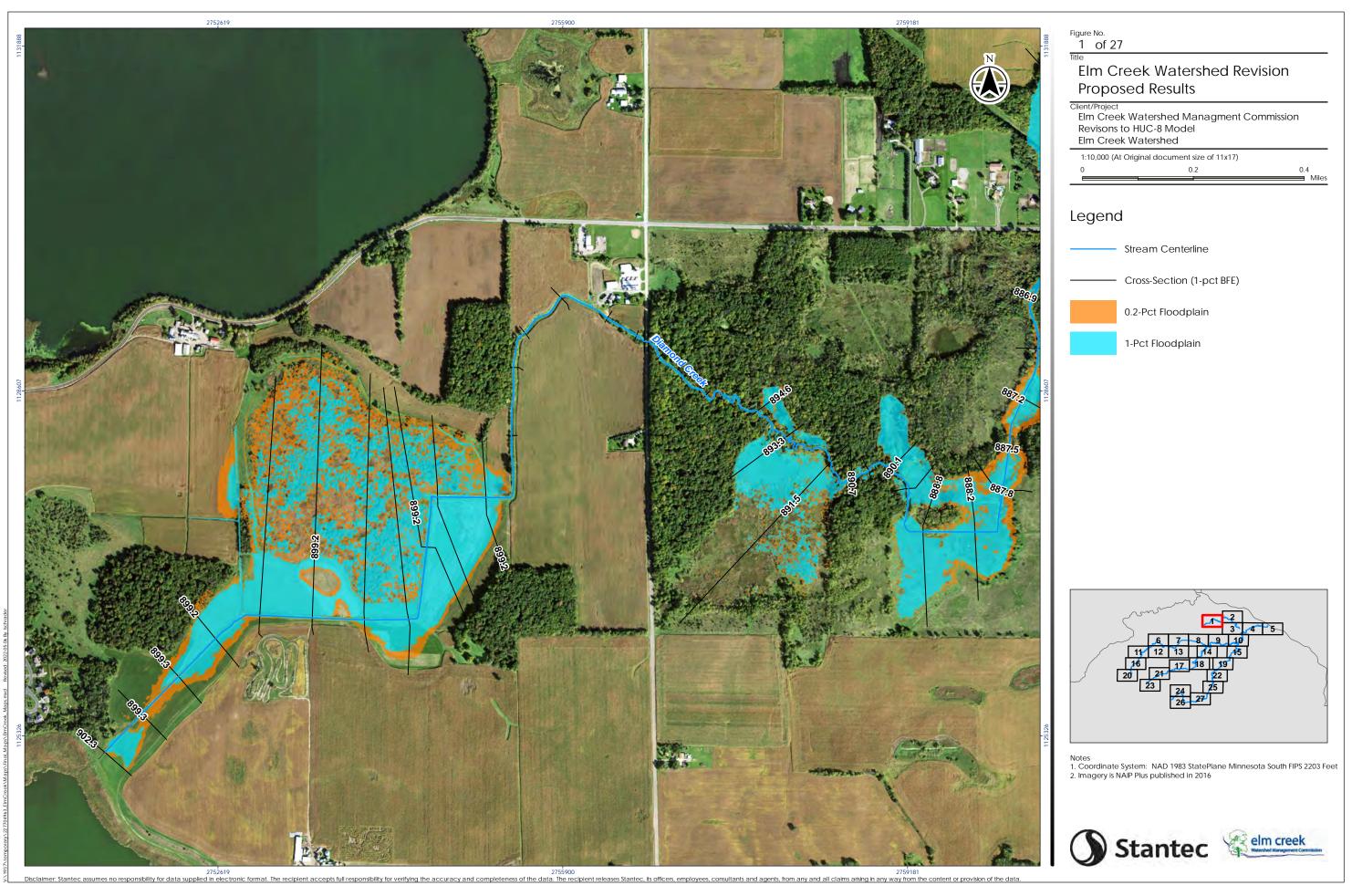
| | | 0.2% AEP Comparison of ECWMC | FIS Flood Profiles to Sta | antec HUC-8 Revised M | odel Results - Flo | ood Elevations ar | d Peak Disc | harges | | | |
|-----------------|--|--|--|---------------------------------|----------------------------------|-------------------|---|-----------------|--|-----------------|---|
| | | | | | ECWMC FIS Flood Profiles | | ECWMC HUC-8 Revised Model Flood Profiles | | Change in Flood Elevations and Flow Rates | | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood | Flow Rate (CFS) | Notes |
| Rush Creek | Creek 104810 US of Rolling Hills Road, DS of CQ 18.44 CP | | I CP | 969.8 | | 966.66 | 117.7 | -3.2 | | | |
| Rush Creek | | US of Rolling Hills Road, At the "limit of detailed of study" | 18.58 | 3 CQ | 971.1 | 300 | 967.7 | 117.7 | -3.4 | | FIS Location: At Jubert Lake outlet. Looked on Arcmap and CQ is at this location |

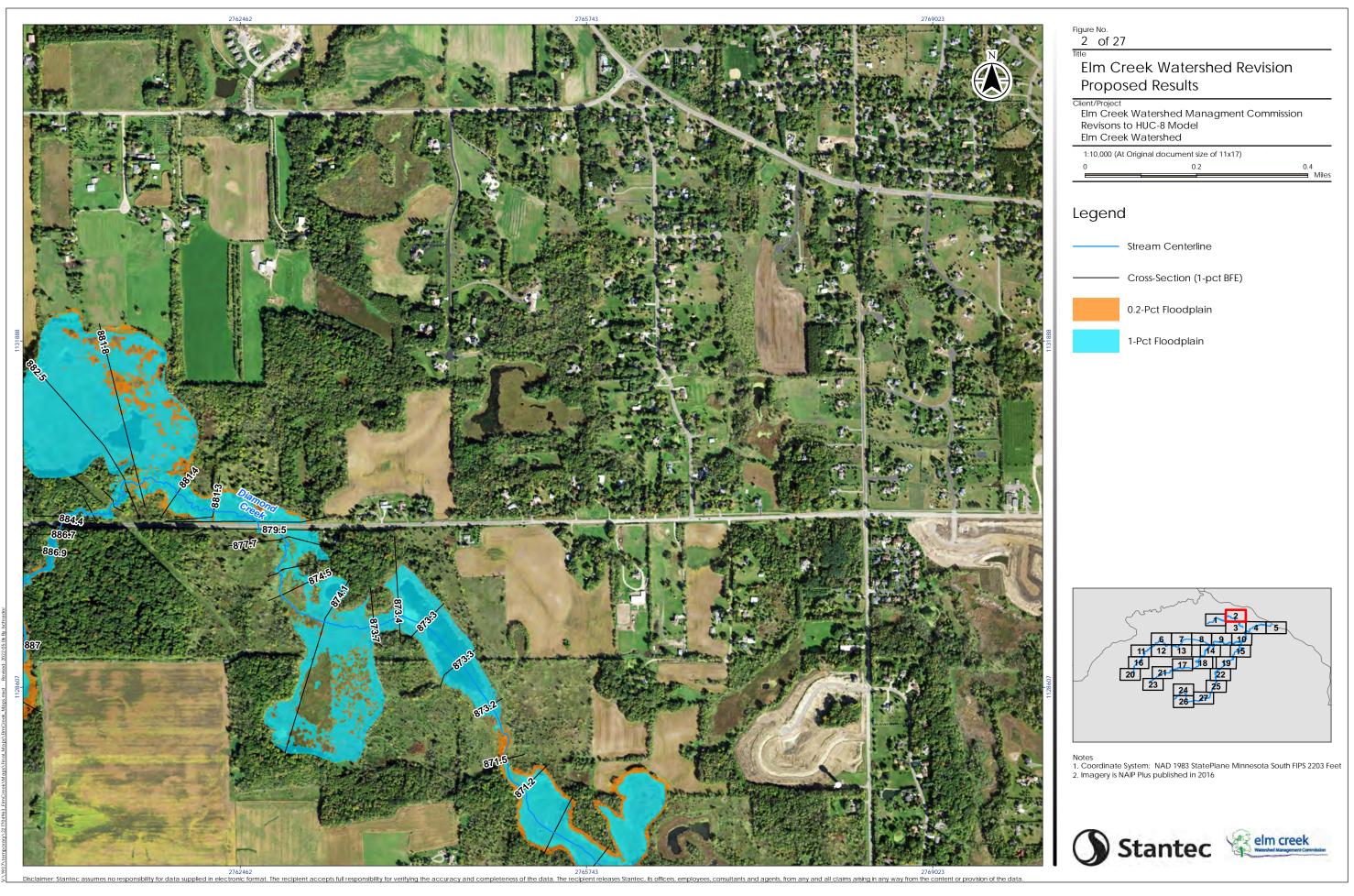
| | | | | | ECWMC FIS F | lood Profiles | | ·8 Revised Model I Profiles | • | lood Elevations low Rates | |
|--|------------|---|---|--------------------------------|----------------------------------|-----------------|----------------------|--------------------------------|------------------------------|------------------------------|-------|
| | | | | | 100 |)-yr | 1 | 00-yr | | .00-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Rush Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| orth Fork Rush Creek | 14593 | County Road 117 (US) | 2.66 | A | 916.0 | | 902.8 | 509.5 | | | |
| orth Fork Rush Creek | 15174 | 109th Avenue North (US) | 2.76 | В | 916.0 | | 904.8 | 509.5 | -11.2 | | |
| orth Fork Rush Creek | | US of 109th Avenue N, DS of Access Road near Cain Road, DS of D | 2.98 | | 916.0 | | 905 | 509.5 | | | |
| orth Fork Rush Creek | | US of 109th Avenue N, DS of Access Road near Cain Road, DS of E | 3.26 | | 916.0 | | 906 | 509.5 | | | |
| orth Fork Rush Creek | | Access Road near Cain Road (DS) | 3.30 | | 916.0 | | 905.6 | 509.5 | | | |
| orth Fork Rush Creek | | Access Road near Cain Road (US) | 3.32 | | 916.0 | | 905.5 | 509.5 | | | |
| orth Fork Rush Creek | | Cain Road | 3.55 | | 916.0 | 700 | 905.2 | 444.6 | | -255.4 | |
| orth Fork Rush Creek | | Cain Road (US) | 3.58 | | 916.0 | | 904.9 | 444.6 | | | |
| orth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of J | 3.70 | | 916.0 | | 909.1 | 444.6 | | | |
| orth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of K | 3.84 | | 916.6 | | 911.5 | 444.6 | | | |
| orth Fork Rush Creek orth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of L | 4.06 | | 918.2 919.0 | | 913.4 | 444.6 444.6 | | | |
| orth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of M US of Cain Road, DS of Trail Haven Road, | 4.24 | | 919.0 | | 913.1 | 444.6 | | | |
| orth Fork Rush Creek | | DS of N US of Cain Road, DS of Trail Haven Road, | 4.50 | | 920.2 | | 915.8 | 444.6 | | | |
| orth Fork Rush Creek | | DS of O US of Cain Road, DS of Trail Haven Road, | 4.72 | | 921.4 | | 916.3 | 213.3 | | | |
| orth Fork Rush Creek | | DS of P US of Cain Road, DS of Trail Haven Road, | 4.87 | | 922.6 | | 915.2 | 213.3 | | | |
| orth Fork Rush Creek | | DS of Q US of Cain Road, DS of Trail Haven Road, | 4.98 | Q | 924.7 | | 917.64 | 213.3 | | | |
| orth Fork Rush Creek | | DS of R Trail Haven Road (DS) | 4.99 | R | 926.2 | 700 | 918.2 | 213.3 | -7.9 | -486.7 | |
| orth Fork Rush Creek | 27759 | Trail Haven Road (US) | 5.03 | S | 926.7 | | 917.2 | 213.3 | -9.5 | | |
| orth Fork Rush Creek | | US of Trail Haven Road, DS of County Road 117, US of S | 5.19 | Т | 926.8 | | 917.5 | 213.3 | -9.3 | | |
| orth Fork Rush Creek | | US of Trail Haven Road, DS of County Road 117, US of T $$ | 5.44 | | 926.9 | | 918.1 | 213.3 | | | |
| orth Fork Rush Creek | | County Road 117/109th Avenue North (DS) | 5.65 | | 927.0 | | 918.6 | 158.6 | | | |
| orth Fork Rush Creek | | At County Road 117/109th Avenue N | 5.67 | | 924.7 | | 918.4 | 158.6 | | | |
| orth Fork Rush Creek | | County Road 117/109th Avenue North (US) | 5.68 | | 927.6 | | 918.4 | 158.6 | | | |
| orth Fork Rush Creek | | US and DS of County Road 117/109th Avenue N, DS of Z | 5.70 | | 928.5 | | 920.4 | 158.6 | | | |
| orth Fork Rush Creek | | DS of County Road 117/109th Ave N, DS of AA | 6.47 | | 928.9 | | 921.2 | 158.6 | | | |
| orth Fork Rush Creek orth Fork Rush Creek | 35391 | US of County Road 117/109th Avenue N US of County Road 117/109th Ave N, DS of AC | 6.50 6.52 | | 932.1 932.1 | | 921.3 923.8 | 158.6 158.6 | | | |
| orth Fork Rush Creek | 35871 | US of County Road 117/109th Ave N, DS of AD | 6.60 | AC | 932.1 | | 925.62 | 158.6 | -6.5 | | |
| orth Fork Rush Creek | 36391 | US of County Road 117/109th Ave N, DS of AE | 6.70 | AD | 936.5 | | 926.05 | 158.6 | -10.5 | | |
| orth Fork Rush Creek | 38053 | DS of Access Road, US of AD | 6.99 | AE | 935.6 | | 929 | 158.6 | -6.6 | | |
| orth Fork Rush Creek | | DS of Bechtold Road, US of Access Road | 7.03 | | 937.9 | | 930.5 | 158.6 | | | |
| orth Fork Rush Creek | 38758 | DS of Bechtold Road | 7.15 | AG | 938.4 | | 931.6 | 158.6 | | | |
| orth Fork Rush Creek | | US of Bechtold Road | 7.16 | | 940.3 | | 931.7 | 158.6 | | | |
| orth Fork Rush Creek | | US of Bechtold Road,DS of AJ | 7.25 | | 941.2 | | 932.2 | 158.6 | | | |
| orth Fork Rush Creek | 40511 | DS of County Road 30/Oak Bole Drive, DS | 7.47 | AJ | 942.8 | | 934.69 | 158.6 | -8.1 | | |

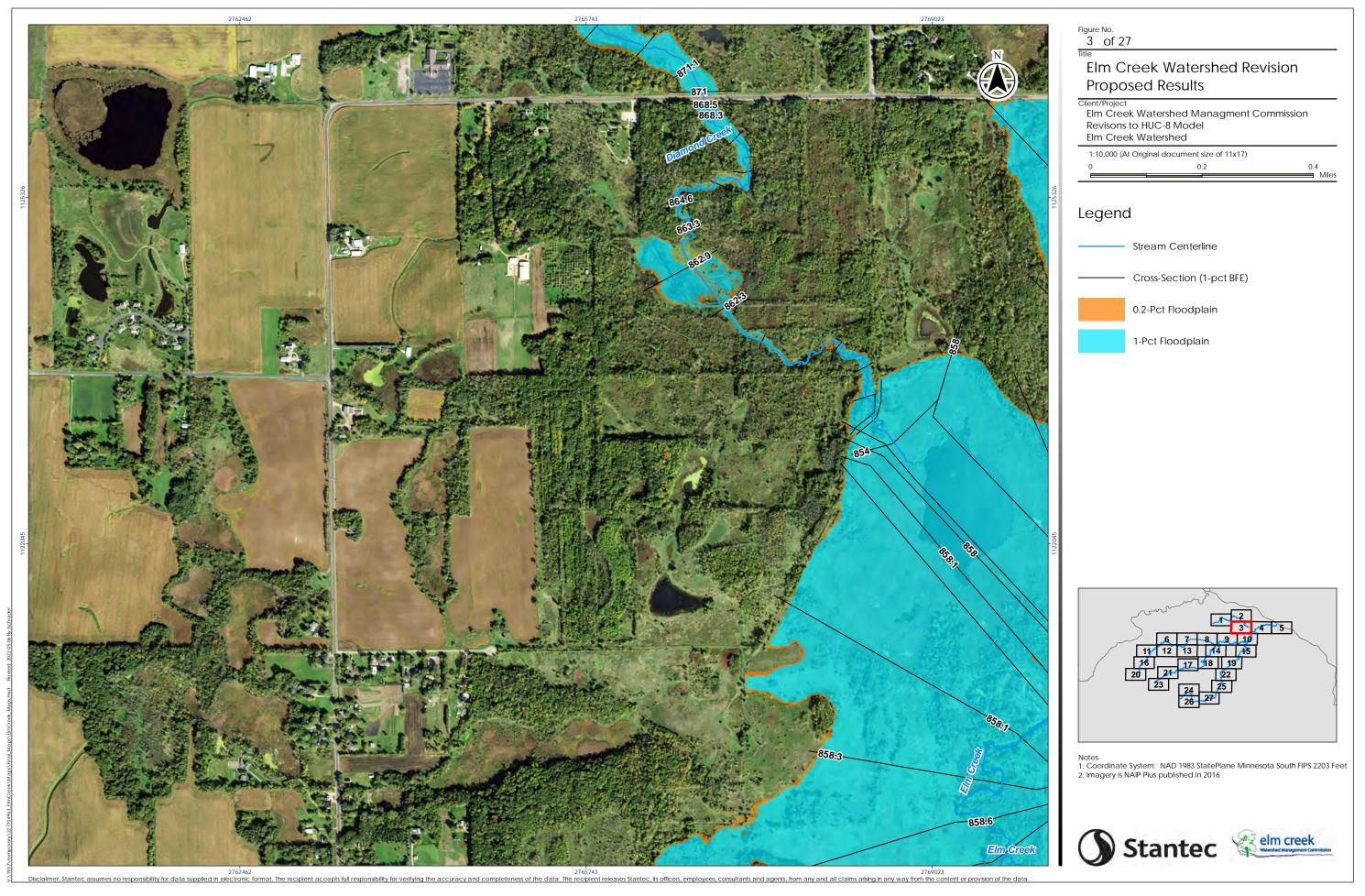
| | | | | | ECWMC FIS I | Flood Profiles | | C-8 Revised Model d Profiles | - | Flood Elevations Flow Rates | |
|-----------------------|--|------------------------|--|--------------------------------|----------------------------------|-----------------|----------------------|---------------------------------|------------------------------|--------------------------------|------|
| | | | | | 100 | 0-yr | 1 | 100-yr | 1 | L00-yr | |
| Main Stem Creek | HEC-RAS XS Loc | ation | Creek Distance above the Rush Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Note |
| orth Fork Rush Creek | 41705 DS of County Road 3 | 0/Oak Bole Drive | 7.67 | AK | 944.7 | | 938.32 | 158.6 | | | |
| orth Fork Rush Creek | 41986 US of County Road 3 | 0/Oak Bole Drive | 7.72 | AL | 948.2 | | 939 | 126.4 | -9.2 | | |
| orth Fork Rush Creek | 43630 US of County Road 3 of AN | 0/Oak Bole Drive, DS | 7.96 | AM | 948.5 | | 941.6 | 126.4 | -6.9 | | |
| orth Fork Rush Creek | 44291 US of County Road 3 of AO | 0/Oak Bole Drive, DS | 8.07 | AN | 949.1 | | 943.7 | | -5.4 | | |
| orth Fork Rush Creek | 46377 DS of Sundance Road | d, DS of AP | 8.37 | AO | 952.2 | | 946.9 | 126.4 | -5.3 | | |
| orth Fork Rush Creek | 47362 DS of Sundance Road | d, DS of AQ | 8.53 | AP | 955.9 | | 949.21 | | -6.7 | | |
| orth Fork Rush Creek | 48342 DS of Sundance Road | d, DS of AR | 8.69 | AQ | 959.3 | | 952.7 | | -6.6 | | |
| orth Fork Rush Creek | 49363 DS of Sundance Road | d | 8.86 | AR | 961.8 | | 953.8 | | -8.0 | | |
| orth Fork Rush Creek | 49436 US of Sundance Road | d | 8.88 | | 964.1 | | 955 | | -9.1 | | |
| orth Fork Rush Creek | 49901 US of Sundance Road | | 8.94 | | 964.1 | | 956.62 | | -7.4 | | |
| orth Fork Rush Creek | 50577 US of Sundance Road | | 9.08 | | 964.1 | | 957.59 | | -6.5 | | |
| orth Fork Rush Creek | 52176 DS of 97th Avenue N | I, DS of AW | 9.29 | AV | 966.3 | | 962 | 126.4 | -4.3 | | |
| orth Fork Rush Creek | 52972 DS of 97th Avenue N | I, DS of AX | 9.42 | AW | 969.0 | | 962.48 | 126.4 | -6.5 | | |
| orth Fork Rush Creek | 54987 DS of 97th Avenue N | I | 9.75 | AX | 974.4 | | 968.3 | 126.4 | -6.1 | | |
| orth Fork Rush Creek | 55226 US of 97th Avenue N | I | 9.78 | AY | 977.5 | | 968.5 | 126.4 | -9.0 | | |
| orth Fork Rush Creek | 55966 US of 97th Avenue N | I, US of AY | 9.91 | AZ | 978.1 | | 971.24 | 126.4 | -6.9 | | |
| orth Fork Rush Creek | 57273 US of 97th Avenue N | I, US of AZ | 10.13 | BA | 981.9 | | 976.18 | 126.4 | -5.7 | | |
| orth Fork Rush Creek | 58518 US of 97th Avenue N | I, DS of BC | 10.32 | BB | 985.4 | | 978.8 | 126.4 | -6.6 | | |
| orth Fork Rush Creek | 59887 DS of Access Road a DS of BD | nd County Road 10, | 10.52 | BC | 989.6 | | 984 | 126.4 | -5.6 | | |
| orth Fork Rush Creek | 59987 DS of Access Road, D | OS of BE | 10.55 | BD | 991.5 | | 984.2 | 126.4 | -7.3 | | |
| orth Fork Rush Creek | 60064 US of Access Road no DS of BF | ear County Road 10, | 10.59 | | 991.7 | | 984.3 | | -7.4 | | |
| orth Fork Rush Creek | 60120 DS of County Road 1 | .0 | 10.61 | BF | 992.1 | 420 | 985.2 | 126.4 | -6.9 | -293.6 | |
| orth Fork Rush Creek | 60352 US of County Road 1 | .0 | 10.63 | BG | 992.4 | | 984.5 | 58.1 | -7.9 | | |
| orth Fork Rush Creek | 60606 US of County Road 1 | .0, DS of Access Road | 10.69 | ВН | 993.1 | | 985.3 | 58.1 | -7.8 | | |
| orth Fork Rush Creek | 60948 US of Access Road, D | OS of BJ | 10.73 | BI | 993.1 | | 985.3 | 58.1 | -7.8 | | |
| orth Fork Rush Creek | 61315 US of County Road 1 of BI | .0 and Access road, US | 10.81 | ВЈ | 993.3 | | 986.1 | . 58.1 | -7.2 | | |
| orth Fork Rush Creek | 63385 US of County Road 1 | .0, US of BJ | 11.20 | BK | 994.5 | | 988.74 | 58.1 | -5.7 | | |
| orth Fork Rush Creek | 63749 US of County Road 1 | | 11.27 | | 995.1 | | 988.6 | | -6.5 | | |
| orth Fork Rush Creek | 64763 DS of County Road 1 Road | 9/Crow Hassan Park | 11.45 | ВМ | 999.8 | | 991.33 | 58.1 | -8.4 | | |
| lorth Fork Rush Creek | 64955 US of County Road 1 Road | .9/Crow-Hassan Park | 11.49 | BN | 1005.2 | | 992.68 | 58.1 | -12.5 | | |
| orth Fork Rush Creek | 65429 DS of Strehler Road, | DS of BP | 11.58 | ВО | 1005.2 | | 991.01 | . 58.1 | -14.2 | | |
| orth Fork Rush Creek | 65983 DS of Strehler Road, | DS of BQ | 11.68 | BP | 1005.2 | | 993.09 | 58.1 | -12.1 | | |
| orth Fork Rush Creek | 66739 DS of Strehler Road, | DS of BR | 11.80 | BQ | 1005.2 | | 995.8 | 58.1 | -9.4 | | |
| orth Fork Rush Creek | 67226 DS of Strehler Road | | 11.92 | BR | 1005.3 | 300 | 995.9 | 58.1 | -9.4 | -241.9 | |
| orth Fork Rush Creek | 67429 US of Strehler Road | | 11.96 | BS | 1005.3 | | 996 | 58.1 | -9.3 | | |
| orth Fork Rush Creek | 68345 US of Strehler Road, | US of BS | 12.12 | ВТ | 1005.3 | | 997.4 | 58.1 | -7.9 | | |
| orth Fork Rush Creek | 69031 US of Strehler Road, | US of BT | 12.24 | BU | 1005.3 | | 998 | 58.1 | -7.3 | | |
| orth Fork Rush Creek | 69474 US of Strehler Road, | US of BU | 12.33 | BV | 1005.3 | | 998.5 | 58.1 | -6.8 | | |
| orth Fork Rush Creek | 71089 US of Strehler Road, | DS of BX | 12.64 | BW | 1005.4 | | 998.7 | 58.1 | -6.7 | | |
| orth Fork Rush Creek | 72186 US of Strehler Road, | US of BW | 12.85 | BX | 1005.4 | | 999.5 | 58.1 | -5.9 | | |
| orth Fork Rush Creek | 72915 US of Strehler Road, | US of BX | 12.99 | BY | 1005.4 | | 1000.2 | 58.1 | -5.2 | | |

APPENDIX E

1% and 0.2% AEP Inundation Maps







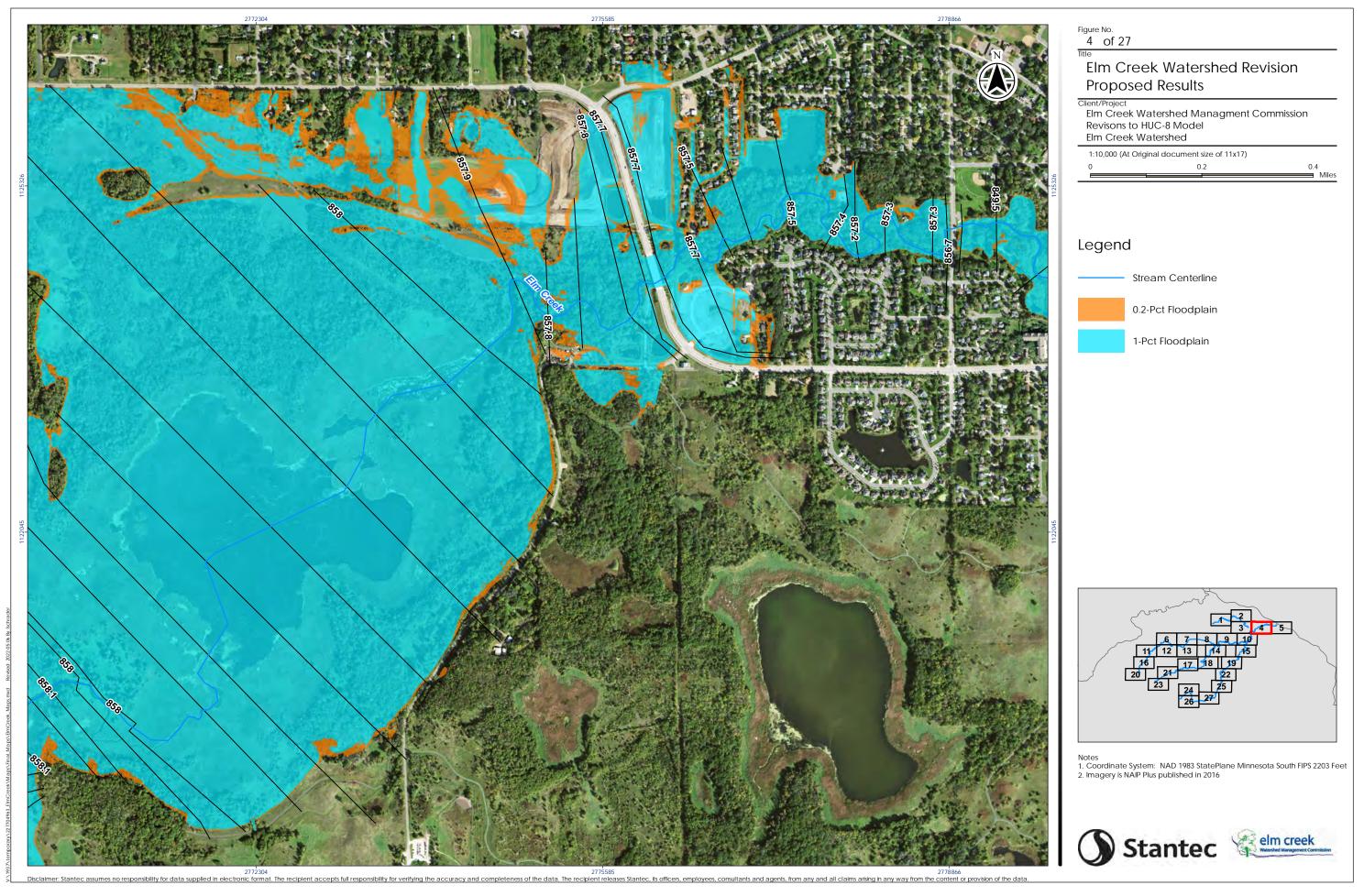
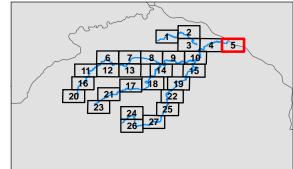




Figure No. 5 of 27 Elm Creek Watershed Revision **Proposed Results** Client/Project
Elm Creek Watershed Managment Commission
Revisons to HUC-8 Model
Elm Creek Watershed 1:10,000 (At Original document size of 11x17)

Legend

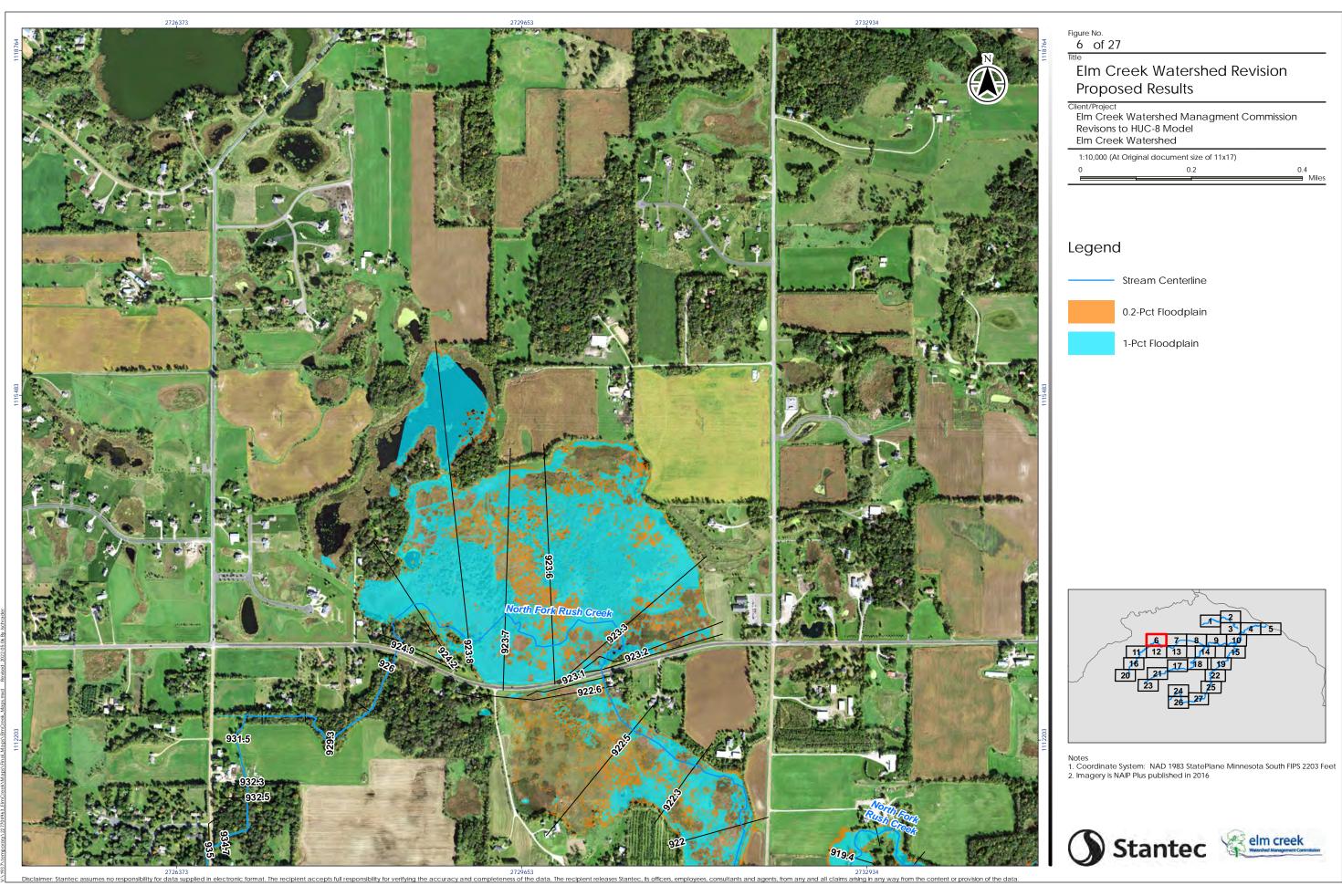
Stream Centerline 0.2-Pct Floodplain 1-Pct Floodplain

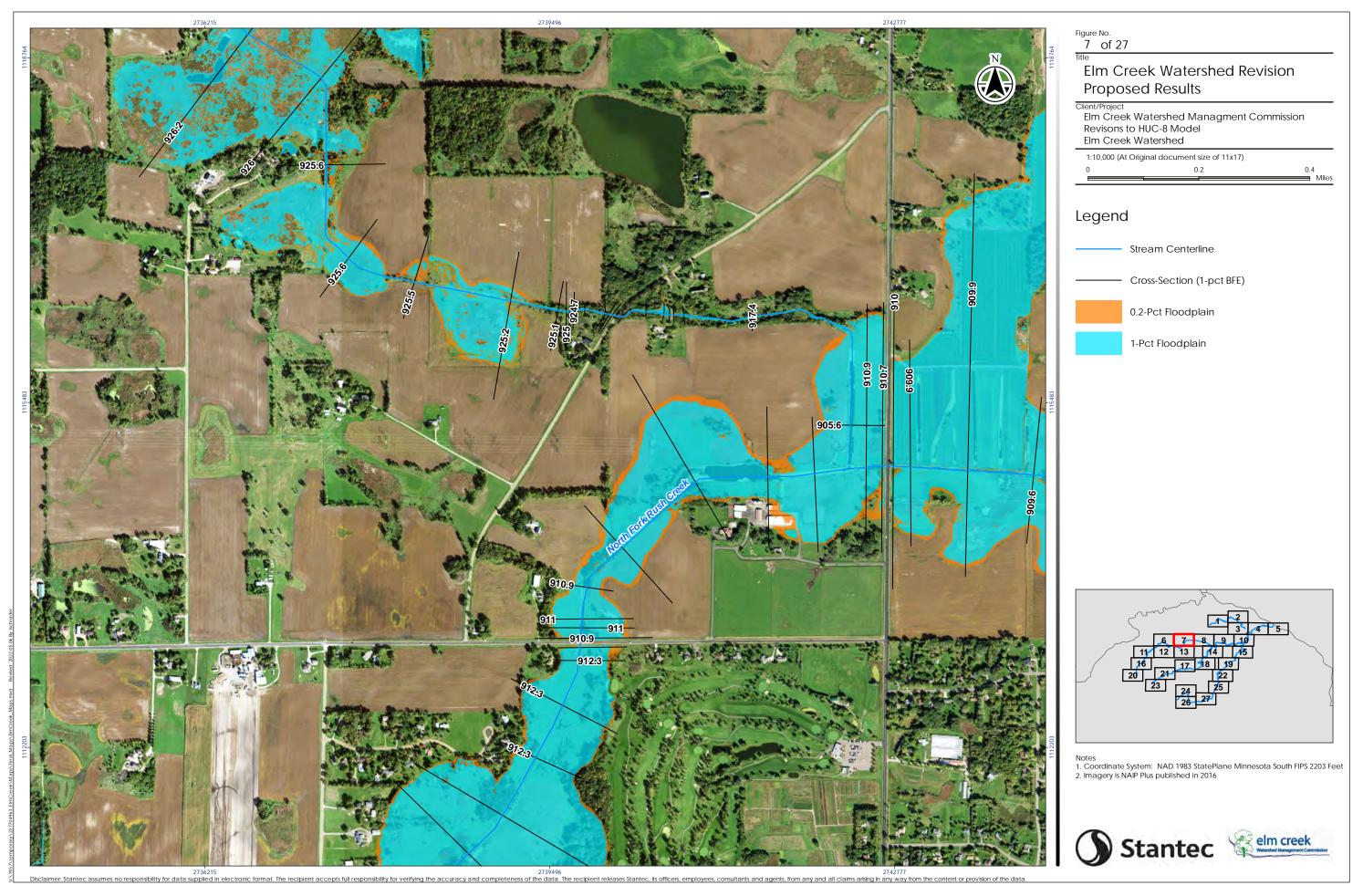


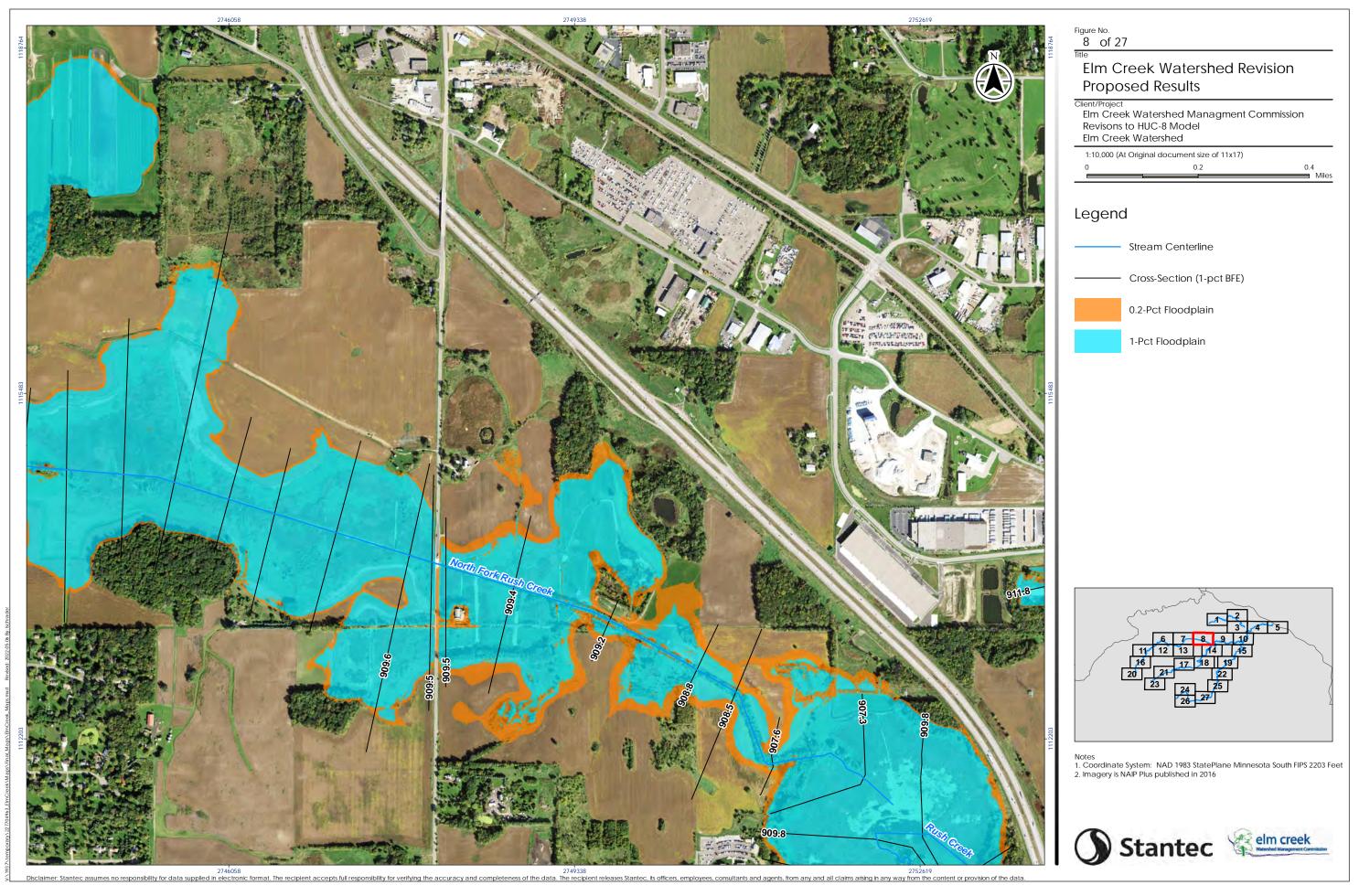
Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Imagery is NAIP Plus published in 2016

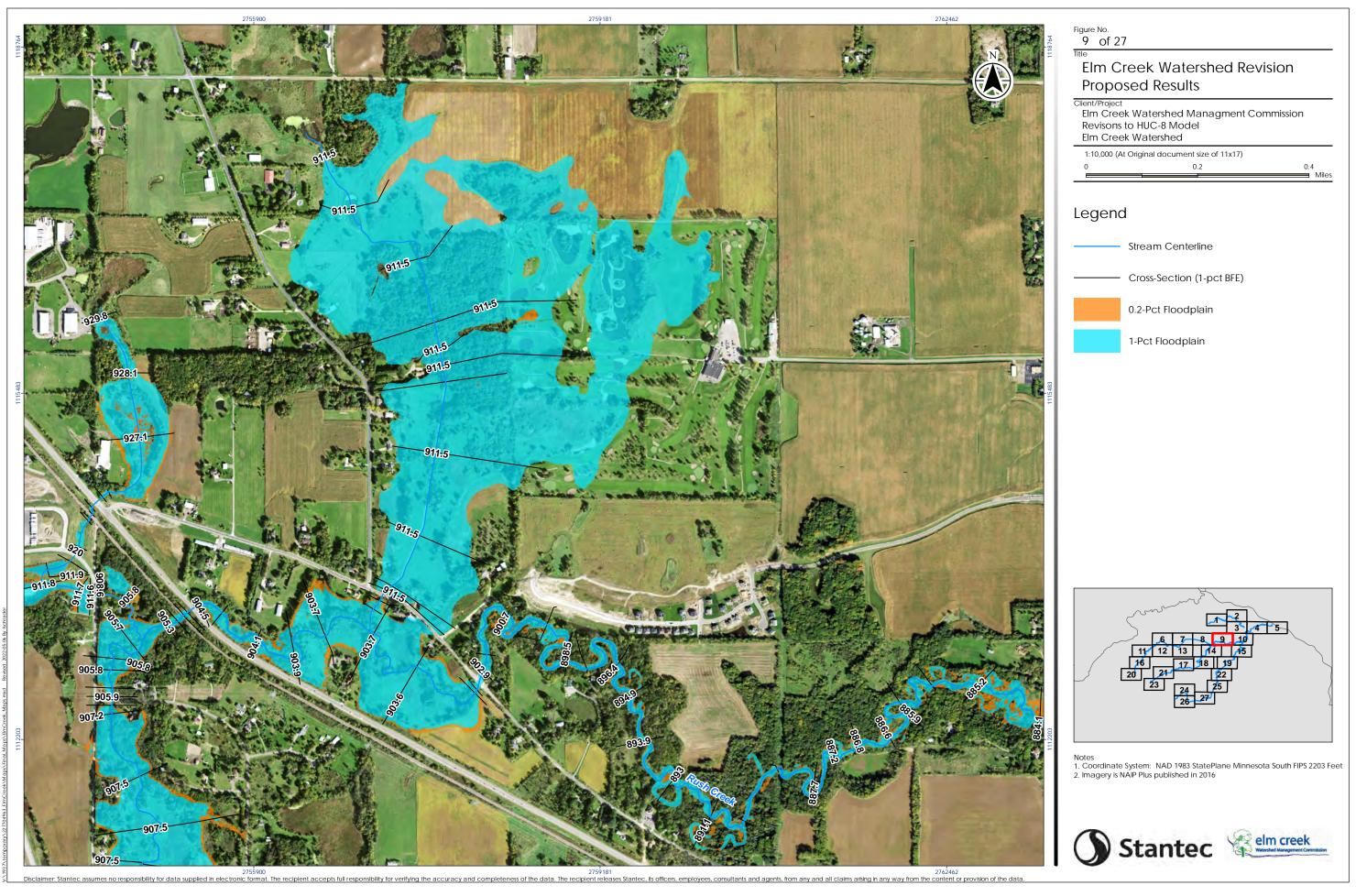


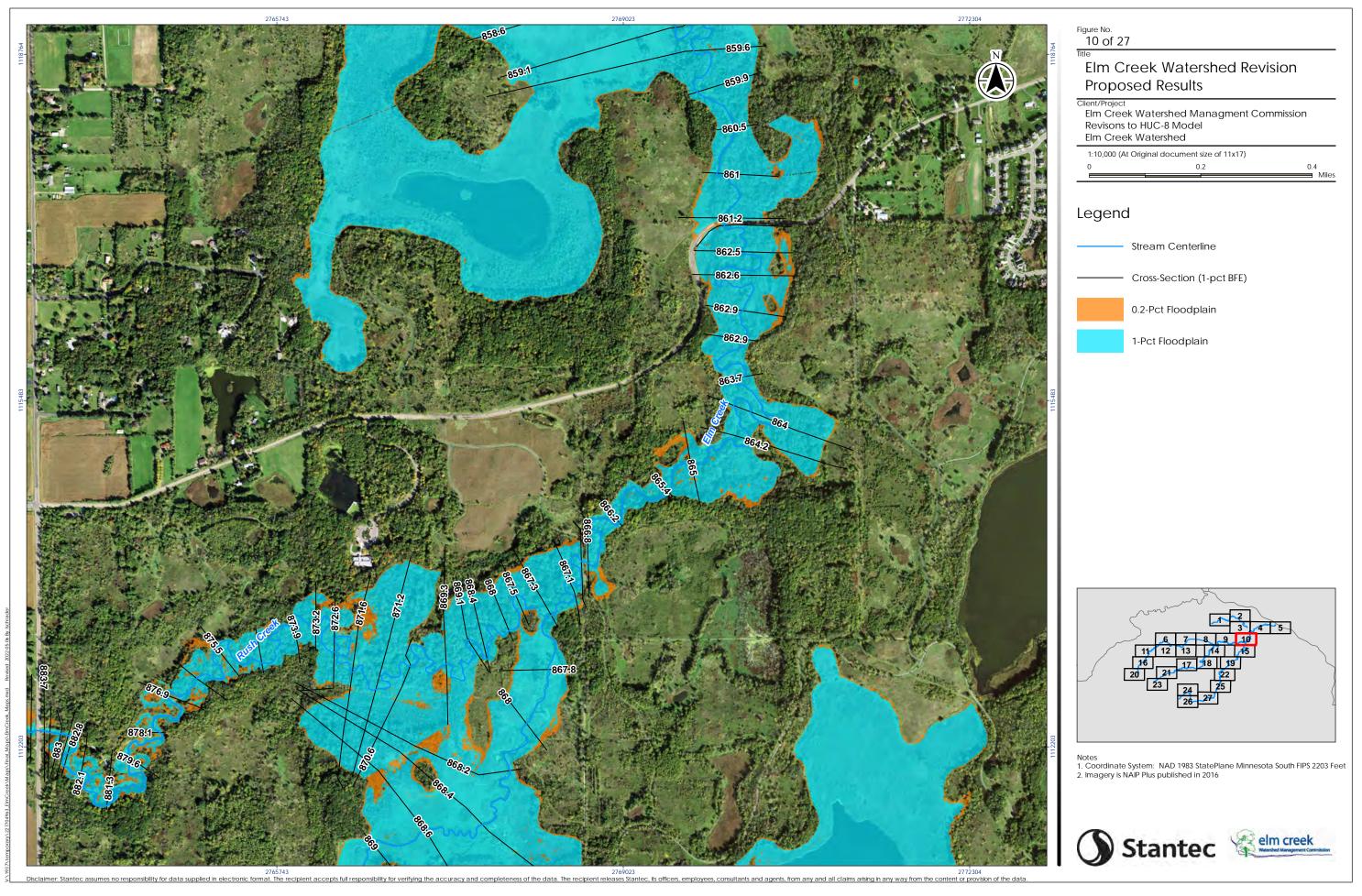


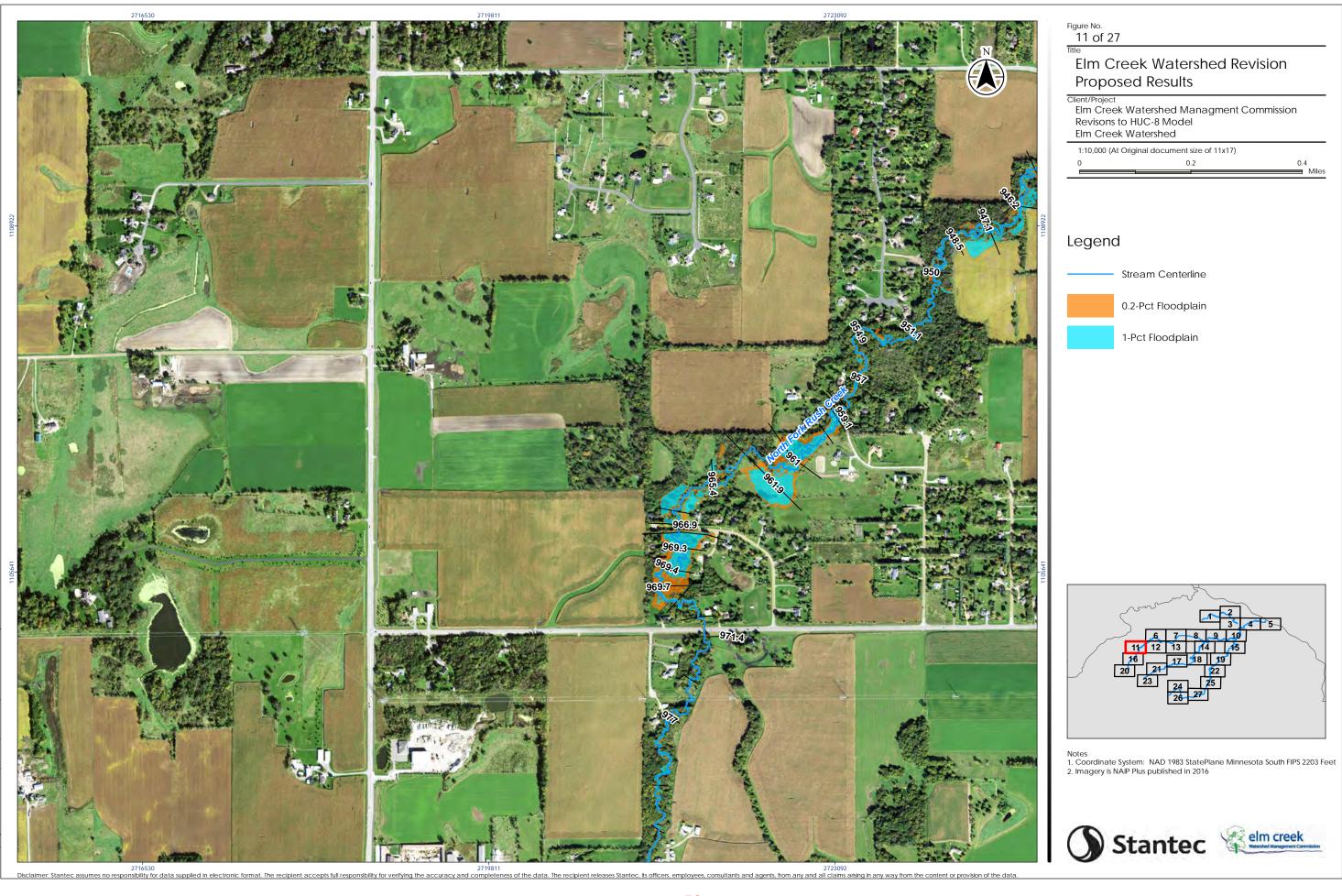


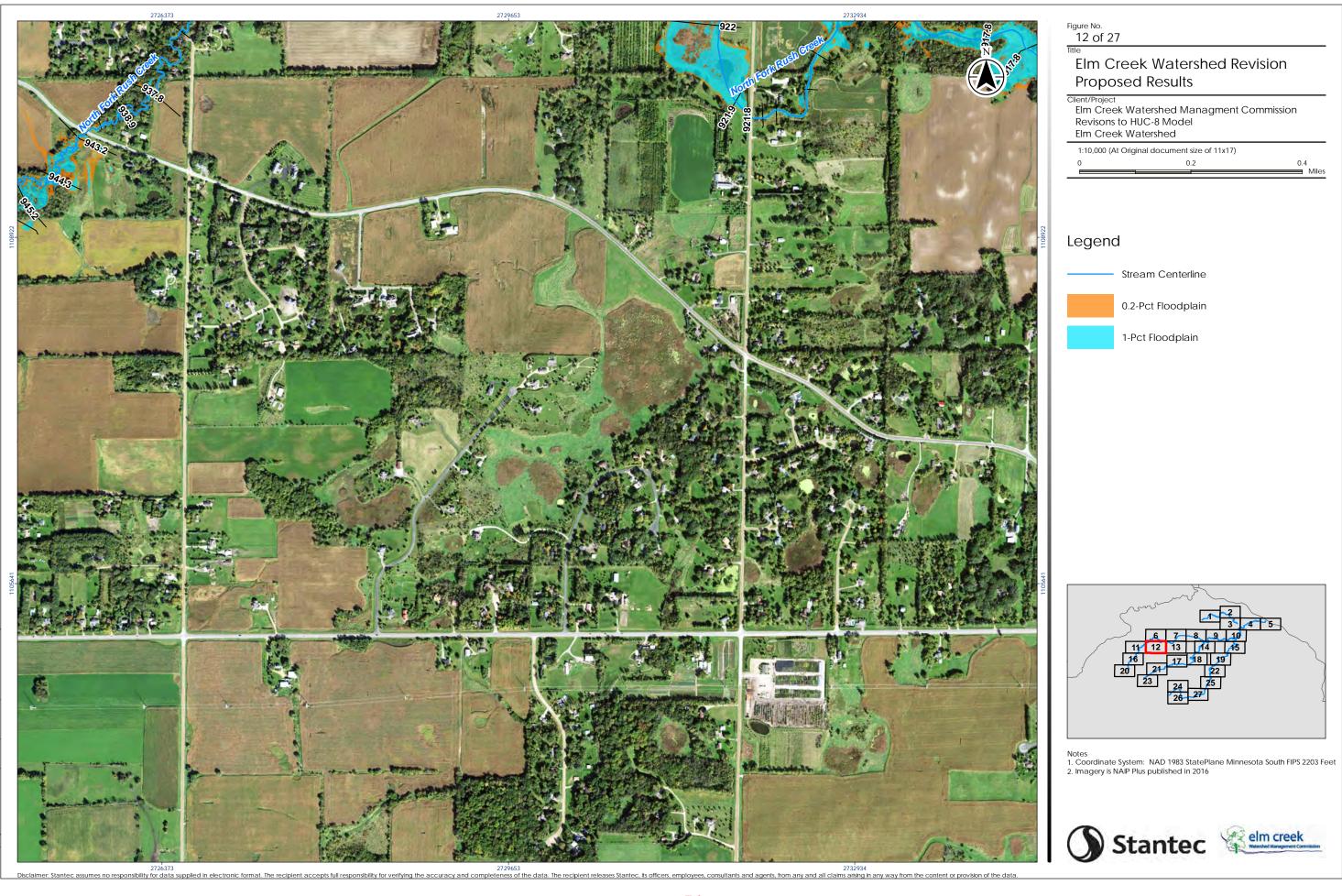


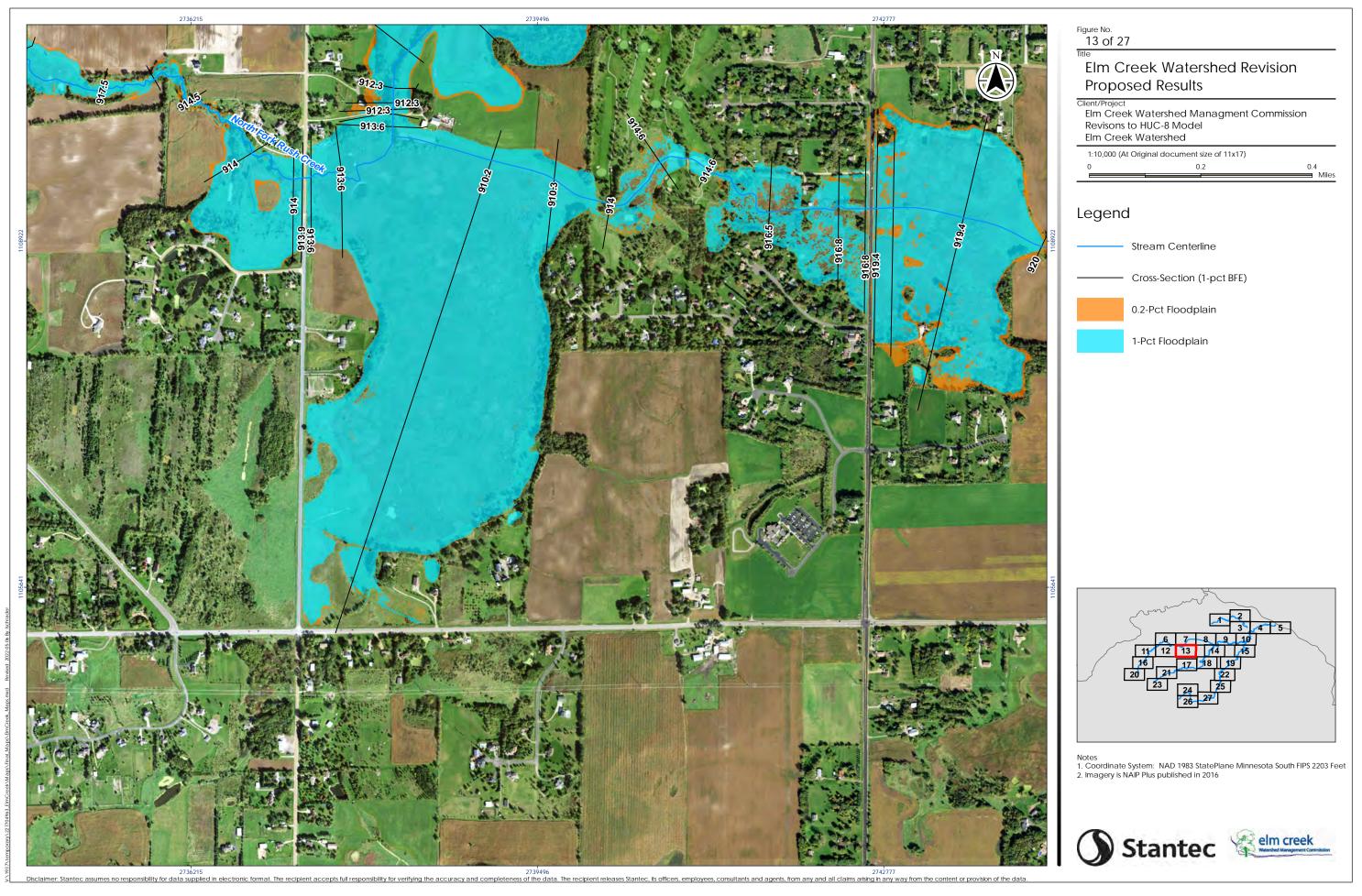


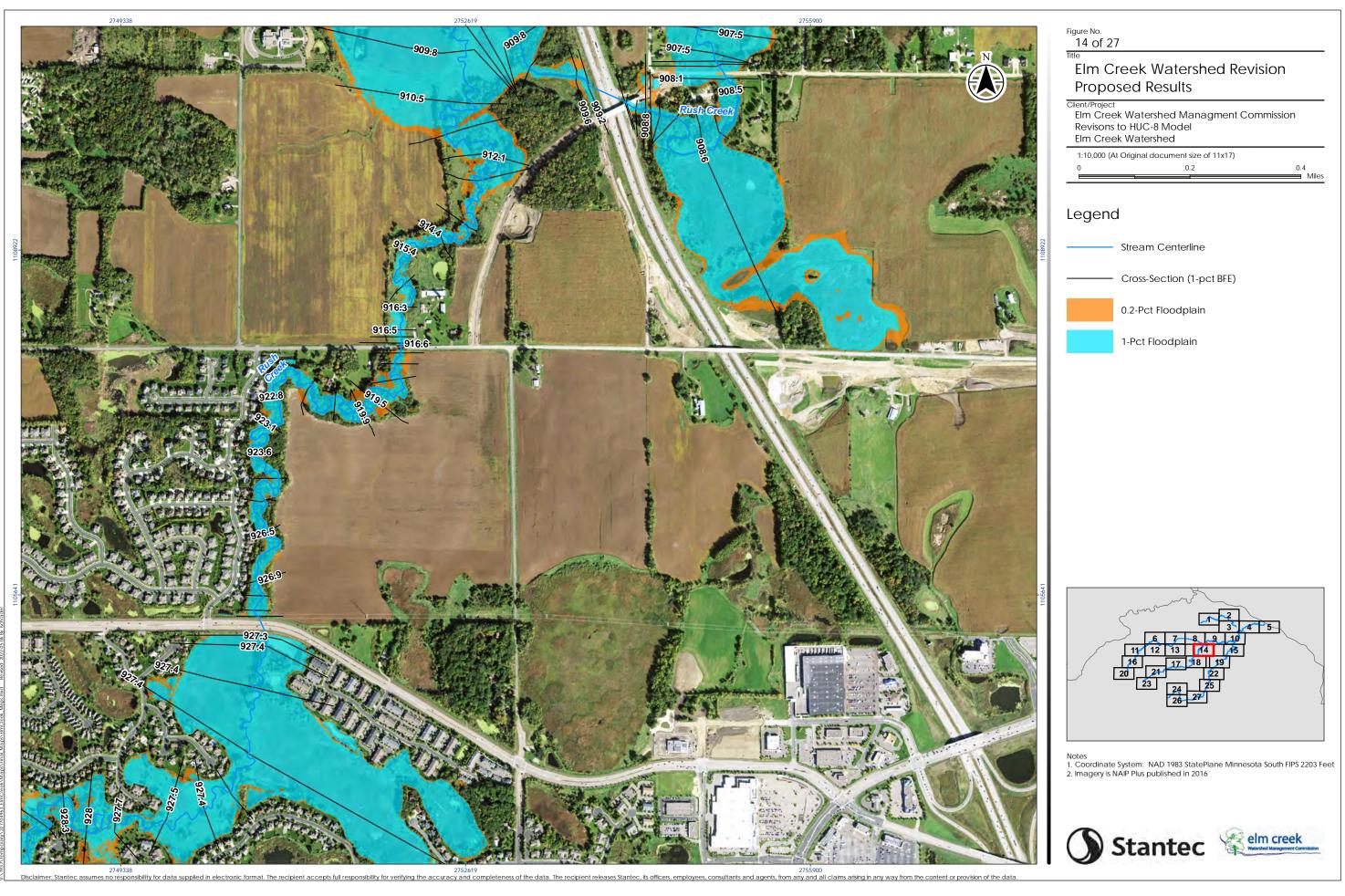


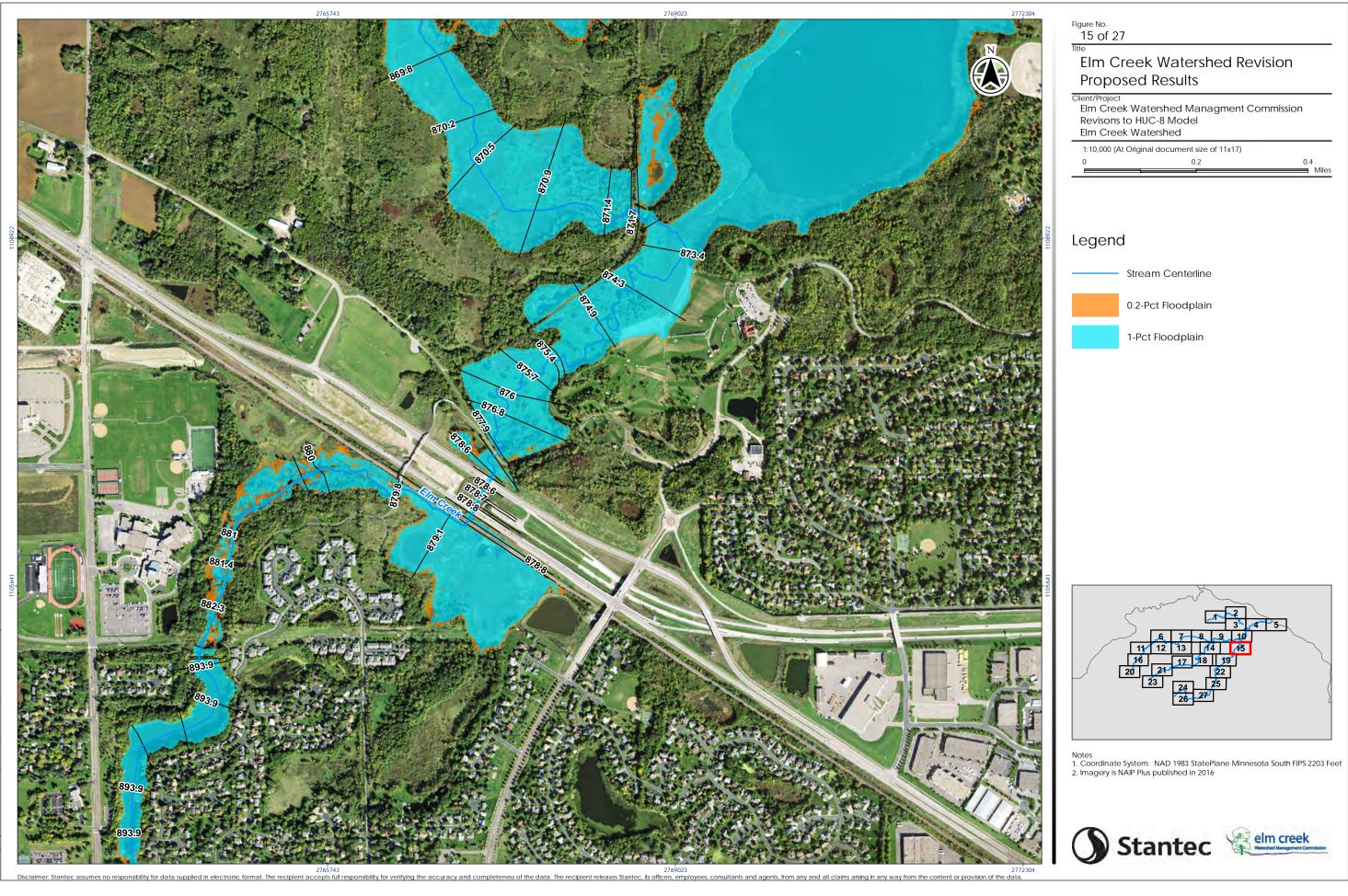


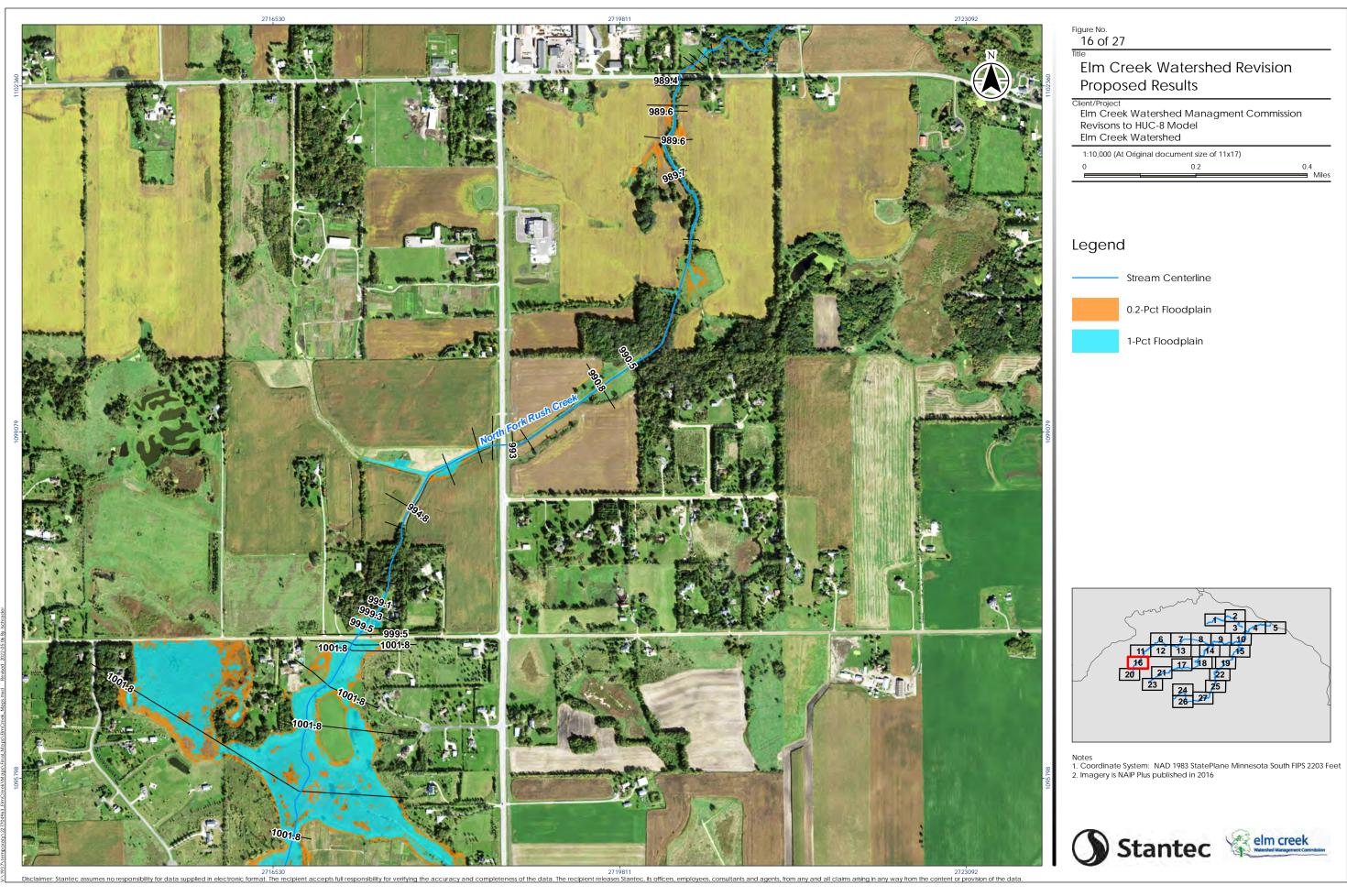


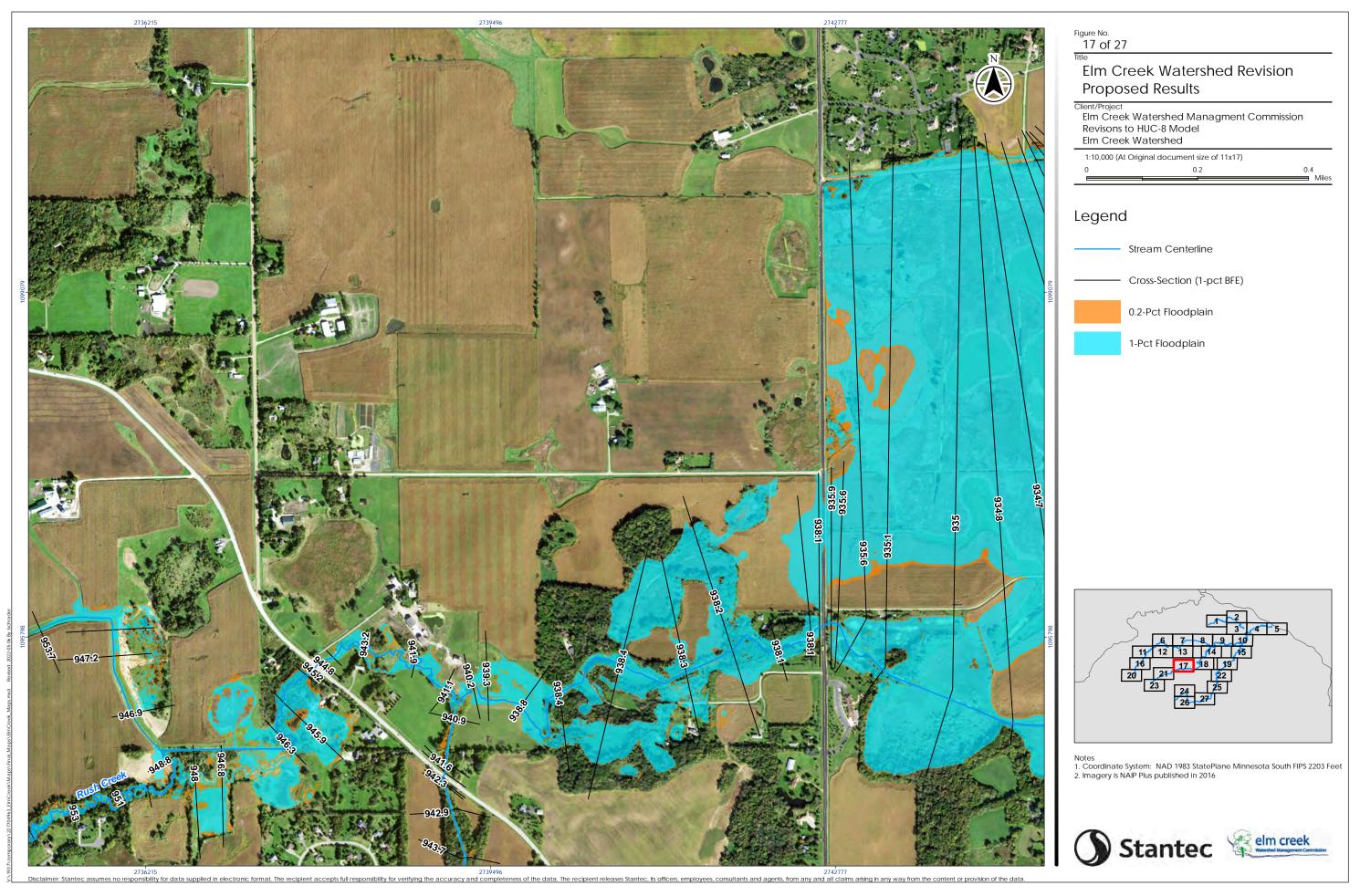


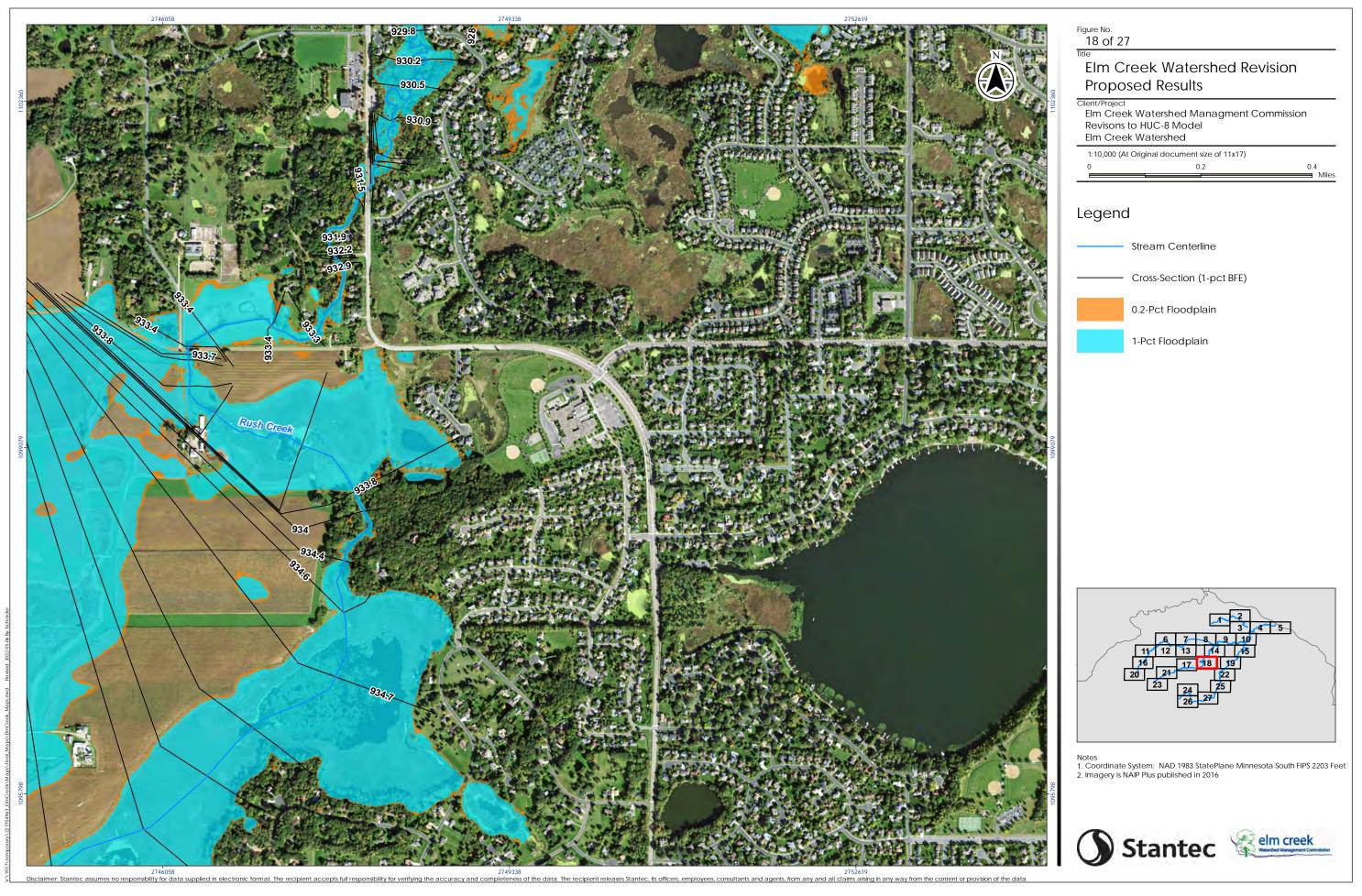


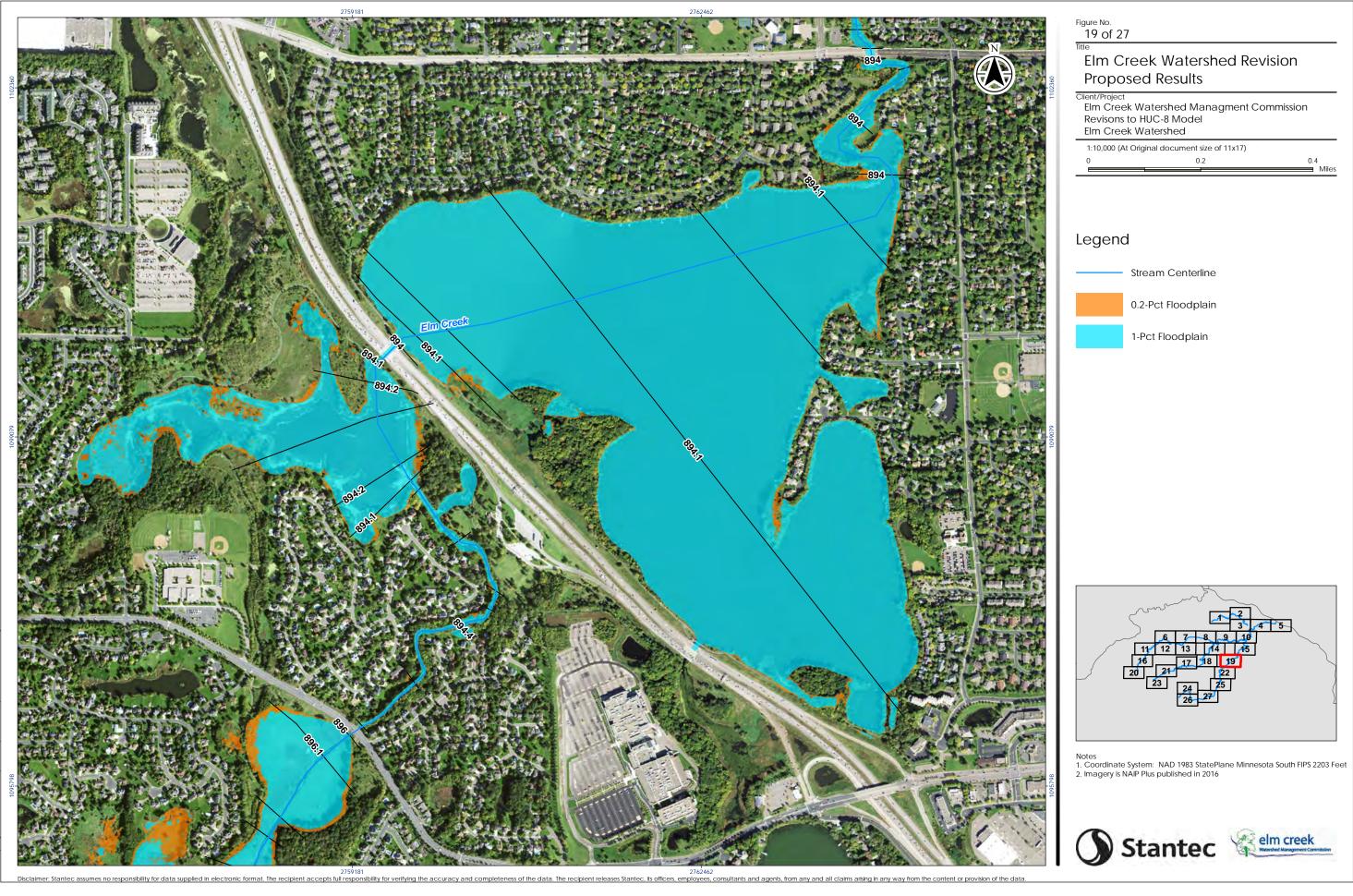












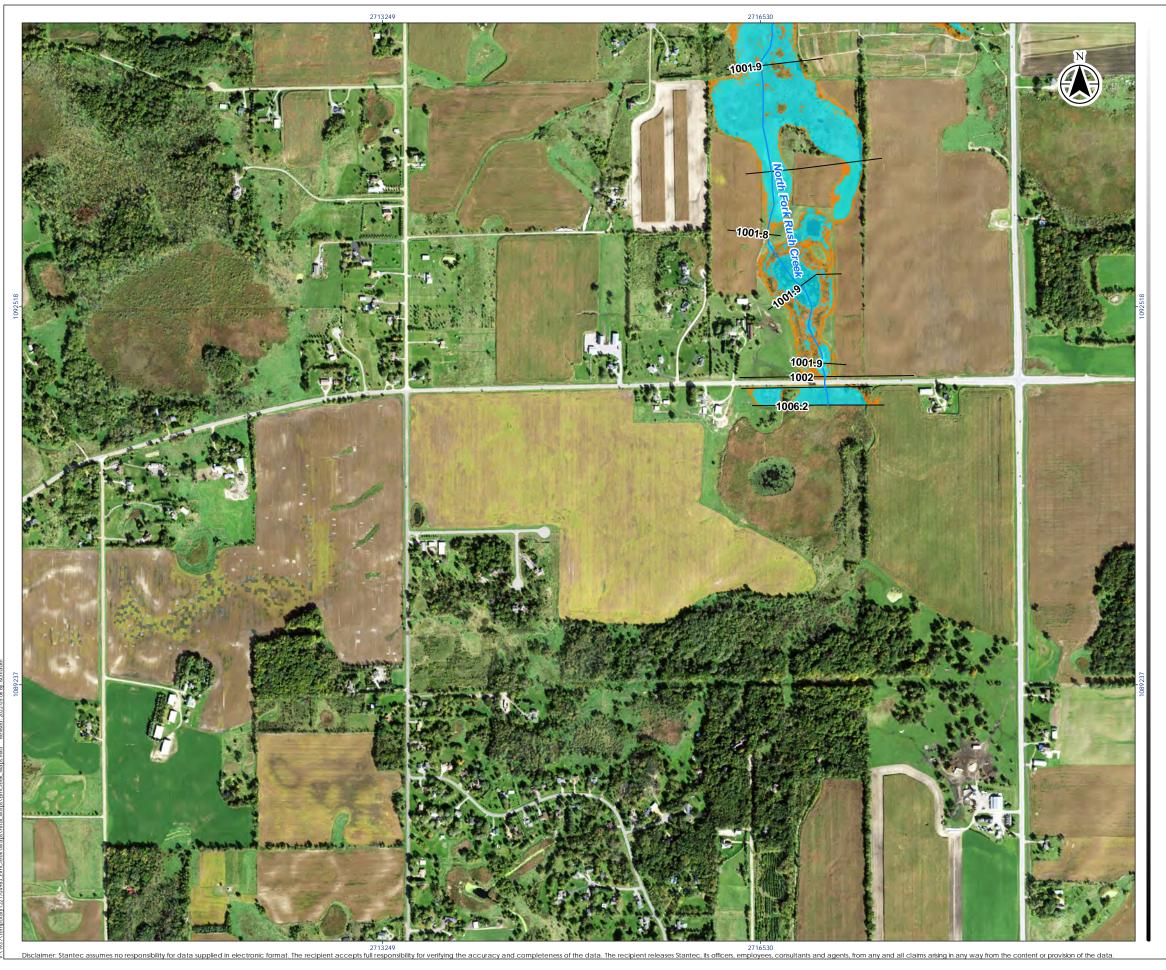


Figure No. 20 of 27

Elm Creek Watershed Revision **Proposed Results**

Client/Project
Elm Creek Watershed Managment Commission
Revisons to HUC-8 Model
Elm Creek Watershed

1:10,000 (At Original document size of 11x17)

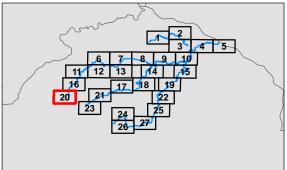
Legend

Stream Centerline

0.2-Pct Floodplain



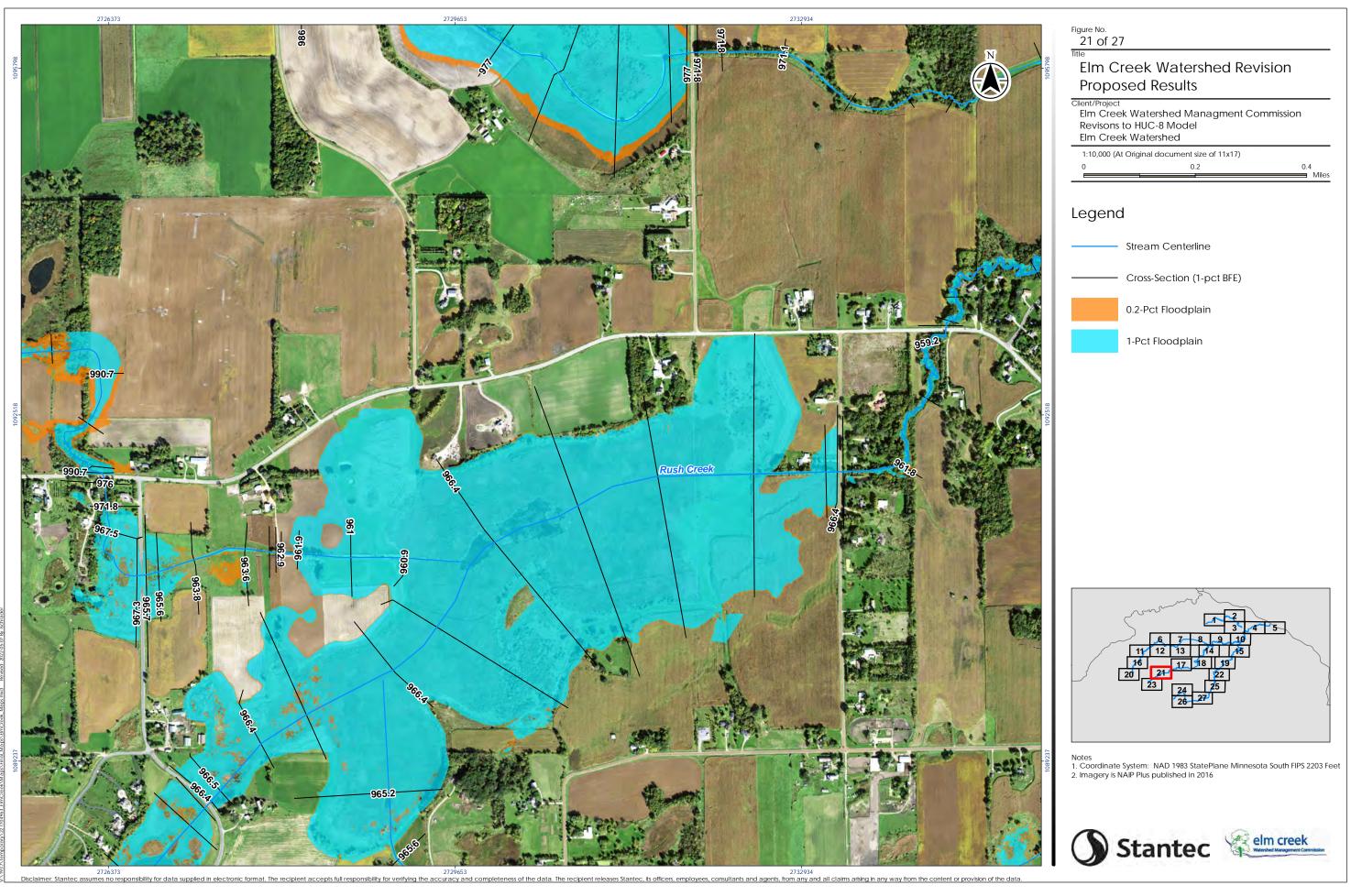
1-Pct Floodplain

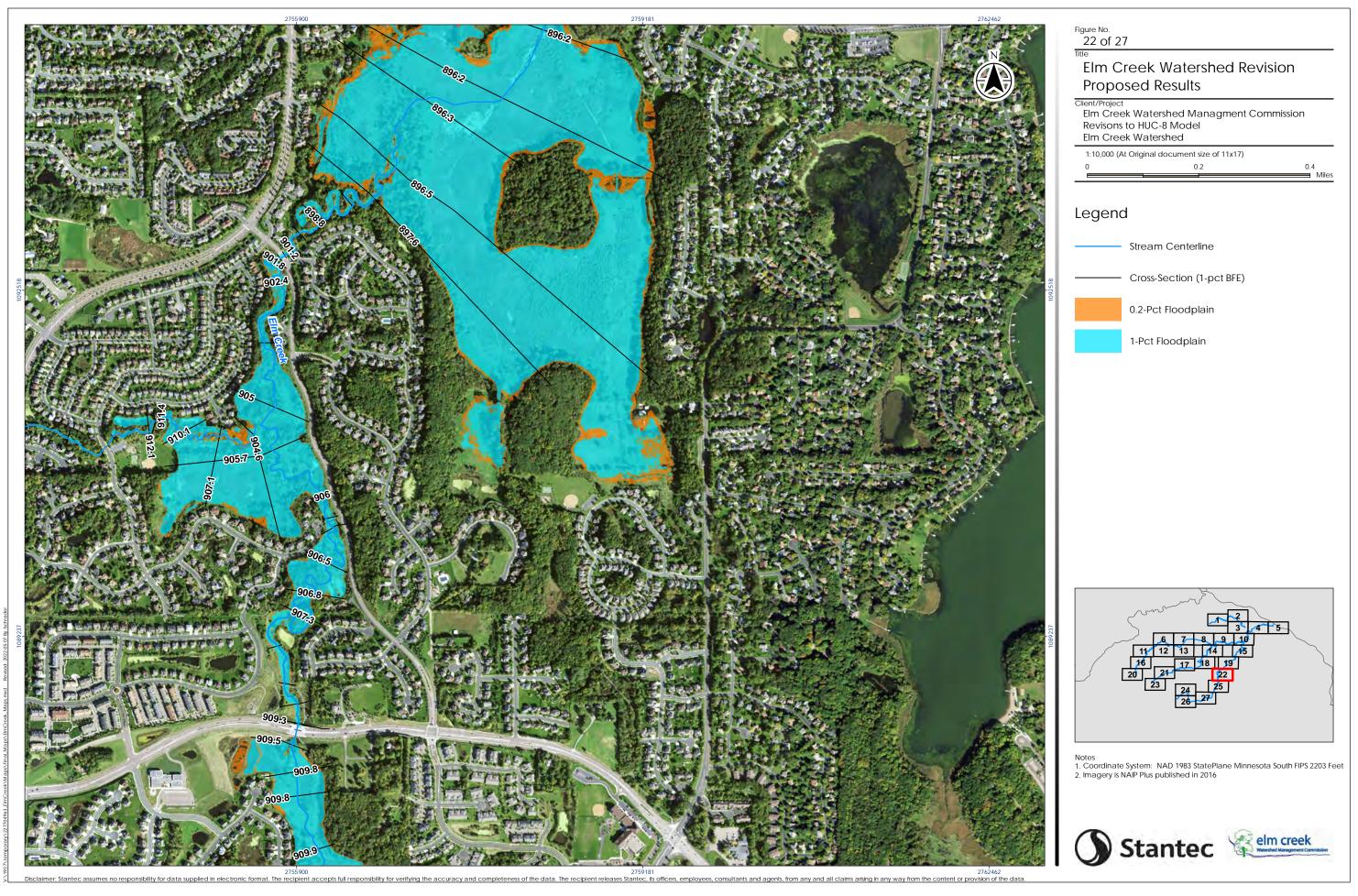


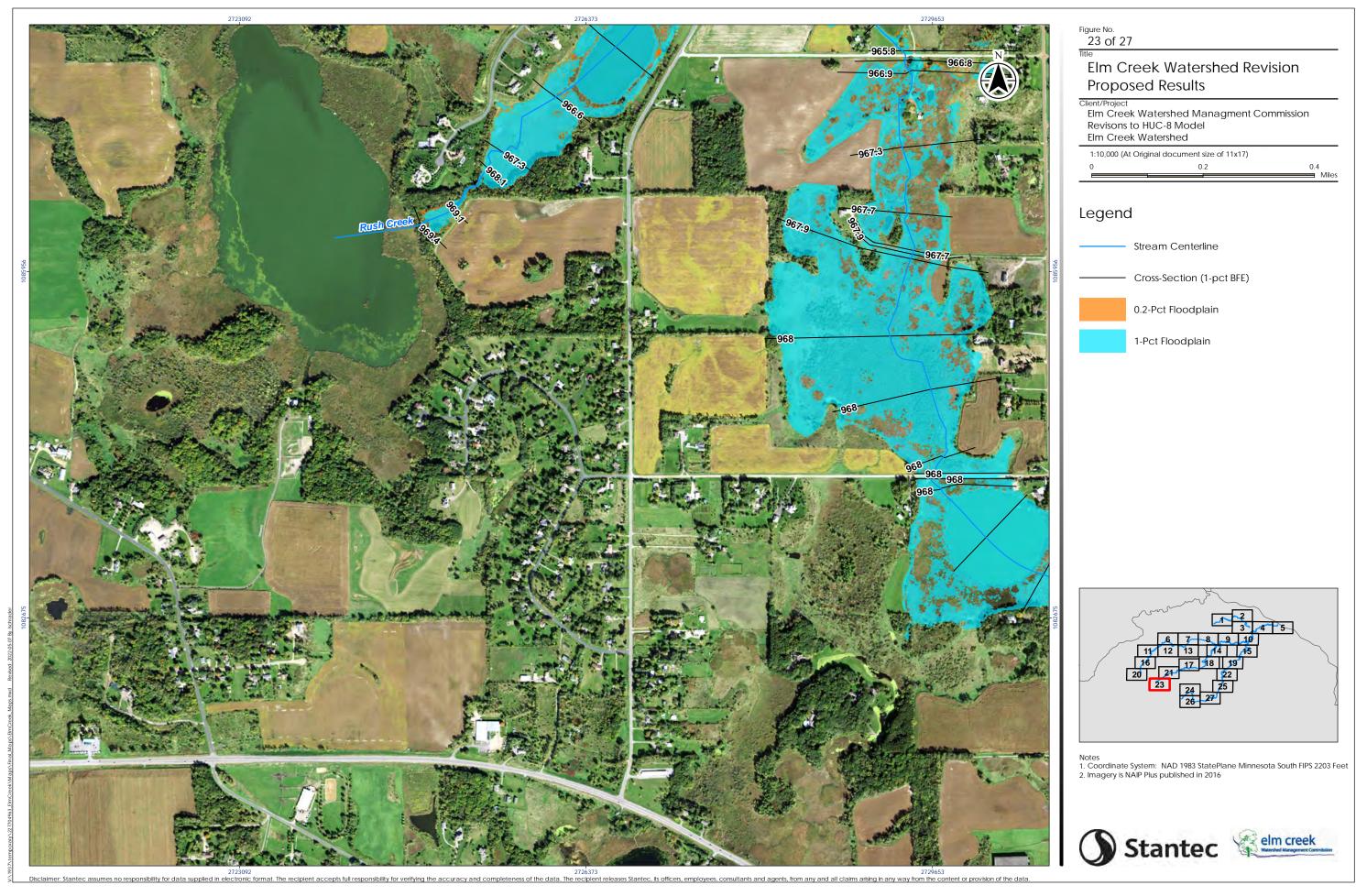
Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Imagery is NAIP Plus published in 2016

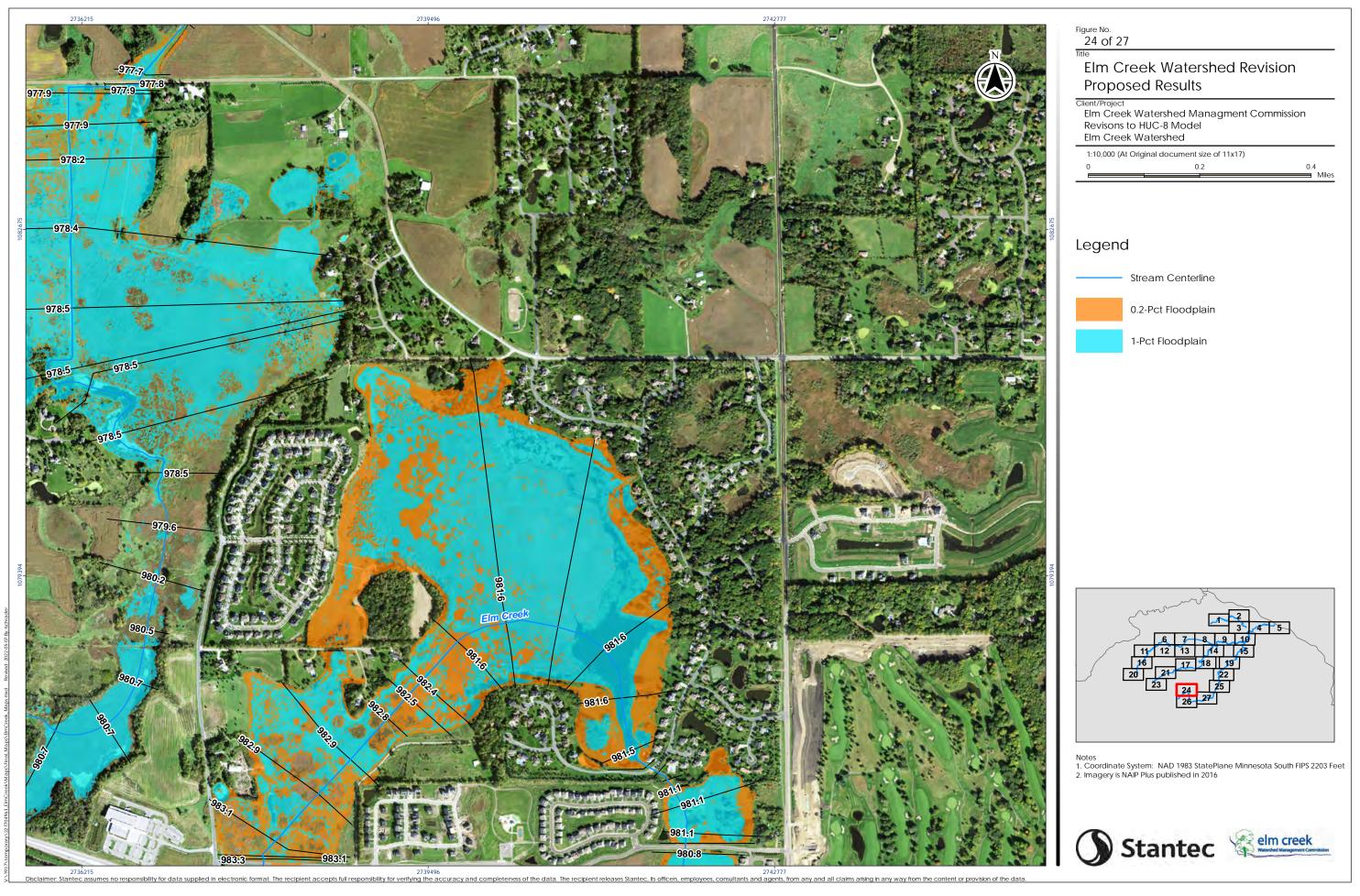


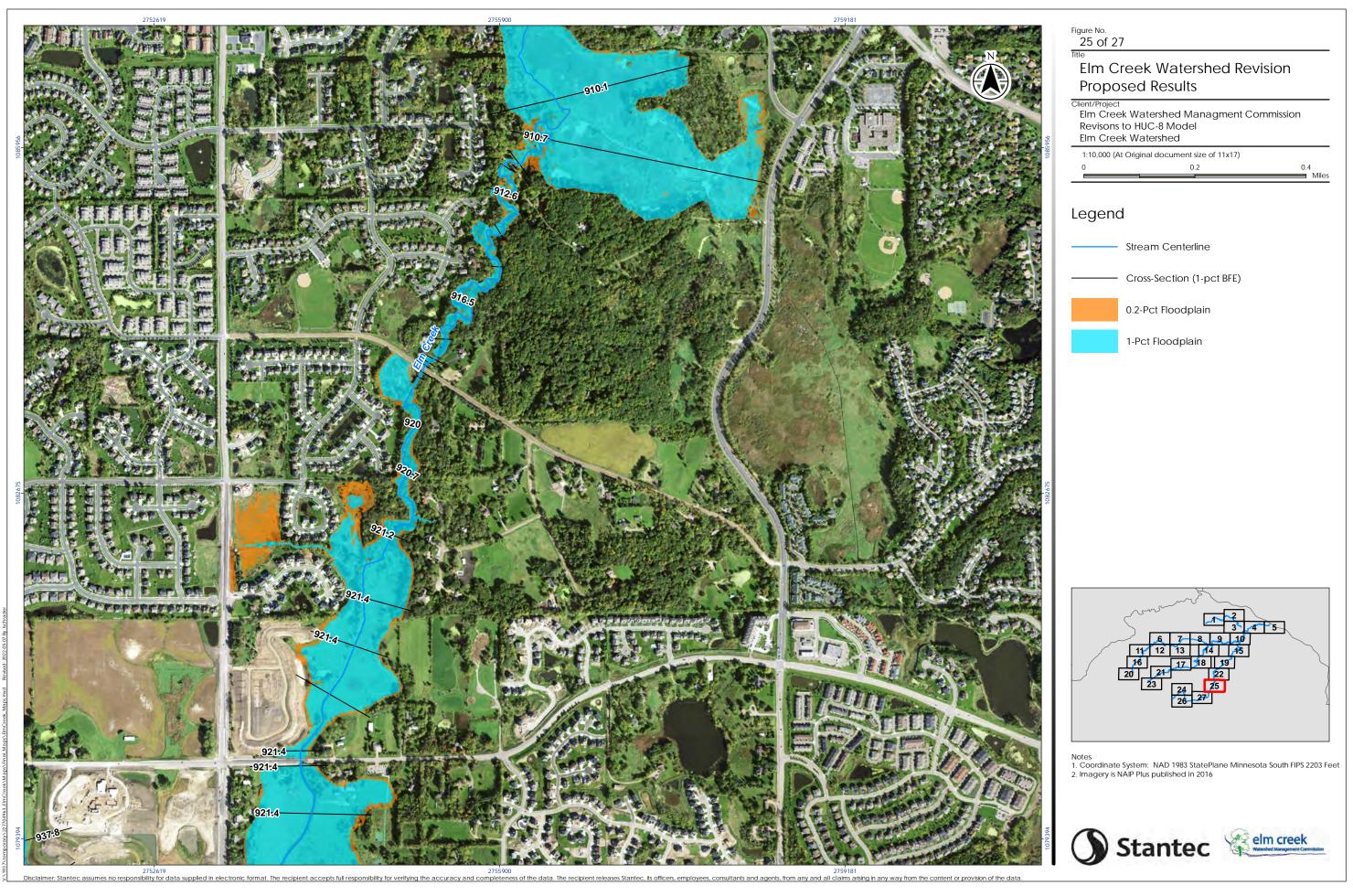


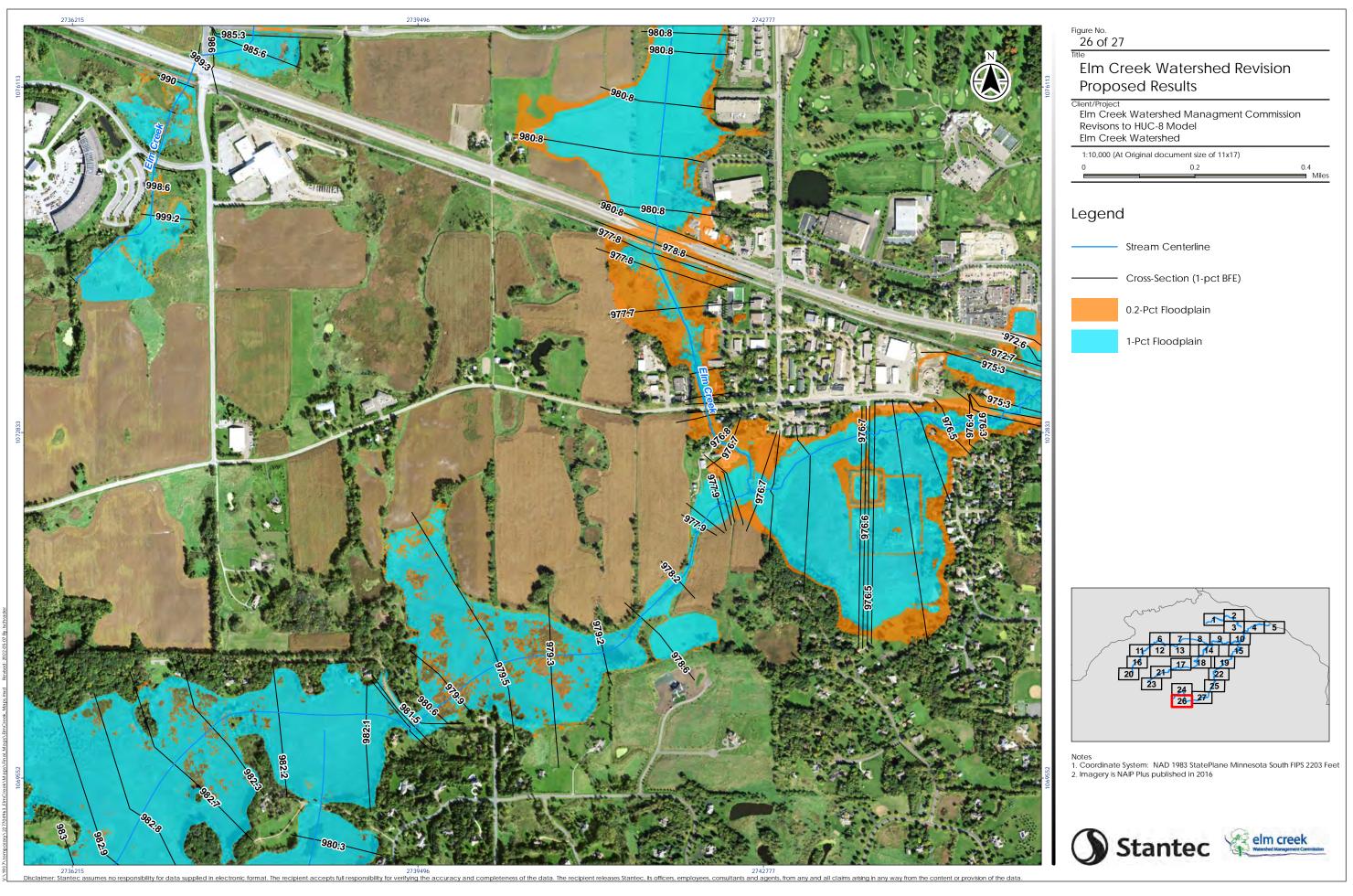


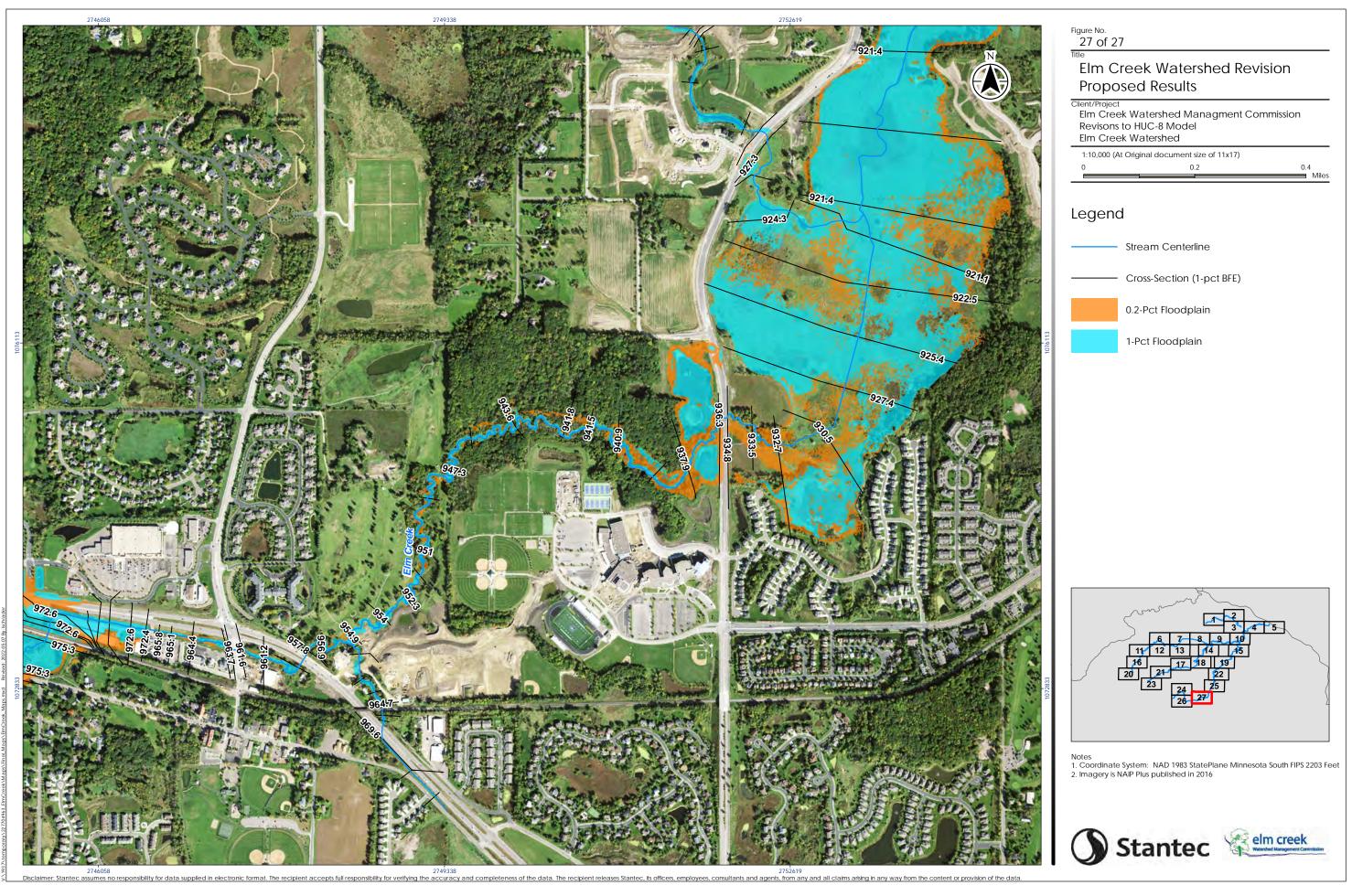












APPENDIX F

HEC-RAS Mapping Overview and Updates



Overall Model Updates

 Model was split into two separate geometries to allow for full extents of main stem streams and tributary streams to be mapped directly in HEC-RAS.

Table 1 Split Geometry Stream Groups

| Group 1 Streams | Group 2 Streams |
|------------------------|---------------------|
| Elm Creek | Rush Creek |
| Rush Creek Branch 1 | Elm Creek Branch 2 |
| Rush Creek Branch 2 | Elm Creek Branch 3 |
| Rush Creek Branch 3 | Elm Creek Branch 4 |
| Rush Creek Branch 5 | Elm Creek Branch 5 |
| Rush Creek Branch 6 | North Fork Rush |
| Rusii Cleek Dialicii 0 | Creek Branch 1 |
| Rush Creek Branch 7 | North Fork Rush |
| Rusii Cleek Dialicii i | Creek Branch 2 |
| North Fork Rush Creek | Diamond Creek |
| Elm Creek Branch 1 | Rush Creek Branch 4 |

Group 1 Model Updates

Elm Creek

- Flow change locations were adjusted according to the river station updates.
- Left portion of XS extended at locations: 17159, 17870, 18774, 19466, 11839, 37254, 38150, 39051, and 65215.
- Right portion of XS extended at locations: 19466, 15477, and 13893.
- Left portion of XS adjusted at: 77973
- Areas of centerline not in floodplain: 101622 to 100653
- IFA adjustment at XS: 90982, 63561, 90939
- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Elm Creek Branch 1

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.



North Fork Rush Creek

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 18117 and 72915
- Moved XS 73061 slightly downstream outside of structure embankments. Now station 73038.

Rush Creek Branch 1

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 8442 and 13645

Rush Creek Branch 2

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Rush Creek Branch 3

· No adjustments made to model geometry.

Rush Creek Branch 5

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- XS 18625 adjusted station elevation point inside channel that appeared to be incorrectly pulled to a higher elevation.

Rush Creek Branch 6

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Rush Creek Branch 7

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 6961



Group 2 Model Updates

Diamond Creek

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 10367

North Fork Rush Creek Branch 1

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Rush Creek Branch 4

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 5320, 5792, 5525, 5113
- Right portion of XS shortened at locations: 9126 and 9250
- Con/Exp coefficients increased to 0.3 and 0.5 respectively for XS's 9552 and 9632 to account for significant changes in floodplain extents (widening)

Rush Creek Branch 5

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 15055

Rush Creek

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- 2 Additional Cross sections added at downstream end for tie in: 724 & 298
- IFA adjustment at drawdowns along structures mainly.

Elm Creek Branch 2

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Elm Creek Branch 3

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- Additional Cross section added at downstream end for tie in: 15



Elm Creek Branch 4

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- 2 Additional Cross sections added at downstream end for tie in: 810 & 236
- River station adjusted and centerline adjusted at downstream end to appropriately tie into the main stem stream

Judie Anderson

From:

Megow, Erik <erik.megow@stantec.com>

Sent:

Thursday, May 12, 2022 8:56 AM

To:

Judie Anderson

Cc:

dasche@maplegrovemn.gov; Spector, Diane

Subject:

RE: ECWMC MAY 2022 TAC Meeting Materials - HUC-8 Modeling Updates Memo and

Mapping

Attachments:

Elm Creek HUC-8 model Updates_DRAFT_5_12_22.pdf

Judie,

Please disperse the attached, updated memo with updated inundation maps in Appendix E. As I discussed with you yesterday, I received some early feedback from TAC Members that the Results Table (Appendix D) was difficult to cross-reference with the Maps in Appendix E.

The only update that was made to these maps (Appendix E) was the inclusion of the HEC-RAS cross-section (XS) ID. This update will allow the Cities to easily compare the mapped elevations and cross-sections with the elevations listed in Appendix D.

Here is an example of the XS IDs added to the maps:



These new IDs will match the HEC-RAS XS IDs in the results tabled of Appendix D:

| HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Let |
|------------|---|--|--------|
| 112306 | State Highway 101 (DS) | 20.73 | |
| 112413 | State Highway 101 (US) | | |
| 113170 | DS of Access Road, US of State Highway 101 | 20.87 | CI |
| 113302 | US and DS of two Access Road, US of State Highway 101 | 20.91 | CK |
| 113654 | US and DS of two Access Road, US of State | 20.96 | CL |
| 113752 | US of Access Road, DS of Railroad | 21.00 | CM |
| 114334 | US Access road, DS railroad and Hamel Road | 21.11 | CN |
| | 112306 -112413 113170 113302 113654 113752 | HEC-RAS XS Location 112306 State Highway 101 (DS) 112413 State Highway 101 (US) 113170 DS of Access Road, US of State Highway 101 113302 US and DS of two Access Road, US of State Highway 101 113654 US and DS of two Access Road, US of State Highway 101, US of CK 113752 US of Access Road, DS of Railroad US Access Road, DS of Railroad US Access Road, DS railroad and Hamel | 112306 |

The mapped inundation areas did not change from the 5_10_22 Draft that was sent out on Tuesday. The only change is the addition of the XS IDs to make the review easier for the TAC.

Thanks,

Erik Megow, PE (MN)

Associate, Water Resources Engineer

Direct: 763 252-6857 erik.megow@stantec.com

Stantec

7500 Olson Memorial Highway Suite 300

Golden Valley MN 55427-4886



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From: Judie Anderson < Judie@jass.biz> Sent: Tuesday, May 10, 2022 1:02 PM

To: Amy Juntunen <Amy@jass.biz>; Amy Riegel (ariegel@plymouthmn.gov) <ariegel@plymouthmn.gov>;

asimmons@ci.rogers.mn.us; Ben Scharenbroich (bscharenbroich@plymouthmn.gov)

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<BVlach@threeriversparkdistrict.org>; Derek Asche <dasche@maplegrovemn.gov>; Spector, Diane

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inc.com>; Shibani Bisson (sbisson@wsbeng.com) <sbisson@wsbeng.com>; Steve Christopher

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Cc: Bill Walraven (traderstec@aol.com) <traderstec@aol.com>; Catherine Cesnik (cesnik@gmail.com) <cesnik@gmail.com>; Dan Riggs (driggs@carlsonmccain.com) <driggs@carlsonmccain.com>; David Katzner (dkatzner@carlsonmccain.com) <driggs@carlsonmccain.com>; Doug Baines (dougbaines@yahoo.com) <dougbaines@yahoo.com>; Joe Trainor (joe.trainor@meritain.com) <joe.trainor@meritain.com>; Ken Guenthner (kenguenthner@gmail.com) <kenguenthner@gmail.com>; Kevin Jullie (kjullie@srfconsulting.com) <kjullie@srfconsulting.com>; Scott Mahar <scott.mahar@trueit.com>; Terry Sharp <tsharp2972@aol.com>; Tom Anderson (tompand@yahoo.com) <tompand@yahoo.com>; Travis Henderson <thenderson@cityofdaytonmn.com> Subject: FW: ECWMC MAY 2022 TAC Meeting Materials - HUC-8 Modeling Updates Memo and Mapping

Members of the Technical Advisory Committee:

Attached are the HUC-8 updates for your review. Remember, we will be meeting via Zoom on Wednesday, May 18, 2022, at 9:30 a.m. to discuss these updates. An agenda with additional meeting items will be emailed to you later this week.

If you have comments or concerns regarding this document, please email them to Erik Megow erik.megow@stantec.com by end of day, Monday, May 16.

Thank you.

- Judie

Judie A. Anderson
WATERSHED ADMINISTRATOR | JASS | 3235 FERNBROOK LANE PLYMOUTH MN 55447

judie@jass.biz | D 763.553.1144 | F 763.553.9326

Representing Elm Creek, Shingle Creek, West Mississippi, and Pioneer-Sarah Creek WMOs and Clearwater River WD

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From: Megow, Erik < erik.megow@stantec.com >

Sent: Tuesday, May 10, 2022 12:44 PM To: Judie Anderson < Judie@jass.biz >

Cc: Spector, Diane < diane.spector@stantec.com >; dasche@maplegrovemn.gov

Subject: ECWMC MAY 2022 TAC Meeting Materials - HUC-8 Modeling Updates Memo and Mapping

Judie,

Attached is our Memo for the HUC-8 Updates for the 5/18/2022 Tac Meeting.

Please confirm that you received this e-mail. The file, with maps is quite large. I would like this to get out to the TAC as soon as we are able so they have a longer time to review the report, updates, results, and mapping.

Thanks,

Erik Megow, PE (MN)

Associate, Water Resources Engineer

Direct: 763 252-6857 erik.megow@stantec.com

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To: Elm Creek Watershed Management Commission Commissioners and Technical

Advisory Committee

From: Erik Megow, PE

Lori Schrader Danielle Johnson Kiley Gafner

Date: May 10, 2022

Subject: Revisions to the Elm Creek Watershed HUC-8 Model - DRAFT

1.0 INTRODUCTION AND PURPOSE

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 summarize the work completed to revise and update the HUC-8 Study based on the findings of the Third-Party Review (Stantec, January 2022) through the Tasks outlined in Stantec's Response to Request for Proposal for Revisions to HUC-8 Model (March 2022). The following sections provide an overview of the revisions made to the hydrologic (HEC-HMS) and hydraulic (HEC-RAS) models, along with a discussion of the calibration analysis.

2.0 HYDROLOGIC MODEL (HEC-HMS) UPDATES AND HYDROLOGIC CALIBRATION

Stantec updated the HEC-HMS (US Army Corps of Engineers Hydrologic Engineering Center – Hydrologic Modeling System) model (received from the DNR January 24, 2022) to provide better estimates of peak streamflows for input into the hydraulic (HEC-RAS) model. After the updates were completed, the model was assessed through the same calibration methodology, and for the same calibration events, that were included in "Elm Creek Narrative and QAQC Documentation" (Barr Engineering Co., 2021).



2.1 HEC-HMS Updates

Three major updates were made to the HEC-HMS model to improve hydrology and estimate new streamflows:

- 1. The model was updated from HEC-HMS Version 4.3 to Version 4.7, the latest version.
- 2. Natural storage and cross-sections were updated to replace areas where a Muskingham-Cunge shortened simplified trapezoidal bank-width cross section was modeled.
- 3. Watershed areas and hydrologic connections between the watersheds and reach segments were updated and a methodology was produced to input the calculated flows into the HEC-RAS Model.

The following sections provide an overview of these updates, while Appendices A and B provide additional details.

2.1.1 HEC-HMS Version Update

The original HEC-HMS model was transitioned from Version 4.3 to Version 4.7 for storage, cross-section, and routing updates. Using Version 4.7 made it possible to easily integrate the required updates, but this update required defining an Index Method (Celerity). According to the HEC-HMS User's Manual, the Index Method (Celerity) is used in conjunction with the physical properties of the channel to discretize the routing reach in both space and time. A celerity, or reference flow, equal to 5 ft/s was assumed uniformly across the model as recommended by the HEC-HMS User's Manual. Assuming a celerity of 5 ft/s, no negligible change in the 100-year flows was seen between the runs in Version 4.3 and 4.7.

2.1.2 Natural Storage and Sub-basin Cross-section Updates

The 55 sub-basins highlighted in the Third-Party Review (Stantec, January 2022) were examined to determine whether storage or updated cross-section definitions would be beneficial to updating flow calculations. Storage considerations included depressions in the Digital Elevation Model (DEM), imagery, and how/if the storage could then be accounted for in the HMS routing. Storage was calculated by first creating polygons around the depression areas seen in imagery and LiDAR. These polygons were then used along with the DEM to create storage capacity curves (elevation-area). The calculated curves were then applied to an existing or added associated reservoir. Added reservoirs were assumed to have outlets estimated by measuring culvert or bridge openings and inlet and outlet elevations. Rise was calculated using engineering judgement based on the size of the structure to subtract 2.5-4 feet from the differential of the structure deck and inlet elevations.

Cross-section updates were made by pulling terrain data for the whole cross section in HEC-RAS and then filtering them to 8 point cross sections. The left and right Manning's coefficient settings were applied by reviewing common overbank channel along the reach.

Overall, 47 sub-basins were updated by adding natural storage areas or updating storage reservoir curves within 37 sub-basin and updating cross-section within the other 10 sub-basins. A summary of the updates is included as Appendix A.

With the added natural storages and updated cross-sections, junctions were added as needed to properly join and route flows within the model. For example, if more than one component (i.e. reach, basin, reservoir, etc.) were joining together and we deemed a potential need to collect flows in that location, a junction was added. Junction components do not contribute to the program calculations. They served a



dual purpose of more accurately modeling the routing of the watershed and making it easier to import flows into HEC-RAS.

2.1.3 Watershed Area and Hydrologic Routing Updates

The subbasin (watershed) areas were calculated in GIS and compared to the drainage areas represented in the HMS model. Eight subbasins had areas that differed by greater than 2 % and were updated. These basins were DC1, DC4, DC5, EC11, EC12, EC17, and EC8.

Every attempt was made to mimic the methodology used previously to route flows from the HMS results to the HEC-RAS cross-sections. The routing method used in the January 24, 2022 HEC-HMS Model, was not replicable and had inconsistencies on where the flows were applied. Without further sub-delineations, Stantec was required to compute ratios for some reaches based on the percentage of drainage area and reach length routed within each sub-basin. A spreadsheet was used to calculate the routed flows and an example (for the 100-year flows) of the methodology used is shown in Appendix B.

2.2 Hydrologic Model Calibration Analysis

Following the HEC-HMS updates outlined in Section 2.1, the model was assessed through the same calibration methodology, and for the same calibration events, that were included in "Elm Creek Narrative and QAQC Documentation" (Barr Engineering Co., 2021).

The updated model was evaluated using the historical flow record at the gage co-operated with the U.S. Geological Survey (USGS) on Elm Creek in Elm Creek Park Preserve, and two Three Rivers Park District-operated flow monitoring gages:

- ECER (Elm Creek at Elm Road near the Plymouth-Maple Grove municipal border), and
- RT (Rush Creek at Territorial Road).

The precipitation events that were used to assess the calibration of the updated model are:

- June 23 July 5, 2003 (rainfall)
 - Data for RT was not available before 2006.
- September 22 October 1, 2016 (rainfall)
- March 6 April 3, 2010 (snowmelt)
 - Data for RT and ECER was not available for winter months
- March 18 March 28, 2011 (snowmelt)
 - Data for RT and ECER was not available for winter months

As outlined in "Elm Creek Narrative and QAQC Documentation" (Barr Engineering Co., 2021), the calibration targets for the June 2003 and September 2016 rainfall events were to achieve a Nash-Sutcliffe Efficiency (NSE) index of 0.6, which is a measure of model fit compared to observed data. With an NSE of 0.6, a model is deemed satisfactorily accurate and with an index >0.75, the model is considered excellent. Figures 1 through 7 show the calibrated HEC-HMS Model results compared to the data from the three stations, when available. A summary of the calibration results is as follows:

- For Figures 1, 2, and 5 the calculated NSE Index was > 0.8 showing that our updated HEC-HMS model matched these storm events very well.
- For Figure 3, we did not have enough data points to calculate an NSE Index, but the modeled peak flow (159 cfs) was within 12.5% of the observed flow (181.5 cfs).



- For the September 16 RT comparison (Figure 4), the HEC-HMS modeled flows were higher than
 the observed, but after further conversation with Brian Vlach at Three Rivers Park District, it was
 determined that the rating curve at this location was not accurate for high flows (56.7 cfs, or water
 levels above 3.13 ft).
- For the snowmelt events, shown in Figures 6 and 7, where the orange line is the model-predicted
 results and the blue dots are the actual observed flows, the modeled (HMS) peak flows continue
 to occur close to the measured peak flow for both events, so no further lag time adjustments were
 made.

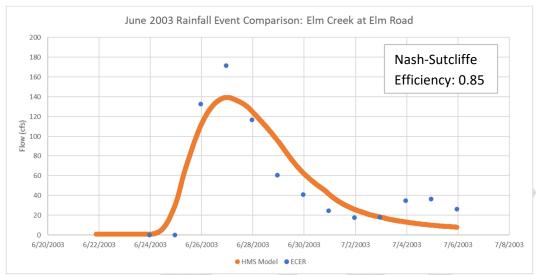


Figure 1. June 2003 rainfall event comparison at ECER.

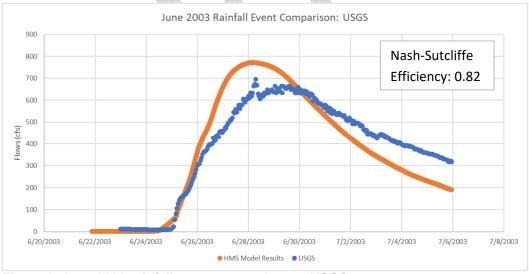


Figure 2. June 2003 rainfall event comparison at USGS.



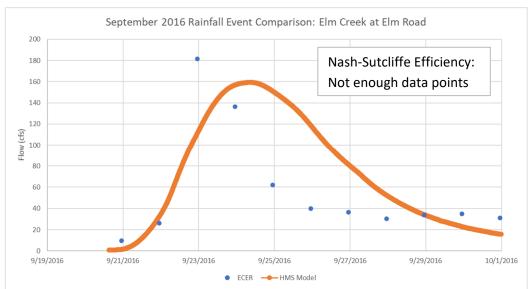


Figure 3. June 2016 rainfall event comparison at ECER.

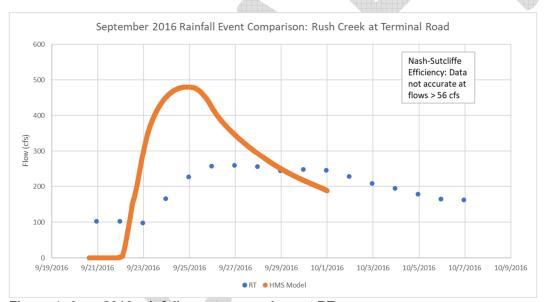


Figure 4. June 2016 rainfall event comparison at RT.



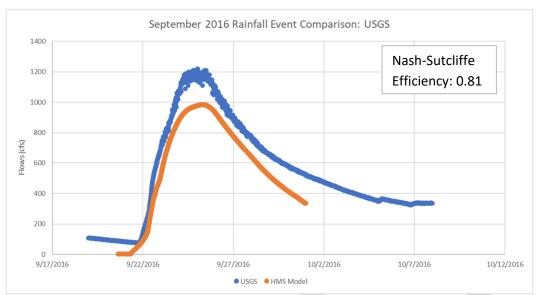


Figure 5. June 2016 rainfall event comparison at USGS.

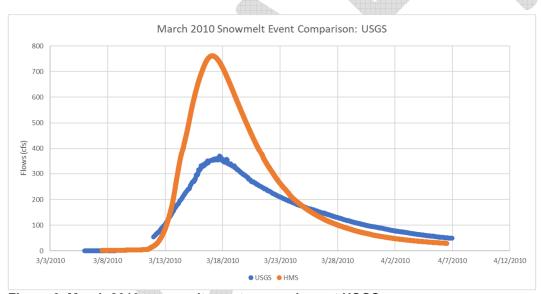


Figure 6. March 2010 snowmelt event comparison at USGS.



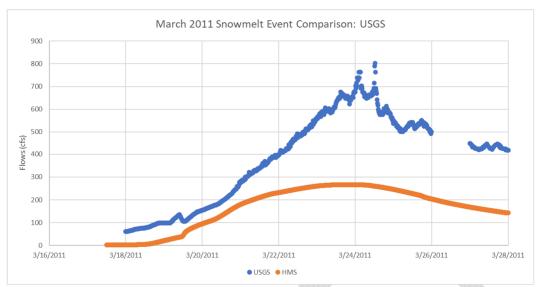


Figure 7. March 2011 snowmelt event comparison at USGS.

Based on the acceptable NSE Indexes (> 0.75) shown in Figures 1, 2, and 5 and the accurate timing of the peak flows shown in Figures 6 and 7, no further changes were made to curve numbers or lag times of the HEC-HMS Model. After calibration, flows for the 10%, 2%, 1%, and 0.2% rain events were calculated in the HEC-HMS model and inported into the HEC-RAS model to calculate elevations and hydraulics for the floodplain mapping task.

3.0 HYDRAULIC MODEL (HEC-RAS) UPDATES

Stantec updated hydraulic connections and downstream boundary conditions within the HEC-RAS model to calculate better estimates of peak water surface elevations. Three groups of updates were made to the HEC-RAS Model:

- Hydraulic crossings (bridges, culverts, weirs, and dams),
- Stream alignments, and
- Downstream boundary conditions.

The following sections provide an overview of these updates, while Appendix C provides additional details.

3.1 Hydraulic Crossing Updates

Fifty-three (53) hydraulic crossings, including Elm Creek Dam, were updated in the HEC-RAS model based on construction drawings, surveys, photos, and as-built information. These 53 structures were highlighted in the Third-Party Review (Stantec, January 2022). The updates included upstream/downstream inverts, road overflow elevation, pipe size, pipe material, and ground elevation (based on LiDAR). The details and any assumptions for these updates are listed in Appendix C



3.2 Stream Alignment Updates

Two major stream alignments were updated in the HEC-RAS Model, as follows:

1) County Ditch 16 east of Brockton Lane (County Road 101).

The alignment of County Ditch 16 was updated to match the record plans from Maple Grove. The ditch is routed through a series of storm sewer pipes beneath Vagabond Lane N and Bass Lake Road. The outlet is on the north side of Bass Lake Road where the ditch line then continues north. The storm sewer was modeled as a culvert without any bends for simplicity. The upstream invert elevation is where the ditch enters the storm sewer, and the downstream invert is where it leaves the storm sewer.

 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 appeared to show a temporary construction alignment of the creek. The alignment was updated to follow the permanent alignment of the watercourse, per record drawings from the City of Plymouth. The watercourse is routed through a culvert crossing County Road 47, and then through a storm sewer pipe, modeled as a culvert, under a new residential development. The storm sewer outlets to a wetland where the watercourse realigns with the natural flow path of the stream.

3.3 Downstream Boundary Condition Updates

As directed by the MNDNR, the downstream boundary conditions were modeled using a 'normal depth' in HEC-RAS. Each of the normal depth boundary conditions were reviewed and the upstream/downstream slopes were changed when necessary. In addition, the most downstream cross section of each tributary and the nearest downstream cross section of the main stem were reviewed to confirm that the tributary cross section had a lower water surface elevation than the main stem cross section. By verifying each tributary had a lower water surface elevation than the main stem, an appropriate tie-in could be made. The elevations along each flooding source could be evaluated independently and the water surface elevation at the confluences would be dictated by the main flooding source elevations.

4.0 RESULTS AND FLOODPLAIN MAPPING

After the hydrologic (HEC-HMS) and hydraulic (HEC-RAS) models were updated, the updated flows for the 10%, 2%, 1%, 0.2%-annual-exceedance-events were exported from the hydrologic model (HEC-HMS) and imported into the HEC-RAS Model. Results from the 1% and 0.2%-annual-exceedance-events are shown in Appendix D, along with a comparison to the effective 2016 FIS flood elevations at road crossings, lettered FEMA cross sections, and other pertinent locations across the watershed.

In addition to the updated models and results, floodplain inundation maps were created 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 was used to automatically generate output and create maps. The maps were then reviewed to correct any issues the initial mapping had at bridge and culvert crossing, sharp turns in the watercourse, and other common automated mapping output issues to display accurate maps. During the mapping iterations, updates needed to be made to the HEC-RAS model. The inundation maps are shown in Appendix E. Appendix F provides a summary of the HEC-RAS model updates that were required for mapping.

APPENDIX A

HEC-HMS Sub-basin Updates

| HMS Basin | Changes made |
|-----------|--|
| DC1 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC1 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC3 | Updated Cross Sections with 8 Point |
| EC5 | Storage Added and updated Cross Section with 8 Point |
| EC7 | Updated Cross Sections with 8 Point |
| EC8 | Storage Curves Updated |
| EC10 | Storage Added, 3 reaches removed to model storage |
| EC11 | Storage Curves Updated |
| EC12 | Storage Curves Updated |
| EC13 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC16 | Updated Cross Sections with 8 Point |
| EC17 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC19 | Updated Cross Sections with 8 Point |
| EC20 | Storage Curves Updated |
| EC22 | Storage Curves Updated |
| EC24 | Updated Cross Sections with 8 Point |
| EC26 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC27 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC29 | Storage Added, Outlet assumed from imagery and LiDAR |
| EC30 | Storage Curves Updated |
| EC34 | Storage Curves Updated |
| RC1 | Updated Cross Sections with 8 Point |
| RC2 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC4 | Storage Curves Updated |
| RC5 | Updated Cross Sections with 8 Point |
| RC6 | Updated Cross Sections with 8 Point |
| RC7 | Storage Curves Updated |
| RC8 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC9 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC10 | Storage Curves Updated |
| RC11 | Updated Cross Sections with 8 Point |
| RC12 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC13 | Storage Added, Outlet assumed from imagery and LiDAR |
| RC15 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC1 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC2 | Storage Added, 1 reach removed to model storage |
| SFRC3 | Storage Curves Updated |
| SFRC4 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC7 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC8 | Storage Curves Updated |
| SFRC10 | Storage Curves Updated |
| SFRC13 | Storage Added, Outlet assumed from imagery and LiDAR |
| SFRC14 | Storage Curves Updated |
| SFRC17 | Storage Curves Updated |
| SFRC19 | Storage Curves Updated |
| SFRC21 | Storage Added, Outlet assumed from imagery and LiDAR |

APPENDIX B

Hydrologic Routing Example

| | | | | | | | Original Subasin | Subasin Component for | Original Subbasin | Subbasin Flow | Original Reach | Reach Component for | | Reach Flow | HMS | Adjusted |
|-----------------------|-------------|------------------|-------------|-----------|-----------|-----------------|------------------|-----------------------|-------------------|---------------|----------------|---------------------|-----------------|--------------|--------|----------|
| IEC-RAS Cross-section | Location ID | StreamName | HMSElement | OrigBasin | OrigReach | HMS_Comm | Area | Ratio | Discharge | Contribution | Length | Ratio Orig | inal Reach Flow | Contribution | Flows | Flows |
| | RCBR7_01 | RushCreek_BR7 | RC3P | | | | | | | | | | | | 49.5 | 49.5 |
| | RCBR6_01 | RushCreek_BR6 | RC4P | | | | | | | | | | | | 30.5 | 30.5 |
| | RCBR5_03 | RushCreek_BR5 | SFRC10P | | | | | | | | | | | | 33.3 | 33.3 |
| | RCBR5_02 | RushCreek_BR5 | SFRC8P | | | | | | | | | | | | 49.8 | 49.8 |
| 1471 | RCBR5_01 | RushCreek_BR5 | SFRC4P | | | | | | | | | | | | 142.5 | 142.5 |
| 10876 | RCBR4_01 | RushCreek_BR4 | SFRC11P | | | | | | | | | | | | 19.3 | 19.3 |
| 10604 | RCBR3_02 | RushCreek_BR3 | SFRC15P | | | | | | | | | | | | 26.2 | 26.2 |
| | RCBR3_01 | RushCreek_BR3 | SFRC14P | | | | | | | | | | | | 62.5 | 62.5 |
| | RCBR2_01 | RushCreek_BR2 | SFRC19P | | | | | | | | | | | | 25 | 25 |
| | RCBR1_01 | RushCreek_BR1 | SFRC17P | | | | | | | | | | | | 50.5 | 50.5 |
| 105486 | | RushCreek | Jubert Lake | | | | | | | | | | | | 76.5 | 76.5 |
| 99522 | RC_08 | RushCreek | JSFRC13_1 | SFRC13 | | plus SR | 1.525122 | 0.437085 | 65.1 | 18.65702121 | | | | | 124.2 | 142.9 |
| | RC_07 | RushCreek | SFRC7P | | | | | | | | | | | | 184.2 | 184.2 |
| | RC_06 | RushCreek | JSFRC4_1 | | | | | | | | | | | | 265.8 | 265.8 |
| 77175 | RC_05 | RushCreek | SFRC2P | | | | | | | | | | | | 357 | 357 |
| 62766 | RC_04 | RushCreek | SFRC1P | | | | | | | | | | | | 396.1 | 396.1 |
| 53717 | RC_03 | RushCreek | RC2P | | | | | | | | | | | | 878 | 878 |
| 37740 | RC_02 | RushCreek | JRC1_2 | | | | | | | | | | | | 914.3 | 914.3 |
| 12615 | RC_01 | RushCreek | EC3R2 | EC3 | | plus SR | 1.904015 | 0.451326 | 69.8 | 16.54532911 | | | | | 986.9 | 1003.4 |
| 17919 | NFRCBR2_01 | NFRushCreek_BR2 | RC7P | | | | | | | | | | | | 33.8 | 33.8 |
| 8127 | NFRCBR_01 | NFRushCreek_BR1 | RC9P | | | | | | | | | | | | 49.9 | 49.9 |
| 73290 | NFRC_07 | NorthForkRushCrk | RC15P | | | | | | | | | | | | 43 | 43 |
| 60120 | NFRC_06 | NorthForkRushCrk | RC13P | | | | | | | | | | | | 91.9 | 91.9 |
| 41705 | NFRC_05 | NorthForkRushCrk | RC12P | | | | | | | | | | | | 117 | 117 |
| 30100 | NFRC_04 | NorthForkRushCrk | RC12R | | | | | | | | | | | | 157.1 | 157.1 |
| 24861 | NFRC_03 | NorthForkRushCrk | JRC8 | | | | | | | | | | | | 311.5 | 311.5 |
| 18282 | NFRC 02 | NorthForkRushCrk | JRC5 | | | | | | | | | | | | 359 | 359 |
| 11411 | NFRC_01 | NorthForkRushCrk | JRC5_2 | | RC5R | minus RR | | | | | 10414.20174 | 1315.207985 | 458.3 | 57.87863868 | 458.3 | 400.4 |
| 16051 | ECBR5_01 | ElmCreek_BR5 | EC22P | | | | | | | | | | | | 113.6 | 113.6 |
| 12125 | ECBR4_02 | ElmCreek_BR4 | EC19R3 | | | | | | | | | | | | 5.6 | 5.6 |
| 6036 | ECBR4_01 | ElmCreek_BR4 | EC19R3 | EC19 | | plus SR | 3.436849 | 1.116634 | 122.5 | 39.80031273 | | | | | 5.6 | 45.4 |
| 1766 | ECBR3_01 | ElmCreek_BR3 | EC27P | | | | | | | | | | | | 34.9 | 34.9 |
| 13614 | ECBR2_02 | ElmCreek_BR2 | EC26R2 | EC26 | | Assumed = split | 2.430516 | 1.215258 | 344.3 | 172.15 | | | | | 17.7 | 189.9 |
| 4652 | ECBR2_01 | ElmCreek_BR2 | JEC26 | | | | | | | | | | | | 344.3 | 344.3 |
| 10253 | ECBR1_01 | ElmCreek_BR1 | SR26 | EC26 | | Assumed = split | 2.430516 | 1.215258 | 344.3 | 172.15 | | | | | 0 | 172.2 |
| 132106 | EC_09 | ElmCreek | EC30P | | | | | | | | | | | | 38.1 | 38.1 |
| 122487 | EC_08 | ElmCreek | EC29P | | | | | | | | | | | | 72.1 | 72.1 |
| 117239 | | ElmCreek | JEC26_1 | | | | | | | | | | | | 235.3 | 235.3 |
| 93233 | EC_06 | ElmCreek | JEC16 | | | | | | | | | | | | 488.4 | 488.4 |
| 71366 | EC_05 | ElmCreek | EC10P | | | | | | | | | | | | 527.3 | 527.3 |
| 63137 | EC_04 | ElmCreek | Rice Lake | | | | | | | | | | | | 688.6 | 688.6 |
| 54439 | EC_03 | ElmCreek | JEC5 | | | | | | | | | | | | 749.4 | 749.4 |
| 34765 | EC_02 | ElmCreek | JEC3_2 | | | | | | | | | | | | 1779.6 | 1779.6 |
| 9268 | EC_01 | ElmCreek | EC1P | | | | | | | | | | | | 1950 | 1950 |
| 33492 | DC_02 | DiamondCreek | French Lake | | | | | | | | | | | | 17.3 | 17.3 |
| 25449 | DC 01 | DiamondCreek | JDC1 | DC1 | | plus SR | 3.854982 | 1.122419 | 89.5 | 26.05887667 | | | | | 46.4 | 72.5 |

APPENDIX C

Hydraulic Crossing Updates

| | | | | | | Preliminary | HUC-8 HEC | C-RAS N | /lodel | | | | | Data Rev | iew and Stantec | Updates | |
|--------------------------|-------------------------------|--------------|----------------------------|---------------------------------|---------------|---|-----------------------------------|-------------------------|-------------------------|----------------------------|--|---|----------------------------|-------------------|----------------------|--|--|
| 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 | Internal Review |
| 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 | ENO_(RICE_Lake_DAM)_D0 |
| 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 | |
| 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 | 1684-74 Elm Creek Dam Roadway - RECORD PLAN.pdf |
| 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 | STS1888.pdf |
| Plymouth | Trojan Trail/ Wayzata High | А | 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 | STS1887.pdf |
| Corcoran/ Medina | Hackamore Road | Α | 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 | Ok- Consistent |
| 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 | Ok- Consistent |
| 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 | STS1972 and STS19733.pdf has limited info |
| 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 | STS1972.pdf top right comer |
| Plymouth | Troy Ln | А | 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 | STS1901.pdf |
| 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 | N/A |
| 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 | STS1846.pdf, STS1855.pdf |
| 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 | ENA_20_07_17-A0.pdf (construction drawing) PD |
| Maple Grove | Private Road | Α | 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 ENA_20_17-11_A0.pdf, sheet 14 |
| Maple Grove | Vagabond Court | А | 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 | ENA_20_01-17_A0.pdf (see PDF page 100 and 10 |
| Maple Grove | Co. Rd. 10 | А | 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 | ENA_20_12-15_A0.pdf |
| 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 | Α | 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 | ENA_20_07-10_A0 |
| Maple Grove | Lawndale Ln | А | 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 | MNDOT-BridgeInfo3 App. ID 97986 and ENA_19 |
| Maple Grove | Inland Ln | А | 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 | ENA_19_97-42_A0.pdf |
| Corcoran | Co. Rd. 116 | A AF | NFRushCreek NFRushCreek | NFRushCreek_BR1 NorthFrkRushCrk | 5112 73093 | 5' Circular 2 5' Circular | | 914.7 | 914.7 1001.2 | 920.8 | Assumed from aerial imagery Assumed from aerial imagery | 3' Circular CMP | 913.04 | 912.96 1000.18 | 921.15 1009.29 | City of Corcoran Survey 2021 | |
| Rogers | Fletcher Lane | А | NFRushCreek | NorthFrkRushCrk | 10707 | 15' x 6' Box | | 905.1 | 905.1 | 915.0 | Assumed from aerial imagery | 8x | 14' Precast Concrete Box | | | MNDOT- BridgeInfo3. App ID 27J52 | |
| Dayton/ Rogers | Brockton Lane | А | NFRushCreek | NorthFrkRushCrk | 5258 | Bridge | 189 | 903.8 | 903.9 | 910.7 | Assumed from aerial imagery | 41.7'Sp | an Bridge (207sq ft conve | eance) | | MNDOT- BridgeInfo3. App ID 27B87 | |
| Maple Grove | 105th Ave N | AE | RushCreek | RushCreek | 36346 | Bridge | 787 | 899.2 | 899.0 | 919.0 | Assumed from aerial imagery | 379.3' Spar | n Bridge over I-94 and Rus | sh Creek | | MNDOT- BridgeInfo3. App ID 27251 | |
| Corcoran | Horseshoe Trail | Α | 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 | А | 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 | А | 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 | This seems off but matches the survey |
| Corcoran | Rolling HIlls Road | А | 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 | |
| Corcoran | Private Road | Α . | 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 Co. Rd. 50 | A | RushCreek RushCreek | RushCreek_BR4 RushCreek_BR4 | 4523 1774 | 2' Circular 5' Circular | | 962.1 946.0 | 962.0 946.0 | 964.7 952.7 | Assumed from aerial imagery Assumed from aerial imagery | 2' Cicrular CMP 4' Circular CMP | 959.23 944.74 | 959.16 944.49 | 961.5 953.12 | City of Corcoran Survey 2021 City of Corcoran Survey 2021 | |
| Corcoran | Settlers Road | A | RushCreek | RushCreek_BR5 | 16293 | 5' Circular | | 973.7 | 974.1 | 952.7 | Assumed from aerial imagery Assumed from aerial imagery | 4' Circular CMP 3' Circular PVC | 944.74 | 973.73 | 953.12 | City of Corcoran Survey 2021 City of Corcoran Survey 2021 | |
| Corcoran | Private Road | А | 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 | |

| | | | | | | Preliminary | HUC-8 HF | -RAS N | Indel | | | | | Data Revi | iew and Stantec | Undates | |
|--------------|-------------------|--------------|-----------|---------------|------------|---|-----------------------------------|-------------------------|-------------------------|----------------------------|-----------------------------|----------------------------|-------------------|----------------|----------------------|---|-----------------|
| 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) | | Road Overflow (feet) | Structure Data Source | Internal Review |
| Corcoran | Blue Bonnet Drive | Α | 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 | А | 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 | А | RushCreek | RushCreek_BR5 | 654 | Bridge | 101 | 938.4 | 938.6 | 947.8 | Assumed from aerial imagery | 10x6' Precast Concrete Box | 938.98 | 938.79 | | City of Corcoran Survey 2021 & MNDOT- BridgeInfo3. App ID 90462 | |
| Dayton | Holly Ln | А | 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 Municiapi 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 | |

APPENDIX D

2016 FIS Comparison Tables

| | | 1% AEP Com | parison of ECWMC 2016 | FIS Flood Profiles to | Stantec HUC-8 Revised | Model Results - | Flood Elevations and Pe | ak Discharges | | |
|----------------------|----------------|--|--|------------------------------------|-------------------------------|-----------------|-------------------------------|--------------------|---------------------------------------|--|
| | | | | | ECWMC FIS Floor | l Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | Change in Flood Elec and Flow Rate | |
| | | | | | 100-yr | | 100-yr | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation Flow Ra (feet) | te (CFS) Notes |
| lm Creek | 1767 | U.S. Route 169 (US) | * (Data not applicable) | | 851.5 | 2,780 | | 1950 | | (830) At conflucence with Mississippi |
| Im Creek | 2505 4251 | U.S. Route 169 (US), US of A U.S. Route 169 (US), US of B | * (Data not applicable) * (Data not applicable) | | 851.7 851.7 | | 853.67 853.66 | | 2.0 2.0 | |
| lm Creek Im Creek | 4251 4604 | | | | 851.7 851.8 | | 853.66 853.71 | | | |
| | | Cartway Road (DS) | | | | | 857.04 | | | |
| Im Creek Im Creek | 4750 5731 | Cartway Road (US) US of confluence with Elm Creek. DS of | 0.85 | | 856.3 856.4 | | 857.58 | | | |
| III Greek | 3731 | Fernbrook Lane | 0.50 | | 030.4 | | 037.30 | 1330 | | |
| Im Creek | 6876 | DS of Fernbrook Lane, US of F | 1.20 | 3 | 856.6 | | 857.68 | 1950 | 1.1 | |
| Im Creek | 7643 | DS of Fernbrook Lane, US of G | 1.40 | | 856.7 | | 857.78 | | | |
| lm Creek | 8448 | Fernbrook Lane (County and State Aide Highway 121) | 1.56 | | 856.7 | | 857.78 | 1950 | 1.1 | |
| Im Creek | 8719 | US of Fernbrook Lane | 1.62 . | | 856.7 | | 857.79 | 1950 | 1.1 | |
| Im Creek | 9684 | US of Fernbrook Lane, US of J | 1.76 | < | 857.4 | | 858 | | 0.6 | |
| Im Creek | 9883 | US of Fernbrook Lane, US of K | 2.19 | | 857.5 | | 858.01 | | | |
| Elm Creek | 10985 | US of Fernbrook Lane, US of L | 2.30 | | 857.8 | | 858.03 | | | |
| lm Creek | 11340 | US of Fernbrook Lane, US of M | 2.34 | | 857.8 | | 858.04 | | | |
| Im Creek | 19957 | DS of Elm Creek Road, DS of P | 3.98 | | 858.3 | | 858.31 | | | |
| Im Creek | 22253 | DS of Elm Creek Road, DS of Q | 4.34 | | 858.3 | | 858.69 | | | |
| Im Creek | 24546 | Elm Creek Road (DS), DS of R | 4.62 | | 858.5 | | 859.89 | | | |
| Im Creek Im Creek | 25060 25541 | DS of Elm Creek Road, DS of S Elm Creek Road (DS) | 4.71 4.80 | | 860.5 861.4 | | 860.47 861.03 | | | |
| Im Creek | 26148 | Elm Creek Road (US) | 4.80 | | 861.4 861.8 | | 861.03 861.24 | | | |
| Im Creek | 26220 | DS of Pineview Lane, US of Elm Creek | 4.95 | | 863.1 | | 861.78 | | | |
| ilm Creek | 28303 | Road, DS of V DS of Pineview Lane, US of Elm Creek | 5.21 | | 863.1 | | 862.86 | | | |
| Im Creek | 29590 | Road, DS of W DS of Pineview Lane, US of Elm Creek | 5.21 | | 864.2 | | 863.73 | | | |
| Im Creek | 32034 | Road, DS of Y DS of Pine View Lane | 5.75 | | 865.8 | | 865.04 | | | |
| Im Creek | 32439 | DS of Pineview Lane, US of Elm Creek | 5.84 | | 866.3 | | 865.35 | | | |
| .iiii Creek | 32433 | Road, DS of Z | 3.04 | | 000.3 | | 005.55 | 1775.0 | -0.5 | |
| Im Creek | 33241 | DS of Pineview Lane, US of Elm Creek Road, DS of AA | 5.99 | 2 | 867.8 | | 866.18 | 1779.6 | -1.6 | |
| Creek | 34180 | Pine View Lane (DS) | 6.10 . | | 869.2 | | 866.82 | 1779.6 | -2.4 | |
| Im Creek | 34246 | Pine View Lane (US) | 6.14 | AB | 869.3 | | 866.99 | 1779.6 | -2.3 | |
| Elm Creek | 34783 | DS of Confluence of Bush Creek, US of Pine View Lane | 6.21 | AC | 869.3 | | 867.09 | 1779.6 | -2.2 | |
| Elm Creek | 35380 | Confluence of Bush Creek (DS) | 6.31 | AD | 869.4 | 945 | 867.29 | 1779.6 | -2.1 | 835 FIS location: Above junction of Rush Creek, just inside corporate limits of City of Dayton. Looked Cross sections on Arcmap and this aligns with the described location. |
| Elm Creek | 36616 | DS of Pine View Lake, DS of AI | 6.63 | AE | 869.6 | | 868 | 749.4 | -1.6 | |
| Im Creek | 37254 | Pine View Lake (DS), downstream of AG | 6.77 | A.F | 869.6 | | 868.16 | 749.4 | -1.4 | |
| Im Creek | 39639 | Pine View Lake (DS) | 7.36 | | 870.1 | | 868.99 | | | |
| Im Creek | 41126 | DS of Pine View Lake, DS of AI | 7.70 | | 870.9 | | 870.18 | | | |
| Im Creek | 42433 | DS of Pine View Lake, DS of AJ | 7.99 | | 871.3 | | 870.88 | | | |
| Im Creek | 43181 | Pine View Lake (DS) | 8.20 | | 871.6 | | 871.36 | | | |
| Im Creek | 43585 | Pine View Lake (US) | 8.37 | | 873.8 | | 872.06 | | | |
| Im Creek | 44250 | DS of Territorial Road, US of Pine View Lake, DS of AM | 8.46 | | 874.2 | | 873.36 | | | |
| Im Creek | 46044 | DS of Territorial Road, US of Pine View Lake, DS of AN | 8.75 | | 874.6 | | 874.9 | | | |
| Im Creek | 47970 | Territorial Road (DS) | 9.20 | | 875.2 | | 876.03 | | | |
| Im Creek | 48986 | Minnesota Trunk Highway 52 (DS) | 9.44 | | 876.2 | | 878.34 | | | |
| Im Creek | 49361 | Minnesota Trunk Highway 52 (US), DS of Railroad | 9.52 | | 877.1 | | 878.61 | | | |
| Im Creek | 49968 | US of Railroad that is US of Minnesota Trunk Highway 152 | 9.63 . | | 879.8 | | 879.05 | | | |
| Im Creek | 50514 | US of Railroad, DS of Rice Lake Dam, DS o AS | f 9.72 | AK | 880.0 | | 879.6 | 749.4 | -0.4 | |

| | | | | | | | | | Change in I | lood Elevations | |
|---------------------------|----------------|---|--|------------------------------------|----------------------------------|-----------------|-------------------------------|--------------------|------------------------------|-----------------|---|
| | | | | | ECWMC FIS Floor | l Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | | low Rates | |
| <u>.</u> | | | | | 100-уг | | 100-уг | | | LOO-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Im Creek | 51433 | Rice Lake Dam (DS) | 9.91 | | 881.8 | | 880.01 | | -1.8 | | |
| Elm Creek Elm Creek | 52499 53197 | DS of Rice Lake Dam, DS of AU Rice Lake Dam (DS) | 10.12 a | | 882.9 884.1 | | 880.99 882.26 | 749.4 749.4 | | | |
| Mill Pond (Elm Creek) | 53796 | | | AV | 893.9 | 860 | | 749.4 | | | FIS Location: 10.33 mi above Mill Pond Spillway. |
| viiii roilo (ciiii cleek) | 33750 | | NOC IISLEU III FIS | ~ | 653.5 | 800 | 053.05 | 745.4 | 0.0 | (111) | Looked on Arcmap and this cross section is on El Creek but near Mill pond and Rice Lake. The cros section on FIS prfile is 10.35 mi above the Mill Pond Spillway. I think all the Mill Pond cross sectins are actually part of Elm Creek and then would in turn have a creek distance. The missing Cross sections from the Elm Creek correspond to the cross section in the Mill Pond main stem. |
| Mill Pond (Elm Creek) | 65333 | | | ΑW | 893.9 | 750 | | | | | FIS Location: 12.52 mi above Mill Pond Spillway. Looked on Arcmap and this cross section is on El Creek but near Mill pond and Rice Lake. The cros section on FIS prfile is 12.52 mi above the Mill Pond Spillway |
| Mill Pond (Elm Creek) | 65946 | | | ΑX | 894.1 | | 894.18 | | | | |
| Elm Creek Elm Creek | 66592 66781 | West Rice Lake Road West Rice Lake Road (US) | 12.76 | | 894.6 895.3 | | 894.24 894.26 | | | | |
| Elm Creek | 67119 | DS of Weaver Lake Road, US of West Rice | 12.78 | _ | 895.6 | | 894.39 | | | | |
| Elm Creek | 68058 | Lake Road DS of Weaver Lake Road, US of West Rice | 13.05 | | 897.3 | | 894.61 | | | | |
| | | Lake Road | | | | | | | | | |
| Elm Creek | 68853 | Weaver Lake Road | 13.17 | | 898.4 | | 895.98 | | | | |
| Im Creek | 69167 | Weaver Lake Road (US) | 13.25 | | 898.4 | | 896.09 | 527.3 | | | |
| Elm Creek Elm Creek | 69875 70093 | US of Weaver Lake Road, DS of BF US of Weaver Lake Road, DS of BG | 13.37 13.44 | | 898.4 898.4 | | 896.11 896.14 | | | | |
| Elm Creek | 70462 | US of Weaver Lake Road, DS of BH | 13.48 | | 898.5 | | 896.22 | | | | |
| Elm Creek | 71981 | Weaver Lake Road (US) | 13.77 | | 898.5 | | 896.27 | | | | |
| Elm Creek | 73933 | DS of Farm Driveway | 14.10 | | 898.5 | 690 | | | | (202) | FIS Location: 14.08 miles above Mill pond spillway |
| Im Creek | 74436 | DS of Farm Driveway, DS of BK | 14.30 | | 901.5 | | 898.84 | | | | |
| Elm Creek | 74718 | Dunkirk Lane | 14.41 | | 903.7 | | 899.28 | | | | |
| Elm Creek Elm Creek | 74971 75680 | Dunkirk Lane (US) US of Dunkirk Lane, DS of Bass Lake Road, DS of BN | 14.44 14.55 | | 903.9 905.1 | | 901.23 902.39 | | | | |
| Elm Creek | 76495 | US of Dunkirk Lane, DS of Bass Lake Road, DS of BO | 14.72 | BN | 906.0 | | 903.78 | 488.4 | -2.2 | | |
| Elm Creek | 77331 | DS of Bass Lake Road, US Dunkirk Lane, DS of BP | 14.86 | 30 | 906.2 | | 904.97 | 488.4 | -1.2 | | |
| Elm Creek | 79194 | DS of Bass Lake Road, US Dunkirk Lane, DS of BQ | | | 906.4 | | 906.08 | | | | |
| Elm Creek | 80843 | DS of Bass Lake Road, US Dunkirk Lane, DS of BR | | | 908.1 | | 906.83 | | | | |
| Elm Creek Elm Creek | 82336 82996 | DS of Bass Lake Road Bass Lake Road | 15.75 15.90 | | 909.8 910.4 | | 908.7 909.19 | | | | |
| Elm Creek | 83398 | DS of Elm Road, US of Bass Lake Road, DS of BU | 15.95 | | 910.7 | | 909.48 | | | | |
| Elm Creek | 83890 | DS of Elm Road, US of Bass Lake Road, DS of BV | 16.05 | BU | 910.9 | | 909.83 | 488.4 | -1.1 | | |
| Elm Creek | 84476 | DS of Elm Road, US of Bass Lake Road, DS of BW | 16.16 | | 911.0 | | 909.88 | | | | |
| Elm Creek | 85470 | DS of Elm Road, US of Bass Lake Road, DS of BX | 16.35 | | 911.0 | | 910.12 | | | | |
| Elm Creek Elm Creek | 86861 88288 | DS of Elm Road, US of Bass Lake Road DS of Elm Road, US of Bass Lake Road, DS of B7 | 16.52 16.74 | | 911.0 915.4 | 520 | 911.35 914.44 | | | (32 | On FIS the creek distance for the 100-yr peak flow rate is 16.73, used this peak flow rate |
| Elm Creek | 88898 | DS of Elm Road, US of Bass Lake Road, DS of CA | 16.82 | 3Z | 916.7 | | 915.3 | 488.4 | -1.4 | | |
| Elm Creek | 90652 | Elm Road (DS) | 17.04 | CA | 918.9 | | 918.09 | 488.4 | -0.8 | | |
| Im Creek | #N/A | Elm Road (US) | 17.11 | | 920.6 | | #N/A | #N/A | #N/A | | |
| Im Creek | 91739 | US of Elm Road, US of CB | 17.24 | | 921.0 | | 919.96 | 488.4 | | | |
| Im Creek | 92290 | US of Elm Road, US of CC | 17.34 | | 921.6 | | 920.71 | 488.4 488.4 | | | |
| Elm Creek Elm Creek | 93102 93848 | US of Elm Road, DS of CF US of Elm Road, US of CE | 17.50 17.63 | | 922.2 922.3 | | 921.2 921.36 | | | | |
| Elm Creek | 111598 | US of State Highway 55, DS of State Highway 101 and CH | 20.66 | | 959.6 | 245 | | | | (10 | FIS Location: At Medina-Plymouth corporate boundary limits. This Cross section is the closest to the city boundaries |

| | | 1% AEP Comp | arison of ECWMC 2016 | FIS Flood Profiles to | Stantec HUC-8 Revised I | /lodel Results - I | Flood Elevations and Pe | ak Discharges | | | |
|-----------------|------------|--|--|------------------------------------|-------------------------------|--------------------|-------------------------------|-----------------|------------------------------|-----------------------------|---|
| | | 2///23 | <u></u> | | ECWMC FIS Floor | | ECWMC HUC-8 Revised Mo | | | lood Elevations ow Rates | |
| | | | | | 100-yr | | 100-yr | | 1 | 00-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above State Route 12 (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Elm Creek | 112306 | State Highway 101 (DS) | 20.73 | CH | 962.1 | | 961.57 | 235.3 | | | |
| Elm Creek | 112413 | State Highway 101 (US) | 20.75 | 1 | 963.9 | | 963.66 | 235.3 | -0.2 | | |
| Elm Creek | 113170 | DS of Access Road, US of State Highway 101 | 20.87 | | 966.0 | | 965.78 | 235.3 | | | |
| Elm Creek | 113302 | US and DS of two Access Road, US of State Highway 101 | 20.91 | CK | 972.4 | | 972.4 | 235.3 | 0.0 | | |
| Elm Creek | 113654 | US and DS of two Access Road, US of State Highway 101, US of CK | 20.96 | CL . | 972.5 | | 972.6 | 235.3 | 0.1 | | |
| Elm Creek | 113752 | US of Access Road, DS of Railroad | 21.00 | CM | 972.7 | | 972.62 | 235.3 | -0.1 | | |
| Elm Creek | 114334 | US Access road, DS railroad and Hamel Road | 21.11 | CN | 972.7 | 210 | 972.65 | 235.3 | -0.1 | | FIS Location: Below Soo Line Bridge, near Hamel Road. I think this is the correct cross section location but not positive. Double check |
| Elm Creek | 114472 | Railroad, DS of Hamel Road | 21.14 | 0 | 974.6 | | 975.33 | 235.3 | 0.7 | | |
| Elm Creek | 114953 | DS of Hamel Road, US of Railroad | 21.21 | CP. | 974.6 | 65 | 975.33 | 235.3 | 0.7 | | FIS Location: downstream of Hamel Road, near Pinto Drive. I picked the cross section that is farthest DS of Hamel Road (Creek meanders around it), and is still near Pinto Road. |
| Elm Creek | 115445 | Elm Creek Drive (DS) | 21.29 | 0 | 975.7 | | 976.29 | 235.3 | 0.6 | | |
| Elm Creek | 115587 | Elm Creek Drive (US) | 21.32 | | 976.9 | | 976.36 | 235.3 | | | |
| Elm Creek | 116667 | Sewage Lagoon Road (DS) | 21.50 | | 976.9 | | 976.55 | 235.3 | | | |
| Elm Creek | 116797 | Sewage Lagoon Road (US) | 21.53 | | 977.0 | | 976.67 | 235.3 | | | |
| Elm Creek | 117854 | DS of Confluence of Tributary to Elm Creek | 21.73 | CU | 977.0 | | 976.68 | 235.3 | -0.3 | | |
| Elm Creek | 118767 | DS of Hamel Road, DS of CW | 21.90 | CV | 977.1 | | 976.76 | 72.1 | -0.3 | | |
| Elm Creek | 119019 | DS of Hamel Road | 21.94 | CW | 977.5 | | 977.34 | 72.1 | -0.2 | | |
| Elm Creek | 119205 | US of Hamel Road DS of SOO Line Railroad | 21.97 | CX . | 977.7 | | 977.67 | 72.1 | 0.0 | | |
| Elm Creek | 119439 | US of Hamel Road DS of SOO Line Railroad | 22.02 | CY | 977.9 | | 977.7 | 72.1 | -0.2 | | |
| Elm Creek | 120084 | DS of SOO Line Railroad | 22.15 | Z | 978.0 | | 977.74 | 72.1 | -0.3 | | |

| | | 1% AEP Comparison of I | CWMC FIS Flood Profi | les to Stantec HUC-8 Re | evised Model Res | suits - Flood Elev | ations arnd f | eak Discharges | 5 | | |
|------------------------|------------|--|---|--------------------------------|----------------------------------|--------------------|-------------------------------------|--------------------------------|------------------------------|--------------------------------|---|
| | | | | | ECWMC FIS F | lood Profiles | | -8 Revised Model d Profiles | | Flood Elevations Flow Rates | |
| | | | | | 100 |)-yr | 1 | 00-yr | : | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| ush Creek | | 1 US of confluence with Elm Creek | 0.26 | | 869.60 | 1,330 | 868.44 | 1003.4 | | | |
| ush Creek | | O US of confluence with Elm Creek, DS of C | 0.76 | | 869.90 | | 871.25 | 1003.4 | | | |
| ush Creek ush Creek | | 1 US of confluence with Elm Creek, DS of D B US of confluence with Elm Creek, DS of E | 1.00 1.39 | | 871.60 874.30 | | 872.64 874.79 | 1003.4 1003.4 | | | |
| ush Creek | | 5 US of confluence with Elm Creek, DS of F | 1.52 | | 875.70 | | 875.47 | 1003.4 | | | |
| ish Creek | | 4 US of confluence with Elm Creek, DS of G | 1.87 | | 880.00 | | 878.1 | 1003.4 | | | |
| ush Creek | | 5 US of confluence with Elm Creek, DS of H | 2.14 | | 882.60 | | 881.29 | 1003.4 | | | |
| ush Creek | | 5 Fernbrook Lane (DS) | 2.36 | Н | 885.00 | | 882.91 | 1003.4 | -2.09 | | |
| ush Creek | | 7 At Fernbrook Lane | 2.42 | | 886.80 | | 883.92 | 914.3 | | | |
| ush Creek | | 0 Fernbrook Lane (US) | 2.60 | | 887.30 | | 885.24 | 914.3 | | | |
| ush Creek | | 5 US of Fernbrook Lane, DS of L | 2.68 | | 887.80 | | 885.45 | | | | |
| ush Creek ush Creek | | 4 US of Fernbrook Lane, DS of M | 2.94 3.01 | | 890.10 890.60 | | 886.57 886.81 | 914.3 914.3 | | | |
| ush Creek ush Creek | | 2 US of Fernbrook Lane, DS of N 4 US of Fernbrook Lane, DS of O | 3.01 | | 890.60 890.80 | | 886.81 887.19 | 914.3 914.3 | | | |
| ush Creek | | 1 US of Fernbrook Lane, DS of P | 3.05 | •• | 890.80 | | 887.19 888.85 | 914.3 | | | |
| ush Creek | | 9 US of Fernbrook Lane, DS of Q | 3.43 | | 894.00 | | 889.86 | 914.3 | | | |
| ush Creek | | O US of Fernbrook Lane, DS of R | 3.64 | | 895.70 | | 893 | 914.3 | | | |
| ush Creek | | 7 US of Fernbrook Lane, DS of S | 3.75 | | 896.90 | | 893.94 | 914.3 | | | |
| ush Creek | 21118 | 8 US of Fernbrook Lane, DS of T | 3.89 | | 898.90 | | 894.95 | 914.3 | | | |
| ush Creek | | 3 Territorial Road (DS) | 4.66 | | 905.50 | | 902.91 | 914.3 | | | |
| ush Creek | | 8 At Territorial Road | 4.70 | | 905.90 | | 903.09 | 914.3 | | | |
| ush Creek | | 4 Territorial Road (US) | 4.84 | | 906.10 | | 903.63 | 914.3 | | | |
| ush Creek | | 8 US of Territorial Road, DS of Minnesota Trunk Highway 152 | 5.00 | | 906.10 | 1,280 | 903.68 | | | | Location from FIS: 5 miles above confluence with Elm Creek |
| ush Creek | | 1 Minnesota Trunk Highway 152 (DS) | 5.22 | | 906.20 | | 903.89 | 914.3 | | | |
| ush Creek ush Creek | | 2 At Minnesota Trunk Highway 152 4 Minnesota Trunk Highway 152 (US), near | 5.30 5.61 | | 906.30 907.50 | | 904.05 905.66 | | | | |
| ush Creek | 31018 | Burling and Nor. RR B US of Burling and Nor. RR, DS of Dunkirk Lane | 5.67 | AA | 907.60 | | 905.78 | 914.3 | -1.82 | | |
| ush Creek | 3113 | 4 Dunkirk Lane (DS) | 5.71 | ΔR | 907.70 | | 905.78 | 914.3 | -1.92 | | |
| ush Creek | | 3 Dunkirk Lane (US) | 5.74 | | 907.80 | | 905.85 | 914.3 | | | |
| ush Creek | | 9 US of Dunkirk Lane, DS of AE | 5.78 | | 909.40 | | 906.28 | 914.3 | | | |
| ush Creek | 3228 | 7 US of Dunkirk Lane, DS of 105th Avenue N, DS of AF | 5.92 | AE | 909.70 | | 907.45 | 914.3 | -2.25 | | |
| ush Creek | 3346 | 1 105th Avenue N (DS) | 6.09 | AF | 909.70 | | 907.53 | 914.3 | -2.17 | | |
| ush Creek | | 2 At 105th Avenue N | 6.18 | | 909.70 | | 907.53 | 914.3 | | | |
| ush Creek | | 7 105th Avenue N (US) | 6.24 | | 911.70 | | 908.14 | 914.3 | | | |
| ush Creek | | 2 US of 105th Avenue N, DS of State Route 92/Interstate 94, DS of AH | 6.35 | | 911.80 | | 908.49 | | | | |
| ush Creek | | O State Route 92/Interstate 94 (DS) | 6.66 | | 911.90 | | 908.88 | 914.3 | | | |
| ush Creek ush Creek | | 7 State Route 92/Interstate 94 (US) D US of the confluence with North Fork Rush | 6.76 7.52 | | 913.00 913.00 | 680 | 909.25 909.81 | 914.3 914.3 | | | Location from FIS: 7.52 mi above |
| ush Creek | | Creek 8 US of the confluence with North Fork Rush | 7.85 | | 913.00 | 000 | 910.49 | | | | confluence with Elm Creek |
| usii Creek | 40406 | Creek, DS of 101st Avenue North, US of AL | 7.63 | AIVI | 913.00 | | 310.43 | 676 | -2.51 | | |
| ush Creek | 42214 | 4 US of the confluence with North Fork Rush Creek, DS of 101st Avenue North, US of AM | 8.05 | AN | 913.00 | | 912.14 | 878 | -0.86 | | |
| ush Creek | | 0 101st Avenue North (DS) | 8.28 | | 913.20 | | 912.8 | 878 | | | |
| ısh Creek | | 4 101st Avenue North (US) | 8.33 | | 914.50 | | 915.37 | 878 | | | |
| ush Creek | | 4 US of 101st Avenue North, DS of 97th Avenue North, US of AP | 8.48 | | 917.60 | | 916.47 | 878 | | | |
| ish Creek | 49423 | 3 US of 101st Avenue North, DS of 97th Avenue North, US of AQ | 8.67 | AR | 921.30 | | 922.15 | 878 | 0.85 | | |
| ush Creek | 5018 | 5 US of 101st Avenue North, DS of 97th Avenue North, US of AR | 8.84 | AS | 922.60 | | 922.84 | 878 | 0.24 | | |
| ush Creek | 51388 | B US of 101st Avenue North, DS of 97th Avenue North, US of AS | 9.08 | AT | 924.50 | | 923.63 | 878 | -0.87 | | |
| ush Creek | 5301: | 1 US of 101st Avenue North, DS of 97th Avenue North, US of AT | 9.37 | AU | 926.60 | | 926.48 | 878 | -0.12 | | |
| sh Creek | 5371 | 7 US of 101st Avenue North, DS of 97th | 9.48 | AV | 927.40 | | 926.88 | 878 | -0.52 | | |

Avenue North, US of AU

| | | 1% AEP Comparison of I | CWMC FIS Flood Profi | les to Stantec HUC-8 Re | evised Model Res | ults - Flood Elev | ations arnd F | eak Discharges | 5 | | |
|--|------------|--|----------------------|--------------------------------|----------------------------------|-------------------|-------------------------------------|--------------------------------|------------------------------|--------------------------------|---|
| | | | | | ECWMC FIS F | lood Profiles | | -8 Revised Model d Profiles | | Flood Elevations Flow Rates | |
| | | | | | 100 |)-yr | | 00-yr | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Elm Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| tush Creek tush Creek | | 1 97th Avenue N (DS) 3 At 97th Avenue N | 9.55 9.59 | | 927.70 928.50 | | 927.07 927.26 | 396.1 396.1 | | | |
| ush Creek | | 3 97th Avenue N (US) | 9.69 | | 928.50 | | 927.37 | 396.1 | | | |
| tush Creek | 56367 | 7 US of 97th Avenue N, DS of BA | 9.92 | AZ | 928.50 | | 927.39 | 396.1 | -1.11 | | |
| tush Creek | | 1 US of 97th Avenue N, DS of Minnnnesota Highway 10, US of AZ | 10.12 | | 928.60 | | 927.46 | | | | |
| tush Creek | | 2 US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BA | 10.22 | | 928.60 | | 927.65 | 396.1 | | | |
| Rush Creek | | 7 US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BB | 10.51 | | 929.70 | | 929.12 | | | | |
| Rush Creek | | 5 DS of Minnesota Highway 101, US of 97th Avenue North, DS of BE | 10.64 | | 930.30 | | 929.77 | | | | |
| Rush Creek | | 5 DS of Minnesota Highway 101, US of BD | 10.96 | | 932.10 | _ | 930.9 | | | | |
| Rush Creek Rush Creek | | 9 State Highway 101 (just DS) 5 DS of Private Road that is DS of Schute | 11.03 11.28 | | 932.40 934.00 | 570 | 931.18 932.19 | | | | FIS Location: At State Highway 101 |
| Rush Creek | | Road US of Private Road that is DS of Schute O US of Private Road that is DS of Schute | 11.28 | | 934.00 | | 932.19 | 357 | | | |
| Rush Creek | | Road US of Private Road that is DS of Schute Road US of Private Road near State Highway 10, | 11.30 | | 935.00 | | 933.27 | 357 | | | |
| Rush Creek | | DS of Schute Road, US of BH DS of Schute Road, US of BI | 11.42 | | 935.20 | | 933.38 | 357 | | | |
| Rush Creek | | 5 Schute Road (DS) | 11.64 | | 935.20 | | 933.42 | 357 | | | |
| Rush Creek | | 5 Schute Road (US) | 11.72 | | 935.20 | | 933.73 | 357 | | | |
| Rush Creek | 67465 | 5 US of Schute Road, DS of BN | 11.84 | BM | 935.30 | | 933.78 | 357 | -1.52 | | |
| Rush Creek | | 4 US of Schute Road, DS of BO | 12.16 | | 935.40 | | 933.97 | 357 | | | |
| Rush Creek | | 1 US of Schute Road, DS of BP | 12.38 | | 935.70 | | 934.64 | 357 | | | |
| Rush Creek | 76315 | 5 US of Schute Road, DS of County Highway 116, DS of BQ | 13.50 | | 936.10 | | 935.12 | 357 | | | |
| Rush Creek | | 1 County Highway 116 (DS) | 13.60 | | 936.10 | 470 | 935.63 | 357 | | (113) | FIS location: Just downstream of Count Road 116 |
| Rush Creek | | 5 County Highway 116 (US) | 13.66 | | 937.20 | | 938.1 | 357 | 0.50 | | |
| Rush Creek | | 5 US of County Highway 116, DS of County Highway 10, DS of BT | 13.94 | | 937.50 | | 938.35 | 265.8 | | | |
| Rush Creek | | 1 US of County Highway 116, DS of County Highway 10, DS of BU | 14.12 | | 937.90 | | 938.39 | 265.8 | | | |
| Rush Creek | | 3 US of County Highway 116, DS of County Highway 10, DS of BV | 14.44 | | 940.70 | 245 | 939.33 | | | | |
| Rush Creek | 8289: | 5 US of County Highway 116, DS of County Highway 10, DS of BW | 14.64 | ви | 942.40 | 315 | 941.92 | 265.8 | -0.48 | (49) | FIS location: Just aboved Unnamed Tributary approximately 0.3 miles downstream of County Highway 10. Cross section BV is ~0.39 mi downstrea of Highway 10 and downstream of a tri |
| Rush Creek | 84156 | 6 County Highway 10 (DS) | 14.78 | BW | 945.10 | | 944.56 | 265.8 | -0.54 | | |
| Rush Creek | | 3 County Highway 10 (US) | 14.86 | | 945.90 | | 945.17 | 265.8 | -0.73 | | |
| Rush Creek | 85510 | US of County Highway 10, DS of County Highway 50, DS of BZ | 15.06 | ВУ | 946.30 | | 946.27 | 265.8 | -0.03 | | |
| Rush Creek | | 5 US of County Highway 10, DS of County Highway 50, DS of CA | 15.14 | | 947.30 | | 946.84 | 265.8 | | | |
| Rush Creek | | US of County Highway 10, DS of County Highway 50, DS of CB | 15.34 | | 949.50 | | 947.98 | | | | |
| Rush Creek | 8813: | B US of County Highway 10, DS of County Highway 50, DS of CC | 15.42 | СВ | 951.10 | 230 | 951.04 | 184.2 | -0.06 | (46) | FIS Location: Just above Unnamed Tributary approximately 0.6 miles upstream of County Highway 10. Cross section CB is 0.6 mi upstream of Count Highway 10 |
| Rush Creek | 89836 | US of County Highway 10, DS of County Highway 50, DS of CD | 15.72 | cc | 955.20 | | 954.56 | 184.2 | -0.64 | | |
| Rush Creek | 90820 | US of County Highway 10, DS of County Highway 50, DS of CE | 15.92 | CD | 957.30 | | 956.32 | 184.2 | -0.98 | | |
| Luch Crook | 91832 | 2 County Highway 50 (DS) | 16.02 | | 958.60 | | 958.7 | 184.2 | | | |
| | | | 46.40 | CE | 959.20 | | 959.2 | 184.2 | 0.00 | | |
| Rush Creek Rush Creek Rush Creek | | 2 County Highway 50 (US) 7 US of County Highway 50, DS of Kalk Road, | 16.12 16.33 | | 960.50 | | 960.92 | | | | |

| | | 1% AEP Comparison of E | CWMC FIS Flood Profi | iles to Stantec HUC-8 Re | evised Model Re | sults - Flood Elev | ations arnd F | Peak Discharges | 5 | | |
|-----------------|---|--|--|--------------------------------|----------------------------------|--------------------|-------------------------------------|---|------------------------------|--------------------------------|--|
| | | | | | | Flood Profiles | Floor | -8 Revised Model d Profiles 00-yr | and | Flood Elevations Flow Rates | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Rush Creek | | US of County Highway 50, DS of Kalk Road, | 16.45 | CH | 962.80 | | 961.84 | 184.2 | -0.96 | | |
| | | DS of CI | | | | | | | | | |
| Rush Creek | | Kalk Road (DS) | 16.53 | | 963.00 | | 962.16 | | | | |
| Rush Creek | 94564 | Kalk Road (US) | 16.57 | | 964.90 | | 966.38 | | | | |
| Rush Creek | | US of Kalk Road, DS of Rolling Hills Road, US of CJ | 16.73 CK | | 964.90 | | 966.4 | 184.2 | 1.50 | | |
| Rush Creek | 100957 | DS of Rolling Hills Road, US of CK | 17.76 | CL | 964.90 | | 966.43 | 76.5 | 1.53 | | |
| Rush Creek | 101677 | Rolling Hills Road (DS) | 17.86 | CM | 964.90 | | 966.45 | 76.5 | 1.55 | | |
| Rush Creek | 101771 | Rolling Hills Road (US) | 17.92 | CN | 965.60 | | 966.58 | 76.5 | 0.98 | | |
| Rush Creek | 104294 US of Rolling Hills Road, DS of CP | | 18.36 | CO | 966.20 | | 967.33 | 76.5 | 1.13 | | |
| Rush Creek | 104810 | US of Rolling Hills Road, DS of CQ | 18.44 | - CP | 969.40 | | 968.66 | 76.5 | -0.74 | | |
| Rush Creek | 105486 US of Rolling Hills Road, At the "limit of detailed of study" | | 18.58 | CQ | 970.60 | 150 | 969.36 | 76.5 | -1.24 | (74) | FIS Location: At Jubert Lake outlet. Looked on Arcmap and CQ is at this location |

| | | 1% AEP Comparison of ECW | /MC FIS Flood Profiles | to Stantec HUC-8 Rev | rised Model Results - Flo | ood Elevations a | rnd Peak Discharges | | | |
|-----------------------|------------|---|--|-----------------------------------|-------------------------------|------------------|-------------------------------|--------------------|---------------------------|--------------------|
| | | | | | ECWMC FIS Floor | d Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | | levations and Flow |
| | | | | | 100-yr | | 100-yr | | 10 | 0-yr |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Rush Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) |
| lorth Fork Rush Creek | | County Road 117 (US) | 2.66 | | 914.8 | | 912.12 | 359 | -2.7 | |
| Iorth Fork Rush Creek | | 109th Avenue North (US) | 2.76 | | 914.8 | | 912.27 | 359 | -2.5 | |
| Jorth Fork Rush Creek | | US of 109th Avenue N, DS of Access Road near Cain Road, DS of D | 2.98 | | 914.8 | | 912.28 | 359 359 | -2.5 | |
| North Fork Rush Creek | | US of 109th Avenue N, DS of Access Road near Cain Road, DS of E Access Road near Cain Road (DS) | 3.26 | | 914.8 | | 912.29 912.29 | 359 | -2.5 -2.5 | |
| Jorth Fork Rush Creek | | Access Road near Cain Road (US) Access Road near Cain Road (US) | 3.30 | | 914.8 | | 912.29 | 359 | -2.5 -1.2 | |
| Jorth Fork Rush Creek | | Cain Road | 3.55 | | 914.8 | | 913.9 | 311.5 | -0.9 | (21 |
| Jorth Fork Rush Creek | | Cain Road (US) | 3.58 | | 915.0 | | 914.03 | 311.5 | -1.0 | (2.2 |
| Jorth Fork Rush Creek | 20321 | US of Cain Road, DS of Trail Haven Road, DS of J | 3.70 | | 915.0 | | 914.04 | 311.5 | | |
| lorth Fork Rush Creek | 20321 | US of Cain Road, DS of Trail Haven Road, DS of J | 3.70 | I | 915.0 | | 914.04 | 311.5 | -1.0 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of J | 3.84 | I | 915.0 | | 914.04 | 311.5 | -1.0 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of K | 3.84 | J | 915.4 | | 914.47 | 311.5 | -0.9 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of L | 4.06 | К | 917.7 | | 917.49 | 311.5 | -0.2 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of M | 4.24 | L | 918.4 | | 917.79 | 311.5 | -0.6 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of N | 4.34 | М | 918.7 | | 917.83 | 311.5 | -0.9 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of O | 4.50 | N | 919.9 | | 918.73 | 311.5 | -1.2 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of P | 4.72 | 0 | 921.1 | | 919.4 | 157.1 | -1.7 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of Q | 4.87 | P | 921.9 | | 920.49 | 157.1 | -1.4 | |
| lorth Fork Rush Creek | | US of Cain Road, DS of Trail Haven Road, DS of R | 4.98 | | 923.2 | | 920.99 | 157.1 | -2.2 | |
| Iorth Fork Rush Creek | | Trail Haven Road (DS) | 4.99 | | 923.3 | | | | -2.1 | (33 |
| Iorth Fork Rush Creek | | Trail Haven Road (US) | 5.03 | | 924.6 | | 921.76 | 157.1 | -2.8 | |
| lorth Fork Rush Creek | | US of Trail Haven Road, DS of County Road 117, US of S | 5.19 | | 924.7 | | 921.97 | 157.1 | -2.7 | |
| lorth Fork Rush Creek | | US of Trail Haven Road, DS of County Road 117, US of T | 5.44 | | 924.7 | | 922.31 | 157.1 | -2.4 | |
| lorth Fork Rush Creek | | County Road 117/109th Avenue North (DS) | 5.65 | | 924.7 | | 922.6 | 117 | -2.1 | |
| Iorth Fork Rush Creek | | At County Road 117/109th Avenue N | 5.67 | | 924.7 | | 922.65 | 117 | -2.1 | |
| lorth Fork Rush Creek | | County Road 117/109th Avenue North (US) | 5.68 | | 924.7 | | 923.06 | 117 | -1.6 | |
| lorth Fork Rush Creek | | US and DS of County Road 117/109th Avenue N, DS of Z | 5.70 | | 925.8 | | 923.21 | 117 | | |
| lorth Fork Rush Creek | | DS of County Road 117/109th Ave N, DS of AA | 6.47 | | 926.6 | | 924.95 | 117 | | |
| Iorth Fork Rush Creek | | US of County Road 117/109th Avenue N | 6.50 | | 930.0 | | 925.29 | 117 | -4.7 | |
| lorth Fork Rush Creek | | US of County Road 117/109th Ave N, DS of AC | 6.52 | AB | 930.2 | | 925.99 | 117 | -4.2 | |
| lorth Fork Rush Creek | | US of County Road 117/109th Ave N, DS of AD | 6.60 | | 930.3 | | 928.5 | 117 | | |
| lorth Fork Rush Creek | | US of County Road 117/109th Ave N, DS of AE | 6.70 | | 931.1 | | 929.29 | 117 | | |
| lorth Fork Rush Creek | | DS of Access Road, US of AD | 6.99 | | 935.6 | | 932.27 | 117 | -3.3 | |
| lorth Fork Rush Creek | | DS of Bechtold Road, US of Access Road | 7.03 | | 937.1 | | 932.52 | 117 | -4.6 | |
| Iorth Fork Rush Creek | | DS of Bechtold Road | 7.15 | | 937.6 | | 934.68 | 117 | -2.9 | |
| Iorth Fork Rush Creek | | US of Bechtold Road | 7.16 | | 937.6 | | 935.05 | 117 | -2.6 | |
| Iorth Fork Rush Creek | | US of Bechtold Road,DS of AJ | 7.25 | | 940.4 | | 936.07 | 117 | -4.3 | |
| lorth Fork Rush Creek | 40511 | DS of County Road 30/Oak Bole Drive, DS | 7.47 | AJ | 941.8 | | 937.84 | 117 | -4.0 | |

| | | 1% AEP Comparison of ECV | /MC FIS Flood Profiles | to Stantec HUC-8 Rev | ised Model Results - Fic | od Elevations a | rnd Peak Discharges | | | | |
|--|-------------------|---|--|--------------------------------|-------------------------------|-----------------|-------------------------------|--------------------|---------------------------|--------------------|--|
| | | | | | ECWMC FIS Floor | d Profiles | ECWMC HUC-8 Revised Mo | del Flood Profiles | Change in Flood E | levations and Flow | |
| | | | | | 100-yr | | 100-yr | | 100-yr | | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Rush Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | |
| North Fork Rush Creek | | of County Road 30/Oak Bole Drive | 7.67 | | 943.3 | | 941.67 | 117 | | | |
| North Fork Rush Creek | | of County Road 30/Oak Bole Drive | 7.72 | | 947.6 | | 943.17 | 91.9 | -4.4 | | |
| North Fork Rush Creek | of A | | 7.96 | | 947.8 | | 945.17 | 91.9 | -2.6 | | |
| North Fork Rush Creek | of A | | 8.07 | | 947.9 | | 946.15 | 91.9 | -1.8 | | |
| North Fork Rush Creek | | of Sundance Road, DS of AP | 8.37 | | 951.0 | | 949.96 | 91.9 | -1.0 | | |
| North Fork Rush Creek | | of Sundance Road, DS of AQ | 8.53 | | 954.8 | | 951.06 | 91.9 | -3.7 | | |
| North Fork Rush Creek | | of Sundance Road, DS of AR | 8.69 | | 957.4 | | 954.88 | 91.9 | | | |
| North Fork Rush Creek | | of Sundance Road | 8.86 | | 959.9 | | 957.21 | 91.9 | -2.7 | | |
| North Fork Rush Creek | | of Sundance Road | 8.88 | | 963.2 | | 959.11 | 91.9 91.9 | | | |
| North Fork Rush Creek | | of Sundance Road, US of AS | 8.94 | | 963.3 | | 960.8 | | -2.5 | | |
| North Fork Rush Creek | | of Sundance Road, US of AT | 9.08 | | 963.5 | | 961 | 91.9 | | | |
| North Fork Rush Creek | | of 97th Avenue N, DS of AW | 9.29 | | 965.8 | | 965.42 | 91.9 | -0.4 | | |
| North Fork Rush Creek | | of 97th Avenue N, DS of AX | 9.42 | | 968.4 973.4 | | 966.9 | 91.9 | | | |
| North Fork Rush Creek | | of 97th Avenue N | 9.75 | | 973.4 977.1 | | 971.08 | 91.9 | -2.3 | | |
| North Fork Rush Creek | | of 97th Avenue N | 9.78 | | | | 971.37 | 91.9 | | | |
| North Fork Rush Creek | | of 97th Avenue N, US of AY | 9.91 | | 977.5 981.4 | | 974.13 978.91 | 91.9 91.9 | -3.4 -2.5 | | |
| North Fork Rush Creek North Fork Rush Creek | | of 97th Avenue N, US of AZ | 10.13 10.32 | | 981.4 | | 982.37 | 91.9 | -2.5 | | |
| North Fork Rush Creek | 59887 DS | of 97th Avenue N, DS of BC of Access Road and County Road 10, | 10.52 | | 988.9 | | 988.04 | 91.9 | | | |
| North Fork Rush Creek | | of Access Road, DS of BE | 10.55 | DD. | 990.9 | | 988.53 | 91.9 | -2.4 | | |
| North Fork Rush Creek | | of Access Road near County Road 10, | 10.59 | | 991.1 | | 988.58 | 91.9 | | | |
| North Fork Rush Creek | | of County Road 10 | 10.61 | RF | 991.9 | 310 | 988.86 | 91.9 | -3.0 | (2: | |
| North Fork Rush Creek | | of County Road 10 | 10.63 | | 992.0 | | 989.36 | 43 | -2.6 | 12. | |
| North Fork Rush Creek | | of County Road 10, DS of Access Road | 10.69 | | 992.0 | | 989.37 | 43 | | | |
| North Fork Rush Creek | 60948 US o | of Access Road, DS of BJ | 10.73 | BI | 992.1 | | 989.64 | 43 | -2.5 | | |
| North Fork Rush Creek | | of County Road 10 and Access road, US | 10.81 | | 992.2 | | 989.66 | 43 | | | |
| North Fork Rush Creek | 63385 US d | of County Road 10, US of BJ | 11.20 | BK | 993.5 | | 990.53 | 43 | -3.0 | | |
| North Fork Rush Creek | | of County Road 10, US of BK | 11.27 | BL | 994.0 | | 990.79 | 43 | -3.2 | | |
| North Fork Rush Creek | | of County Road 19/Crow Hassan Park | 11.45 | BM | 995.0 | | 993.02 | 43 | -2.0 | | |
| North Fork Rush Creek | 64955 US c Roa | of County Road 19/Crow-Hassan Park | 11.49 | BN | 1001.2 | | 994.07 | 43 | -7.1 | | |
| North Fork Rush Creek | 65429 DS 0 | of Strehler Road, DS of BP | 11.58 | ВО | 1001.2 | | 994.84 | 43 | -6.4 | | |
| North Fork Rush Creek | | of Strehler Road, DS of BQ | 11.68 | | 1001.2 | | 994.85 | 43 | | | |
| North Fork Rush Creek | | of Strehler Road, DS of BR | 11.80 | | 1001.2 | | 998.53 | 43 | | | |
| North Fork Rush Creek | | of Strehler Road | 11.92 | BR | 1001.9 | 215 | 999.47 | 43 | -2.4 | (1 | |
| North Fork Rush Creek | | of Strehler Road | 11.96 | | 1004.1 | | 1001.78 | 43 | | · · | |
| North Fork Rush Creek | 68345 US d | of Strehler Road, US of BS | 12.12 | BT | 1004.1 | | 1001.84 | 43 | -2.3 | | |
| North Fork Rush Creek | | of Strehler Road, US of BT | 12.24 | BU | 1004.1 | | 1001.84 | 43 | -2.3 | | |
| North Fork Rush Creek | 69474 US 0 | of Strehler Road, US of BU | 12.33 | BV | 1004.1 | | 1001.84 | 43 | -2.3 | | |
| North Fork Rush Creek | 71089 US o | of Strehler Road, DS of BX | 12.64 | BW | 1004.2 | | 1001.87 | 43 | -2.3 | | |
| North Fork Rush Creek | 72186 US 0 | of Strehler Road, US of BW | 12.85 | BX | 1004.3 | | 1001.91 | 43 | -2.4 | | |
| North Fork Rush Creek | 72915 US o | of Strehler Road, US of BX | 12.99 | BY | 1004.3 | | 1001.9 | 43 | -2.4 | | |

| | Flood Elevations Flow Rates | | | ECWMC HUC-8 Revised Model Flood Profiles | | ECWMC FIS Flood Profiles | | | | | |
|---|--------------------------------|------------------------------|-----------------|---|-----------------|----------------------------------|-----------------------------------|--|--|------------|-----------------|
| | 500-vr | 500-yr | | 500-yr | | 500-yr | | | | | |
| Notes | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | ettered Cross Section from FIS | Creek Distance above State Route 12 (miles) | Location | HEC-RAS XS | Main Stem Creek |
| At confluence v Mississippi | | 0.3 | 2685.6 | 854.88 | 4,350 | 854.6 | | * (Data not applicable) | U.S. Route 169 (US) | 1767 | Creek |
| | | 0.6 | 2685.6 | 855.16 | | 854.6 | | * (Data not applicable) | U.S. Route 169 (US), US of A | 2505 | Creek |
| | | 0.5 | | 855.14 | | 854.6 | | * (Data not applicable) | U.S. Route 169 (US), US of B | | Creek |
| | | 0.4 | | 855.21 | | 854.8 | | | Cartway Road (DS) | | Creek |
| | | -0.9 | | 857.61 | | 858.5 | | 0.85 | Cartway Road (US) | | Creek |
| | | -0.2 | | 858.48 | | 858.6 | | 0.98 | US of confluence with Elm Creek. DS of Fernbrook Lane | | Creek |
| | | -0.2 | | 858.6 | | 858.8 | | 1.20 | DS of Fernbrook Lane, US of F | | Creek |
| | | -0.3 | | 858.73 | | 859.0 | | 1.40 | DS of Fernbrook Lane, US of G | | Creek |
| | | -0.5 | | 858.74 | | 859.2 | | 1.56 | Fernbrook Lane (County and State Aide Highway 121) | | Creek |
| | | -0.5 | | 858.74 | | 859.3 | | 1.62 | US of Fernbrook Lane | | Creek |
| | | -0.5 -0.8 | | 859.01 859.02 | | 859.5 859.8 | | 1.76 2.19 | US of Fernbrook Lane, US of J US of Fernbrook Lane, US of K | | Creek Creek |
| | | -0.9 | | 859.02 | | 859.9 | 1 | 2.30 | US of Fernbrook Lane, US of L | | Creek |
| | | -0.8 | | 859.03 | | 859.8 | | 2.34 | US of Fernbrook Lane, US of M | | Creek |
| | | -0.5 | | 859.35 | | 859.8 | | 3.98 | DS of Elm Creek Road, DS of P | | Creek |
| | | -0.3 | | 859.61 | | 859.9 | | 4.34 | DS of Elm Creek Road, DS of Q | | Creek |
| | | 0.5 | 2423.8 | 860.53 | | 860.0 | | 4.62 | Elm Creek Road (DS), DS of R | 24546 | Creek |
| | | -0.4 | 2423.8 | 860.92 | | 861.3 | | 4.71 | DS of Elm Creek Road, DS of S | 25060 | Creek |
| | | -0.7 | | 861.71 | | 862.4 | | 4.80 | Elm Creek Road (DS) | | Creek |
| | | -1.1 | | 861.91 | | 863.0 | | 4.90 | Elm Creek Road (US) | | Creek |
| | | | | 862.52 | | 863.2 | | 4.95 | DS of Pineview Lane, US of Elm Creek Road, DS of V | | Creek |
| | | -0.3 | | 863.89 | | 864.1 | | 5.21 | DS of Pineview Lane, US of Elm Creek Road, DS of W | | Creek |
| | | -0.8 | 2423.8 | 864.67 | | 865.5 | 1 | 5.39 | DS of Pineview Lane, US of Elm Creek Road, DS of Y | | Creek |
| | | -1.5 | | 866.01 | | 867.5 | | 5.75 | DS of Pine View Lane | | Creek |
| | | -1.6 | | 866.14 | | 867.8 | | 5.84 | DS of Pineview Lane, US of Elm Creek Road, DS of Z | | Creek |
| | | -2.2 | | 867.17 | | 869.4 | | 5.99 | DS of Pineview Lane, US of Elm Creek Road, DS of AA | | Creek |
| | | -2.3 | | 867.89 | | 870.2 | | 6.10 | Pine View Lane (DS) | | Creek |
| | | -2.4 | | 868.25 | | 870.7 | | 6.14 | Pine View Lane (US) | | Creek |
| | | -2.5 | 2423.8 | 868.35 | | 870.9 | С | e 6.21 | DS of Confluence of Bush Creek, US of Pin View Lane | | Creek |
| FIS location: Ab junction of Rusl just inside corp limits of City of Dayton. Looked Cross sections of Arcmap and thi with the describlocation | | -2.4 | 2423.8 | 868.53 | 1,480 | 871.0 | D | 6.31 | Confluence of Bush Creek (DS) | 35380 | Creek |
| | | -1.9 | 1034.6 | 869.05 | | 871.0 | E | 6.63 | DS of Pine View Lake, DS of AI | 36616 | Creek |
| | | -1.8 | 1034.6 | 869.15 | | 871.0 | F | 6.77 | Pine View Lake (DS), downstream of AG | | Creek |
| | | -1.7 | 1034.6 | 869.53 | | 871.2 | | 7.36 | Pine View Lake (DS) | 39639 | Creek |
| | | -1.1 | | 870.65 | | 871.7 | | 7.70 | DS of Pine View Lake, DS of AI | | Creek |
| | | -1.0 | | 871.28 | | 872.3 | | 7.99 | DS of Pine View Lake, DS of AJ | | Creek |
| | | 0.0 | 1024 C | 871.74 | | 872.6 | I | 8.20 | Pine View Lake (DS) | 43181 | Creek |
| | | -0.9 -2.2 | | 872.86 | | 875.0 | | 8.37 | Pine View Lake (US) | | Creek |

| | Flood Elevations | | -8 Revised Model | | | ECWMC FIS Flood Profiles | | | | | |
|---|-----------------------|--|--|---|-----------------|---|--|---|--|--|--|
| Notes | and Flow Rates 500-yr | | Flood Profiles 500-yr | | 500-yr | | | | | | |
| | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (NGVD29 feet) | Lettered Cross Section from FIS | Creek Distance above State Route 12 (miles) | Location | HEC-RAS XS | Main Stem Creek |
| | | -1.0 | 1034.6 | 875.27 | | 876.3 | 5 AM | 8.75 | DS of Territorial Road, US of Pine View Lake, DS of AN | 46044 | lm Creek |
| | | -0.2 | 1034.6 | 876.39 | | 876.6 |) AN | 9.20 |) Territorial Road (DS) | 47970 | lm Creek |
| | | 2.3 | | 879.32 | | 877.0 | 1 AO | | Minnesota Trunk Highway 52 (DS) | | m Creek |
| | | 1.8 | | 879.63 | | 877.9 | 2 AP | | . Minnesota Trunk Highway 52 (US), DS of Railroad | | m Creek |
| | | -1.7 | | 880.16 | | 881.8 | 3 AQ | | US of Railroad that is US of Minnesota Trunk Highway 152 | | m Creek |
| | | -1.3 | | 880.7 | | 882.0 | 2 AR | | US of Railroad, DS of Rice Lake Dam, DS of AS | | lm Creek |
| | | -1.9 | 1034.6 | 881.07 | | 883.0 | | 9.9: | Rice Lake Dam (DS) | | m Creek |
| | | -2.4 | | 881.85 | | 884.2 | | 10.13 | DS of Rice Lake Dam, DS of AU | | lm Creek |
| IS Location: 10.3 | | -4.1 -0.3 | | 883.14 894.49 | | 887.2 894.8 | S AU AV | Not listed in FIS | ' Rice Lake Dam (DS) | 53197 53796 | lm Creek 1ill Pond (Elm Creek) |
| pillway. Looked of rcromap and this co- cection is on Elm of ut near Mill pond ice Lake. The cro ection on FIS prii 0.35 mi above th Mill Pond Spillway hink all the Mill P ross sectins are ctually part of El reek and then w. It turn have a cre istance. The miss ross sections fro he Elm Creek orrespond to the ross section in th dill Pond main st. IS Location: 12.5. | (401) | -0.3 | 729.5 | 894.87 | 1,130 | 895.2 | AW | Not listed in FIS | | 65333 | till Pond (Elm Creek) |
| | | | | | | | | | | | |
| bove Mill Pond pillway. Looked of cromap and this coction is on Elm (ut near Mill pondice Lake. The croection on FIS prfi 2.52 mi above the Mill Pond Spillway | | | | | | | | | | | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.5 -0.8 | | 894.91 894.99 | | 895.4 | AX S AV | Not listed in FIS | | 65946 6550 | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 | 729.5 | 894.99 | | 895.8 | 5 AY | 12.76 | West Rice Lake Road | 66592 | iiil Pond (Elm Creek) im Creek im Creek |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | | 729.5 729.5 | | | | 5 AY 3 AZ | | | 66592 66781 | |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 | 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 | | 895.8 896.1 897.5 | 5 AY 8 AZ 1 BA 5 BB | 12.70 12.71 12.80 13.09 | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road | 66592 66781 67119 68058 | im Creek im Creek im Creek im Creek |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 | 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 | | 895.8 896.1 897.5 898.6 | 5 AY 8 AZ 1 BA 5 BB | 12.7/ 12.7/ 12.8/ 13.0! | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road | 66592 66781 67119 68058 | m Creek m Creek m Creek m Creek m Creek |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 -1.1 -2.6 | 729.5 729.5 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 897.27 897.42 | | 895.8 896.1 897.5 898.6 898.4 900.0 | 5 AY 8 AZ 1 BA 5 BB 7 BC 5 BD | 12.7(12.7(12.84 13.0(13.1) 13.1: | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road Weaver Lake Road Weaver Lake Road | 66592 66781 67119 68058 68853 69167 | im Creek |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 -1.1 -2.6 -2.6 | 729.5 729.5 729.5 729.5 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 897.27 897.42 897.43 | | 895.8 896.1 897.5 898.6 898.4 900.0 900.0 | 5 AY 3 AZ 5 BB 7 BC 5 BD 8 BE | 12.7(12.7i 12.8i 13.0i 13.1i 13.2i 13.3: | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road US Weaver Lake Road US Weaver Lake Road US of Weaver Lake Road, DS of BF | 66592 66781 67119 68058 68853 69167 69875 | im Creek |
| pillway. Looked of arcmap and this conception is on Elm (out near Mill pondice Lake. The cro ection on FIS prfi 2.52 mi above th | | -0.8 -1.0 -2.3 -3.3 -1.1 -2.6 | 729.5 729.5 729.5 729.5 729.5 729.5 729.5 729.5 | 894.99 895.01 895.18 895.3 897.27 897.42 | | 895.8 896.1 897.5 898.6 898.4 900.0 | 5 AY 3 AZ 5 BB 7 BC 5 BD 8 BE 8 BF | 12.7(12.7(12.84 13.0(13.1) 13.1: | West Rice Lake Road West Rice Lake Road (US) DS of Weaver Lake Road, US of West Rice Lake Road DS of Weaver Lake Road, US of West Rice Lake Road Weaver Lake Road Weaver Lake Road Weaver Lake Road | 66592 66781 67119 68058 68853 69167 69875 70093 | m Creek |

| Main Stem Creek HEC-RAS XS Location Creek Distance above State Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cross Section from Flood El (NGVD: Lettered Cross Section from Route 12 (miles) Lettered Cro | 900.0 902.0 904.0 905.1 905.1 907.2 | | Floor | -8 Revised Model d Profiles 00-yr Flow Rate (CFS) 672.2 672.2 672.2 672.2 672.2 | and F | | Notes FIS Location: 14.08 miles above Mill por spillway |
|--|--|-----------------|---|--|--|-----------------|--|
| Continue | 900.0 902.0 904.0 905.1 905.9 906.6 | Flow Rate (CFS) | Elevation (NGVD29 500 898.86 899.56 899.97 901.89 903.13 | 672.2 672.2 672.2 672.2 672.2 | Flood Elevation (feet) -1.2 -2.4 -4.1 | Flow Rate (CFS) | FIS Location: 14.08 miles above Mill por |
| Continue | 900.0 902.0 904.0 905.1 905.9 906.6 | | 899.56 899.97 901.89 903.13 | 672.2 672.2 672.2 672.2 | -1.2 -2.4 -4.1 | (348) | FIS Location: 14.08 miles above Mill pond |
| Elm Creek 74436 DS of Farm Driveway, DS of BK 14.30 BJ Elm Creek 74718 Dunkirk Lane 14.41 BK Elm Creek 74971 Dunkirk Lane (US) 14.44 BL Elm Creek 75680 US of Dunkirk Lane, DS of Bass Lake Road, 14.55 BM DS of BN Elm Creek 76495 US of Dunkirk Lane, DS of Bass Lake Road, 14.72 BN DS of BO Elm Creek 77331 DS of Bass Lake Road, US Dunkirk Lane, DS 14.86 BO | 902.0 904.0 905.1 905.9 906.6 | 1,020 | 899.56 899.97 901.89 903.13 | 672.2 672.2 672.2 | -1.2 -2.4 -4.1 | | miles above Mill pond |
| Elm Creek 74718 Dunkirk Lane 14.41 BK Elm Creek 74971 Dunkirk Lane (US) 14.44 BL Elm Creek 75680 US of Dunkirk Lane, DS of Bass Lake Road, 14.55 BM DS of BN Elm Creek 76495 US of Dunkirk Lane, DS of Bass Lake Road, 14.72 BN DS of BO Elm Creek 77331 DS of Bass Lake Road, US Dunkirk Lane, DS 14.86 BO | 904.0 905.1 905.9 906.6 | | 899.97 901.89 903.13 | 672.2 672.2 | -4.1 | | |
| Elm Creek 74718 Dunkirk Lane 14.41 BK Elm Creek 74971 Dunkirk Lane (US) 14.44 BL Elm Creek 75680 US of Dunkirk Lane, DS of Bass Lake Road, 14.55 BM DS of BN DS of BN Elm Creek 76495 US of Dunkirk Lane, DS of Bass Lake Road, 14.72 BN DS of BO Elm Creek 77331 DS of Bass Lake Road, US Dunkirk Lane, DS 14.86 BO | 904.0 905.1 905.9 906.6 | | 899.97 901.89 903.13 | 672.2 | | | |
| Elm Creek 75680 US of Dunkirk Lane, DS of Bass Lake Road, DS of BN Elm Creek 76495 US of Dunkirk Lane, DS of Bass Lake Road, 14.72 BN DS of BO Elm Creek 77331 DS of Bass Lake Road, US Dunkirk Lane, DS 14.86 BO | 905.9 906.6 907.2 | | 903.13 | | -3 2 | | |
| DS of BN Elm Creek 76495 US of Dunkirk Lane, DS of Bass Lake Road, 14.72 BN DS of BO Elm Creek 77331 DS of Bass Lake Road, US Dunkirk Lane, DS 14.86 BO | 906.6 | | | 672.2 | | | |
| DS of BO Elm Creek 77331 DS of Bass Lake Road, US Dunkirk Lane, DS 14.86 BO | 907.2 | | 904.13 | | -2.7 | | |
| | | | | | -2.5 | | |
| 70404 PC (FROM LIVE PORTING PO | 907.6 | | 905.55 | 672.2 | -1.6 | | |
| Elm Creek 79194 DS of Bass Lake Road, US Dunkirk Lane, DS 15.18 BP of BQ. Elm Creek 80843 DS of Bass Lake Road, US Dunkirk Lane, DS 15.48 BQ | 908.9 | | 906.67 | 672.2 672.2 | -0.9 | | |
| of BR | | | | | | | |
| Elm Creek 82336 DS of Bass Lake Road 15.75 BR | 910.4 | | 909.34 | | -1.0 | | |
| Elm Creek 82996 Bass Lake Road 15.90 BS | 911.3 | | 909.95 | 672.2 | -1.3 | | |
| Elm Creek 83398 DS of Elm Road, US of Bass Lake Road, DS 15.95 BT of BU | 911.8 | | 910.3 | 672.2 | -1.5 | | |
| Elm Creek 83890 DS of Elm Road, US of Bass Lake Road, DS 16.05 BU of BV | 911.9 | | 910.75 | 672.2 | -1.1 | | |
| Elm Creek 84476 DS of Elm Road, US of Bass Lake Road, DS 16.16 BV of BW | 912.0 | | 910.79 | 672.2 | -1.2 | | |
| Elm Creek 85470 DS of Elm Road, US of Bass Lake Road, DS 16.35 BW of BX | 912.0 | | 910.96 | 672.2 | -1.1 | | |
| Elm Creek 86861 DS of Elm Road, US of Bass Lake Road 16.52 BX | 912.4 | | 911.86 | 672.2 | -0.5 | | |
| Elm Creek 88288 DS of Elm Road, US of Bass Lake Road, DS 16.74 BY of BZ | 916.1 | 740 | 915.07 | 672.2 | -1.0 | (68) | On FIS the creek distance for the 100- peak flow rate is 16.73, used this peak flow rate |
| Elm Creek 88898 DS of Elm Road, US of Bass Lake Road, DS 16.82 BZ of CA | 917.3 | | 915.99 | 672.2 | -1.3 | | |
| Elm Creek 90652 Elm Road (DS) 17.04 CA | 920.1 | | 918.75 | 672.2 | -1.4 | | |
| Elm Creek #N/A Elm Road (US) 17.11 CB | 921.0 | | #N/A | #N/A | #N/A | | |
| Elm Creek 91739 US of Elm Road, US of CB 17.24 CC | 921.7 | | 921 | 672.2 | -0.7 | | |
| Elm Creek 92290 US of Elm Road, US of CC 17.34 CD | 922.3 | | 921.82 | 672.2 | -0.5 | | |
| Elm Creek 93.102 US of Elm Road, DS of CF 17.50 CE | 923.5 | | 922.22 | 672.2 | -1.3 | | |
| Elm Creek 93848 US of Elm Road, US of CE 17.63 CF | 922.3 | | 922.42 | 460.5 | 0.1 | | |
| Elm Creek 111598 US of State Highway 55, DS of State 20.66 CG Highway 101 and CH | 960.8 | 330 | 962.82 | 460.5 | 2.1 | 131 | FIS Location: At Medina-Plymouth corporate boundary limits. This Cross section is the closest to the city boundarie |
| Elm Creek 112306 State Highway 101 (DS) 20.73 CH | 963.9 | | 963.56 | | -0.3 | | |
| Elm Creek 112413 State Highway 101 (US) 20.75 CI Elm Creek 113170 DS of Access Road, US of State Highway 20.87 CJ | 965.3 966.2 | | 966.76 967.72 | | 1.5 1.5 | | |
| 101 Elm Creek 113302 US and DS of two Access Road, US of State 20.91 CK Highway 101 | 973.1 | | 974.04 | 460.5 | 0.9 | | |
| Film Creek 113654 US of two Access Road, US of State 20.96 CL Highway 101, US of CK | 973.2 | | 974.57 | 460.5 | 1.4 | | |
| Elm Creek 113752 US of Access Road, DS of Railroad 21.00 CM | 973.3 | | | 460.5 | | | |

| | | 0.2% AEP Comparison of ECWN | AC FIS Flood Profiles to | Stantec HUC-8 Revised | Model Results - | Flood Elevations | and Peak Di | ischarges | | | |
|-----------------|------------|---|--------------------------|---------------------------------|----------------------------------|---|----------------------|--|------------------------------|-----------------|--|
| | | | | | Flood Profiles 0-yr | ECWMC HUC-8 Revised Model Flood Profiles 500-yr | | Change in Flood Elevations and Flow Rates 500-yr | | | |
| Main Stem Creek | HEC-RAS XS | C-RAS XS Location | | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Elm Creek | 114334 | US Access road, DS railroad and Hamel Road | 21.11 | CN | 973.4 | 305 | 974.59 | 460.5 | 1.2 | | FIS Location: Below Soo Line Bridge, near Hamel Road. I think this is the correct cross section location but not positive. Double check |
| Elm Creek | 114472 | ! Railroad, DS of Hamel Road | 21.14 | CO | 976.6 | | 983.4 | 460.5 | 6.8 | | |
| Elm Creek | 114953 | DS of Hamel Road, US of Railroad | 21.2 | СР | 977.4 | 72 | 983.4 | 460.5 | 6.0 | | FIS Location: downstream of Hamel Road, near Pinto Drive. I picked the cross section that is farthest DS of Hamel Road (Creek meanders around it), and is still near Pinto Road. |
| Elm Creek | 115445 | Elm Creek Drive (DS) | 21.29 | CQ | 977.8 | | 983.4 | 460.5 | 5.6 | | |
| Elm Creek | 115587 | ' Elm Creek Drive (US) | 21.32 | | 977.8 | | 983.4 | | | | |
| Elm Creek | 116667 | ' Sewage Lagoon Road (DS) | 21.50 | CS | 977.9 | | 983.41 | 460.5 | 5.5 | | |
| Elm Creek | | ' Sewage Lagoon Road (US) | 21.53 | | 977.9 | | 983.41 | | | | |
| Elm Creek | 117854 | DS of Confluence of Tributary to Elm Creek | 21.73 | CU | 977.8 | | 983.41 | 460.5 | 5.6 | | |
| Elm Creek | 118767 | DS of Hamel Road, DS of CW | 21.90 | CV | 978.0 | | 983.41 | 102 | 5.4 | | |
| Elm Creek | 119019 | DS of Hamel Road | 21.94 | CW | 978.0 | | 983.41 | 102 | 5.4 | | |
| Elm Creek | 119205 | US of Hamel Road DS of SOO Line Railroad | 21.97 | CX | 978.2 | | 983.65 | 102 | 5.4 | | |
| Elm Creek | 119439 | US of Hamel Road DS of SOO Line Railroad | 22.02 | . CY | 978.4 | | 983.65 | 102 | 5.3 | | |
| Elm Creek | 120084 | DS of SOO Line Railroad | 22.15 | CZ | 978.5 | | 983.65 | 102 | 5.1 | | |

| | | | | | ECWMC FIS F | lood Profiles | | -8 Revised Model I Profiles | | Flood Elevations Flow Rates | | |
|------------------------|---------------------|---|---|----|-------------------------------|---------------|----------------------|--------------------------------|---|--------------------------------|--|--|
| | | | | | 100 | -yr | 1 | 00-yr | 100-yr | | | |
| Main Stem Creek | HEC-RAS XS Location | | Creek Distance above the Elm Creek (miles) Lettered Cross Section from FIS | | (NGVD29 feet) Flow Rate (CFS) | | Elevation (NGVD29 | | Flood) Elevation Flow Rate (CFS (feet) | | Notes | |
| ush Creek | | US of confluence with Elm Creek | 0.26 | | 971.0 | 2,000 | 860.1 | 1345.8 | -110.9 | -654.2 | | |
| sh Creek | | US of confluence with Elm Creek, DS of C | 0.76 | | 971.0 | | 862.3 | 1345.8 | -108.7 | | | |
| ish Creek | | US of confluence with Elm Creek, DS of D | 1.00 | | 872.2 | | 864.3 | 1345.8 | -7.9 | | | |
| ush Creek | | US of confluence with Elm Creek, DS of E | 1.39 | | 875.3 | | 867 | 1345.8 | -8.3 | | | |
| ısh Creek | | US of confluence with Elm Creek, DS of F | 1.52 | | 876.4 | | 868.3 | 1345.8 | | | | |
| ısh Creek | | US of confluence with Elm Creek, DS of G | 1.87 | | 880.7 | | 869 | 1345.8 | | | | |
| ish Creek | | US of confluence with Elm Creek, DS of H | 2.14 | | 884.0 | | 871.1 | 1345.8 | | | | |
| ush Creek | | Fernbrook Lane (DS) | 2.36 | | 886.6 | | 874.3 | 1345.8 | -12.3 | | | |
| ush Creek | | At Fernbrook Lane | 2.42 | | 888.8 | | 875.5 | 1227.5 | | | | |
| ish Creek ish Creek | | Fernbrook Lane (US) US of Fernbrook Lane, DS of L | 2.60 2.68 | | 889.4 889.6 | | 876.7 879 | 1227.5 1227.5 | -12.7 -10.6 | | | |
| ish Creek | | US of Fernbrook Lane, DS of L US of Fernbrook Lane, DS of M | 2.68 | | 889.b 891.2 | | 879 878.7 | 1227.5 | -10.6 | | | |
| ush Creek | | US of Fernbrook Lane, DS of N | 3.01 | | 891.2 | | 880.2 | 1227.5 | -12.5 | | | |
| ish Creek | | US of Fernbrook Lane, DS of O | 3.05 | | 891.8 | | 880.2 | 1227.5 | -11.8 | | | |
| ish Creek | | US of Fernbrook Lane, DS of P | 3.33 | | 893.9 | | 882.88 | 1227.5 | | | | |
| ush Creek | | US of Fernbrook Lane, DS of Q | 3.43 | | 894.8 | | 883.6 | 1227.5 | -11.0 | | | |
| ush Creek | | US of Fernbrook Lane, DS of R | 3.64 | | 896.6 | | 886.9 | 1227.5 | | | | |
| ish Creek | | US of Fernbrook Lane, DS of S | 3.75 | | 897.9 | | 888.51 | 1227.5 | -9.4 | | | |
| ısh Creek | | US of Fernbrook Lane, DS of T | 3.89 | | 900.4 | | 888.7 | 1227.5 | -11.7 | | | |
| ısh Creek | | Territorial Road (DS) | 4.66 | | 907.1 | | 894.7 | 1227.5 | -12.4 | | | |
| ush Creek | | At Territorial Road | 4.70 | | 907.9 | | 895.2 | 1227.5 | | | | |
| ush Creek | | Territorial Road (US) | 4.84 | | 907.9 | | 895.3 | 1227.5 | -12.6 | | | |
| ush Creek | | US of Territorial Road, DS of Minnesota Trunk Highway 152 | 5.00 | w | 907.9 | 1,860 | 894.1 | 1227.5 | -13.8 | -632.5 | Location from FIS: 5 miles above confluence with Elm Cre | |
| ısh Creek | 28541 | Minnesota Trunk Highway 152 (DS) | 5.22 | X | 907.9 | | 895.6 | 1227.5 | -12.3 | | | |
| ush Creek | | At Minnesota Trunk Highway 152 | 5.30 | | 907.9 | | 895.6 | 1227.5 | | | | |
| ush Creek | 30564 | Minnesota Trunk Highway 152 (US), near Burling and Nor. RR | 5.61 | Z | 909.7 | | 898.24 | 1227.5 | -11.5 | | | |
| ush Creek | | US of Burling and Nor. RR, DS of Dunkirk Lane | 5.67 | | 910.0 | | 898.24 | 1227.5 | -11.8 | | | |
| ush Creek | | Dunkirk Lane (DS) | 5.71 | | 910.0 | | 898.14 | 1227.5 | -11.9 | | | |
| ish Creek | | Dunkirk Lane (US) | 5.74 | | 912.6 | | 898.14 | 1227.5 | | | | |
| ush Creek ush Creek | 32287 | US of Dunkirk Lane, DS of AE US of Dunkirk Lane, DS of 105th Avenue N, DS of AF | 5.78 · 5.92 · | | 912.9 912.9 | | 899.7 898.1 | 1227.5 1227.5 | -13.2 -14.8 | | | |
| ush Creek | | 105th Avenue N (DS) | 6.09 | AF | 912.9 | | 897.5 | 1227.5 | -15.4 | | | |
| ush Creek | | At 105th Avenue N | 6.18 | | 912.9 | | 896.2 | 1227.5 | -16.7 | | | |
| ısh Creek | 34127 | 105th Avenue N (US) | 6.24 | AH | 912.9 | | 896.2 | 1227.5 | -16.7 | | | |
| ush Creek | | US of 105th Avenue N, DS of State Route 92/Interstate 94, DS of AH | 6.35 | | 912.9 | | 898.8 | 1227.5 | | | | |
| ush Creek | | State Route 92/Interstate 94 (DS) | 6.66 | | 912.9 | | 899.2 | 1227.5 | | | | |
| ısh Creek | | State Route 92/Interstate 94 (US) | 6.76 | | 913.5 | | 899.5 | 1227.5 | -14.0 | | | |
| ish Creek | | US of the confluence with North Fork Rush Creek | 7.52 | AL | 913.9 | 960 | 901.6 | 1227.5 | -12.3 | 267.5 | Location fro FIS: 7.52 mi above confluence with Elm Cr | |

| | | 0.2% AEP Comparison of ECWMC F | 13 Floor Florines to Sta | antec 110c-8 Revised IVI | ouei nesuits - Fil | Jou Lievations di | IN FEAR DISC | iiuiges | | | |
|--------------------------|------------|---|--|--|----------------------------------|-------------------|--------------------------------|-----------------|------------------------------|-----------------|---|
| | | | | ECWMC HUC-8 Revised Model ECWMC FIS Flood Profiles Flood Profiles | | | Flood Elevations Flow Rates | | | | |
| | | | | | 100-yr | | 100-yr | | | 100-yr | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Notes |
| Rush Creek | | US of the confluence with North Fork Rush Creek, DS of 101st Avenue North, US of AM | 8.05 | AN | 916.2 | | 904.94 | 1178.8 | | | |
| Rush Creek | | 101st Avenue North (DS) | 8.28 | AO | 918.2 | | 906 | 1178.8 | -12.2 | 2 | |
| Rush Creek | | 101st Avenue North (US) | 8.33 | AP | 920.2 | | 907.9 | 1178.8 | -12.3 | 3 | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AP | 8.48 | AQ | 920.3 | | 910.3 | 1178.8 | -10.0 |) | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AQ | 8.67 | | 921.9 | | 913.4 | | | | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AR | 8.84 | | 923.3 | | 915.1 | | | | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AS | 9.08 | | 925.1 | | 916.8 | | | | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AT | 9.37 | | 927.1 | | 918 | | | | |
| Rush Creek | | US of 101st Avenue North, DS of 97th Avenue North, US of AU | 9.48 | AW | 928.2 | | 918.6 919.1 | | | | |
| Rush Creek Rush Creek | | 97th Avenue N (DS) | 9.55 | | 928.8 929.0 | | | | | | |
| Rush Creek | | At 97th Avenue N 97th Avenue N (US) | 9.69 | | 929.0 | | 919.4 919.4 | | | | |
| Rush Creek | | US of 97th Avenue N, DS of BA | 9.92 | | 929.0 | | 920.2 | | | | |
| Rush Creek | 57461 | US of 97th Avenue N, DS of Minnnnesota Highway 10, US of AZ | 10.12 | | 929.2 | | 920.6 | | | | |
| Rush Creek | 58182 | US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BA | 10.22 | ВВ | 929.2 | | 920.7 | 521.9 | -8.5 | i | |
| Rush Creek | | US of 97th Avenue N, DS of Minnnnesota Highway 10, US of BB | 10.51 | . BC | 930.0 | | 922.1 | 521.9 | -7.9 |) | |
| Rush Creek | | DS of Minnesota Highway 101, US of 97th Avenue North, DS of BE | 10.64 | BD | 930.6 | | 923 | 521.9 | -7.6 | 5 | |
| Rush Creek | | DS of Minnesota Highway 101, US of BD | 10.96 | | 932.8 | | 925.5 | | | | |
| Rush Creek | 63179 | State Highway 101 (just DS) | 11.03 | BF | 933.4 | 810 | 925.7 | 464.5 | -7.7 | -345.5 | FIS Location At State Highway 103 |
| Rush Creek | | DS of Private Road that is DS of Schute Road | 11.28 | BG | 934.6 | | 925.9 | 464.5 | -8.7 | , | |
| Rush Creek | | US of Private Road that is DS of Schute Road | 11.36 | ВН | 936.2 | | 926.6 | 464.5 | -9.5 | ; | |
| Rush Creek | | US of Private Road near State Highway 10, DS of Schute Road, US of BH | 11.42 | | 936.3 | | 926.6 | | | , | |
| Rush Creek | | DS of Schute Road, US of BI | 11.52 | | 936.3 | | 926 | | | | |
| tush Creek | | Schute Road (DS) | 11.64 | | 936.4 | | 926 | | | | |
| Rush Creek | | Schute Road (US) | 11.72 | | 936.5 | | 926.54 | | | | |
| tush Creek | | US of Schute Road, DS of BN | 11.84 | | 936.6 | | 927.1 | | | | |
| Rush Creek | | US of Schute Road, DS of BD | 12.16 12.38 | | 936.8 937.0 | | 928.4 928.5 | | | | |
| Rush Creek Rush Creek | 76315 | US of Schute Road, DS of BP US of Schute Road, DS of County Highway 116, DS of BQ | 13.50 | | 937.1 | | 928.5 928.8 | | | | |
| Rush Creek | 76731 | County Highway 116 (DS) | 13.60 | | 937.1 | 680 | 929.72 | | | | FIS location: Just downstream County Road 116 |
| Rush Creek | | County Highway 116 (US) | 13.66 | | 939.2 | | 930.5 | | | · | |
| Rush Creek | | US of County Highway 116, DS of County Highway 10, DS of BT | 13.94 | | 939.3 | | 931.9 | | | | |
| Rush Creek | | US of County Highway 116, DS of County Highway 10, DS of BU | 14.12 | BT | 939.4 | | 932.3 | 365.5 | -7.1 | L | |

| | | | | | EC:: 10.0 | Flood Duckit | | -8 Revised Model | | Flood Elevations | |
|-----------------|--------------|--|--------------------------|-----------------------------|-----------------|------------------------|-----------|---------------------|--------------------|----------------------|--|
| | | | | | | Flood Profiles 0-yr | | d Profiles 00-yr | | Flow Rates 100-yr | _ |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the | Lettered Cross Section from | Flood Elevation | Flow Rate (CFS) | Elevation | Flow Rate (CFS) | Flood Elevation | Flow Rate (CFS) | Notes |
| | | | Elm Creek (miles) | FIS | (NGVD29 feet) | | (NGVD29 | | (feet) | | |
| ish Creek | | IS of County Highway 116, DS of County lighway 10, DS of BV | 14.44 | 1 BU | 941.2 | | 935.8 | 365.5 | -5.4 | | |
| ish Creek | | IS of County Highway 116, DS of County lighway 10, DS of BW | 14.64 | i BV | 942.5 | 485 | 938.63 | 365.5 | -3.9 | -119. | 5 FIS location Just abovec Unnamed Tributary approximat 0.3 miles downstrear County Highway 10 Cross sectic BV is ~0.39 downstrear Highway 10 and downstrear |
| ush Creek | 84156 0 | ounty Highway 10 (DS) | 14.78 | RRW | 945.9 | | 939.7 | 365.5 | -6.2 | | a trib |
| ish Creek | | ounty Highway 10 (US) | 14.86 | | 947.0 | | 939 | | | | |
| sh Creek | 85510 U | IS of County Highway 10, DS of County lighway 50, DS of BZ | 15.06 | | 947.3 | | 941 | | | | |
| sh Creek | 86165 U | IS of County Highway 10, DS of County lighway 50, DS of CA | 15.14 | 1 BZ | 947.6 | | 943.62 | 365.5 | -4.0 | | |
| ish Creek | 86434 U | IS of County Highway 10, DS of County lighway 50, DS of CB | 15.34 | 1 CA | 950.5 | | 944.26 | 365.5 | -6.3 | | |
| sh Creek | 88133 U H | IS of County Highway 10, DS of County lighway 50, DS of CC | 15.42 | | 952.0 | | 946.8 | | | | 9 FIS Location Just above Unnamed Tributary approximation 0.6 miles upstream of County Highway 10 Cross section CB is 0.6 m upstream of County Highway 11 Highway 10 |
| sh Creek | н | S of County Highway 10, DS of County lighway 50, DS of CD | 15.72 | | 956.1 | | 951.6 | | | | |
| sh Creek | н | S of County Highway 10, DS of County lighway 50, DS of CE | 15.92 | | 957.9 | | 952.5 | | | | |
| sh Creek | | ounty Highway 50 (DS) | 16.02 | | 960.0 | | 953.9 | | | | |
| h Creek | | ounty Highway 50 (US) | 16.12 | | 960.0 | | 955.7 | 251.1 | -4.3 | | |
| h Creek | | IS of County Highway 50, DS of Kalk Road, IS of CH | 16.33 | 3 CG | 961.1 | | 957.73 | 251.1 | -3.4 | | |
| h Creek | 93948 U | IS of County Highway 50, DS of Kalk Road, IS of CI | 16.45 | 5 CH | 963.2 | | 958.1 | 251.1 | -5.1 | | |
| h Creek | | alk Road (DS) | 16.53 | 3 CI | 963.8 | | 958.5 | 251.1 | -5.3 | | |
| h Creek | | alk Road (US) | 16.57 | 7 CJ | 966.1 | | 957.5 | 251.1 | -8.6 | | |
| h Creek | | IS of Kalk Road, DS of Rolling Hills Road, IS of CJ | 16.73 | 3 CK | 966.1 | | 956.8 | 251.1 | -9.3 | | |
| sh Creek | | S of Rolling Hills Road, US of CK | 17.76 | S CL | 966.3 | | 962 | 117.7 | -4.3 | | |
| sh Creek | 101677 R | olling Hills Road (DS) | 17.86 | | 966.3 | | 960.5 | | -5.8 | | |
| sh Creek | | olling Hills Road (US) | 17.92 | 2 CN | 968.0 | | 960.5 | 117.7 | -7.5 | | |
| sh Creek | 104294 11 | IS of Rolling Hills Road, DS of CP | 18.36 | 5 CO | 967.6 | | 965.84 | 117.7 | -1.8 | | |

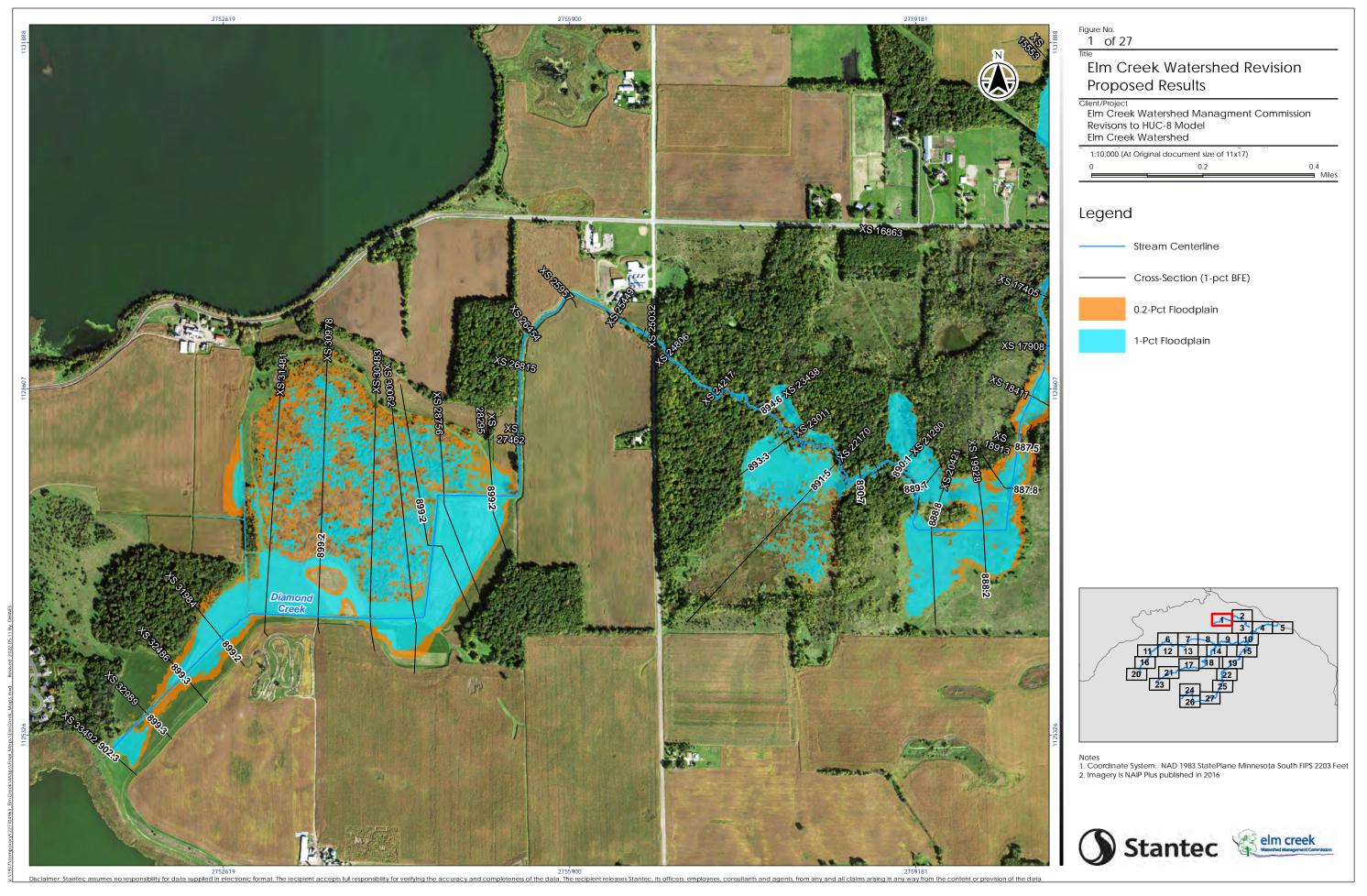
| | | 0.2% AEP Comparison of ECWMC | FIS Flood Profiles to Sta | antec HUC-8 Revised M | odel Results - Flo | ood Elevations ar | d Peak Disc | harges | | | |
|-----------------|--|---|--|---------------------------------|----------------------------------|-------------------|---|-----------------|--|-----------------|---|
| | | | | | ECWMC FIS F | Flood Profiles | ECWMC HUC-8 Revised Model Flood Profiles | | Change in Flood Elevations and Flow Rates | | |
| Main Stem Creek | HEC-RAS XS | Location | Creek Distance above the Elm Creek (miles) | Lettered Cross Section from FIS | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood | Flow Rate (CFS) | Notes |
| Rush Creek | 104810 US of Rolling Hills Road, DS of CQ 18.44 CP | | L CP | 969.8 | | 966.66 | 117.7 | -3.2 | | | |
| Rush Creek | | US of Rolling Hills Road, At the "limit of detailed of study" | 18.58 | з са | 971.1 | 300 | 967.7 | 117.7 | -3.4 | | FIS Location: At Jubert Lake outlet. Looked on Arcmap and CQ is at this location |

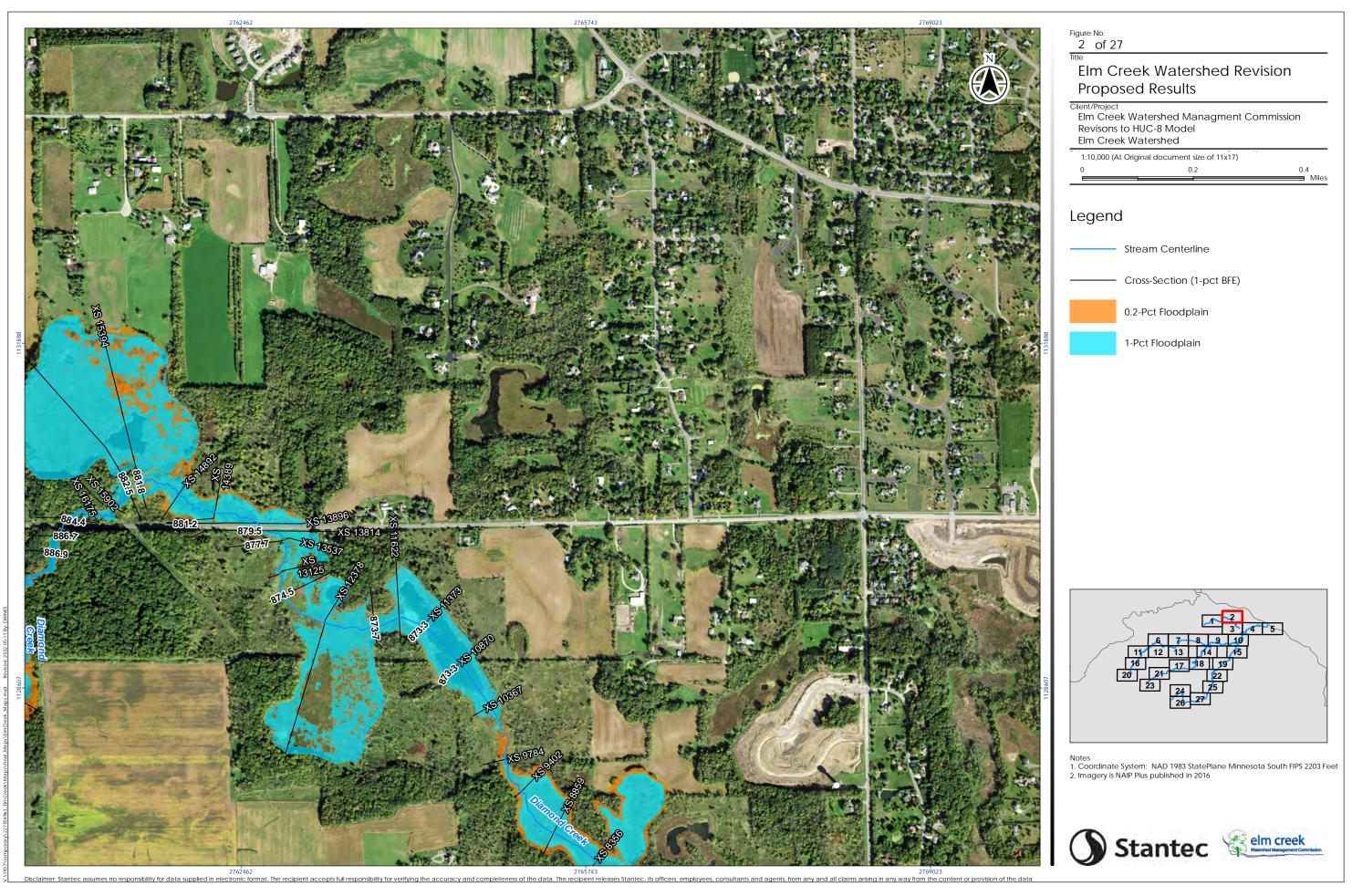
| North Fork Rush Creek | 15174 : 16367 (| Location Sounty Road 117 (US) O9th Avenue North (US) IS of 109th Avenue N, DS of Access Road ear Cain Road, DS of D So of 109th Avenue N, DS of Access Road ear Cain Road, DS of E CCESS Road near Cain Road (DS) CCESS Road near Cain Road (US) Cain Road Cain Road, DS of Trail Haven Road, DS of Cain Road, DS of Trail Haven Road, DS of IS of Cain Road, DS of Trail Haven Road, DS of IS of Cain Road, DS of Trail Haven Road, DS of IS of Cain Road, DS of Trail Haven Road, DS of IS of Cain Road, DS of Trail Haven Road, DS of MS of Cain Road, DS of Trail Haven Road, DS of MS of NS of | Creek Distance above the Rush Creek (miles) 2.66 2.76 2.98 3.26 3.30 3.32 3.55 3.58 3.70 4.06 4.24 4.34 4.50 4.72 4.87 | B C D E F G H I J K L M N O | 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.2 919.0 918.2 919.3 | | Flood | 509.5 509.5 509.5 444.6 444.6 444.6 444.6 444.6 444.6 | and F Flood Elevation (feet) -13.2 -11.2 -10.0 -10.4 -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 -6.2 | Flow Rate (CFS) | Note |
|---|--|--|---|---|--|-----------------|---|---|--|-----------------|------|
| Main Stem Creek North Fork Rush Creek | 14593 15174 16367 17914 16367 17914 16367 17914 17914 17914 18117 18282 19664 19750 120321 121320 12 | Jounty Road 117 (US) O9th Avenue North (US) IS of 109th Avenue N, DS of Access Road lear Cain Road, DS of D IS of 109th Avenue N, DS of Access Road lear Cain Road, DS of E Is of Loght Avenue N, DS of Access Road lear Cain Road, DS of E Is of Cain Road, DS of E Is of Cain Road, DS of Trail Haven Road, IS of J IS of Cain Road, DS of Trail Haven Road, IS of L IS of Cain Road, DS of Trail Haven Road, IS of L IS of Cain Road, DS of Trail Haven Road, IS of M IS of Cain Road, DS of Trail Haven Road, IS of M IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven | Rush Creek (miles) 2.66 2.76 2.98 3.26 3.30 3.32 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | FI A B C C D E F F G H I I J K L M N O | Flood Elevation (NGVD29 feet) 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 919.0 919.2 919.3 | Flow Rate (CFS) | 902.8 904.8 905.9 906 905.5 905.2 904.9 909.1 911.5 913.4 913.1 | Flow Rate (CFS) 509.5 509.5 509.5 509.5 509.5 444.6 444.6 444.6 444.6 444.6 444.6 444.6 | Flood Elevation (feet) -13.2 -11.2 -11.0 -10.0 -10.4 -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 -6.2 | Flow Rate (CFS) | Note |
| North Fork Rush Creek | 14593 15174 16367 17914 16367 17914 16367 17914 17914 17914 18117 18282 19664 19750 120321 121320 12 | Jounty Road 117 (US) O9th Avenue North (US) IS of 109th Avenue N, DS of Access Road lear Cain Road, DS of D IS of 109th Avenue N, DS of Access Road lear Cain Road, DS of E Is of Loght Avenue N, DS of Access Road lear Cain Road, DS of E Is of Cain Road, DS of E Is of Cain Road, DS of Trail Haven Road, IS of J IS of Cain Road, DS of Trail Haven Road, IS of L IS of Cain Road, DS of Trail Haven Road, IS of L IS of Cain Road, DS of Trail Haven Road, IS of M IS of Cain Road, DS of Trail Haven Road, IS of M IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of OI IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven | Rush Creek (miles) 2.66 2.76 2.98 3.26 3.30 3.32 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | FI A B C C D E F F G H I I J K L M N O | 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.0 916.6 918.2 919.2 | | 902.8 904.8 905.9 906 905.5 905.2 904.9 909.1 911.5 913.4 913.1 | 509.5 509.5 509.5 509.5 509.5 444.6 444.6 444.6 444.6 444.6 | Elevation (feet) -13.2 -11.2 -11.0 -10.0 -10.4 -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 -6.2 | | Note |
| North Fork Rush Creek | 15174 : 16367 (| O9th Avenue North (US) IS of 109th Avenue N, DS of Access Road lear Cain Road, DS of D IS of 109th Avenue N, DS of Access Road lear Cain Road, DS of E IS of 109th Avenue N, DS of Access Road lear Cain Road, DS of E IS occess Road near Cain Road (US) Is in Road Is Road (US) Is of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of S of IS IS of Cain Road, DS of Trail Haven Road, IS of S of IS IS of Cain Road, DS of Trail Haven Road, IS of S of IS IS of Cain Road, DS of Trail Haven Road, IS of S of IS IS of Cain Road, DS of Trail Haven Road, IS of S of IS IS of Cain Road, DS of Trail Haven Road, IS of S of IS IS of Cain Road, DS of Trail Haven Road, | 2.76 2.98 3.26 3.30 3.32 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | B C D E F G H I J K L M N O | 916.0 916.0 916.0 916.0 916.0 916.0 916.6 918.2 919.0 919.3 | 700 | 904.8 905 906 905.6 905.5 905.2 904.9 909.1 911.5 913.4 913.1 | 509.5 509.5 509.5 509.5 509.5 444.6 444.6 444.6 444.6 444.6 444.6 | -11.2 -11.0 -10.0 -10.4 -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 | -255.4 | |
| orth Fork Rush Creek | 16367 kg 17914 kg 17914 kg 18117 f 18282 g 19664 kg 19750 g 20321 kg 19750 | US of 109th Avenue N, DS of Access Road lear Cain Road, DS of D DS of Access Road lear Cain Road, DS of D DS of Access Road lear Cain Road, DS of E Locess Road near Cain Road (DS) (Locess Road near Cain Road (DS) (Locess Road near Cain Road (US) (Locess Road near Cain Road, DS of Cain Road, DS of Trail Haven Road, DS of K (Locess Road (US) (Locess Road (US) (Locess Road (US) (Locess Road (US) (US) (Locess Road (US) (US) (Locess Road (US) (US) (US) (Locess Road (US) (US) (US) (US) (Locess Road (US) (US) (US) (US) (US) (US) (US) (US) | 2.98 3.26 3.30 3.32 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | E F G H I | 916.0 916.0 916.0 916.0 916.0 916.0 916.6 918.2 919.0 919.3 | 700 | 905 906 905.6 905.5 905.2 904.9 909.1 911.5 913.4 913 913.1 | 509.5 509.5 509.5 509.5 444.6 444.6 444.6 444.6 444.6 444.6 | -11.0 -10.0 -10.4 -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 | -255.4 | |
| orth Fork Rush Creek | 17914 (18117 / 18282 / 19664 (19750 (20321 (21320 (23477 (23984 (24861 (26026 (26892 (27431 | ear Cain Road, DS of D IS of 109th Avenue N, DS of Access Road rear Cain Road, DS of E ICCESS Road near Cain Road (DS) ICCESS Road near Cain Road (US) ICCESS Road near Cain Road (US) ICCESS Road near Cain Road (US) IS of Cain Road, DS of Trail Haven Road, IS of J IS of Cain Road, DS of Trail Haven Road, IS of S IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of S IS of Cain Road, DS of Trail Haven Road, IS of S IS of Cain Road, DS of Trail Haven Road, IS of S IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O | 3.26 3.30 3.32 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | E F G H H I J K L | 916.0 916.0 916.0 916.0 916.0 916.6 918.2 919.0 919.3 | 700 | 906 905.6 905.5 905.2 904.9 909.1 911.5 913.4 913 913.1 | 509.5 509.5 509.5 444.6 444.6 444.6 444.6 444.6 444.6 | -10.0 -10.4 -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 | -255.4 | |
| orth Fork Rush Creek | 18117 / 1828 / 19664 (19750) 20321 | rear Cain Road, DS of E CCCESS Road near Cain Road (DS) Cain Road Cain Road (US) Cain Road Cain Road, DS of Trail Haven Road, CS of Cain Road, DS of Trail Haven Road, CS of Cain Road, DS of Trail Haven Road, CS of LS CS of Cain Road, DS of Trail Haven Road, CS of LS CS of Cain Road, DS of Trail Haven Road, CS of LS CS of Cain Road, DS of Trail Haven Road, CS of M CS of Cain Road, DS of Trail Haven Road, CS of N CS of Cain Road, DS of Trail Haven Road, CS of N CS of Cain Road, DS of Trail Haven Road, CS of O CS of Cain Road, DS of Trail Haven Road, CS of P CS of Cain Road, DS of Trail Haven Road, CS of P CS of Cain Road, DS of Trail Haven Road, CS of P CS of Cain Road, DS of Trail Haven Road, CS of P CS of Cain Road, DS of Trail Haven Road, CS of O CS of Cain Road, DS of Trail Haven Road, CS of O CS of Cain Road, DS of Trail Haven Road, CS of O CS of Cain Road, DS of Trail Haven Road, CS of O CS of Cain Road, DS of Trail Haven Road, CS of O | 3.30 3.32 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | E F G H I J K L M | 916.0 916.0 916.0 916.0 916.0 916.6 918.2 919.0 919.3 | 700 | 905.6 905.5 905.2 904.9 909.1 911.5 913.4 913.1 915.8 | 509.5 509.5 444.6 444.6 444.6 444.6 444.6 444.6 | -10.4 -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 | -255.4 | |
| forth Fork Rush Creek | 18282 / 19664 / 19750 (20321 21320 (22487 (23477 (23984 24861 (26026 (26892 (27431 (| Access Road near Cain Road (US) Alain Road Alain Road (US) Also f Cain Road, DS of Trail Haven Road, Also f J Also f Cain Road, DS of Trail Haven Road, Also f J Also f Cain Road, DS of Trail Haven Road, Also f L Also f Cain Road, DS of Trail Haven Road, Also f L Also f Cain Road, DS of Trail Haven Road, Also f M Also f Cain Road, DS of Trail Haven Road, Also f N Also f Cain Road, DS of Trail Haven Road, Also f O Also f Cain Road, DS of Trail Haven Road, Also f O Also f Cain Road, DS of Trail Haven Road, Also f O Also f Cain Road, DS of Trail Haven Road, Also f O Also f Cain Road, DS of Trail Haven Road, Also f Cain Road, DS of Trail Haven Road, Also f Cain Road, DS of Trail Haven Road, Also f O Also f Cain Road, DS of Trail Haven Road, Also f O | 3.32 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | F G H I J K L M N | 916.0 916.0 916.0 916.0 916.6 918.2 919.0 919.3 | 700 | 905.5 905.2 904.9 909.1 911.5 913.4 913.1 915.8 | 509.5 444.6 444.6 444.6 444.6 444.6 444.6 | -10.5 -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 -6.2 | -255.4 | |
| orth Fork Rush Creek | 19664 (19750) 20321 (19750) 21320 (19750) 22487 (19750) 23984 (19750) 24861 (19750) 26026 (19750) 26892 (19750) 27431 (19750) | cain Road (ain Road (US) (S of Cain Road, DS of Trail Haven Road, (DS of J) (S of Cain Road, DS of Trail Haven Road, (DS of K) (DS of Cain Road, DS of Trail Haven Road, (DS of K) (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Cain Road, DS of Trail Haven Road, (DS of Q) | 3.55 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | G H I J K L M N | 916.0 916.0 916.0 918.2 919.0 919.3 | 700 | 905.2 904.9 909.1 911.5 913.4 913.1 915.8 | 444.6 444.6 444.6 444.6 444.6 444.6 | -10.8 -11.1 -6.9 -5.1 -4.8 -6.0 -6.2 | -255.4 | |
| orth Fork Rush Creek | 19750 (20321) 20321) 21320 (2032) 22487 (2032) 23984 (2032) 24861 (2032) 26026 (2032) 26892 (2032) | rain Road (US) IS of Cain Road, DS of Trail Haven Road, IS of Jain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Lain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of M IS of Cain Road, DS of Trail Haven Road, IS of N IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of P IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O IS of Cain Road, DS of Trail Haven Road, IS of O | 3.58 3.70 3.84 4.06 4.24 4.34 4.50 | H I J K L M N | 916.0 916.0 916.6 918.2 919.0 919.3 | 700 | 904.9 909.1 911.5 913.4 913.1 915.8 | 444.6 444.6 444.6 444.6 444.6 444.6 | -11.1 -6.9 -5.1 -4.8 -6.0 -6.2 | -255.4 | |
| orth Fork Rush Creek | 20321 (21320 (22487 (23477 (23984 (24861 (26026 (26892 (27431 (| US of Cain Road, DS of Trail Haven Road, US of J US of Cain Road, DS of Trail Haven Road, US of J US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of L US of Cain Road, DS of Trail Haven Road, US of M US of Cain Road, DS of Trail Haven Road, US of S US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Q | 3.70 3.84 4.06 4.24 4.34 4.50 | і к L м N | 916.0 916.6 918.2 919.0 919.3 | | 909.1 911.5 913.4 913.1 915.8 | 444.6 444.6 444.6 444.6 444.6 | -6.9 -5.1 -4.8 -6.0 -6.2 | | |
| Iorth Fork Rush Creek | 21320 0 22487 0 23477 0 23984 1 24861 1 26026 0 26892 0 | US of J US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of N US of Cain Road, DS of Trail Haven Road, US of O US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, | 3.84 4.06 4.24 4.34 4.50 | J K L M N | 916.6 918.2 919.0 919.3 920.2 | | 911.5 913.4 913 913.1 915.8 | 444.6 444.6 444.6 444.6 | -5.1 -4.8 -6.0 -6.2 | | |
| North Fork Rush Creek | 22487 (23477 (23984 (24861 (26026 (26892 (27431 (| DS of K US of Cain Road, DS of Trail Haven Road, DS of L US of Cain Road, DS of Trail Haven Road, DS of M US of Cain Road, DS of Trail Haven Road, DS of M US of Cain Road, DS of Trail Haven Road, DS of OS of N US of Cain Road, DS of Trail Haven Road, DS of OS US of Cain Road, DS of Trail Haven Road, DS of OS of P US of Cain Road, DS of Trail Haven Road, DS of OS o | 4.06 4.24 4.34 4.50 4.72 | K L M N | 918.2 919.0 919.3 920.2 | | 913.4 913 913.1 915.8 | 444.6 444.6 444.6 | -4.8 -6.0 -6.2 | | |
| North Fork Rush Creek | 23984 24861 26026 26892 27431 | NS of L IS of Cain Road, DS of Trail Haven Road, IS of M IS of Cain Road, DS of Trail Haven Road, IS of N IS of Cain Road, DS of Trail Haven Road, IS of S IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, IS of Cain Road, DS of Trail Haven Road, | 4.24 4.34 4.50 4.72 | L M N O | 919.0 919.3 920.2 | | 913.1 915.8 | 444.6 444.6 444.6 | -6.0 -6.2 -4.4 | | |
| North Fork Rush Creek | 23984 (| US of M US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of P US of Cain Road, DS of Trail Haven Road, US of Cain Road, DS of Trail Haven Road, US of Q | 4.34 4.50 4.72 | M N | 919.3 920.2 | | 913.1 915.8 | 444.6 444.6 | -6.2 -4.4 | | |
| North Fork Rush Creek | 24861 (24861 (26026 (26892 (1 27431 (| DS of N US of Cain Road, DS of Trail Haven Road, US of O US of O US of Cain Road, DS of Trail Haven Road, US of P US of Cain Road, DS of Trail Haven Road, US of Q | 4.50 4.72 | N O | 920.2 | | 915.8 | 444.6 | -4.4 | | |
| Iorth Fork Rush Creek | 26026 (26892 (27431 (| DS of O US of Cain Road, DS of Trail Haven Road, DS of P US of Cain Road, DS of Trail Haven Road, DS of Q | 4.72 | 0 | | | | | | | |
| Iorth Fork Rush Creek | 26892 (26892 (1 27431 (| OS of P US of Cain Road, DS of Trail Haven Road, OS of Q | | | 921.4 | | 916.3 | | | | |
| Iorth Fork Rush Creek | 27431 U | OS of Q | 4.87 | P | 000.0 | | | 213.3 | -5.1 | | |
| Jorth Fork Rush Creek | | | | | 922.6 | | 915.2 | | -7.4 | | |
| Iorth Fork Rush Creek | | JS of Cain Road, DS of Trail Haven Road, DS of R | 4.98 | | 924.7 | | 917.64 | 213.3 | -7.1 | | |
| orth Fork Rush Creek | | rail Haven Road (DS) | 4.99 | | 926.2 | 700 | 918.2 | 213.3 | -7.9 | -486.7 | |
| orth Fork Rush Creek | | rail Haven Road (US) | 5.03 | | 926.7 | | 917.2 | 213.3 | -9.5 | | |
| orth Fork Rush Creek forth Fork Rush Creek forth Fork Rush Creek orth Fork Rush Creek | | JS of Trail Haven Road, DS of County Road 17, US of S | 5.19 | | 926.8 | | 917.5 | 213.3 | -9.3 | | |
| orth Fork Rush Creek orth Fork Rush Creek orth Fork Rush Creek | 1 | JS of Trail Haven Road, DS of County Road 17, US of T | 5.44 | | 926.9 | | 918.1 | 213.3 | -8.8 | | |
| Iorth Fork Rush Creek Iorth Fork Rush Creek | (| County Road 117/109th Avenue North DS) | 5.65 | | 927.0 | | 918.6 | 158.6 | -8.4 | | |
| lorth Fork Rush Creek | | at County Road 117/109th Avenue N | 5.67 | | 924.7 | | 918.4 | 158.6 | -6.3 | | |
| | (| County Road 117/109th Avenue North US) | 5.68 | | 927.6 | | 918.4 | 158.6 | -9.2 | | |
| orth Fork Rush Creek | , | JS and DS of County Road 117/109th evenue N, DS of Z | 5.70 | | 928.5 | | 920.4 | 158.6 | -8.1 | | |
| | | OS of County Road 117/109th Ave N, DS of NA | 6.47 | | 928.9 | | 921.2 | 158.6 | -7.7 | | |
| orth Fork Rush Creek | | JS of County Road 117/109th Avenue N | 6.50 | | 932.1 | | 921.3 | 158.6 | -10.8 | | |
| orth Fork Rush Creek | | JS of County Road 117/109th Ave N, DS of C | 6.52 | | 932.1 | | 923.8 | 158.6 | -8.3 | | |
| orth Fork Rush Creek | , | JS of County Road 117/109th Ave N, DS of ND | 6.60 | | 932.1 | | 925.62 | 158.6 | -6.5 | | |
| orth Fork Rush Creek | | JS of County Road 117/109th Ave N, DS of LE | 6.70 | AD | 936.5 | | 926.05 | 158.6 | -10.5 | | |
| orth Fork Rush Creek | | S of Access Road, US of AD | 6.99 | | 935.6 | | 929 | 158.6 | -6.6 | | |
| orth Fork Rush Creek | | S of Bechtold Road, US of Access Road | 7.03 | | 937.9 | | 930.5 | 158.6 | -7.4 | | |
| orth Fork Rush Creek | | S of Bechtold Road | 7.15 | | 938.4 | | 931.6 | 158.6 | -6.8 | | |
| orth Fork Rush Creek | | JS of Bechtold Road | 7.16 | | 940.3 | | 931.7 | 158.6 | -8.6 | | |
| orth Fork Rush Creek orth Fork Rush Creek | | JS of Bechtold Road,DS of AJ | 7.25 | Al | 941.2 | | 932.2 934.69 | 158.6 158.6 | -8.9 -8.1 | | |

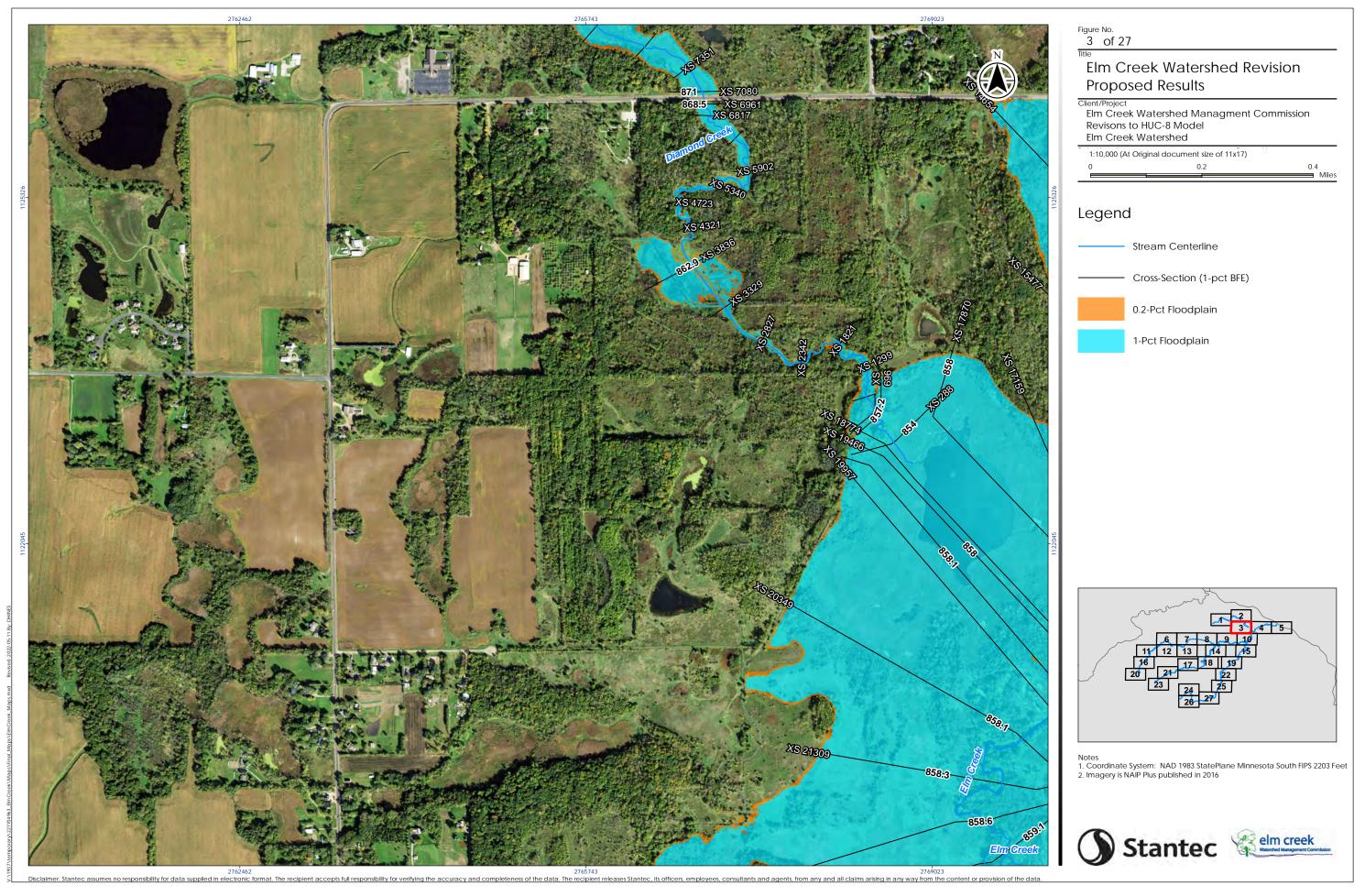
| | | | | | ECWMC FIS F | Flood Profiles | | C-8 Revised Model d Profiles | - | Flood Elevations Flow Rates | |
|-----------------------|--|-----------------------|--|--------------------------------|----------------------------------|-----------------|----------------------|---------------------------------|------------------------------|--------------------------------|------|
| | | | | 100 | 0-yr | 100-yr | | 100-yr | | | |
| Main Stem Creek | HEC-RAS XS Loc | ation | Creek Distance above the Rush Creek (miles) | Lettered Cross Section from FI | Flood Elevation (NGVD29 feet) | Flow Rate (CFS) | Elevation (NGVD29 | Flow Rate (CFS) | Flood Elevation (feet) | Flow Rate (CFS) | Note |
| orth Fork Rush Creek | 41705 DS of County Road 30 | 0/Oak Bole Drive | 7.67 | AK | 944.7 | | 938.32 | 158.6 | | | |
| orth Fork Rush Creek | 41986 US of County Road 3 | 0/Oak Bole Drive | 7.72 | AL | 948.2 | | 939 | 126.4 | -9.2 | | |
| orth Fork Rush Creek | 43630 US of County Road 30 of AN | 0/Oak Bole Drive, DS | 7.96 | AM | 948.5 | | 941.6 | 126.4 | -6.9 | | |
| orth Fork Rush Creek | 44291 US of County Road 30 of AO | 0/Oak Bole Drive, DS | 8.07 | AN | 949.1 | | 943.7 | | -5.4 | | |
| orth Fork Rush Creek | 46377 DS of Sundance Road | d, DS of AP | 8.37 | AO | 952.2 | | 946.9 | 126.4 | -5.3 | | |
| orth Fork Rush Creek | 47362 DS of Sundance Road | d, DS of AQ | 8.53 | AP | 955.9 | | 949.21 | | -6.7 | | |
| orth Fork Rush Creek | 48342 DS of Sundance Road | d, DS of AR | 8.69 | AQ | 959.3 | | 952.7 | | -6.6 | | |
| orth Fork Rush Creek | 49363 DS of Sundance Road | i | 8.86 | AR | 961.8 | | 953.8 | | -8.0 | | |
| orth Fork Rush Creek | 49436 US of Sundance Road | d | 8.88 | | 964.1 | | 955 | | -9.1 | | |
| orth Fork Rush Creek | 49901 US of Sundance Road | | 8.94 | | 964.1 | | 956.62 | | -7.4 | | |
| orth Fork Rush Creek | 50577 US of Sundance Road | d, US of AT | 9.08 | AU | 964.1 | | 957.59 | 126.4 | -6.5 | | |
| orth Fork Rush Creek | 52176 DS of 97th Avenue N | , DS of AW | 9.29 | AV | 966.3 | | 962 | 126.4 | -4.3 | | |
| orth Fork Rush Creek | 52972 DS of 97th Avenue N | , DS of AX | 9.42 | AW | 969.0 | | 962.48 | 126.4 | -6.5 | | |
| orth Fork Rush Creek | 54987 DS of 97th Avenue N | | 9.75 | AX | 974.4 | | 968.3 | 126.4 | -6.1 | | |
| orth Fork Rush Creek | 55226 US of 97th Avenue N | | 9.78 | AY | 977.5 | | 968.5 | 126.4 | -9.0 | | |
| orth Fork Rush Creek | 55966 US of 97th Avenue N | , US of AY | 9.91 | AZ | 978.1 | | 971.24 | 126.4 | -6.9 | | |
| orth Fork Rush Creek | 57273 US of 97th Avenue N | , US of AZ | 10.13 | BA | 981.9 | | 976.18 | 126.4 | -5.7 | | |
| orth Fork Rush Creek | 58518 US of 97th Avenue N | , DS of BC | 10.32 | BB | 985.4 | | 978.8 | 126.4 | -6.6 | | |
| orth Fork Rush Creek | 59887 DS of Access Road at DS of BD | nd County Road 10, | 10.52 | BC | 989.6 | | 984 | 126.4 | -5.6 | | |
| orth Fork Rush Creek | 59987 DS of Access Road, D | S of BE | 10.55 | BD | 991.5 | | 984.2 | 126.4 | -7.3 | | |
| orth Fork Rush Creek | 60064 US of Access Road no DS of BF | ear County Road 10, | 10.59 | | 991.7 | | 984.3 | | -7.4 | | |
| orth Fork Rush Creek | 60120 DS of County Road 10 | 0 | 10.61 | BF | 992.1 | 420 | 985.2 | 126.4 | -6.9 | -293.6 | |
| orth Fork Rush Creek | 60352 US of County Road 1 | 0 | 10.63 | BG | 992.4 | | 984.5 | 58.1 | -7.9 | | |
| orth Fork Rush Creek | 60606 US of County Road 10 | 0, DS of Access Road | 10.69 | ВН | 993.1 | | 985.3 | 58.1 | -7.8 | | |
| orth Fork Rush Creek | 60948 US of Access Road, D | S of BJ | 10.73 | BI | 993.1 | | 985.3 | 58.1 | -7.8 | | |
| orth Fork Rush Creek | 61315 US of County Road 10 of BI | 0 and Access road, US | 10.81 | ВЈ | 993.3 | | 986.1 | . 58.1 | -7.2 | | |
| orth Fork Rush Creek | 63385 US of County Road 10 | 0, US of BJ | 11.20 | BK | 994.5 | | 988.74 | 58.1 | -5.7 | | |
| orth Fork Rush Creek | 63749 US of County Road 1 | | 11.27 | | 995.1 | | 988.6 | | -6.5 | | |
| orth Fork Rush Creek | 64763 DS of County Road 19 Road | 9/Crow Hassan Park | 11.45 | ВМ | 999.8 | | 991.33 | 58.1 | -8.4 | | |
| lorth Fork Rush Creek | 64955 US of County Road 19 Road | 9/Crow-Hassan Park | 11.49 | BN | 1005.2 | | 992.68 | 58.1 | -12.5 | | |
| orth Fork Rush Creek | 65429 DS of Strehler Road, | DS of BP | 11.58 | ВО | 1005.2 | | 991.01 | . 58.1 | -14.2 | | |
| orth Fork Rush Creek | 65983 DS of Strehler Road, | DS of BQ | 11.68 | BP | 1005.2 | | 993.09 | 58.1 | -12.1 | | |
| orth Fork Rush Creek | 66739 DS of Strehler Road, | DS of BR | 11.80 | BQ | 1005.2 | | 995.8 | 58.1 | -9.4 | | |
| orth Fork Rush Creek | 67226 DS of Strehler Road | | 11.92 | BR | 1005.3 | 300 | 995.9 | 58.1 | -9.4 | -241.9 | |
| orth Fork Rush Creek | 67429 US of Strehler Road | | 11.96 | BS | 1005.3 | | 996 | 58.1 | -9.3 | | |
| orth Fork Rush Creek | 68345 US of Strehler Road, | US of BS | 12.12 | ВТ | 1005.3 | | 997.4 | 58.1 | -7.9 | | |
| orth Fork Rush Creek | 69031 US of Strehler Road, | US of BT | 12.24 | BU | 1005.3 | | 998 | 58.1 | -7.3 | | |
| orth Fork Rush Creek | 69474 US of Strehler Road, | US of BU | 12.33 | BV | 1005.3 | | 998.5 | 58.1 | -6.8 | | |
| orth Fork Rush Creek | 71089 US of Strehler Road, | DS of BX | 12.64 | BW | 1005.4 | | 998.7 | 58.1 | -6.7 | | |
| orth Fork Rush Creek | 72186 US of Strehler Road, | US of BW | 12.85 | BX | 1005.4 | | 999.5 | 58.1 | -5.9 | | |
| orth Fork Rush Creek | 72915 US of Strehler Road, | US of BX | 12.99 | BY | 1005.4 | | 1000.2 | 58.1 | -5.2 | | |

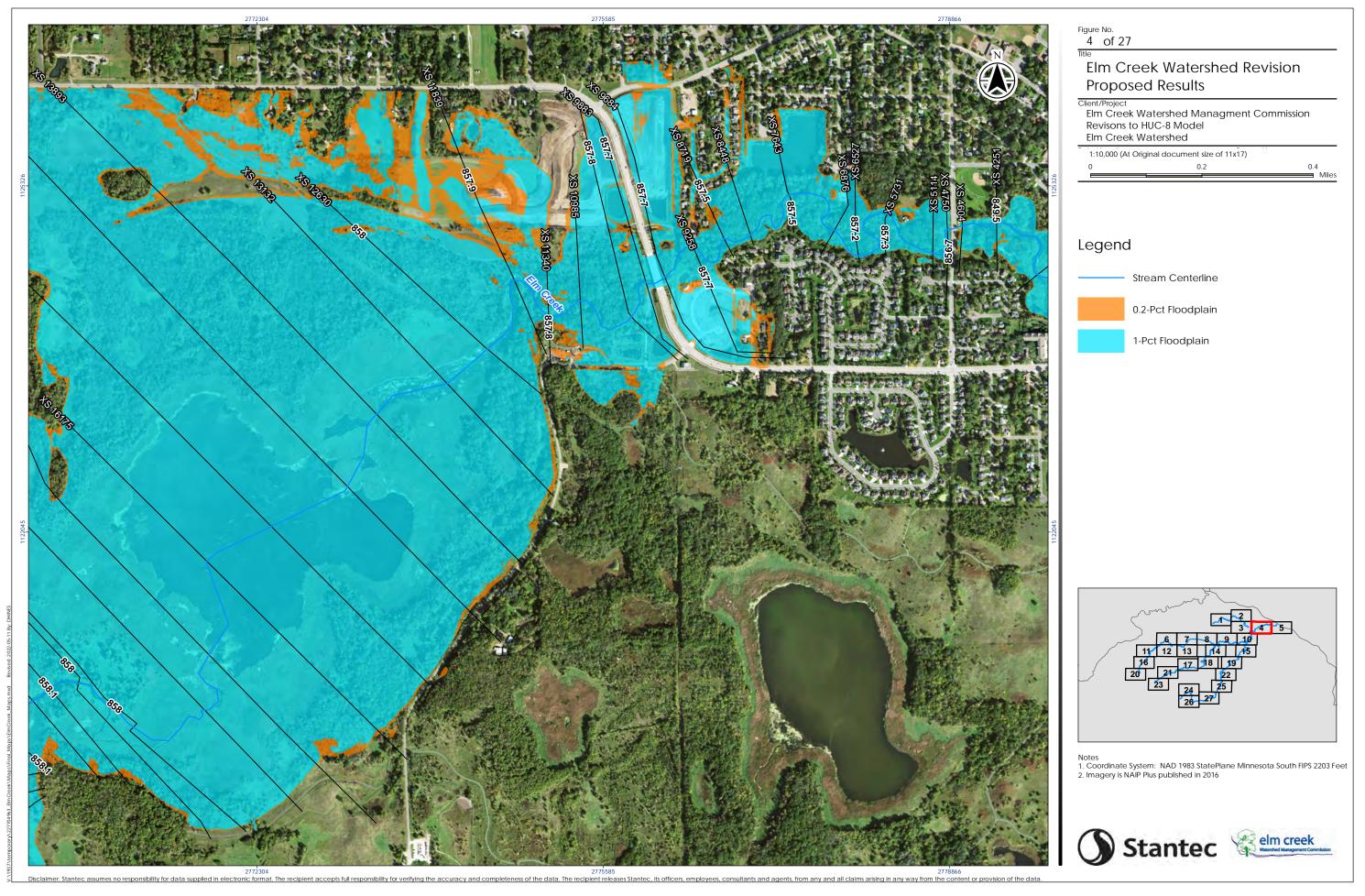
APPENDIX E

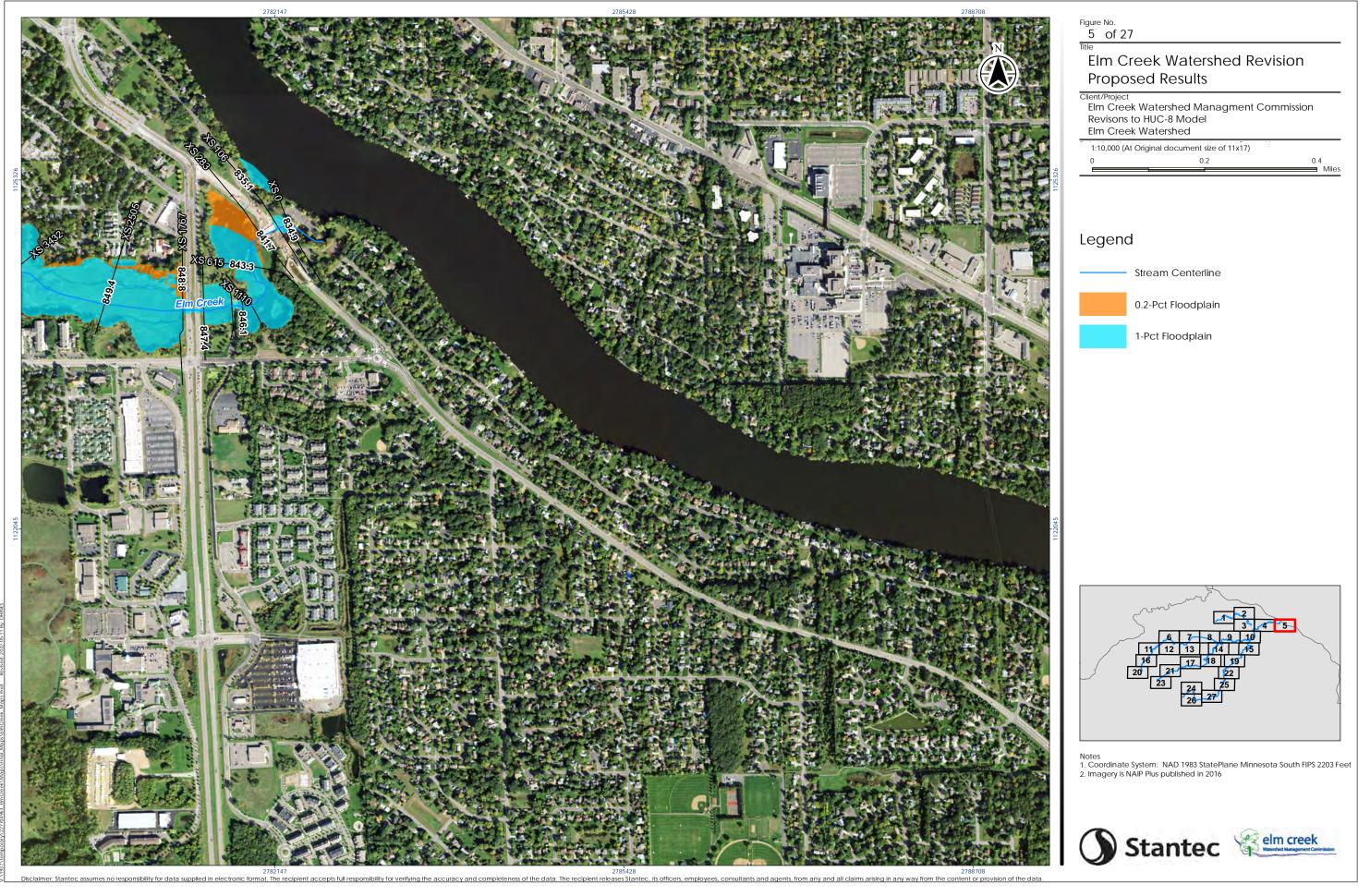
1% and 0.2% AEP Inundation Maps

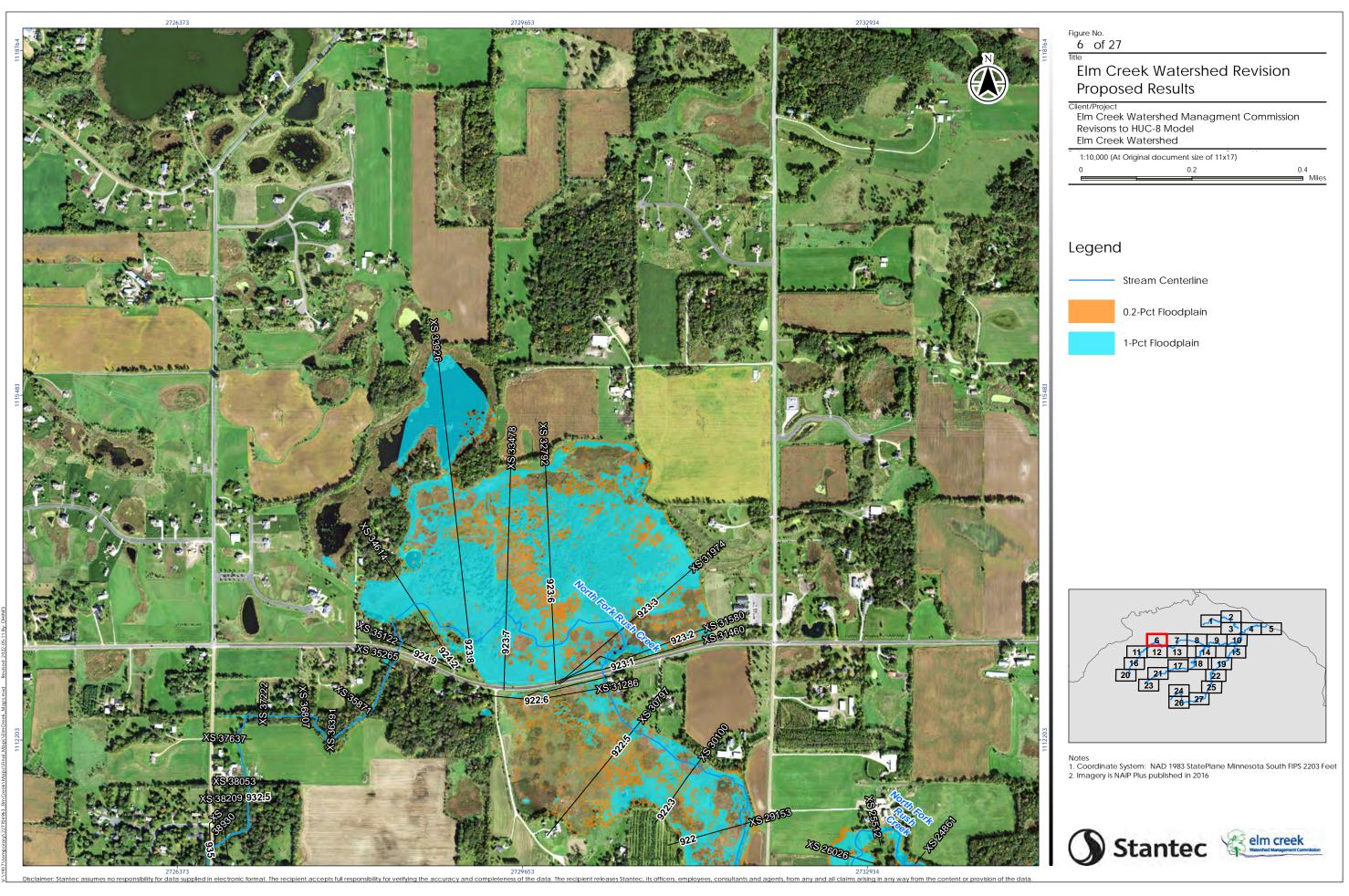


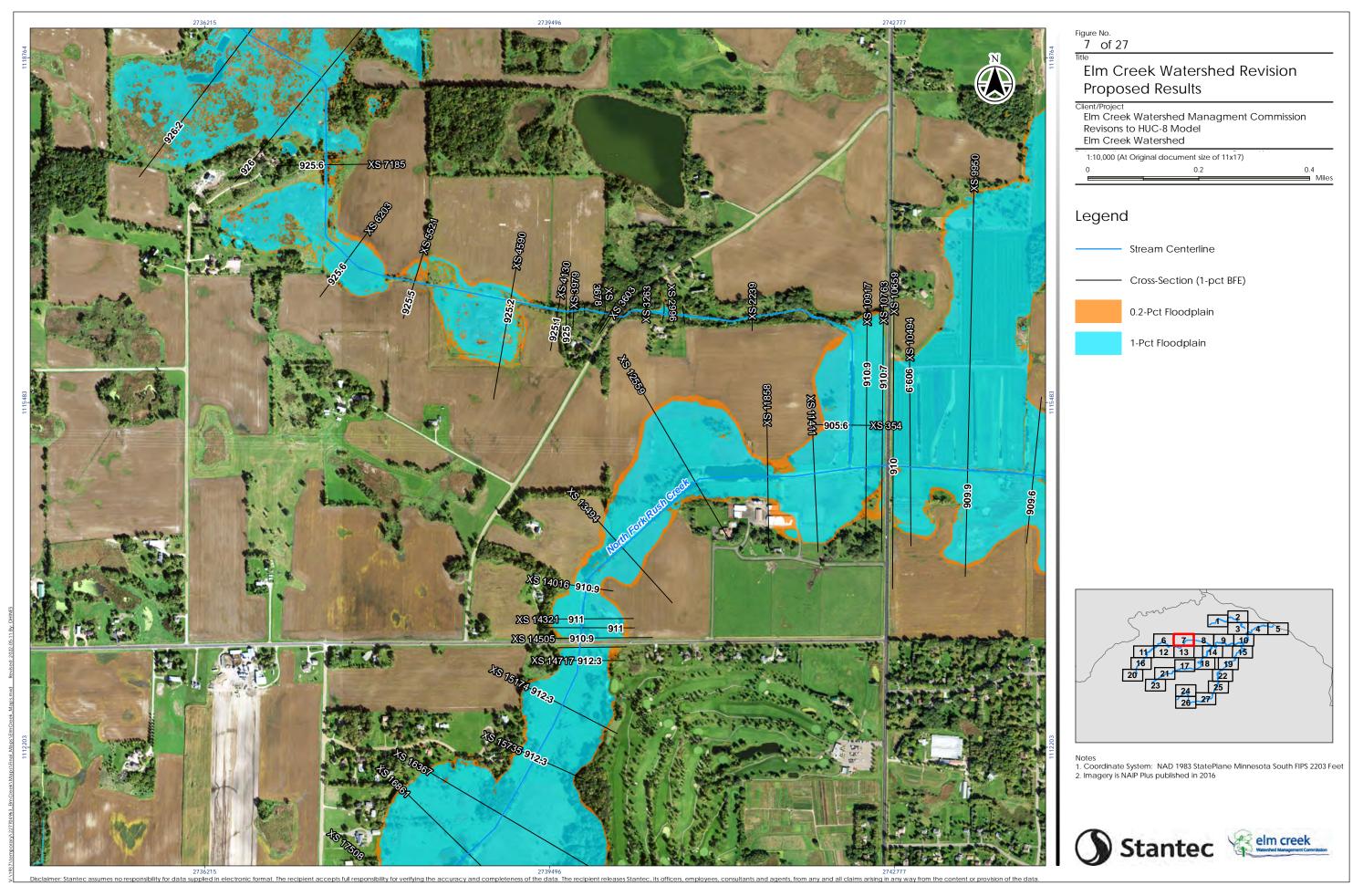


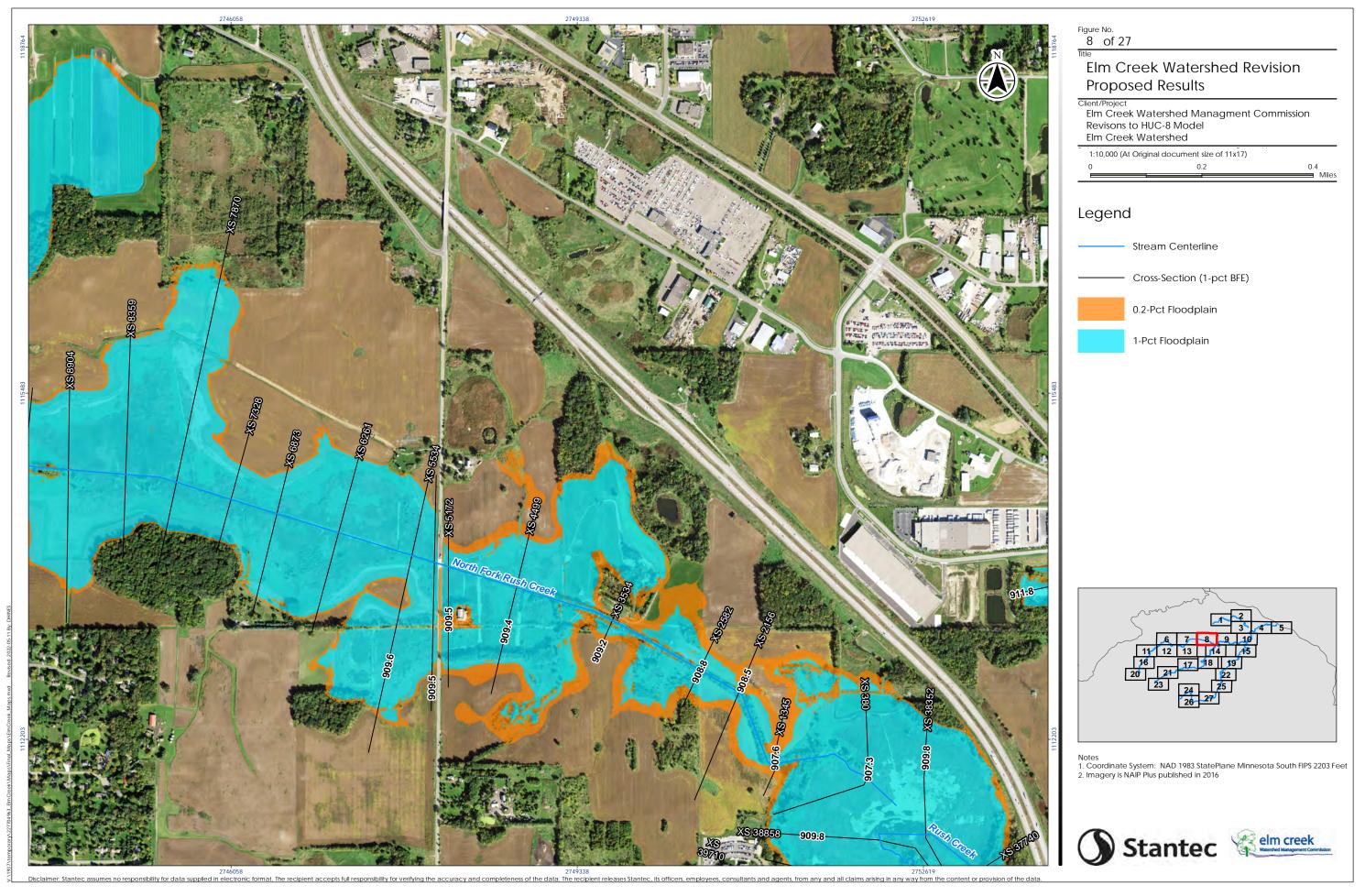


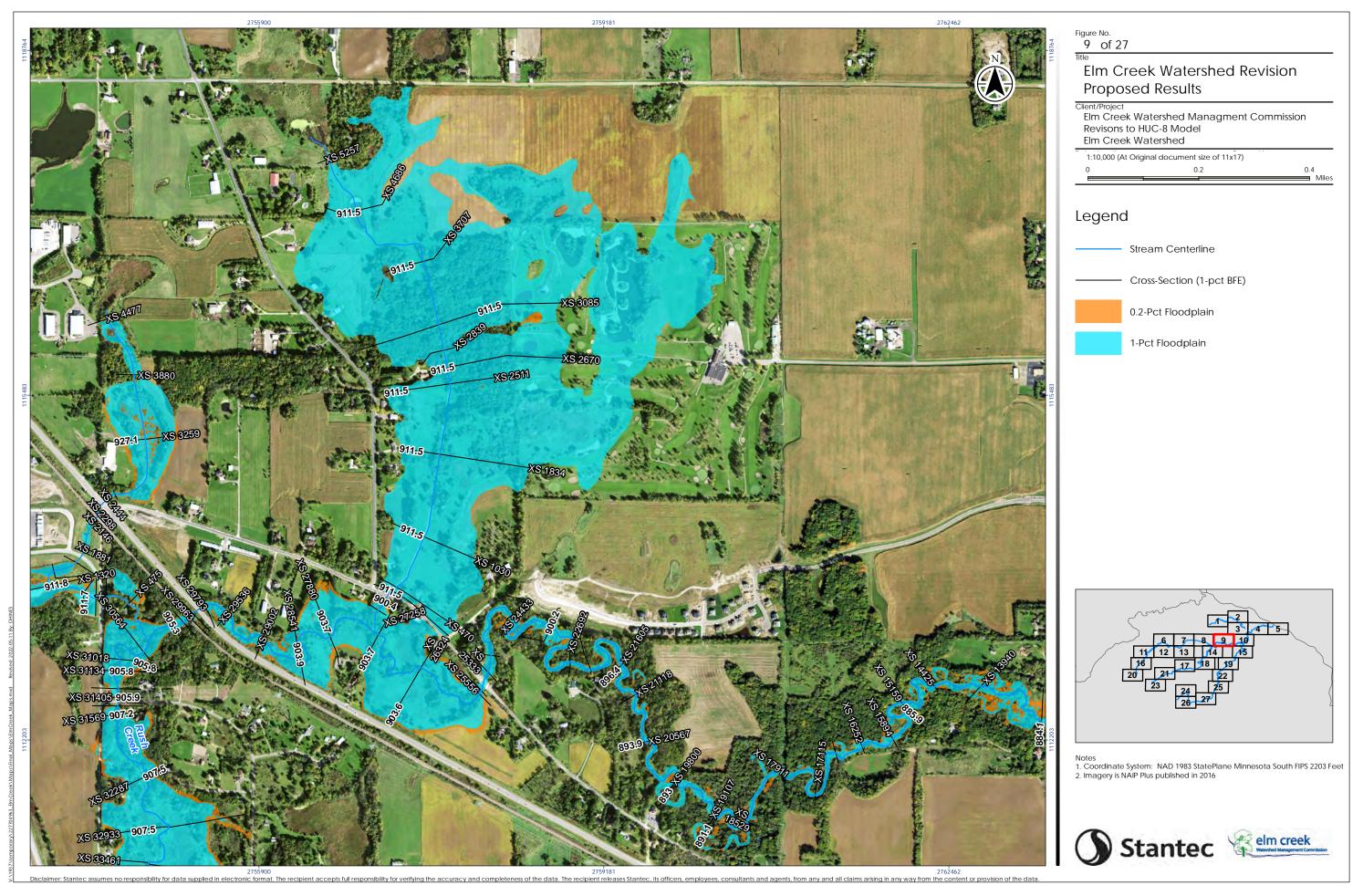


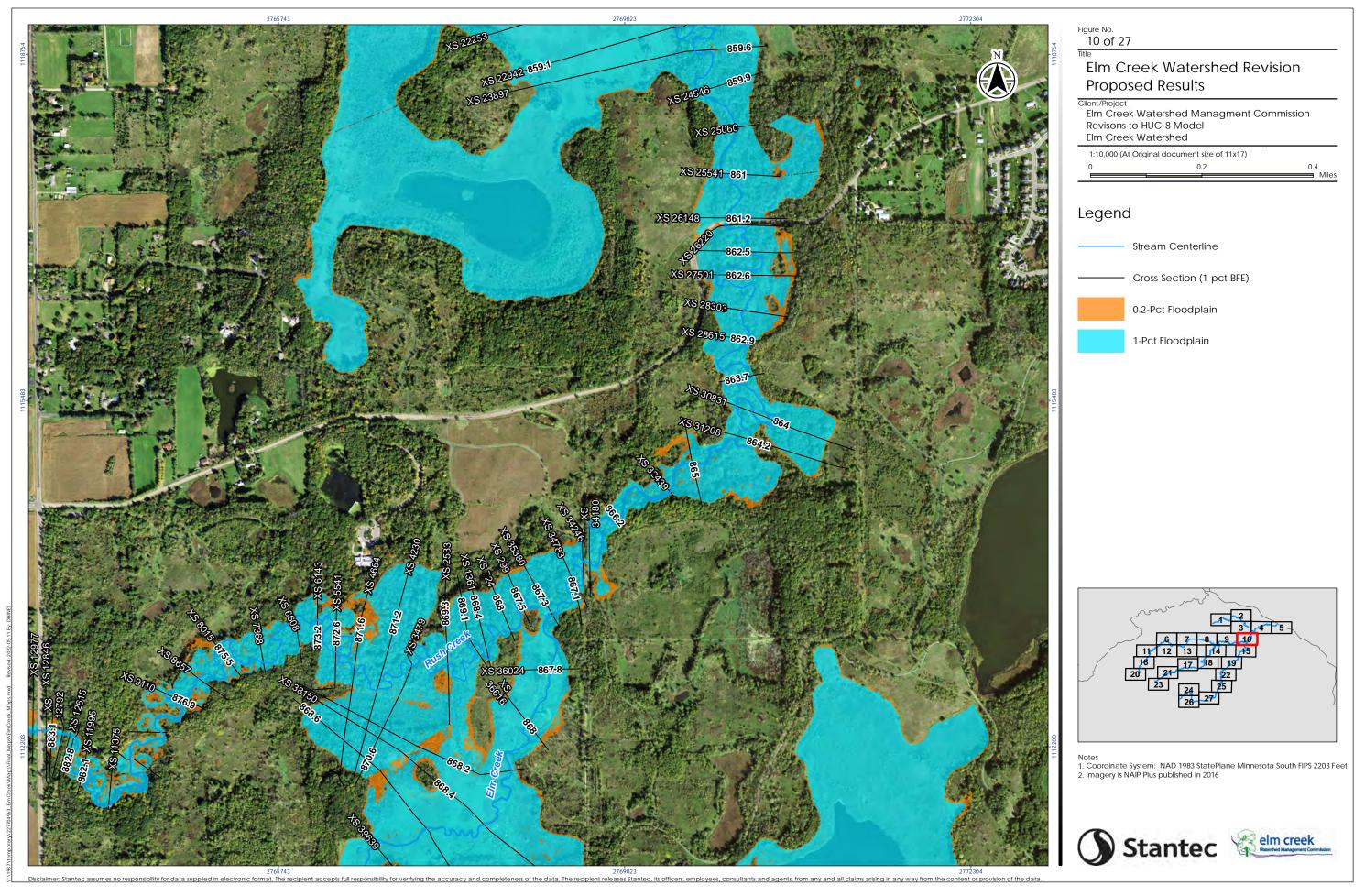


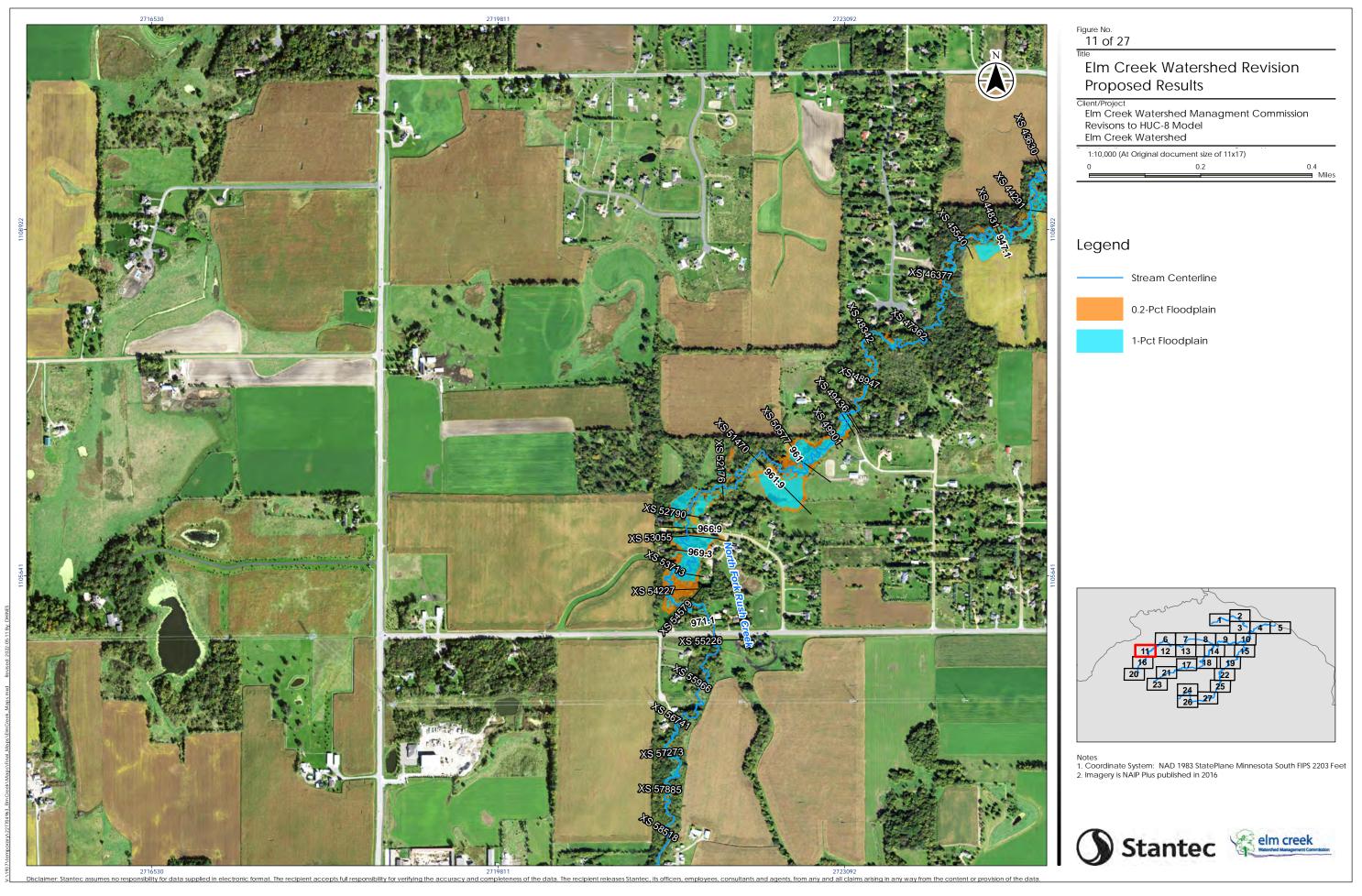


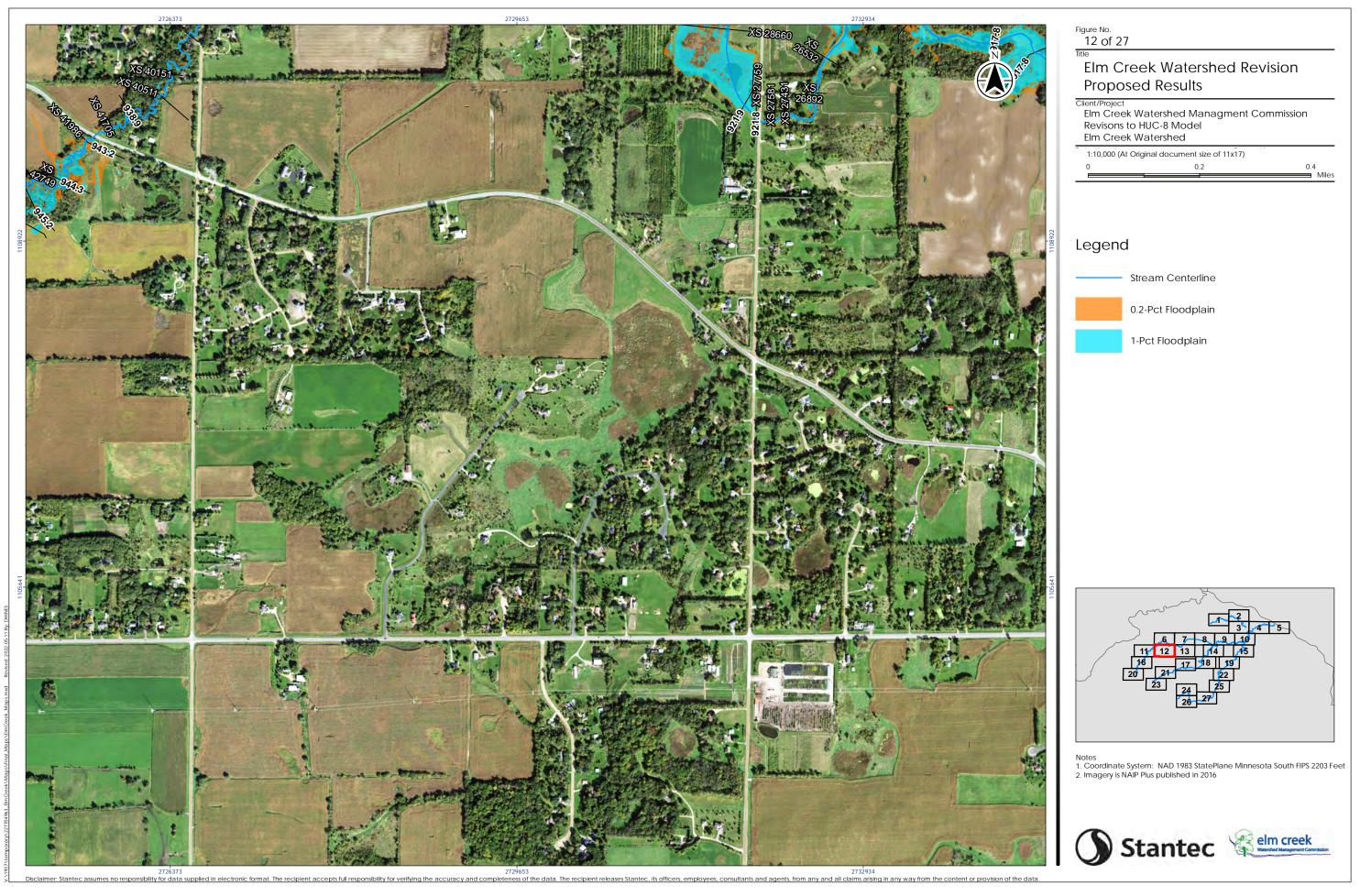


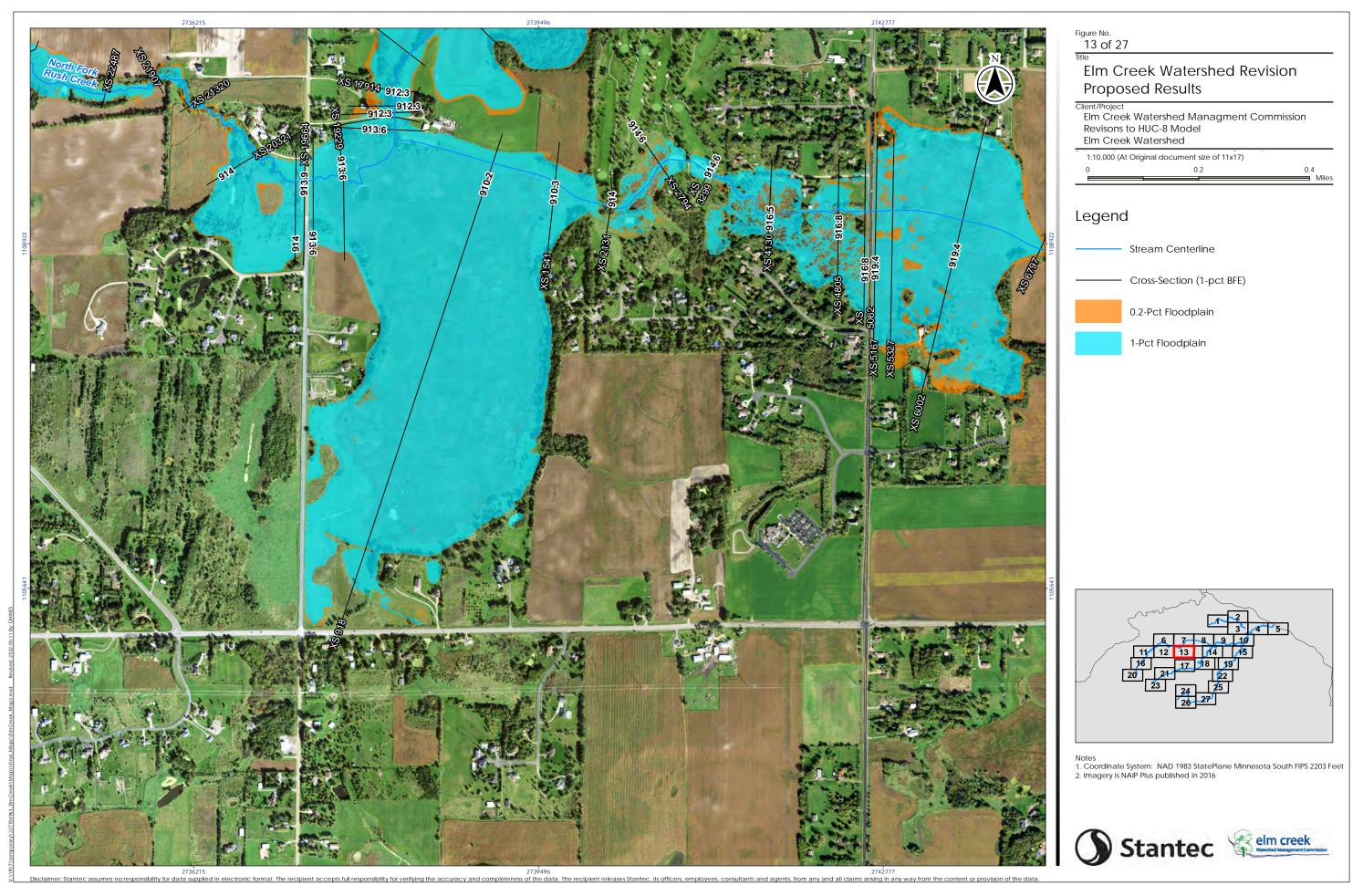


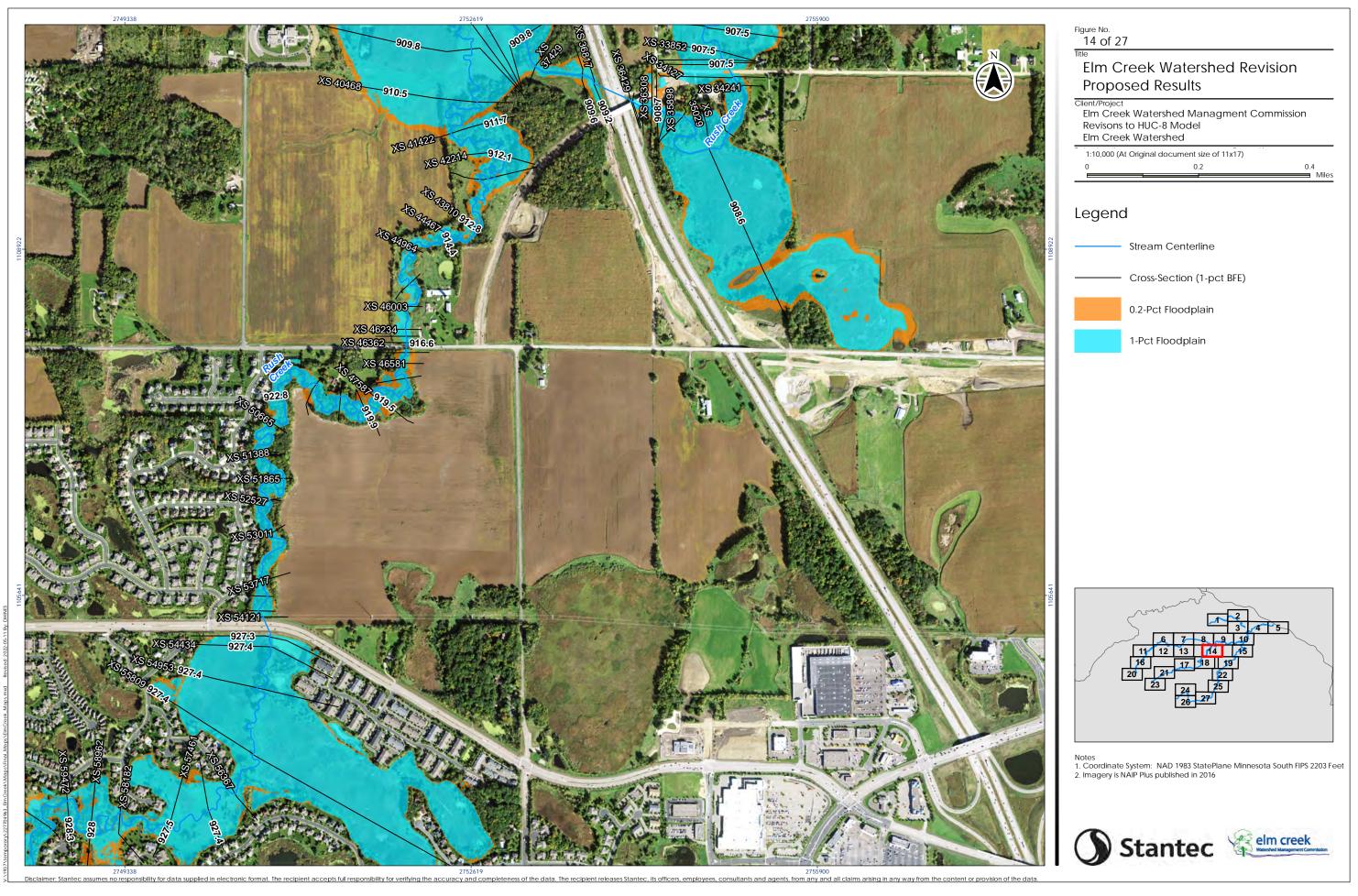


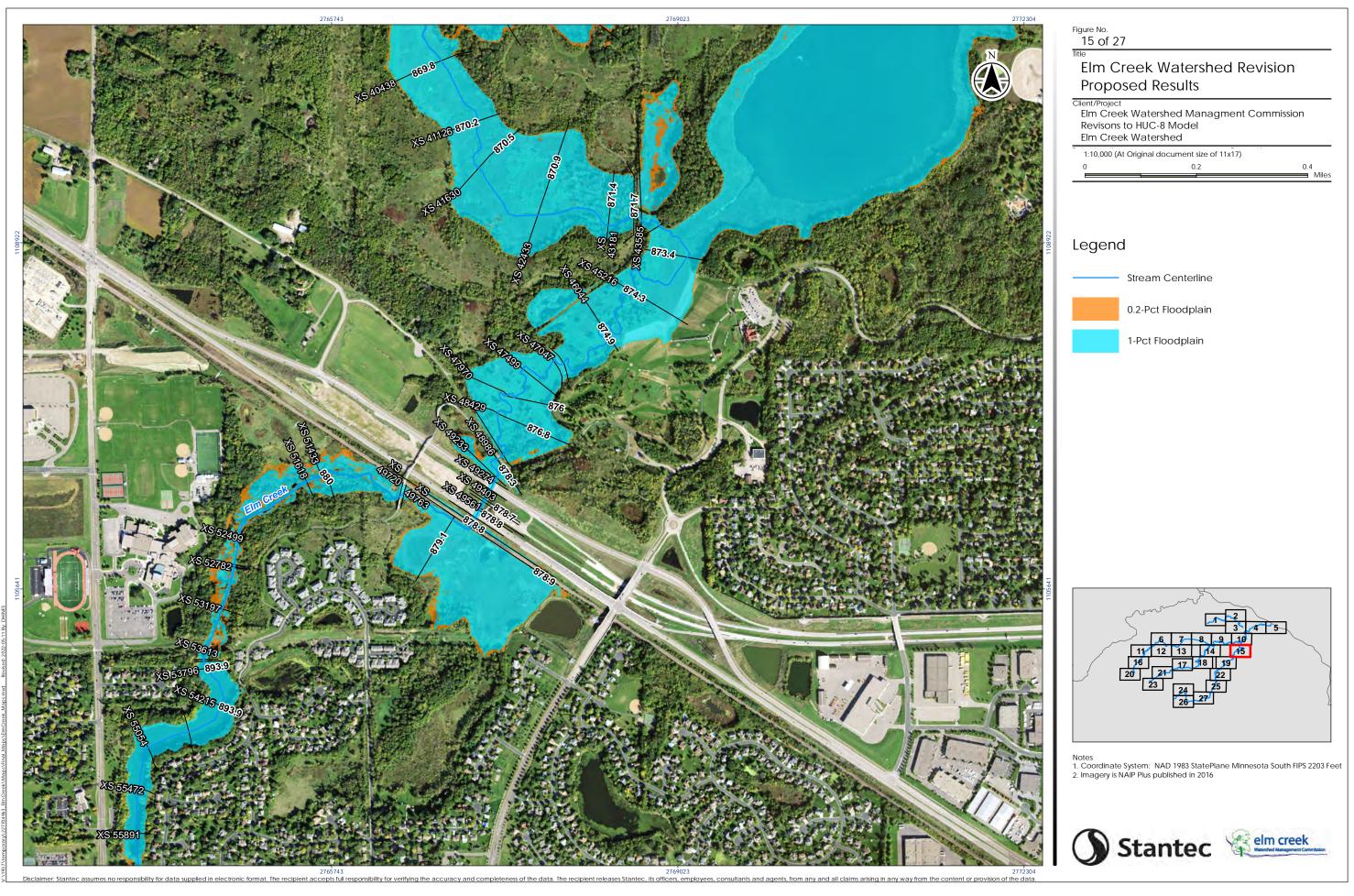


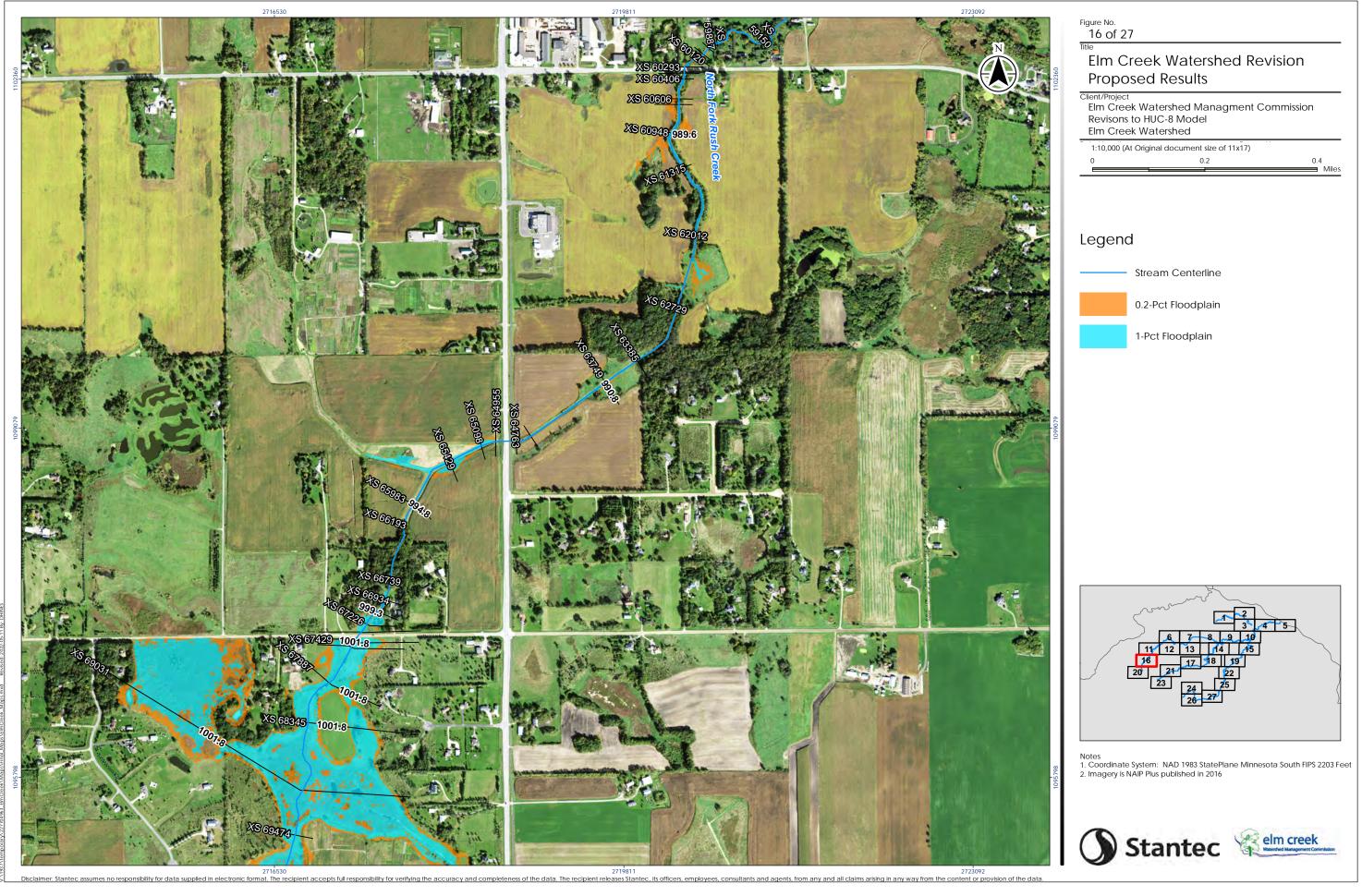


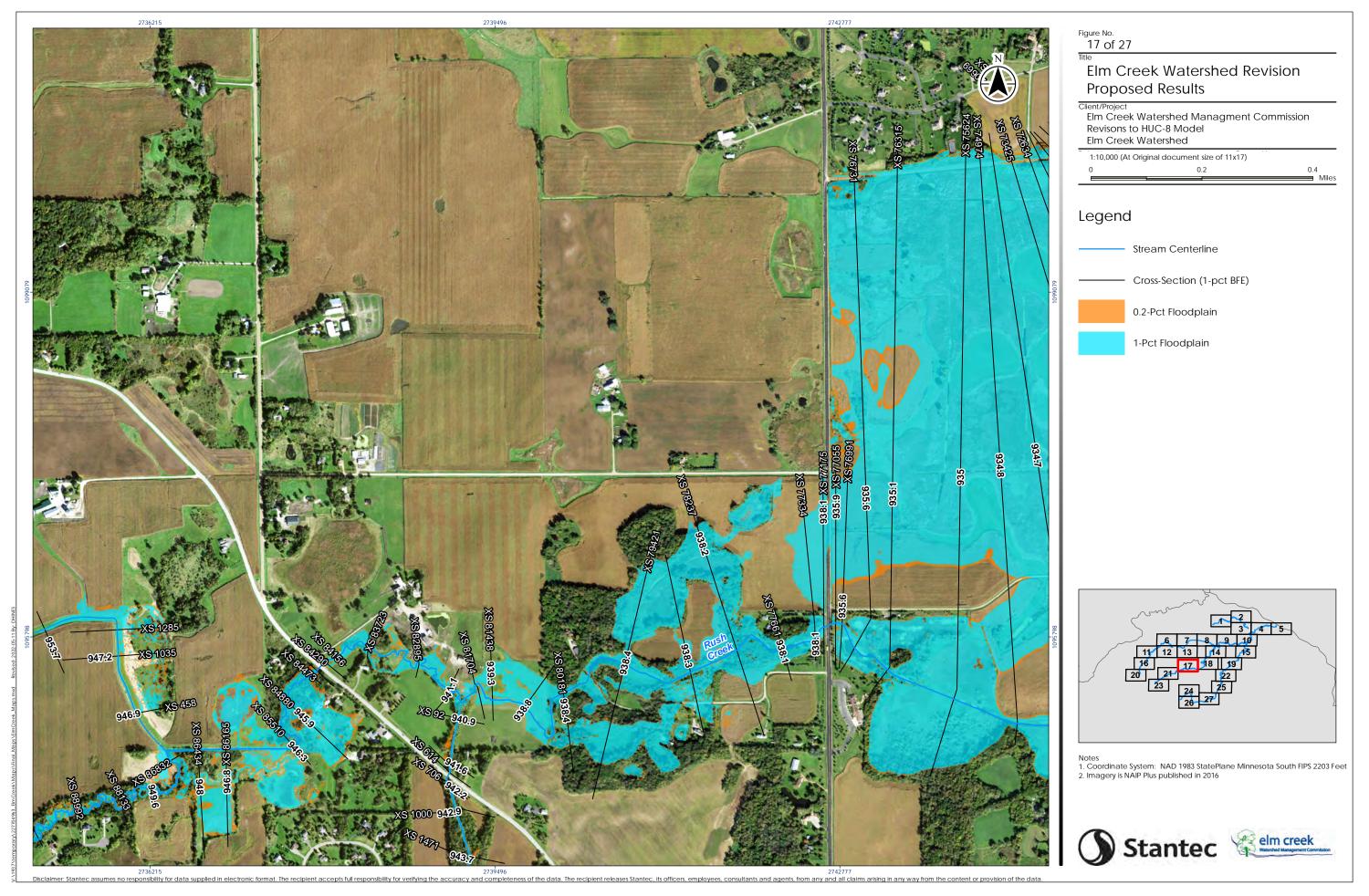


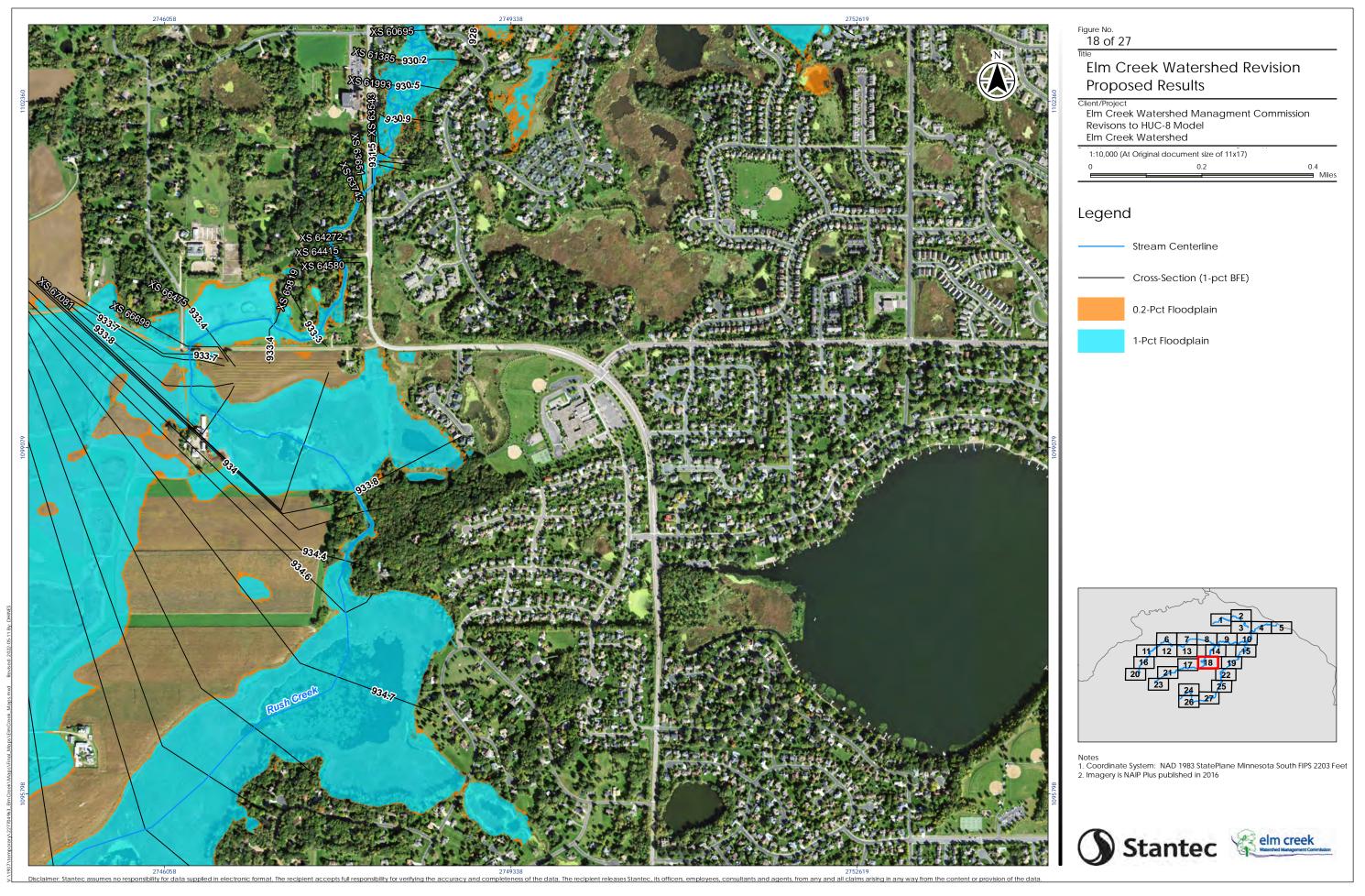


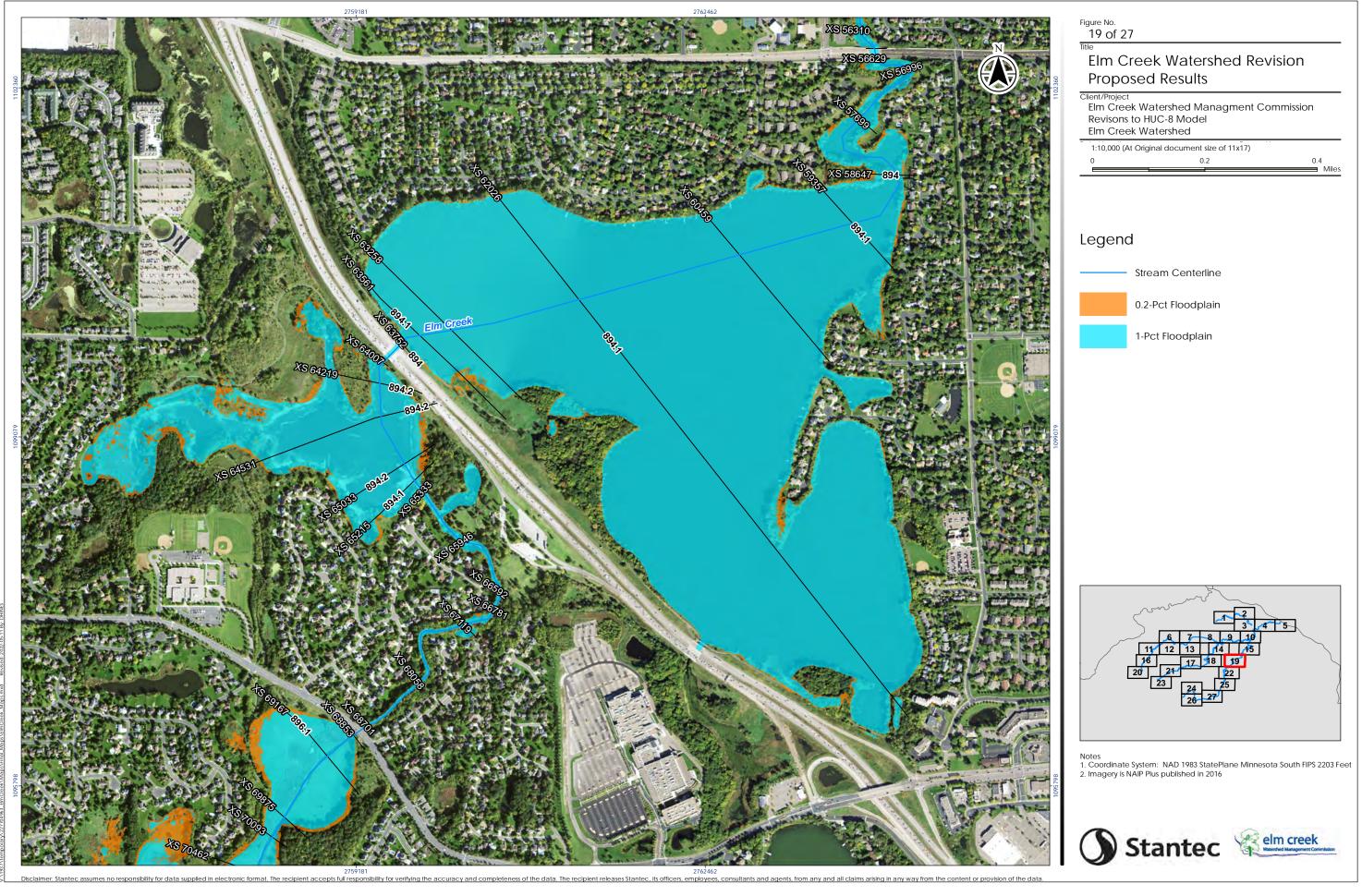


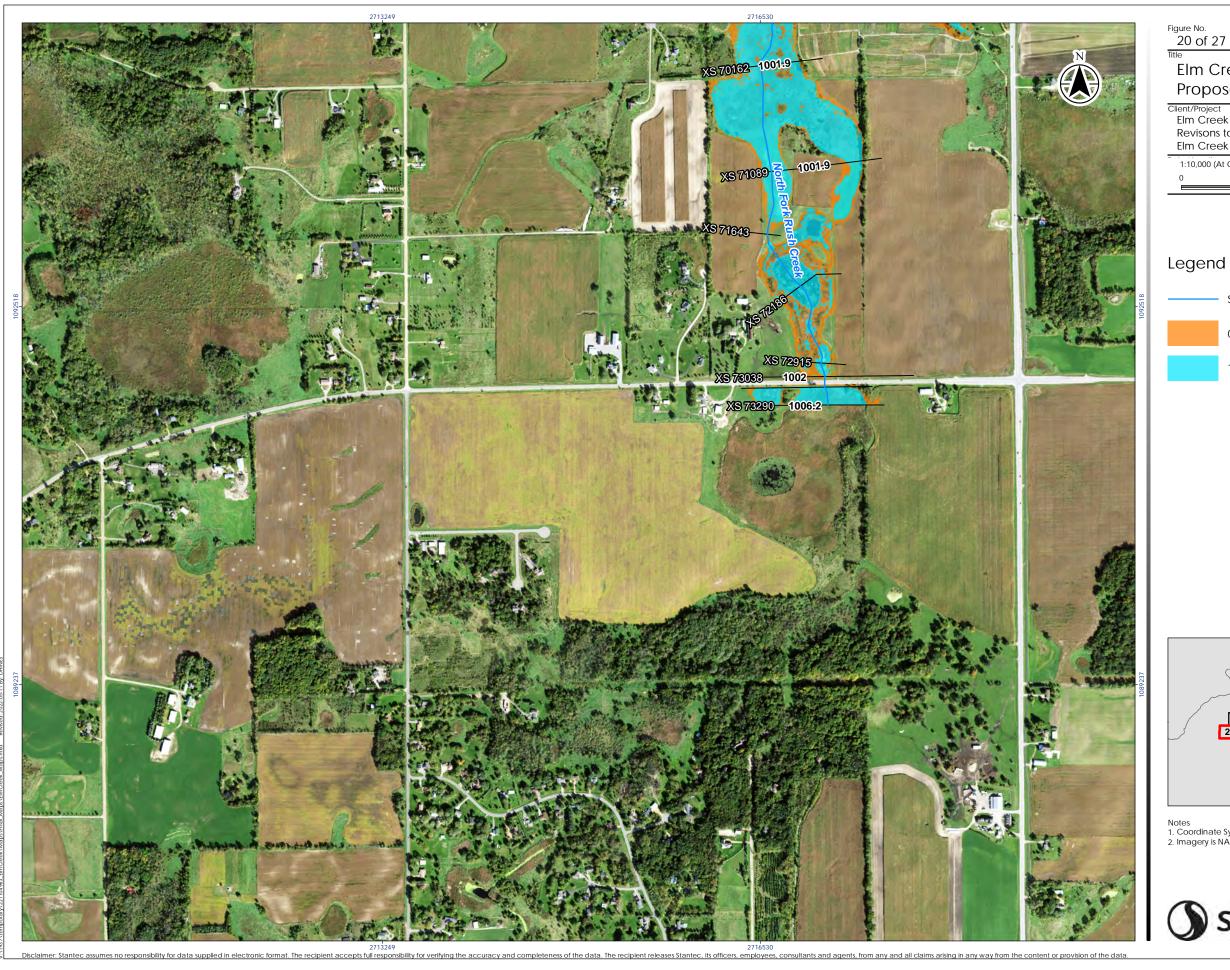












Elm Creek Watershed Revision **Proposed Results**

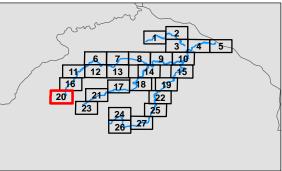
Client/Project
Elm Creek Watershed Managment Commission
Revisons to HUC-8 Model
Elm Creek Watershed

1:10,000 (At Original document size of 11x17)

Stream Centerline

0.2-Pct Floodplain

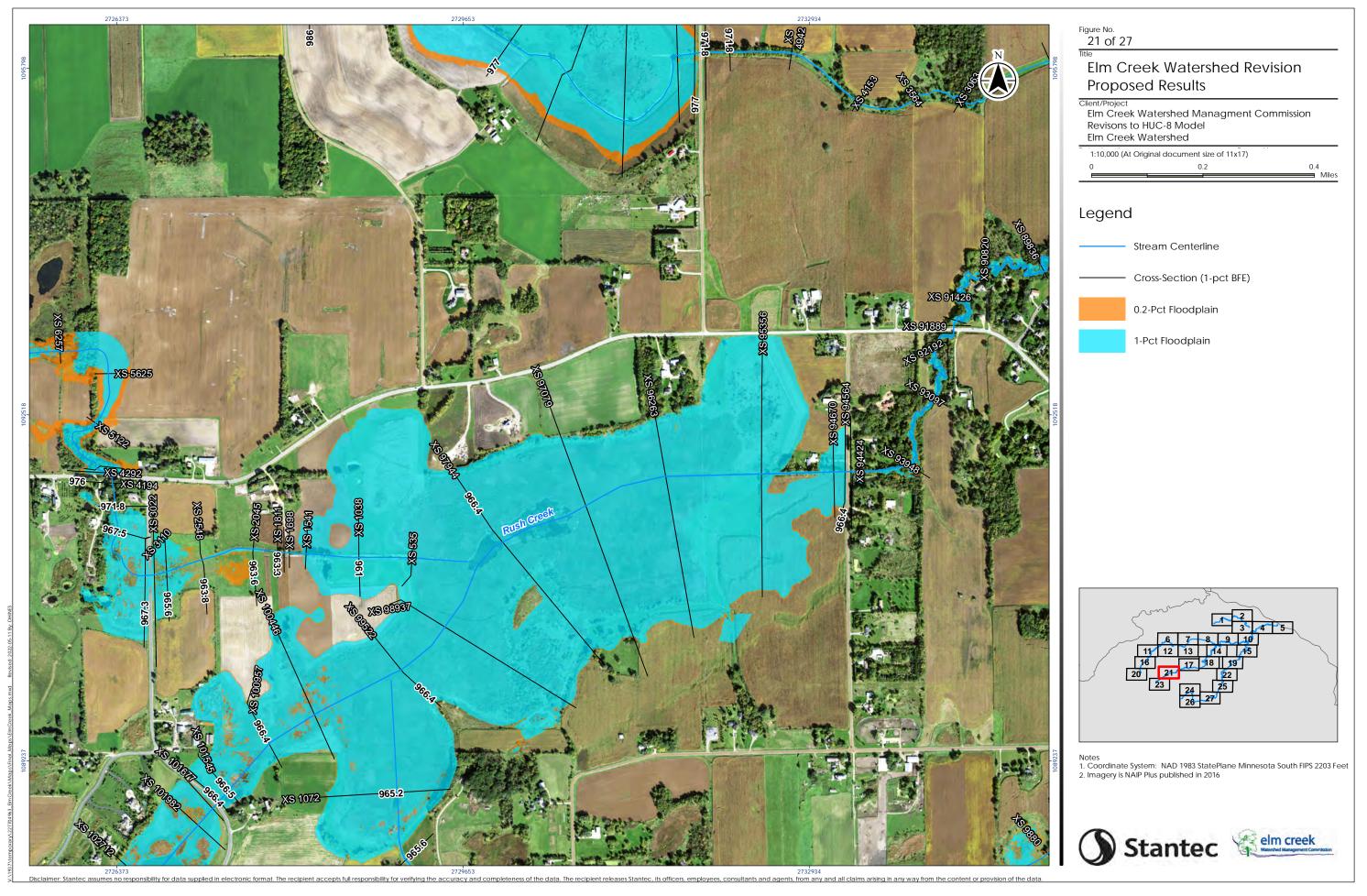
1-Pct Floodplain

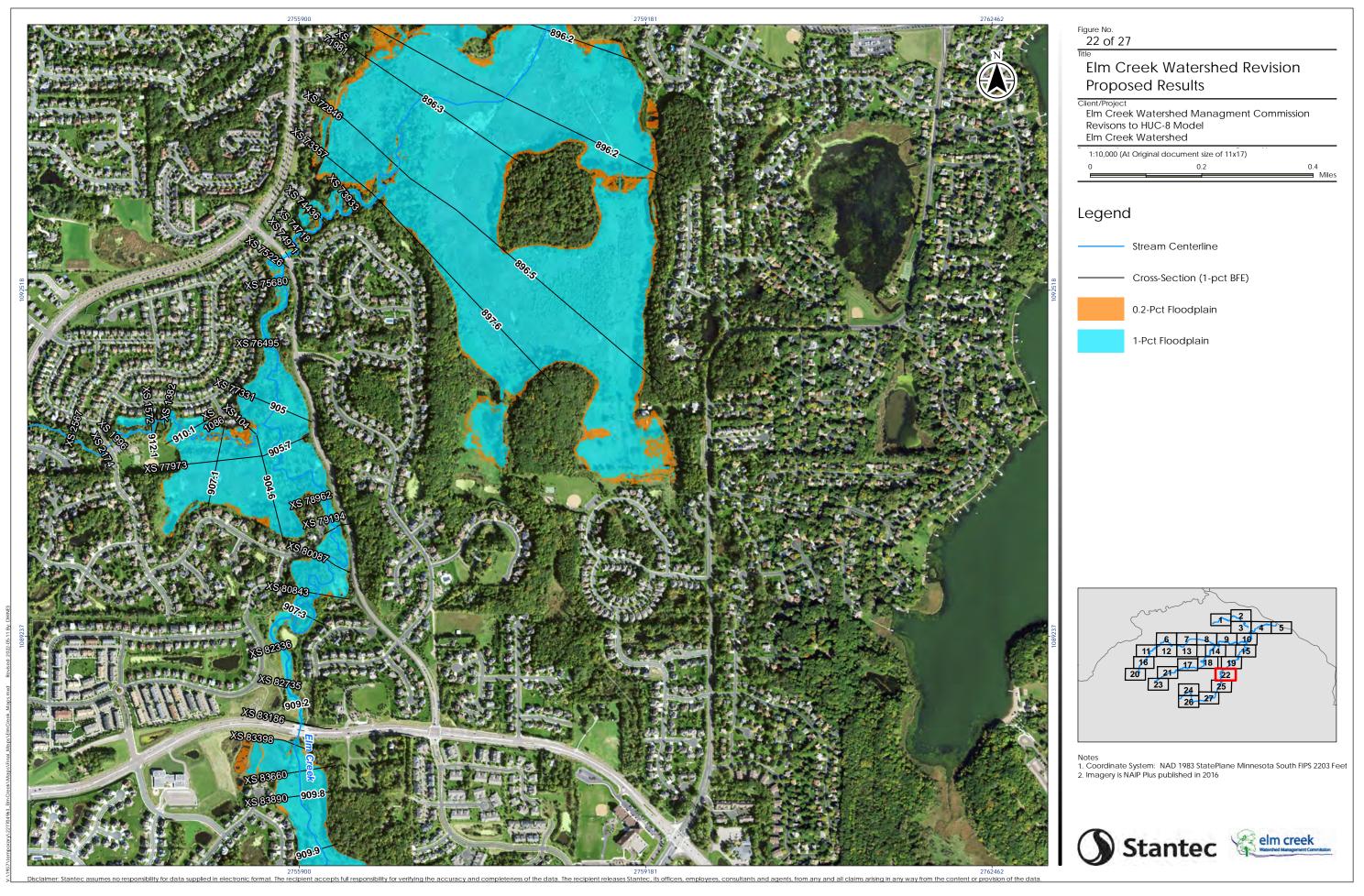


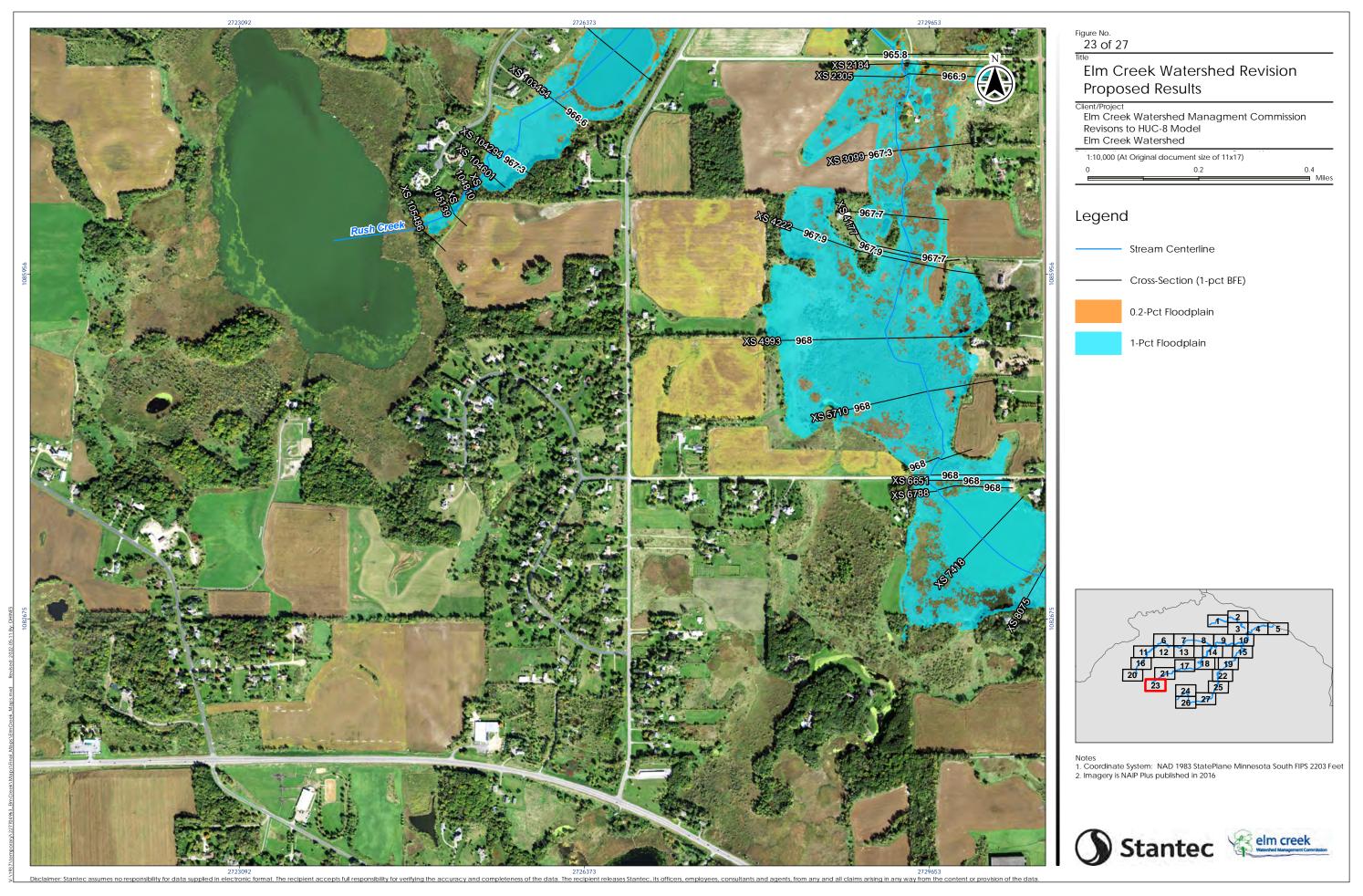
Notes
1. Coordinate System: NAD 1983 StatePlane Minnesota South FIPS 2203 Feet
2. Imagery is NAIP Plus published in 2016

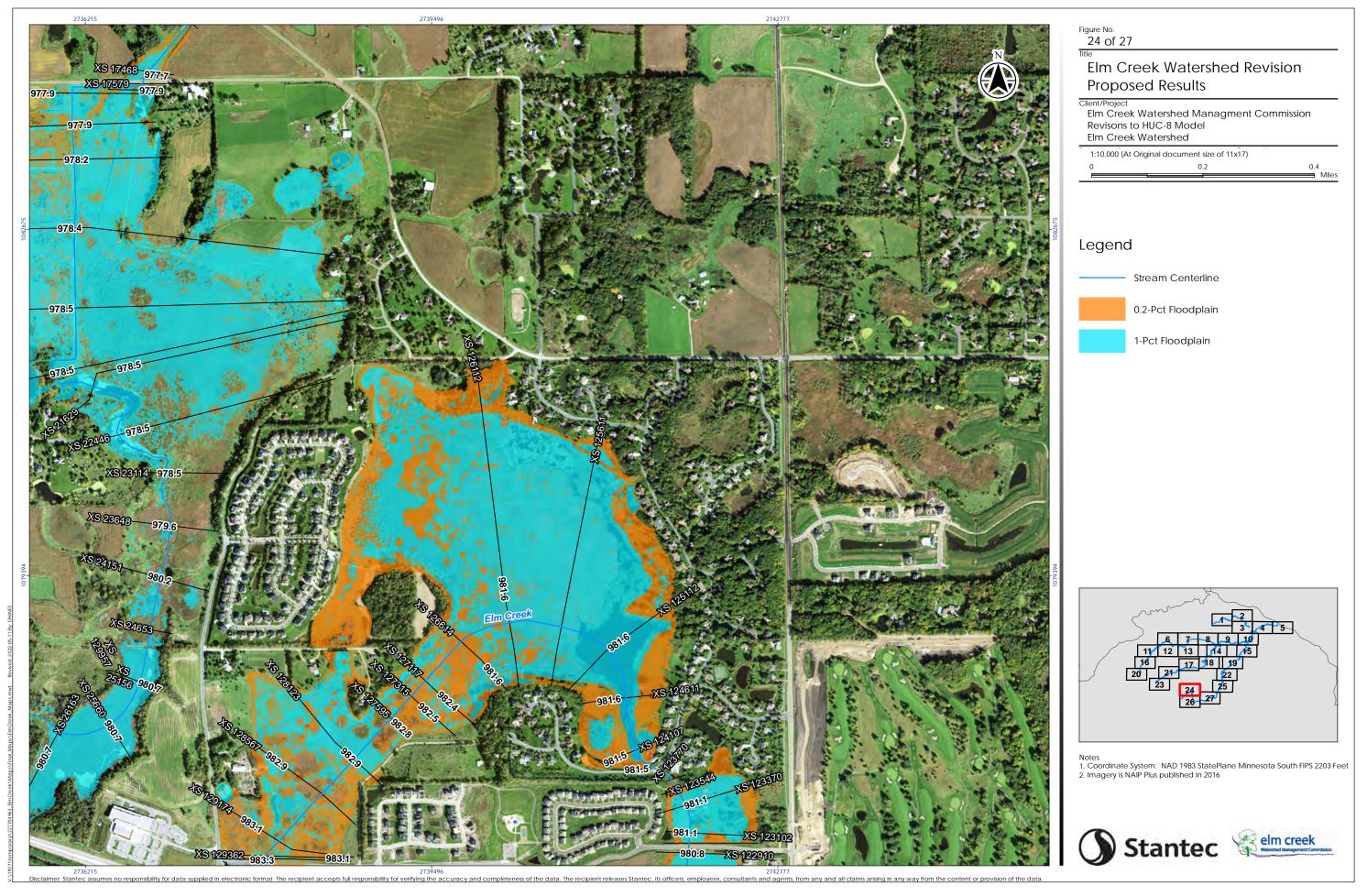


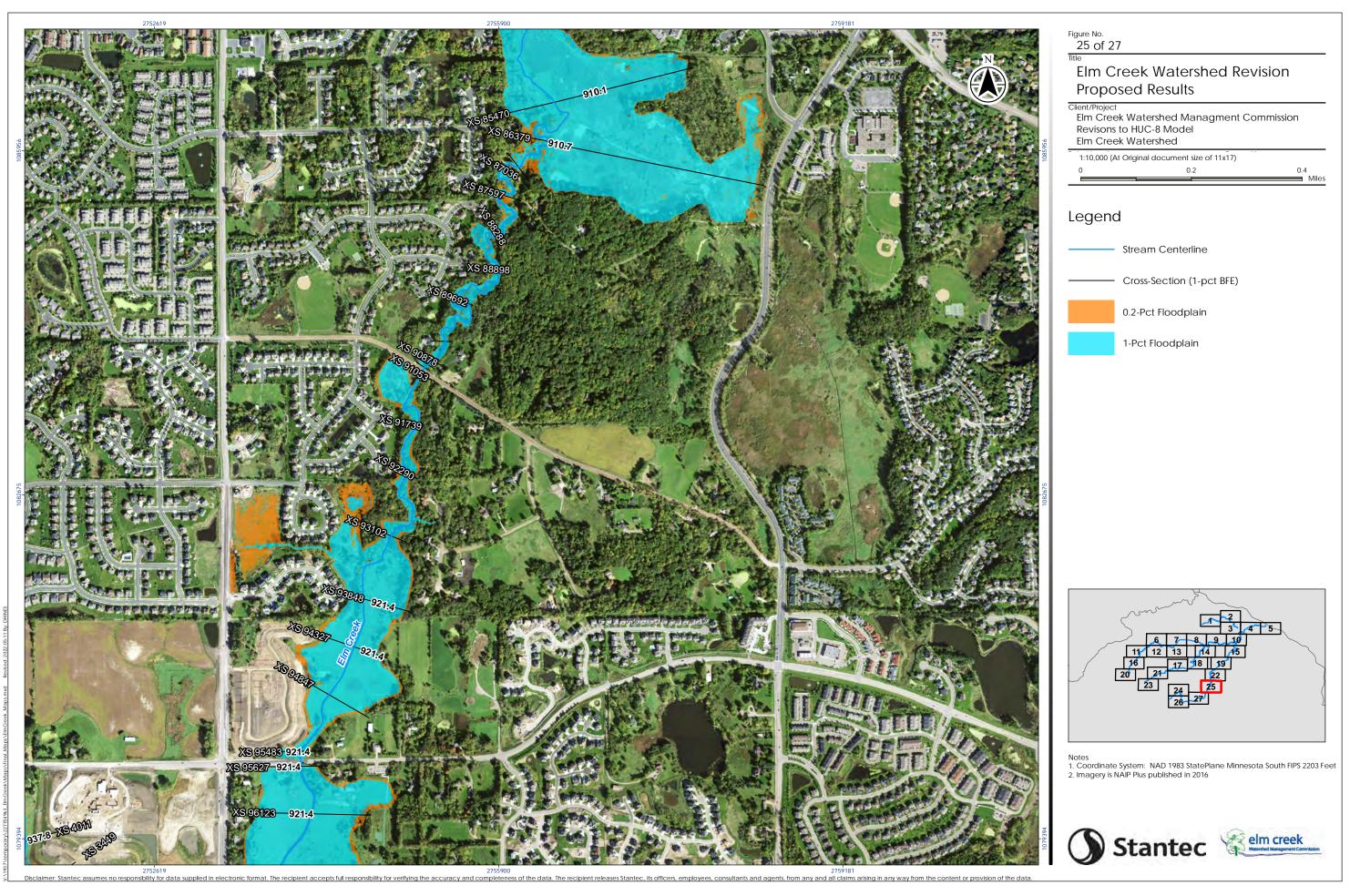


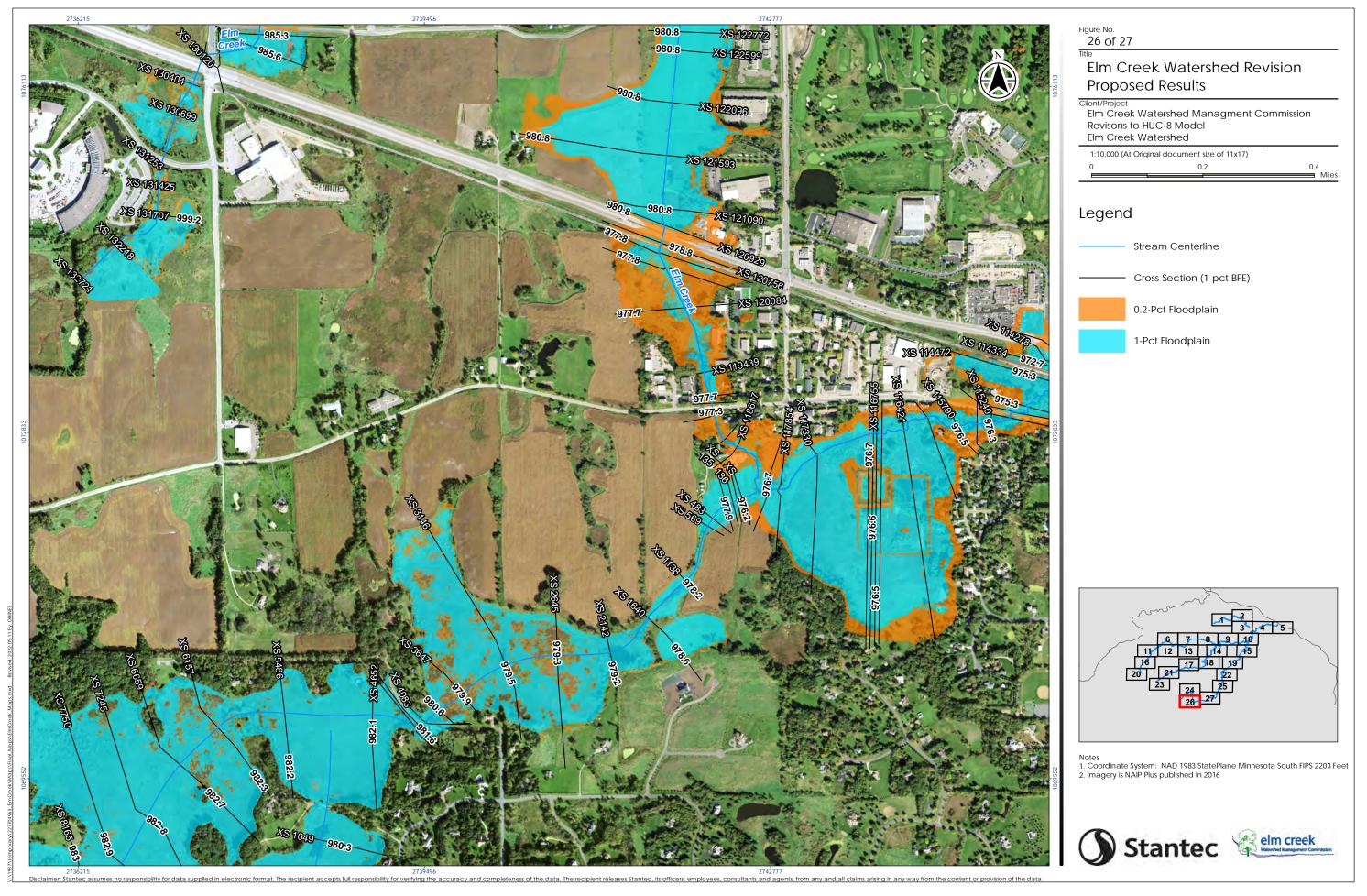


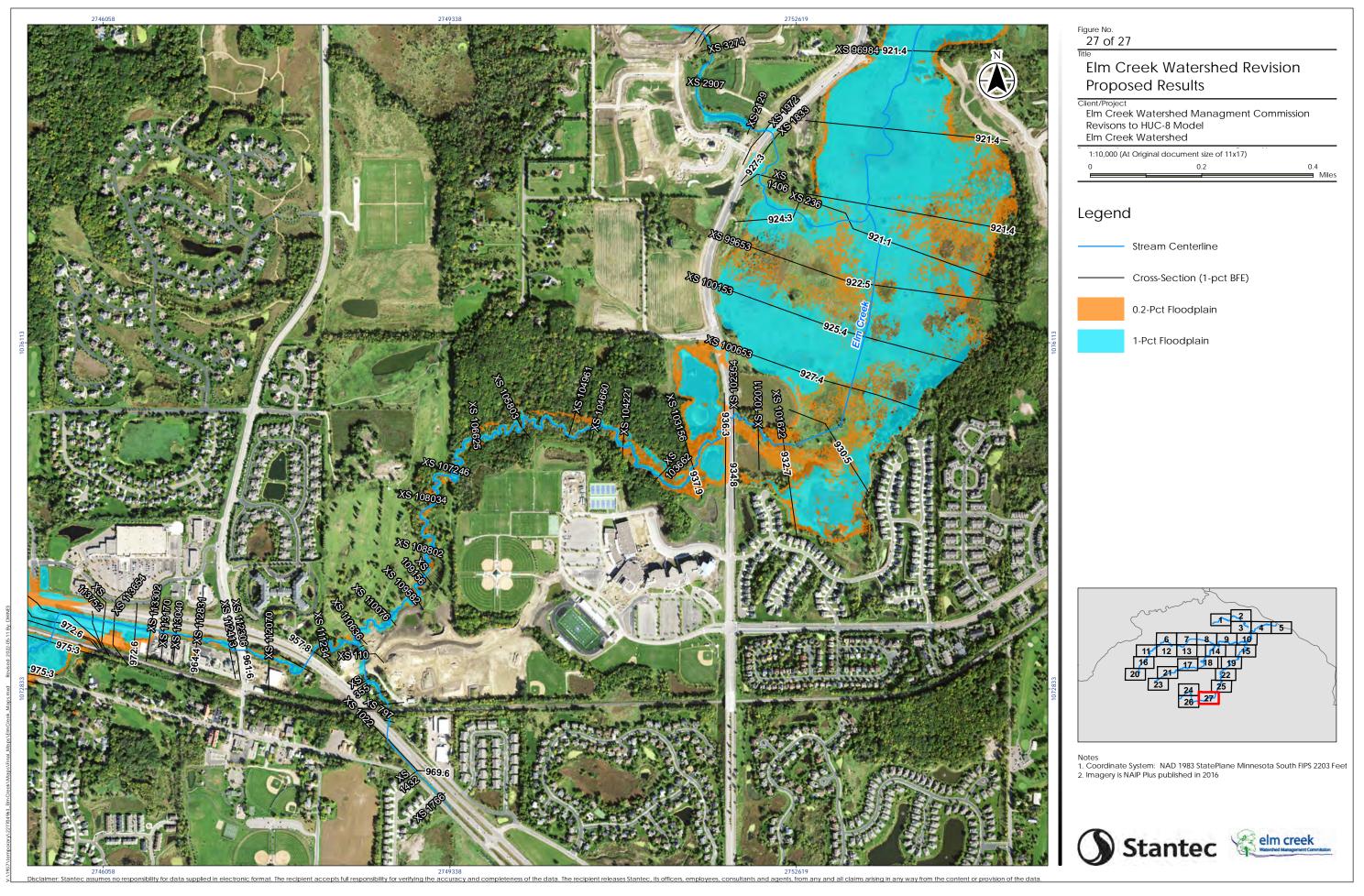












APPENDIX F

HEC-RAS Mapping Overview and Updates



Overall Model Updates

 Model was split into two separate geometries to allow for full extents of main stem streams and tributary streams to be mapped directly in HEC-RAS.

Table 1 Split Geometry Stream Groups

| Group 1 Streams | Group 2 Streams |
|------------------------|---------------------|
| Elm Creek | Rush Creek |
| Rush Creek Branch 1 | Elm Creek Branch 2 |
| Rush Creek Branch 2 | Elm Creek Branch 3 |
| Rush Creek Branch 3 | Elm Creek Branch 4 |
| Rush Creek Branch 5 | Elm Creek Branch 5 |
| Rush Creek Branch 6 | North Fork Rush |
| Rusii Cleek Dialicii 0 | Creek Branch 1 |
| Rush Creek Branch 7 | North Fork Rush |
| Rusii Cleek Dialicii i | Creek Branch 2 |
| North Fork Rush Creek | Diamond Creek |
| Elm Creek Branch 1 | Rush Creek Branch 4 |

Group 1 Model Updates

Elm Creek

- Flow change locations were adjusted according to the river station updates.
- Left portion of XS extended at locations: 17159, 17870, 18774, 19466, 11839, 37254, 38150, 39051, and 65215.
- Right portion of XS extended at locations: 19466, 15477, and 13893.
- Left portion of XS adjusted at: 77973
- Areas of centerline not in floodplain: 101622 to 100653
- IFA adjustment at XS: 90982, 63561, 90939
- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Elm Creek Branch 1

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.



North Fork Rush Creek

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 18117 and 72915
- Moved XS 73061 slightly downstream outside of structure embankments. Now station 73038.

Rush Creek Branch 1

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 8442 and 13645

Rush Creek Branch 2

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Rush Creek Branch 3

• No adjustments made to model geometry.

Rush Creek Branch 5

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- XS 18625 adjusted station elevation point inside channel that appeared to be incorrectly pulled to a higher elevation.

Rush Creek Branch 6

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Rush Creek Branch 7

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 6961



Group 2 Model Updates

Diamond Creek

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 10367

North Fork Rush Creek Branch 1

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Rush Creek Branch 4

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 5320, 5792, 5525, 5113
- Right portion of XS shortened at locations: 9126 and 9250
- Con/Exp coefficients increased to 0.3 and 0.5 respectively for XS's 9552 and 9632 to account for significant changes in floodplain extents (widening)

Rush Creek Branch 5

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- IFA adjustment at XS: 15055

Rush Creek

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- 2 Additional Cross sections added at downstream end for tie in: 724 & 298
- IFA adjustment at drawdowns along structures mainly.

Elm Creek Branch 2

 Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.

Elm Creek Branch 3

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- Additional Cross section added at downstream end for tie in: 15



Elm Creek Branch 4

- Bank station and n value adjustment done for cross sections with bank stations significantly higher than 100 yr WSEL after flow adjustment.
- 2 Additional Cross sections added at downstream end for tie in: 810 & 236
- River station adjusted and centerline adjusted at downstream end to appropriately tie into the main stem stream